OKLAHOMA DEPARTMENT OF TRANSPORTATION
MULTIPLE LOCATIONS

PRELIMINARY MONOPILE DESIGN REPORT

FOR

MKARNS MOORING MODERNIZATION PROJECT

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EXECUTIVE SUMMARY

A major flood event in 2019 resulted in two barges breaking loose and hitting the Webbers Falls Dam. In order to reduce the likelihood of a similar occurrence, the Oklahoma Department of Transportation (ODOT) has commissioned Lanier & Associates Consulting Engineers, Inc. (Lanier) and CONSOR Engineers, LLC (CONSOR) to do the preliminary engineering necessary to design new mooring structures along the McClellan-Kerr Arkansas River Navigation System (MKARNS). The new mooring dolphins will be located where existing mooring structures are deficient or obsolete. The new mooring dolphins will be designed to protect down river structures by minimizing the likelihood of breakaways.

In previous studies, three ports were selected to receive new mooring dolphins: The Port of Catoosa, Port of Muskogee, and Oakley's 33 Grand River site. This study focused on the further development of the barge mooring improvements needed at each proposed site. All previous reports and inspections were reviewed and sites visits conducted to determine the specific improvement needs of each site. It was concluded that six (6) new mooring dolphins would be installed at the Port of Catoosa, twenty (20) for the Port of Muskogee, and six (6) for the Oakley's 33 Grand River site.

A hydraulic study, geotechnical study, and topographic and hydrographic surveys were performed for this project and preliminary findings were used to develop this report. The information gathered from these studies was used for the preliminary design of the new mooring dolphins for each site. Based on our proven industry practice and discussions with ODOT and the ports, single-pile mooring dolphins, commonly referred to as monopiles, were chosen as the design barge dolphins. An example of a single-pile mooring dolphin can be seen in Figure 1


FIGURE 1-INSTALLED BARGE MONOPILES

Our preliminary study developed an opinion of probable cost and schedule for the installation of new barge mooring dolphins at each of the proposed sites. Below is a summary of the cost and schedules anticipated for each site. This cost and schedule was developed based on the anticipated pile details determined from the engineering study and a review of the cost and durations of past projects with similar installation details.

TABLE 1 - ESTIMATED FACILITY CONSTRUCTION COST AND SCHEDULE

Port	Number of Proposed Dolphins	Estimated Construction Cost	Estimated Schedule
Port of Catoosa	6	$2,734,000	15 months
Port of Muskogee	20	$10,017,000	23 months
Oakley's 33 Grand River site	6	$3,502,000	15 months

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INTRODUCTION

Lanier & Associates Consulting Engineers, Inc. (Lanier) and CONSOR Engineers, LLC (CONSOR) were commissioned by the Oklahoma Department of Transportation (ODOT) to perform preliminary engineering for the addition of several new mooring dolphins at several ports along the McClellan-Kerr Arkansas River Navigation System (MKARNS). In 2019, severe flood flows resulted in two barges breaking away from their anchorage and striking the Webber Falls Dam.

ODOT is taking the opportunity to upgrade obsolete and deficient mooring structures. The dolphins are to be designed for normal operating loads and extreme flood events. The scope of the study was to: investigate design loads for normal operating conditions and extreme flood events, prepare a preliminary mooring and breasting analysis, perform a preliminary design of new mooring dolphins, and prepare a proposed project schedule and project construction estimate.

This project proposes the installation of thirty-two (32) new mooring dolphins. The new dolphins will be designed as single-pile mooring dolphins, commonly referred to as monopiles. Each monopile will have a varying wall thickness to provide both an effective and economical design. The monopiles will include mooring rails to accommodate moored barges in a variety of river elevations, and will be fitted with laminated rubber fendering.

Based on previous studies and discussions between the ports and ODOT, the thirty-two (32) new mooring dolphins will be located as follows: six (6) for Port of Catoosa, twenty (20) for Port of Muskogee, and six (6) for Oakley's 33 Grand River site. The location of the three ports is shown in Figure 2 below. Three (3) monopiles should be used per barge to provide redundancy for mooring lines.

FIGURE 2 - OVERALL PORT LOCATIONS

EXISTING AND PROPOSED LAYOUTS

PORT OF CATOOSA

The Port of Catoosa is the most upriver port on the MKARNS, north of Tulsa, Oklahoma. The full design basis for the Port of Catoosa can be found in *Appendix A - Port of Catoosa Design Basis.* This port is in a side-channel off the Verdigris River and serves both bulk and liquid barges.

The current mooring and breasting structures consist of a concrete cap supported by multiple piles. See Figure 3 for a picture depicting a typical mooring and breasting structure at the port. Above each concrete cap is a steel-framed structure used for mooring, breasting, and loading/unloading barges. The six (6) structures that will be replaced are separated into two locations. Location 1 is along the northeast bank at the terminus of the channel and has three (3) existing dolphins that will be replaced. Location 2 is along the midpoint of the channel and also has of three (3) existing dolphins that will be replaced. See Figure 4 for the locations of the proposed dolphins. The current mooring dolphins support loading/unloading structures. The existing loading structures will be removed by the Port of Catoosa prior to installation of new monopiles, any new barge loading structures are not a part of this design.

FIGURE 3 - EXISTING MOORING DOLPHINS

The six (6) mooring dolphins exhibit surface corrosion on all off the superstructures. Based on the site inspection performed by Lanier and the previous inspection performed by BKL, Inc., these dolphins have significant structural deficiencies and should be replaced. See *Appendix D - Facility Assessment Report* for the detailed inspection report.

FIGURE 4 – PORT OF CATOOSA DOLPHIN LOCATIONS

PORT OF MUSKOGEE

The Port of Muskogee is located near mile marker 393.4 on the west bank of the Arkansas River. The design basis for the Port of Muskogee can be found in *Appendix B - Port of Muskogee Design Basis*. The current breasting structures are comprised of three (3) piles connected by steel bracing. After the 2019 flood, an additional pile with mooring rings was installed to accommodate higher river stages. See Figure 5 for a picture showing a typical mooring structure at the Port of Muskogee.

During the 2019 flood, the river water overtopped the existing mooring structures. For this reason, Lanier has determined that these structures are operationally obsolete. Of the twenty (20) new dolphins proposed, seventeen (17) will be placed downriver of the loading dock, and the other three (3) will be placed upriver. Two of the dolphins support an overhead crane used to load and unload barges. These dolphins will remain in place, and the new monopiles will be driven adjacent to the existing structures. See Figure 6 for an overview of the Port of Muskogee with the proposed mooring locations.

FIGURE 5 - EXISTING MOORING DOLPHINS

FIGURE 6 - PORT OF MUSKOGEE DOLPHIN LOCATIONS

OAKLEY'S 33 GRAND RIVER SITE

Oakley's 33 Grand River site is located near the Port of Muskogee at the mouth of the Neosho River. This port is used for barge fleeting. The barges are moored by tying off to lines that are anchored to large concrete blocks that have been buried on shore, commonly referred to deadmen. The design basis for the Oakley's 33 Grand River site can be found in *Appendix C - Oakley's 33 Grand Site Design Basis*.

The current mooring arrangement does not provide ridged structures for barges to secure against to prevent excessive movement. It has been observed that barges have been grounded when the water elevation falls. The proposed design would include six monopiles installed approximately 75 ft from the bank, directly offshore of the existing mooring site. This provides more secure mooring and places the barges in deeper water to mitigate grounding.

FIGURE 7 - OAKLEY'S 33 GRAND RIVER SITE DOLPHIN LOCATIONS

FACILITY ASSESSMENT AND REPLACEMENT PRIORITY

An inspection of the ports was performed by Lanier. The full report can be found in Appendix D The superstructure of the dolphins at the Port of Catoosa are in fair condition. The piles for these dolphins have begun to experience significant section loss. The mooring dolphins at the Port of Muskogee show signs of damage with several braces missing and beam that have been crushed. Oakley's 33 Grand River Site does not have any breasting/mooring structures only deadman anchors on shore used for mooring.

A decision matrix, see Table 2 on page 6, was created to assist ODOT in prioritizing structures for installation.

The following criteria were used in the Decision Matrix (graded on a scale of 1 - 5):

- Need Based on Condition of Existing Berth Structures - the current condition of the existing structures.
- Need Based on the Functional Obsolescence of Existing Structures – how well the existing structures measure up to current design standards.
- Need Based on the Hydraulic Loading at the Facility – the river conditions that would prompt a barge breakaway, specifically river elevation and flow.
- Need Based on the Reduction of Risk Due to Extreme Flooding Events – this factor is based on the likelihood of a breakaway barge damaging a downstream bridge or dam.
- Cost Efficiency of the Installation / Per berth – the cost per berth at a particular installation verses the cost per berth at the other installations.

For the Grading Scale, the higher the number, the greater the assumed benefit to the MKARNS system. The weight given to each criterion was determined with input from ODOT.

TABLE 2 - DECISION MATRIX – PRIORITIZATION OF IMPROVEMENTS AT THE THREE PORTS

Grading Scale 1 - 5	**Ports/Facilities**		
Criteria Considered for Prioritization	**Port of Catoosa**	**Port of Muskogee**	**Oakley's 33 Grand River**
Need Based on Condition of Existing Berth Structures	3	4	4
Need Based on the Functional Obsolescence of Existing Structures	3	3	5
Need Based on the Hydraulic Loading at the Facility	2	5	5
Need Based on the Reduction of Risk Due to Extreme Flooding Events	3	5	5
Cost Efficiently of the Installation / Per berth	5	3	2
Total Grade	**16**	**20**	**21**

ENVIRONMENTAL CONDITIONS

Relevant information from the design bases for each facility, Appendix A through C are summarized below.

PORT OF CATOOSA (APPENDIX A)

Design Low Water Elevation	532 feet
Design High Water Elevation	560 feet
Extreme High Water Elevation	560 feet
Normal Design Current – Low River Ebb	1 knot
Normal Design Current – High River	1 knot
Bedrock Elevation	520 feet
Maximum Wind Velocity for Mooring	75 knots
Operating Wind Velocity for Breasting	40 knots

PORT OF MUSKOGEE (APPENDIX B)

Design Low Water Elevation	488.5 feet
Design High Water Elevation	518.5 feet
Extreme High Water Elevation	522 feet
Normal Design Current – Low River Ebb	2 knot
Normal Design Current – High River	6.6 knot
Bedrock Elevation	468 feet
Maximum Wind Velocity for Mooring	75 knots
Operating Wind Velocity for Breasting	40 knots

OAKLEY'S 33 GRAND RIVER SITE (APPENDIX C)

Design Low Water Elevation	488.52 feet
Design High Water Elevation	517.5 feet
Extreme High Water Elevation	522 feet
Normal Design Current – Low River Ebb	2 knot
Normal Design Current – High River	6.6 knot
Bedrock Elevation	468 feet
Maximum Wind Velocity for Mooring	75 knots
Operating Wind Velocity for Breasting	40 knots

BREASTING LOADS

All of the ports will be designed using the same berthing loads. The barge tows used for design will be based on the largest barge tow that can fit through the locks at Chouteau Lock and Dam 17. This is comprised of twelve (12) 35'x200' inland barges arranged in floats that are three barges wide and four barges long. Currently, the MKARNS is only dredged to a depth of 9 feet, relative to the design low water condition. Considering a feasibility study performed by the US Army Corps of Engineers[a], discussions with the ports, and the findings of this report, a design draft of 12 feet will be used to account for future dredging. For safety reasons, barges are not moved when the flow exceeds 150,000 cfs at the Port of Muskogee and Oakley's 33 Grand River site. This flow rate will determine the maximum water elevation that will be used.

Depending on the design of the structure, there are two ways to determine the load imparted on the structure from the barge tow berthing. The first method is a dynamic analysis while the second is a static analysis. The dynamic method utilizes balancing kinetic energy of the barge tow with the structure's ability to absorb and dissipate energy. The structure dissipates energy through elastic deformation; therefore the dynamic method is best for flexible structures. For rigid structures, empirical data collected by the US Army Corps of Engineers is used to determine the reactions from a barge tow onto the structure.

Regardless of the method used to determine the breasting load the approach velocity is determined the same way. The approach velocity shall be determined based on a favorable berthing condition, sheltered. The berthing velocity from PIANC[b] is shown in Table 3. The velocity that is used in the calculation is 7 in/s (0.58 ft/s).The berthing velocity was determined based on "favorable conditions" resulting in a selected velocity of 0.18 m/s (0.58 ft/s, 7 in./s). Although the design velocity is higher than the upper end presented in the PIANC (2002) Table, this is reasonable due to the variability of the barge tow's weight. These values presented in PIANC assume a barge is assisting by pushing the barges towards the berth. Based on experience, the barge tow will have a tug boat on the stern and swing the barges into the berth. For this reason we believe a higher number is needed. If ODOT or the Ports are aware of larger velocities typically used during berthing, the design velocities should be elevated.

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[a] Little Rock District, Tulsa District. "Arkansas River Navigation Study Arkansas and Oklahoma Final Feasibility Report" US Army Corps of Engineers, 2005.

[b] PIANC. *Guidelines for the Design of Fender Systems: 2002*. Brussels, Belgium: International Navigation Association, 2002.

TABLE 3 - PIANC SUGGESTED APPROACH VELOCITY (m/s)

Vessel displacement in tonnes	Favorable Condition	Moderate Condition	Unfavorable Condition
Under 10,000	0.2-0.16	0.45-0.3	0.6-0.40
10,000 – 50,000	0.12-0.08	0.3-0.15	0.45-0.22
50,000-100,000	0.08	0.15	0.20
Over 100,000	0.08	0.15	0.20

DYNAMIC METHOD

The monopiles are designed to deflect when barge tows breast against them to gradually dissipate the kinetic energy of the barge tow in a safe manner and slowly bring the barge tow to a stop. The monopile needs to be designed to be strong enough to withstand the large loads of the barge tow while being flexible enough to deflect without damaging the monopile or the barge hull at the point of contact. The kinetic energy of the barge tow is calculated in accordance with PIANC Guidelines for the Design of Fender Systems.

The energy absorption of the fenders is provided by the vendor, and the energy absorption of the monopile is calculated by integrating the force vs displacement curve. For monopiles, this formula is presented below where E is the energy, P is the applied force, and Δ is the displacement due to the applied force.

$$E = \frac{1}{2} P\, \Delta$$

The weight of the barge tow (W, in metric tons) is determined by calculating the displaced weight of water. The weight of the tug, assumed to be 250 tonnes/tug, also needs to be accounted for.

$$W = LOA \times B \times D \times 62.4pcf \times \frac{1\,MT}{2204\,lbs} + 250MT = 28{,}790MT$$

Where : LOA (length overall) = 800 ft (4x200ft)
B (Beam) = 105 ft (3x35ft)
D (Draft) = 12 ft
Unit weight of water = 63.4 pcf

The abnormal impact factor is applied to the design energy. This factor is used to take into account a berthing that will exceed the design loads. Several factors can contribute to an abnormal berthing. All of these factors should be taken into account when selecting the impact factor. The factors that contribute to the abnormal impact factor are described in detail in PIANC Section 4.2.8.4[b]. The abnormal berthing factor used for this barge tow is 1.25.

Based on PIANC[b], a fender that deforms less than 6 inches under the design load is considered a hard fender. Based on the analysis, the deflection of the design monopiles is less than 12 inches. The softness coefficient will therefore be 0.9.

This coefficient also takes into account the dock configuration. If the dock has a closed support system, water displaced during a berthing operation will have a more difficult time moving around the ship as the ship as it moves closer to the fenders. This will cause the water to act as a cushion and dissipate some of the energy. As the monopile design is considered an open structure, a factor of 1.0 will be used.

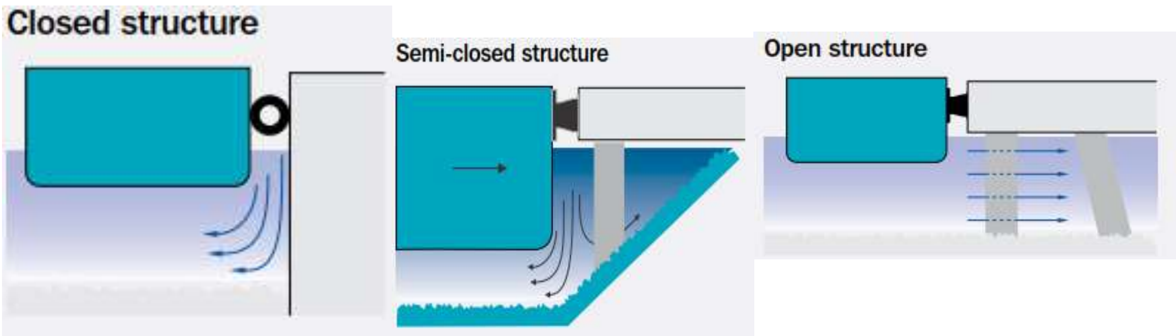


FIGURE 8 - BERTH STRUCTURE CONFIGURATIONS

Calculation of Berthing Energy (based on Vasco Costa Method)			
E	184	kip-ft	= Berthing Energy = W Ce Cm Cs Cc V2 / 2g
W	28,790	tonnes	= Displacement of vessel (including tug)
g	32.2	ft/sec2	= Acceleration of gravity
V	0.58	ft/sec	= Approach velocity of vessel normal to the berth
C_m	1.00		= Virtual (hydrodynamic) mass coefficient = 1+2D/B
D	12.0	feet	= Mean draft of vessel
B	105.0	feet	= Beam of vessel
C_s	0.90		= Softness coefficient
C_e	0.61		= Eccentricity coefficient = (r2+r2cos2g)/(r2+m2)
C_c	1.00		= Configuration coefficient
r	240.00	feet	= Radius of gyration of the ship = (0.19*BC+0.11)*LOA
m	206.78	feet	= Distance between the center of gravity of the vessel and the berthing contact
g	75.3	degrees	= Angle that the velocity of ship makes with line connecting the center of gravity with contact point
LBP	800.00	feet	= Length between perpendiculars (excludes tug)
BC	1.00		= Vessel block coefficient = W / (LOA*B*D*den) all values in metric (not to exceed 1.0 for barges)
den	62.4	lb/ft3	= Density of water (freshwater = 62.4 lb/ft3, seawater = 64.3 lb/ft3)
LOA	800.0	feet	= Length overall (excludes tug)
x	0.25		= fraction of LOA from end of vessel to berthing contact point (e.g. 0.25, 0.33, 0.4 etc.)

The berthing energy is calculated above. The energy used for the design of the monopile is the calculated energy (184 k-ft) multiplied by the abnormal berth factor (1.25). This design berth energy is 231 k-ft. An 11 inch thick laminated fender can absorb 6.25 k-ft/ft^2. It is assumed the contact area is 1 ft x 12 ft for a total fender energy of 75 k-ft. This reduced the energy the monopile must dissipate to 156 k-ft.

STATIC METHOD

At low water conditions, the contact point of the barge and the monopile is low enough that the dolphin is considered rigid. The limit to the force exerted by the barge tow on ridged structures is calculated based on the report by the US Army Corps of Engineers[c]. The formula used to determine the design force is shown in Figure 9. The maximum barge impact load that will be used as a limiting factor for berthing is:

$$F_m = 0.435\left(\frac{2W}{g}\right)\left(V_{ox}\sin\phi + V_{oy}\cos\phi\right) = 0.435\left(\frac{2\times 28{,}790\times 2.204/2}{g}\right)(0.58\times\sin 10° + 0.1\cos 10°)$$

$$F_m = 173\ kips$$

A load factor of 1.6 will be used for the berthing loads. A limiting load for berthing will be 276k

[c] Arroyo, Jose R, and Robert M Ebeling. Tech. *A Numerical Method for Computing Barge Impact Forces Based on Ultimate Strength of Lashing Between Barges*. Vicksburg, MS: US Army Corps of Engineers, 2004.

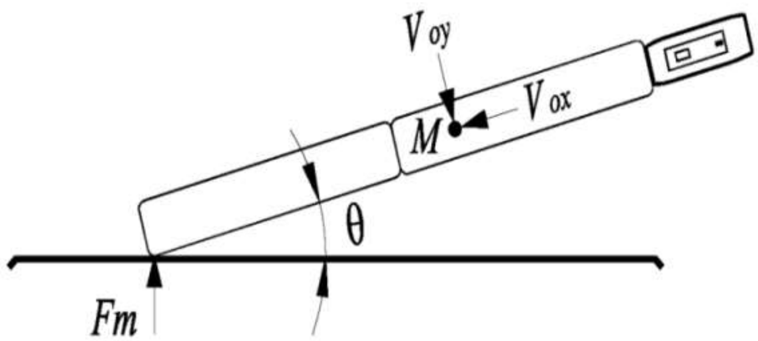
BARGE IMPACT

STATIC LOAD ON CONTINUOUS FENDER SYSTEM

Empirical Barge Impact Model – Deterministic Model

$$F_m = 0.435 * M * [V_{0x} * \sin(\ ) + V_{0y} * \cos(\ )] \text{-------- Eq. 1}$$

Equation 1 is valid for $F_m < 800$ kips



where, as shown in Figure above,

F_m = Impact force

V_{0x} = Initial longitudinal velocity of barge in x-direction, ft/sec

V_{0y} = Initial longitudinal velocity of barge in y-direction, ft/sec

M = Mass of barge train, kip-sec2/ft
= $2W/g$

W = Weight of barge train in short tons, including towboat (but excluding hydrodynamic added mass)

2 = Conversion factor from short tons to kips

g = 32.2 ft/sec^2

FIGURE 9 - BARGE STATIC LOADING

MOORING ANALYSIS

The mooring analysis was performed using the industry-standard design program Optimoor. The mooring analysis takes into account all environmental conditions and line arrangements and determines a controlling-case wind speed and direction. After discussions with the ports, the mooring arrangement that was selected is one that would allow for six (6) barges across. It will be assumed that a set of twenty-four (24) barges will be moored together in a 6x4 barge arrangement. For the purpose of analysis the barges will be moored as shown below in Figure 10.

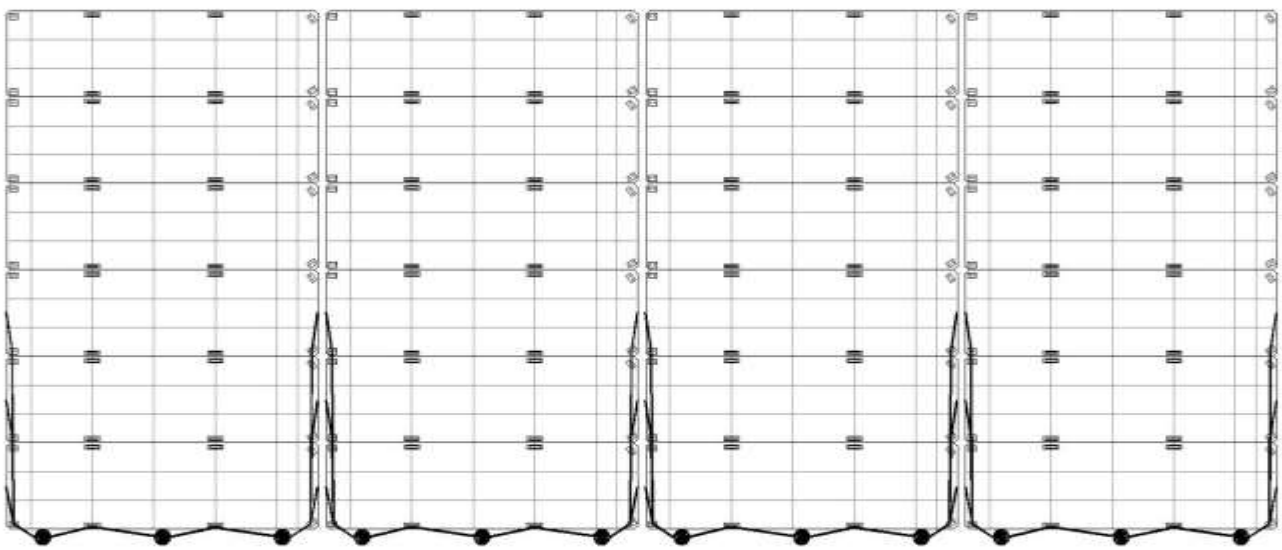


FIGURE 10 -MOORING ARRANGEMENT

The mooring lines for the analysis are 7/8" diameter Dyneema based on discussion with the ports. The breaking strength of these lines is 81.7 kips. The maximum allowable working load limit of these lines is 45 kips (55% of the design break strength force[d]). The allowable working load limit is used to determine an acceptable mooring line arrangement under normal mooring conditions. For extreme flow events the ports should use a larger quantity of lines.

For each mooring arrangement (normal and storm conditions), the bollard loads generated in the mooring analysis will be used to design the monopiles.

The current loads are based on the hydraulic analysis performed by Utley & Associates, LLC. The report can be found in Appendix F .

[d] OCIMF. Mooring Equipment Guidelines (MEG4). Witherby Publishing Group Ltd, 2018.

MOORING CASES INVESTIGATED

Two design currents will be used for the mooring analysis: the maximum current and the normal operating current. Based on a probability analysis, the chance of two 50 year events occurring simultaneously is 0.04%. For this reason, the extreme wind event and extreme flood loads will not applied concurrently. The maximum current load will be applied in combination with the normal operational wind speed. The maximum wind speed will be combined with a normal current velocity.

Due to the characteristics of the river, the current does not change direction. In all cases the current is aligned longitudinally with the river and the force is applied parallel to the fenderline. The wind will be applied in all directions to determine the controlling direction that produces the largest magnitude tension in each line. The results are presented as a wind rose illustrating the effect of the wind speed and direction on various vessel loads.

A total of eight (8) mooring conditions were evaluated based on the following parameters:

a) Barge tow arrangement: 6 wide x 4 long or 6 wide x 1 long
b) Draft: 1 ft or 12 ft
c) Wind/Current Speed: 75 knot wind/2 knot current or 40 knot wind/6.6 knot current

The full mooring analysis output can be found in *Appendix H - Optimoor Results.* A summary of the monopile reactions and maximum tension can be found in Table 4 below.

TABLE 4 - MOORING SUMMARY

Mooring Case	Barge Tow Arrangement	Draft (ft.)	Wind Speed (knots)	Current Speed (knots)	Maximum Line Tension (kips)	Maximum Monopile Load (kips)
1	6x1 Barges	12	75	2	97.90	140.60
2	6x1 Barges	12	40	6.6	165.30	246.50
3	6x1 Barges	1	75	2	112.90	188.70
4	6x1 Barges	1	40	6.6	52.30	82.70
5	6x4 Barges	12	75	2	21.20	46.40
6	6x4 Barges	12	40	6.6	40.20	60.60
7	6x4 Barges	1	75	2	102.50	226.00
8	6x4 Barges	1	40	6.6	50.10	110.50

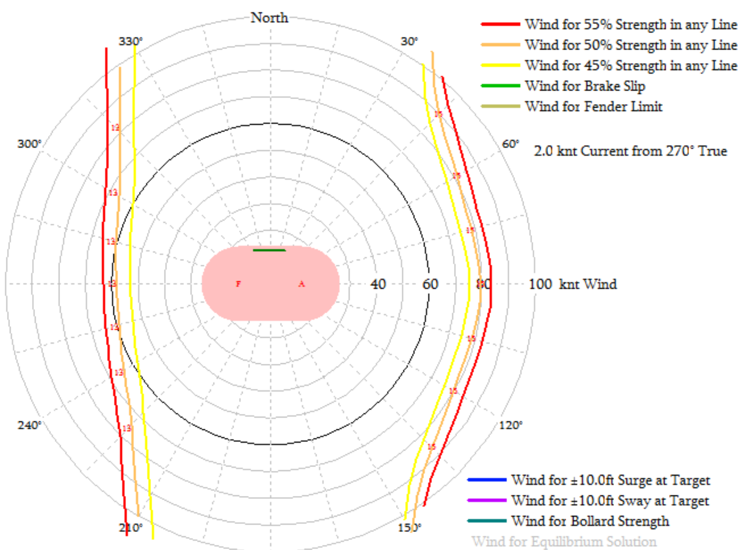


Figure 11 - Mooring Case 1: 6x1 Barges 2 kn Current 12-ft Draft

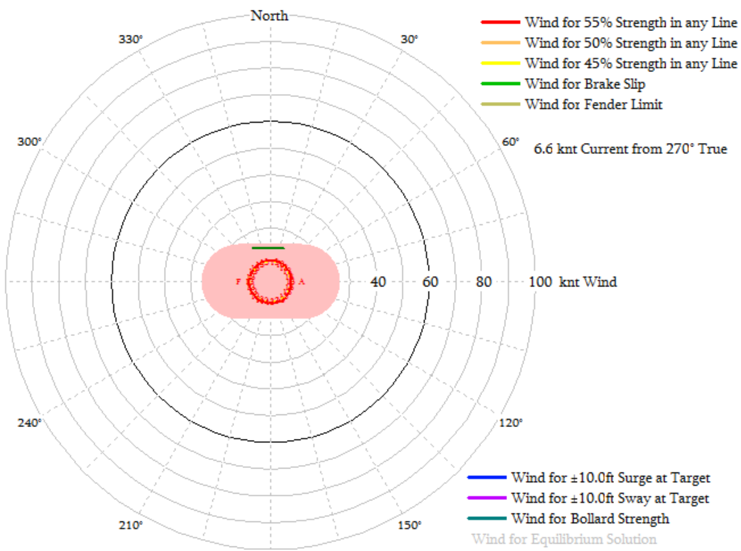


Figure 12 - Mooring Case 2: 6x1 Barges with 6.6 kn Current 12-ft Draft

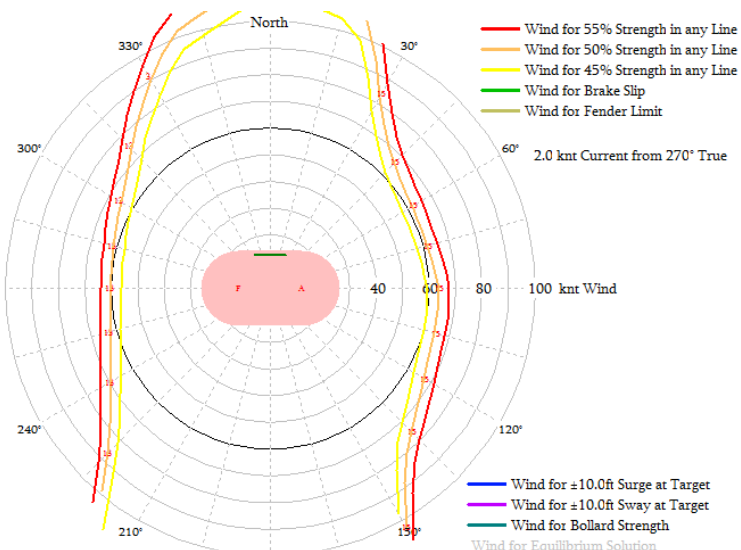


Figure 13 - Mooring Case 3: 6x1 Barges 2 kn Current 1-ft Draft

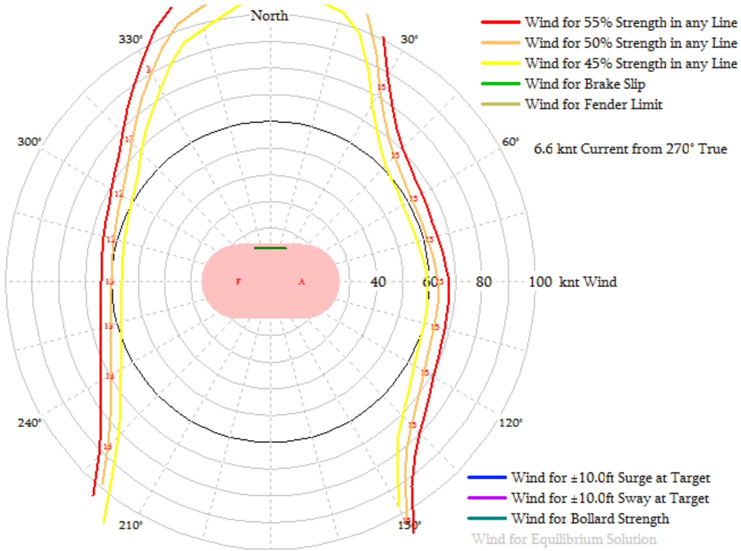


Figure 14 - Mooring Case 4: 6x1 Barges with 6.6 kn Current 1-ft Draft

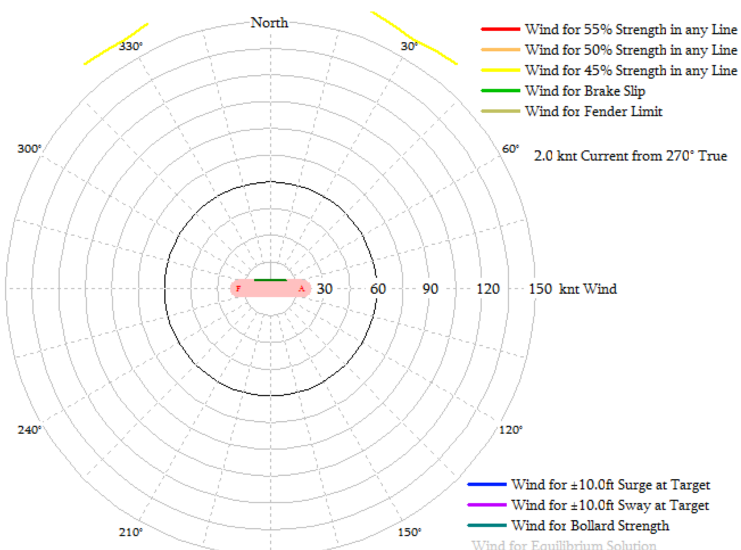


Figure 15 - Mooring Case 5: 6x4 Barges 2 kn Current, 12-ft Draft

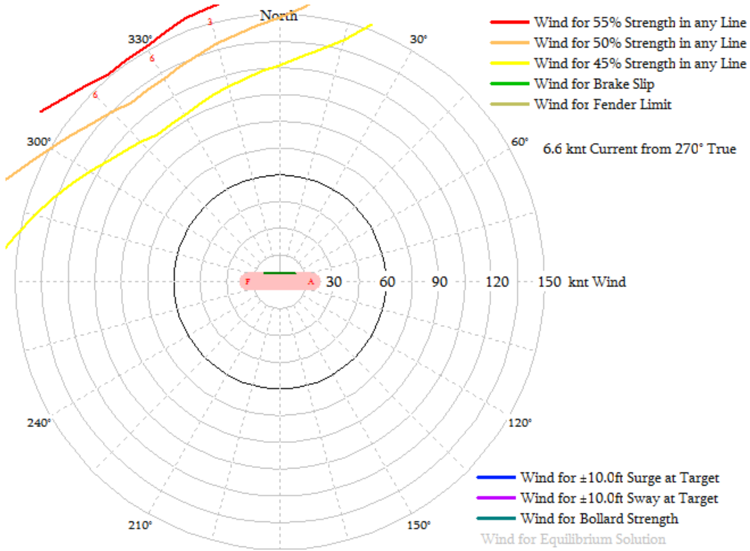


Figure 16 - Mooring Case 6: 6x4 Barges with 6.6 kn Current 12-ft Draft

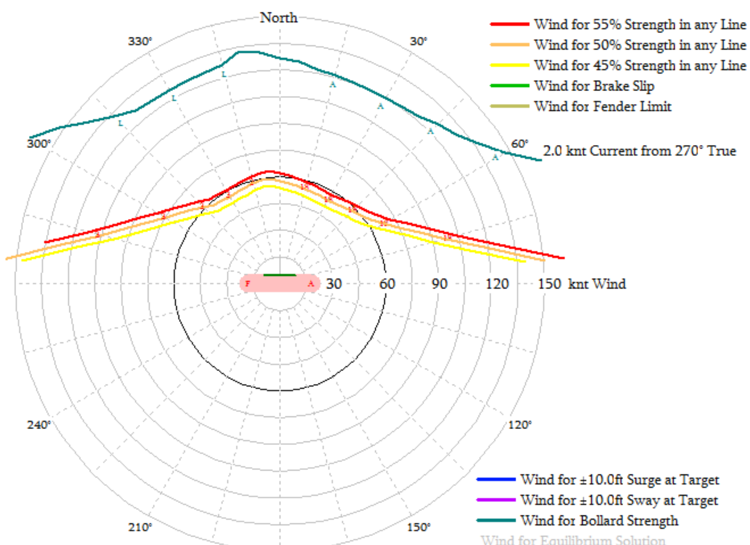


Figure 17 - Mooring Case 7: 6x4 Barges 2 kn Current 1-ft Draft

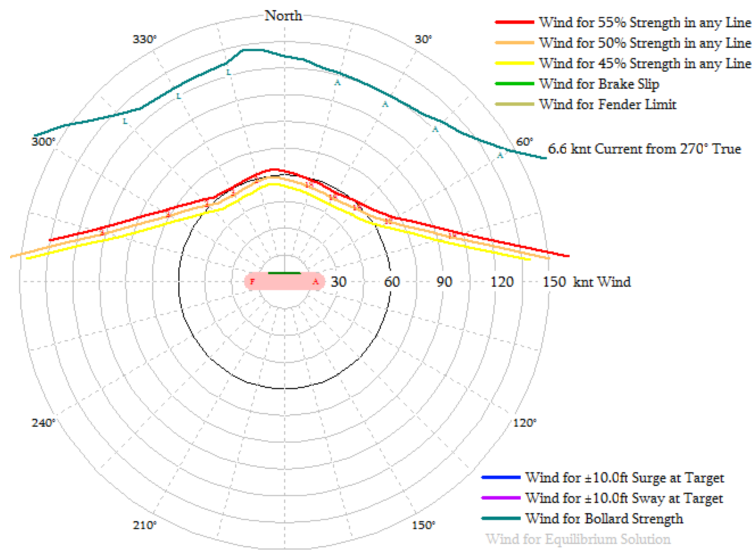


Figure 18 - Mooring Case 8: 6x4 Barges with 6.6 kn Current 1-ft Draft

DESIGN LOADS

For the monopile design, the maximum berthing load for high and low water will be used as well as the maximum bollard load. The location where the load is applied is critical in determining the stress in the pile. Figure 19, below, illustrates how water elevation changes the loading location along the length of the pile.

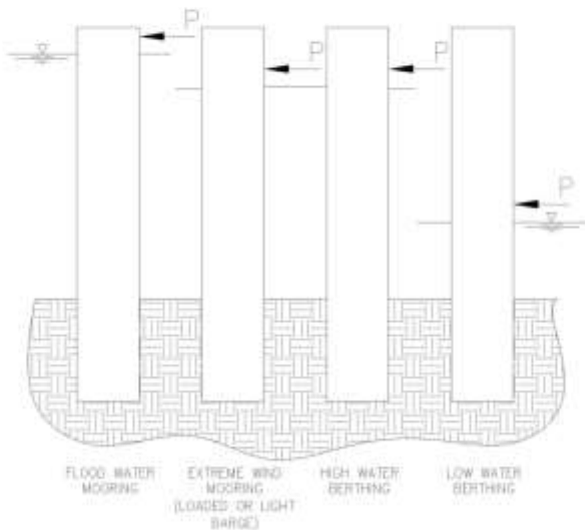


FIGURE 19 - MONOPILE LOADING DIAGRAM

TABLE 5 - PORT OF CATOOSA DESIGN LOADS

Port of Catoosa							
Condition	Mudline Elevation (ft)	Water Elevation (ft)	Load Elevation (ft)	Load (kips)	Head Deflection (in)	Energy (k-ft)	Maximum Moment (k-ft)
6x4 Flood Mooring (light ship)	520	560	566	110.6	1.24	NA	5,308
6x4 Flood Mooring (loaded ship)		560	554	46	0.77	NA	1,658
6x4 Extreme Wind Mooring (light ship)		560	566	225.8	2.58	NA	10,833
6x4 Extreme Wind Mooring (loaded ship)		560	554	46.4	0.78	NA	1,667
6x1 Flood Mooring (light ship)		560	566	67.4	0.70	NA	3,233
6x1 Flood Mooring (loaded ship)		560	554	135	2.50	NA	4,858
6x1 Extreme Wind Mooring (light ship)		560	566	159.7	1.82	NA	7,667
6x1 Extreme Wind Mooring (loaded ship)		560	554	119	2.20	NA	4,283
3x4 High Water Berthing		560	554	276	1.98	22.77*	9,917
3x4 Low Water Berthing		532	526	276	0.04	0.46*	2,300

*Berthing load limited to static loading

TABLE 6 - PORT OF MUSKOGEE/OAKLEY'S DESIGN LOADS

Port of Muskogee/Oakley's 33 Grand River site							
Condition	Bedrock Elevation (ft)	Water Elevation (ft)	Load Elevation (ft)	Load (kips)	Head Deflection (in)	Energy (k-ft)	Maximum Moment (k-ft)
6x4 Flood Mooring (lightship)	470	522	528	110.6	7.05	NA	8,917
6x4 Flood Mooring (loaded ship)		522	516	46	2.16	NA	3,775
6x4 Extreme Wind Mooring (lightship)		518.5	524.5	225.8	13.37	NA	16,667
6x4 Extreme Wind Mooring (loaded ship)		518.5	512.5	46.4	1.96	NA	3,575
6x1 Flood Mooring (lightship)		522	528	67.4	4.28	NA	5,392
6x1 Flood Mooring (loaded ship)		522	516	135	6.4	NA	11,083
6x1 Extreme Wind Mooring (lightship)		518.5	524.5	159.7	9.43	NA	11,750
6x1 Extreme Wind Mooring (loaded ship)		518.5	512.5	119	5.07	NA	9,167
3x4 High Water Berthing		518.5	512.5	276	12.3	141.5*	20,083
3x4 Low Water Berthing		488.5	482.5	276	2.62	30.8*	9,583

*Berthing load limited to static load

MONOPILE DESIGN

The monopiles are designed as a single steel pipe pile with varying wall thicknesses along its length that will be anchored into bedrock. This design is one of the more economical designs since it allows for the wall thickness to vary along the length. Figure 20 below shows a monopile being fabricated. Since the sheets are typically rolled in 10-foot lengths, the wall thickness can change every 10 feet without increasing the labor cost.

FIGURE 20 - MONOPILE FABRICATION

The monopiles are typically fabricated to their full length in the shop. Fabricating most of the pile in the shop will reduces field cost, allows for a safer construction site, and reduces the time in the field and subsequently down time at the port. Delivery of the piles is often done by barge; see Figure 21 on page 24. The casing will require that the top of the pile where the mooring rails and fenders are located be shipped separately and welded in the field. An alternate option would be to have the pile fabricated to the full length and the mooring rails and fenders installed in the field.

FIGURE 21 - MONOPILE DELIVERY

FIGURE 22 - MONOPILE INSTALLATION

The thickness of the monopile will vary along the length of the pile. The moment curves along the depth can be found in Figure 23 and Figure 24 for the Port of Catoosa and the Ports of Muskogee and Oakley's 33 Grand River site, respectively. The piles will be coated with coal tar epoxy to protect the dolphins from corrosion.

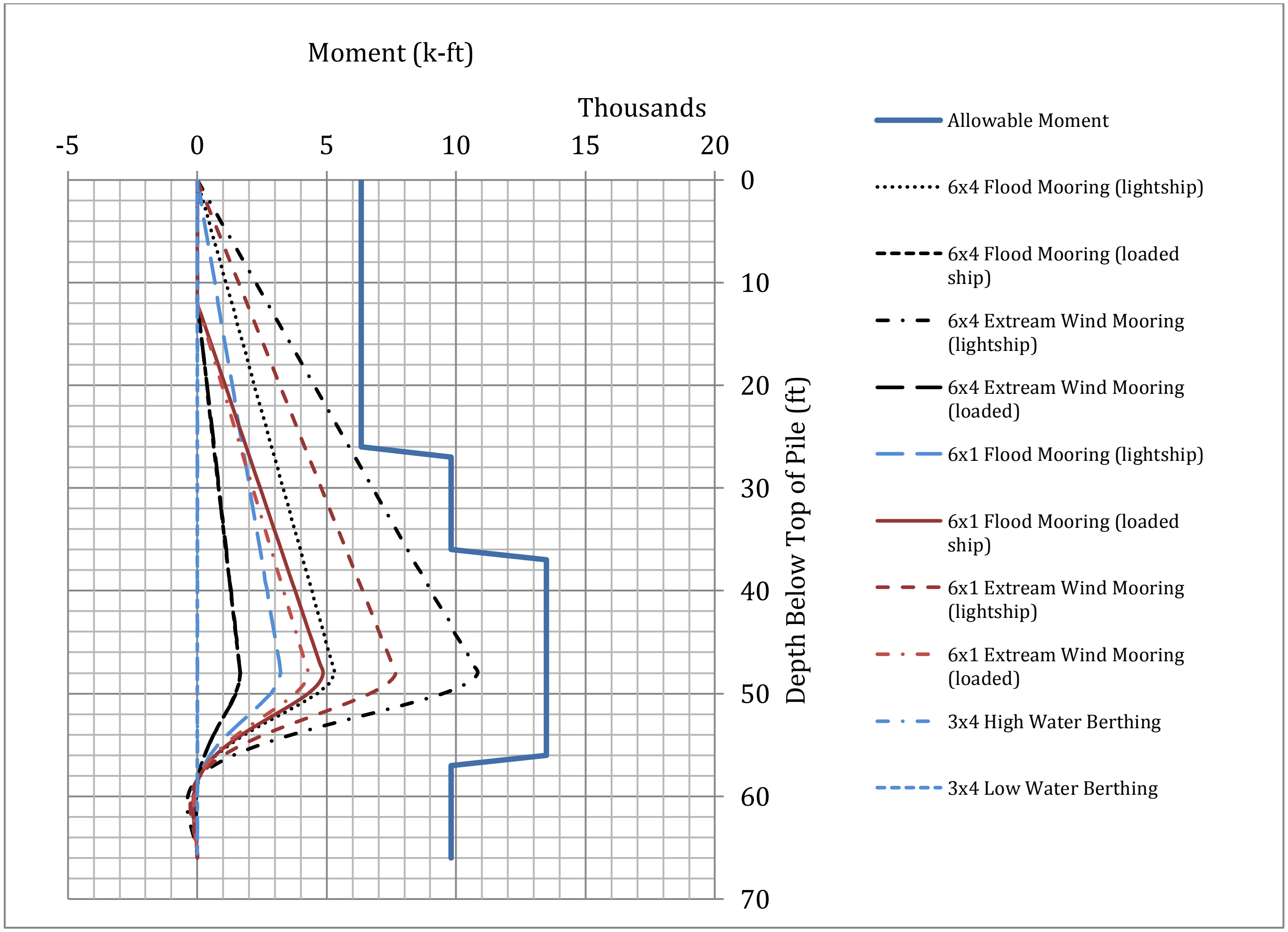


FIGURE 23 - PORT OF CATOOSA PILE MOMENT

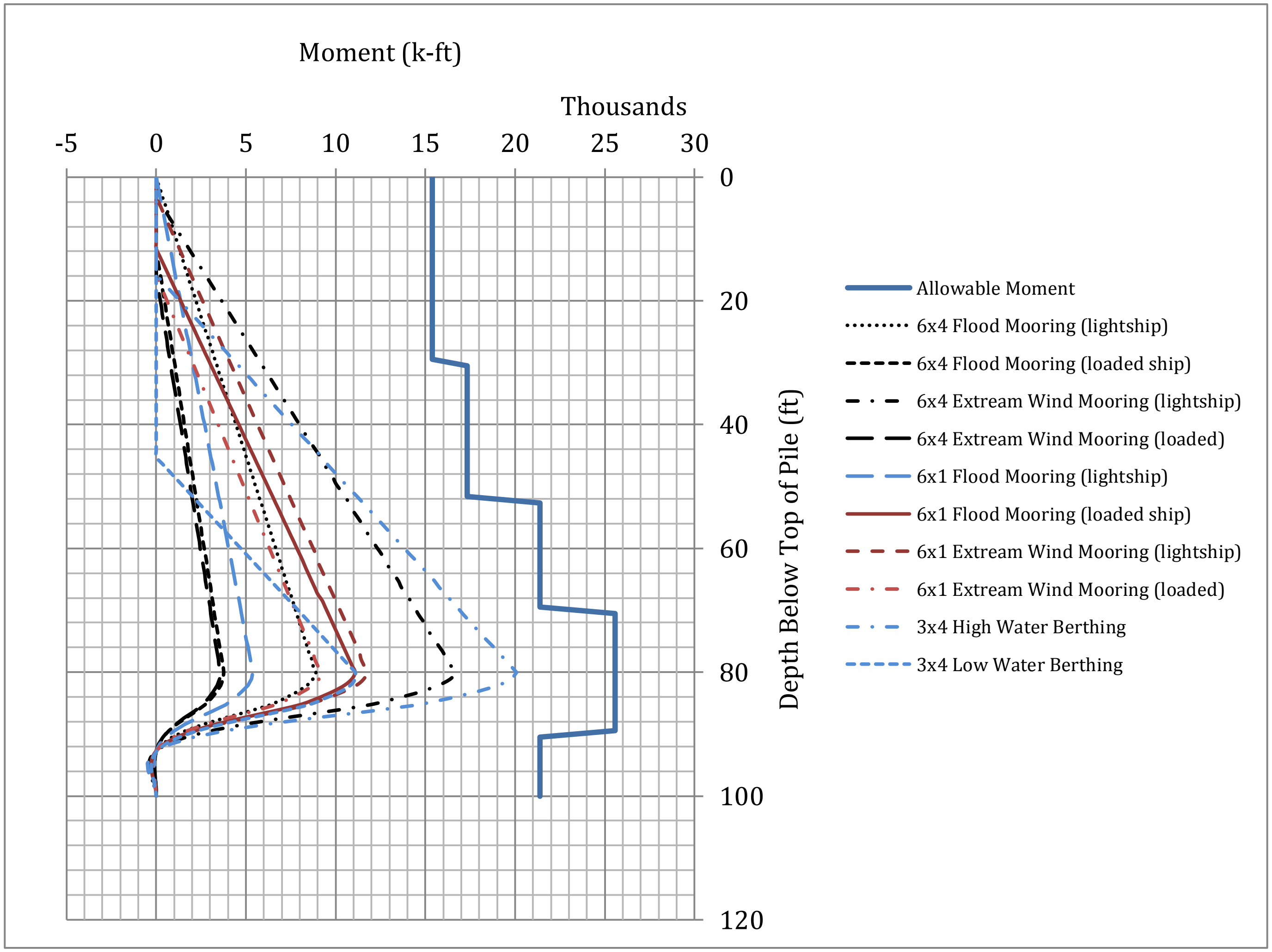


FIGURE 24 - PORT OF MUSKOGEE/OAKLEY'S 33 GRAND RIVER SITE PILE MOMENT

The capacity of the piles is calculated in accordance with AASHTO Section 6.[e] The capacities of the pile sections is calculated and presented in Table 7, below.

TABLE 7 - PIPE SECTION CAPACITY

Diam. (in)	Thick. (in)	Moment of Inertia[1] (in^4)	Area[2] (in^2)	D/t	Plastic Section Modulus[3] (in^3)	Elastic Section Modulus[4] (in^3)	Weight per ft (lb/ft)	Nominal Moment[5] (k-ft)
60	1.000	80,675	185	60.00	3,481	2,689	631	13,480
60	1.125	90,191	208	53.33	3,900	3,006	708	15,387
60	1.250	99,584	231	48.00	4,315	3,319	785	17,341
60	1.375	108,855	253	43.64	4,727	3,629	862	19,339
60	1.500	118,006	276	40.00	5,135	3,934	938	21,380
60	1.625	127,037	298	36.92	5,539	4,235	1,014	23,079
60	1.750	135,949	320	34.29	5,940	4,532	1,090	24,749
60	1.875	144,744	342	32.00	6,337	4,825	1,165	26,404
60	2.000	153,423	364	30.00	6,731	5,114	1,240	28,044
60	2.125	161,986	386	28.24	7,121	5,400	1,315	29,670
60	2.250	170,434	408	26.67	7,508	5,681	1,389	31,282

EQUATION 1: $I = \frac{\pi(d^4-(d-2t)^4)}{64}$

EQUATION 2: $A = \frac{\pi(d^2-(d-2t)^2)}{4}$

EQUATION 3: $S = \frac{\pi(d^4-(d-2t)^4)}{32d}$

EQUATION 4: $z = \frac{d^3}{6} - \frac{(d-2t)^3}{6}$

EQUATION 5: $M_N = F_y Z < \left(\frac{0.021E}{D/t} + F_y\right)S$

[e] *LRFD Bridge Design Specifications*, American Association of State Highway and Transportation Officials, Washington, DC, 2020.

SUMMARY

It is our opinion that single large diameter piles with varying wall thicknesses will be the most economical option for these ports. The overall cost of the project is projected to be $16,253,000. Of this total, $2,734,000 will be required for the Port of Catoosa, $10,017,000 for the Port of Muskogee, and $3,502,000 for Oakley's 33 Grand River site. A detailed breakdown of the cost for each of the ports can be found in *Appendix K - Proposed Construction Estimate*.

A preliminary construction schedule has been prepared and is presented in *Appendix J - Proposed Project Schedule.* The schedule includes a preliminary engineering phase, permitting phase, and construction schedule. Based on conversations with the Corp of Engineers, it is believed that the permitting can be done on a nationwide permit.

These piles are designed to withstand the normal operational loads as well as extreme loading due to storms and flood associated with a 50-year return period. The proposed mooring dolphin layout provides some redundancy in that three (3) piles would be installed at each berth for barges moored to. Having three dolphins installed at each berth provides the number of mooring points for a balanced and well distributed mooring arrangement needed to support the extreme mooring loads. The mooring dolphin layout coupled with the proposed monopile design will provide a significant upgrade to the barge mooring capabilities for the proposed port facilities.

Appendix A - Port of Catoosa Design Basis

OKLAHOMA DEPARTMENT OF TRANSPORTATION
MULTIPLE LOCATIONS

PORT OF CATOOSA DESIGN BASIS

FOR

MKARNS MOORING MODERNIZATION PROJECT

PREPARED BY:

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EC-2320
JOB PIECE NO. 35247(05)

MARCH, 2022

DOCUMENT CONTROL							
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				Approved	Approved As Noted	Revise As Noted & Resubmit	Reviewed

Instructions to Recipient

1. This page shall be completed and returned to Lanier & Associates Consulting Engineers, Inc. by all that review the design basis.
2. A copy of all comments associated with each review shall be returned to Lanier & Associates Consulting Engineers, Inc.

TABLE OF CONTENTS:

DOCUMENT 00 66 13 - DESIGN BASIS

1.1 PROJECT SCOPE

A. General Description

1. The Project will replace existing structures which were not designed for the type of major flood events the region has experienced in recent years and enhance harbor safety by eliminating risk of loose barges and damage to infrastructure. The Project will expand much needed capacity for vessels within the waterway and prepare ports for forecasted increases in freight demand through the MKARNS.

2. Lanier & Associates Consulting Engineers, Inc. (Lanier) to provide engineering services related to the conceptual layout and permitting of marine facilities at the Port of Catoosa in association with MKARNS Mooring Modernization.

1.2 AVAILABLE INFORMATION

A. SURVEYS

1. Hydrographic Survey: To be provided by Consor

2. Topographic Survey: Performed by Keystone

3. Boundary Survey: Performed by Keystone

B. GEOTECHNICAL INFORMATION

1. Performed by Red Rock

2. Draft results transmitted on 12/21/21

C. DRAFTING STANDARDS

1. Lanier to use in-house drafting standards

D. GOVERNMENT AND INDUSTRY CODES & STANDARDS

1. Design shall consider the applicable editions of specifications of government and industry codes and standards including but not limited to: OSHA, US Coast Guard, US Army Corps of Engineers, Code of Federal Regulations, and NFPA.

2. The following codes, standards and guidelines will be referenced during the design development and construction of the proposed facilities:

a. PIANC (Guidelines for the design of Fender Systems & Recommendations for the Design and Assessment of Marine Oil and Petrochemical Terminals)

b. OCIMF (Oil Companies International Marine Forum)

1.3 SITE AND ENVIRONMENTAL CONDITIONS

A.	Risk Category (ASCE 7-16)	II
B.	Design Environmental Return Period	50 year
C.	Mudline Elevation	520-ft ft NAVD88
D.	Design Wind Conditions (ASCE 7-10)	
1.	Gust Duration	30 seconds
2.	Maximum Wind Velocity for Mooring	75-kts
3.	Operating Wind Velocity for Breasting	40-kts
E.	Design Water Levels	
1.	Extreme High Water Elevation	(+) 560-ft NAVD88
2.	Design High Water Elevation	(+) 560-ft NAVD88
3.	Design Low Water Elevation	(+) 532-ft NAVD88
F.	Design Current	
1.	Normal Design Current	
a.	High River	1.0-kts
b.	Low River Ebb	1.0-kts
2.	50-yr Design Current	1.0-kts
G.	Seismic Design Conditions (ASCE 7-16) (To be confirmed by Geotechnical analysis)	
1.	Site Class	B
2.	Mapped Acceleration Parameter Ss (0.2s response)	0.141 (IBC 2015)
3.	Mapped Acceleration Parameter S1 (1.0s response)	0.077 (IBC 2015)
4.	Site Coefficient (Fa)	0.9
5.	Site Coefficient (Fv)	0.8
6.	Spectral Acceleration Parameter SDS (0.2s response)	1.5
7.	Spectral Acceleration Parameter SD1 (1.0s response)	0.6
8.	Seismic Design Category	Category A (IBC 2015)

1.4 VESSEL DATA

A. Design Vessel Criteria

1. Single inland Barge

a.	Vessel Size	35-ft x 200-ft
b.	Molded Depth	13-ft
c.	Maximum Draft	12-ft
d.	Displacement Tonnage	2,400 MT

2. Barge Tow

a.	Maximum Barge Breasting Configuration	3 wide x 4 long
b.	Barge Mooring Configuration	6 wide x 4 long
c.	Barge Mooring Configuration	6 wide x 1 long

B. Berthing Parameters

1. Vessel Berthing

a. Mooring and breasting structures will be designed and configured for the berthing of both a single barge and barge tow.

b. Laminated berthing fenders shall be attached to the breasting structures for the berthing of barges.

c. Berthing vessels shall be tug assisted.

d. Berthing velocity per PIANC.

e. Barges shall be moored with a minimum of (6) lines. Two bow lines and two stern lines will be attached to each of the independent mooring structures. Four spring lines (two forward and two aft) shall be attached to mooring bollards on the breasting structures.

f. Breasting dolphins will be equipped with mooring rails.

g. While at berth, the barges mooring lines shall properly tended.

1.5 STRUCTURAL

A. General Description

1. Six (6) new mooring dolphins are intended to replace and supplement existing mooring structures at the Port of Catoosa.

2. Top of mooring dolphins shall be 10 feet above design high water.

B. Monopiles

1. Mooring equipment will consist of side rails.

2. Top of Working Surface 570-ft

3. Design Loads

   a. Breasting Energy

      1) Will be defined as the largest breasting energy for the design vessels at their respective approach velocities with an applied abnormal berthing factor.

   b. Mooring Line Load

      1) Design mooring line load to be verified for sizing equipment through analysis, practical experience for similar facilities with similar design barges, and in accordance with the appropriate Port of Catoosa Standards.

      2) Maximum Line Break Strength 81.7 kips

C. Coating Systems

1.	Steel Piles	Coal tar epoxy
2.	Steel Pipe Shapes & Structural Shapes Below Deck	Coal tar epoxy
3.	Steel Pipe Shapes & Structural Shapes Above Deck	Three coat epoxy
4.	Mooring rails	Carboguard 1209
		Color Signal Yellow

END OF SECTION 00 31 10

Appendix B - Port of Muskogee Design Basis

OKLAHOMA DEPARTMENT OF TRANSPORTATION
MULTIPLE LOCATIONS

PORT OF MUSKOGEE DESIGN BASIS

FOR

MKARNS MOORING MODERNIZATION PROJECT

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EC-2320
JOB PIECE NO. 35247(05)

MARCH, 2022

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1.1 PROJECT SCOPE

A. General Description

1. The Project will replace existing structures which were not designed for the type of major flood events the region has experienced in recent years and enhance harbor safety by eliminating risk of loose barges and damage to infrastructure. The Project will expand much needed capacity for vessels within the waterway and prepare ports for forecasted increases in freight demand through the MKARNS.

2. Lanier & Associates Consulting Engineers, Inc. (Lanier) to provide engineering services related to the conceptual layout and permitting of marine facilities at the Port of Muskogee in association with MKARNS Mooring Modernization.

1.2 AVAILABLE INFORMATION

A. SURVEYS

1. Hydrographic Survey: To be provided by Consor

2. Topographic Survey: Performed by Keystone

3. Boundary Survey: Performed by Keystone

B. GEOTECHNICAL INFORMATION

1. Performed by Kleinfelder

2. Draft results transmitted on 11/29/21

C. DRAFTING STANDARDS

1. Lanier to use in-house drafting standards

D. GOVERNMENT AND INDUSTRY CODES & STANDARDS

1. Design shall consider the applicable editions of specifications of government and industry codes and standards including but not limited to: OSHA, US Coast Guard, US Army Corps of Engineers, Code of Federal Regulations, and NFPA.

2. The following codes, standards and guidelines will be referenced during the design development and construction of the proposed facilities:

a. PIANC (Guidelines for the design of Fender Systems & Recommendations for the Design and Assessment of Marine Oil and Petrochemical Terminals)

b. OCIMF (Oil Companies International Marine Forum)

1.3 SITE AND ENVIRONMENTAL CONDITIONS

A.	Risk Category (ASCE 7-16)	II
B.	Design Environmental Return Period	50 year
C.	Mudline Elevation	479-ft NAVD88
D.	Design Wind Conditions (ASCE 7-10)	
1.	Gust Duration	30 seconds
2.	Maximum Wind Velocity for Mooring	75-kts
3.	Operating Wind Velocity for Breasting	40-kts
E.	Design Water Levels	
1.	Extreme High Water Elevation	(+) 522-ft NAVD88
2.	Design High Water Elevation	(+) 518.5-ft NAVD88
3.	Design Low Water Elevation	(+) 488.52-ft NAVD88
F.	Design Current	
1.	Normal Design Current	
a.	High River	6.6-kts
b.	Low River Ebb	2.0-kts
2.	50-yr Design Current	6.6-kts
G.	Seismic Design Conditions (ASCE 7-16) (To be confirmed by Geotechnical analysis)	
1.	Site Class	B
2.	Mapped Acceleration Parameter Ss (0.2s response)	0.141 (IBC 2015)
3.	Mapped Acceleration Parameter S1 (1.0s response)	0.077 (IBC 2015)
4.	Site Coefficient (Fa)	0.9
5.	Site Coefficient (Fv)	0.8
6.	Spectral Acceleration Parameter SDS (0.2s response)	1.5

7. Spectral Acceleration Parameter SD1 (1.0s response) — 0.6

8. Seismic Design Category — Category A (IBC 2015)

1.4 VESSEL DATA

A. Design Vessel Criteria

1. Single inland Barge

a.	Vessel Size	35-ft x 200-ft
b.	Molded Depth	13-ft
c.	Maximum Draft	12-ft
d.	Displacement Tonnage	2,400 MT

2. Barge Tow

a.	Maximum Barge Breasting Configuration	3 wide x 4 long
b.	Barge Mooring Configuration	6 wide x 4 long
c.	Barge Mooring Configuration	6 wide x 1 long

B. Berthing Parameters

1. Vessel Berthing

a. Mooring and breasting structures will be designed and configured for the berthing of both a single barge and barge tow.

b. Laminated berthing fenders shall be attached to the breasting structures for the berthing of barges.

c. Berthing vessels shall be tug assisted.

d. Berthing velocity per PIANC.

e. Barges shall be moored with a minimum of (6) lines. Two bow lines and two stern lines will be attached to each of the independent mooring structures. Four spring lines (two forward and two aft) shall be attached to mooring bollards on the breasting structures.

f. Breasting dolphins will be equipped with mooring rails.

g. While at berth, the barge mooring lines shall be properly tended.

1.5 STRUCTURAL

1. Twenty (20) new mooring dolphins are intended to replace and supplement existing mooring structures at the Port of Muskogee.

2. Top of mooring dolphins shall be 10 feet above design high water.

B. Monopiles

1. Mooring equipment will consist of side rails.

2. Top of Working Surface 532-ft

3. Design Loads

a. Breasting Energy

1) Will be defined as the largest breasting energy for the design vessels at their respective approach velocities with an applied abnormal berthing factor.

b. Mooring Line Load

1) Design mooring line load to be verified for sizing equipment through analysis, practical experience for similar facilities with similar design barges, and in accordance with the appropriate Port of Muskogee Standards.

2) Maximum Line Break Strength 81.7 kips

C. Coating Systems

1. Steel Piles Coal tar epoxy

2. Steel Pipe Shapes & Structural Shapes Below Deck Coal tar epoxy

3. Steel Pipe Shapes & Structural Shapes Above Deck Three coat epoxy

4. Mooring rails Carboguard 1209
Color Signal Yellow

END OF SECTION 00 31 10

Appendix C - Oakley's 33 Grand Site Design Basis

OKLAHOMA DEPARTMENT OF TRANSPORTATION
MULTIPLE LOCATIONS

OAKLEY'S 33 GRAND RIVER DESIGN BASIS

FOR

MKARNS MOORING MODERNIZATION PROJECT

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MARCH ,2022

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2. Lanier & Associates Consulting Engineers, Inc. (Lanier) to provide engineering services related to the conceptual layout and permitting of marine facilities at the Oakley’s 33 Grand River site in association with MKARNS Mooring Modernization.

1.2 AVAILABLE INFORMATION

A. SURVEYS

1. Hydrographic Survey: To be provided by Consor

2. Topographic Survey: Performed by Keystone

3. Boundary Survey: Performed by Keystone

B. GEOTECHNICAL INFORMATION

1. Performed by Kleinfelder

2. Draft results transmitted on 11/29/21

C. DRAFTING STANDARDS

1. Lanier to use in-house drafting standards

D. GOVERNMENT AND INDUSTRY CODES & STANDARDS

1. Design shall consider the applicable editions of specifications of government and industry codes and standards including but not limited to: OSHA, US Coast Guard, US Army Corps of Engineers, Code of Federal Regulations, and NFPA.

2. The following codes, standards and guidelines will be referenced during the design development and construction of the proposed facilities:

a. PIANC (Guidelines for the design of Fender Systems & Recommendations for the Design and Assessment of Marine Oil and Petrochemical Terminals)

b. OCIMF (Oil Companies International Marine Forum)

1.3 SITE AND ENVIRONMENTAL CONDITIONS

A.	Risk Category (ASCE 7-16)	II
B.	Design Environmental Return Period	50 year
C.	Mudline Elevation	479-ft NAVD88
D.	Design Wind Conditions (ASCE 7-10)	
1.	Gust duration	30 seconds
2.	Maximum Wind Velocity for Mooring	75-kts
3.	Operating Wind Velocity for Breasting	40-kts
E.	Design Water Levels	
1.	Extreme High Water Elevation	(+) 522-ft NAVD88
2.	Design High Water Elevation	(+) 517.5-ft NAVD88
3.	Design Low Water Elevation	(+) 488.52-ft NAVD88
F.	Design Current	
1.	Normal Design Current	
a.	High River	6.6-kts
b.	Low River Ebb	2.0-kts
2.	Extreme Design Current	6.6-kts
G.	Seismic Design Conditions (ASCE 7-16) (To be confirmed by Geotechnical analysis)	
1.	Site Class	B
2.	Mapped Acceleration Parameter Ss (0.2s response)	0.141 (IBC 2015)
3.	Mapped Acceleration Parameter S1 (1.0s response)	0.077 (IBC 2015)
4.	Site Coefficient (Fa)	0.9
5.	Site Coefficient (Fv)	0.8
6.	Spectral Acceleration Parameter SDS (0.2s response)	1.5
7.	Spectral Acceleration Parameter SD1 (1.0s response)	0.6

8. Seismic Design Category — Category A (IBC 2015)

1.4 VESSEL DATA

A. Design Vessel Criteria

1. Single inland Barge

a.	Vessel Size	35-ft x 200-ft
b.	Molded Depth	13-ft
c.	Maximum Draft	12-ft
d.	Displacement Tonnage	2,400 MT

2. Barge Tow

a.	Maximum Barge Breasting Configuration	3 wide x 4 long
b.	Barge Mooring Configuration	6 wide x 4 long
c.	Barge Mooring Configuration	6 wide x 1 long

B. Berthing Parameters

1. Vessel Berthing

a. Mooring and breasting structures will be designed and configured for the berthing of both a single barge and barge tow.

b. Laminated berthing fenders shall be attached to the breasting structures for the berthing of barges.

c. Berthing vessels shall be tug assisted.

d. Berthing velocity per PIANC.

e. Barges shall be moored with a minimum of (6) lines. Two bow lines and two stern lines will be attached to each of the independent mooring structures. Four spring lines (two forward and two aft) shall be attached to mooring bollards on the breasting structures.

f. Breasting dolphins will be equipped with mooring rails.

g. While at berth, the barge mooring lines shall be properly tended.

1.5 STRUCTURAL

A. General Description

1. Six (6) new mooring dolphins are intended to replace and supplement existing mooring structures at the Oakley's 33 Grand River .

2. Top of mooring dolphins shall be 10 feet above design high water.

3. All monopiles shall have laminated rubber fenders with mooring rails

B. Monopiles

1. Mooring equipment will consist of side rails.

2. Top of Working Surface 532-ft

3. Design Loads

a. Breasting Energy

1) Will be defined as the largest breasting energy for the design vessels at their respective approach velocities with an applied abnormal berthing factor.

b. Mooring Line Load

1) Design mooring line load to be verified for sizing equipment through analysis, practical experience for similar facilities with similar design barges, and in accordance with the appropriate standards.

2) Maximum Line Break Strength 81.7 kips

C. Coating Systems

1.	Steel Piles	Coal tar epoxy
2.	Steel Pipe Shapes & Structural Shapes Below Deck	Coal tar epoxy
3.	Steel Pipe Shapes & Structural Shapes Above Deck	Three coat epoxy
4.	Mooring rails	Carboguard 1209 Color Signal Yellow

END OF SECTION 00 31 10

Appendix D - Facility Assessment Report

OKLAHOMA DEPARTMENT OF TRANSPORTATION
MULTIPLE LOCATIONS

FACILITY INSPECTION REPORT

FOR

MKARNS MOORING MODERNIZATION PROJECT

PREPARED BY:

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OKLAHOMA FIRM NO. 2518

EC-2320
JOB PIECE NO. 35247(05)

MARCH, 2022

EXECUTIVE SUMMARY

Lanier & Associates Consulting Engineers, Inc. (Lanier) was tasked with performing a site inspection of the mooring dolphins that will be used at three ports along the McClellan-Kerr Arkansas River Navigation System (MKARNS). These three ports are, Port of Catoosa, Port of Muskogee, and Oakley's 33 Grand River site. The purpose of the inspection was to determine which mooring dolphins were in need of replacement, review current mooring operations, and observe any unique conditions that may interfere with the mooring modernization project.

After the inspection, it was concluded that six (6) dolphins should be replaced at the Port of Catoosa, twenty (20) at the Port of Muskogee, and six (6) new dolphins should be installed at Oakley's 33 Grand River site. New dolphins are required due to the age, condition, and operational deficiency of the current mooring dolphins.

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INTRODUCTION

On September 22nd and 23rd of 2021, Eric Gagnet, P.E. visited the Port of Catoosa, Port of Muskogee, and Oakley's 33 Grand site. The purpose of the site visit was to perform a visual above water inspection of the existing mooring dolphins. A summary of the inspection can be found in this report. Photographs taken of the site are located in Appendixes A, B, and C. The Port of Catoosa had a below water inspection performed, excerpts from this report can be found in Appendix D.

PORT OF CATOOSA

The number of the dolphins will follow the same used with in the BKL report. The dolphins inspected were 6 through 8 and 11 through 13. See Figure 1 below for the site plan and naming convention.

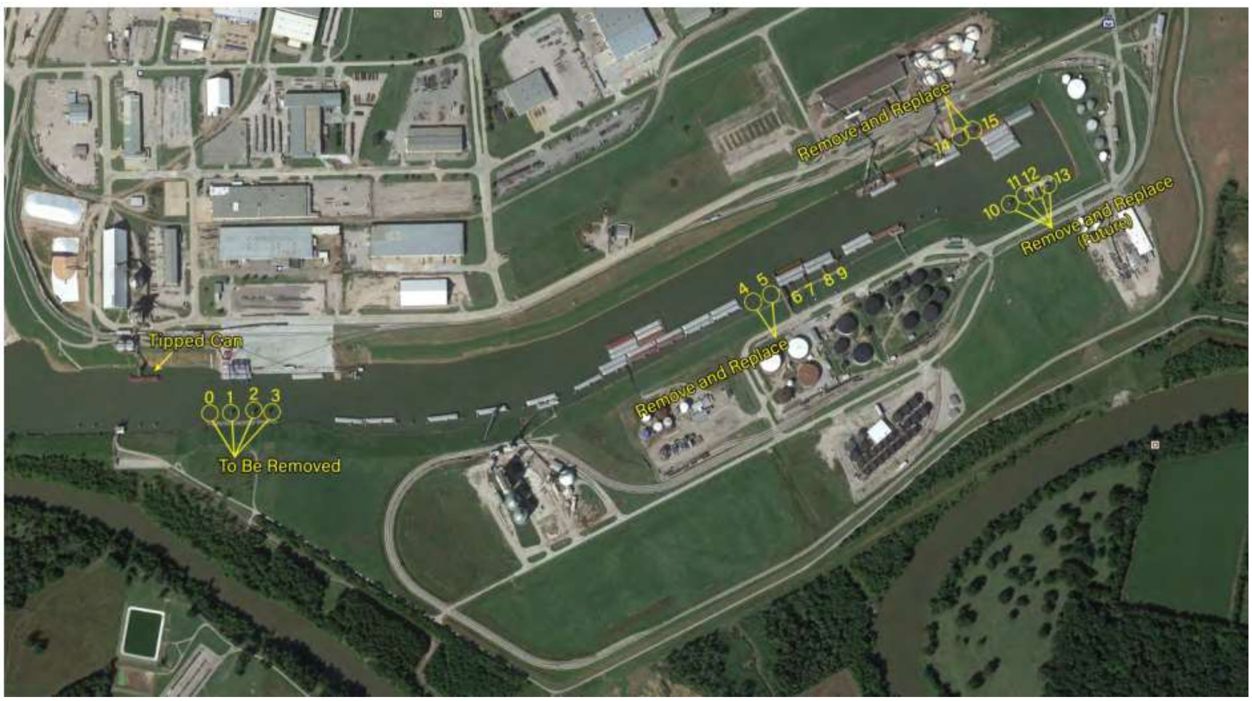

FIGURE 1 - PORT OF CATOOSA SITE PLAN

Mooring Dolphin 6 – coating failure has resulted min surface rust over entire superstructure. The below water portion of the dolphin has experienced significant section loss.

Mooring Dolphin 7 – coating failure has resulted min surface rust over entire superstructure. The below water portion of the dolphin has experienced significant section loss.

Mooring Dolphin 8 – coating failure has resulted min surface rust over entire superstructure. The below water portion of the dolphin has experienced significant section loss.

Mooring Dolphin 11 – coating failure has resulted min surface rust over entire superstructure. The below water portion of the dolphin has experienced significant section loss.

Mooring Dolphin 12 – coating failure has resulted min surface rust over entire superstructure. The below water portion of the dolphin has experienced significant section loss. This dolphin was hit recently and there is noticeable damage where the catwalk connects to the tower. Paint cracking was observed around critical connection. However do to the age of the coating it could not be determined if this was due to a coating failure of excessive loading.

Mooring Dolphin 13 – coating failure has resulted min surface rust over entire superstructure. The below water portion of the dolphin has experienced significant section loss.

PORT OF MUSKOGEE

The port of Muskogee utilizes the same mooring structure throughout. During the 2019 flood, the water rose higher than these dolphins. As a temporary solution, an additional longer pile was driven and attached to the upstream side of many of the dolphins. All of the dolphins show serious coating failures and surface rust. Several of the structures have been damaged and taken out of service.

OAKLEY’S 33 GRAND SITE

The Oakley’s 33 Grand site uses buried concrete anchors on shore attached to mooring lines. This mooring style allow for a more flexibility with respect to water levels. However, this style does not allow for the same amount of stability as a mooring structure for the barges to berth against. During the inspection no barges were moored. A discussion with the operators brought to light that the current arrangement does have barges that become grounded when water levels fall.

Appendix A - Port of Catoosa Photographs

PORT OF CATOOSA - 1

PORT OF CATOOSA - 2

PORT OF CATOOSA - 3

PORT OF CATOOSA - 4

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Appendix B - Port of Muskogee Photographs

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Appendix C - Port of Oakley's 33 Grand River Site Photographs

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Oakley's 33 - 4

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Oakley’s 33 - 26

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Appendix D - BLK Dolphin Removal and Replacement Study

TULSA PORT OF CATOOSA

DOLPHIN REMOVAL & REPLACEMENT STUDY

Prepared by:

BKL
ENGINEERS | ARCHITECTS

ARCHITECTS, CIVIL & STRUCTURAL ENGINEERS

C.A. 0049 (ARCH) RENEWAL DATE: 06-30-2019
C.A. 262 (PE) RENEWAL DATE: 06-30-2020

LICENSED PROFESSIONAL ENGINEER
Stacy A. Loeffler
16658
OKLAHOMA

2/1/19

January 2019

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Executive Summary

The Tulsa Port of Catoosa wishes to remove and replace several failing or deteriorating mooring dolphins in the main channel. In the summer of 2014 the Port conducted an underwater inspection of 15 dolphins. The aerial in Figure 1 depicts all of the dolphins inspected with yellow numbers. The inspection report is in Appendix A and referred to as *Marcan Report.* All of the inspected Dolphins showed signs of deterioration, some requiring immediate repair or decommissioning. The scope of this study is to investigate construction methods for removal and replacement of the dolphins, determine the most feasible construction methods and the associated opinion of probable cost and recommend project phasing.

Our investigation included speaking with three local contractors that were recommended as the most capable of this construction, meeting with industries that will be impacted by the construction and will be using the proposed new dolphins, speaking with the City of Tulsa planning division about impacts to the Spavinaw water supply lines that cross the main channel, reviewing plans for the existing structures and recently constructed dolphins, site visits to familiarize ourselves with the existing dolphin configuration and how they are used, reviewing existing geotechnical reports for soil borings in the channel and reviewing the underwater inspection reports.

Based on our investigation we concluded that Phase I construction plans should be produced for the following items:

- The removal of eight existing dolphins, constructed with eight 24" diameter piers each with platforms at the normal water level and steel truss towers extending above, known as tower dolphins. These are shown as Dolphins 0-3, 4 and 5, 14 and 15.
- Removal of one existing, tipped-over can dolphin near the Galvilon West loading structure.
- Reconstruction of five seven ft. diameter piers drilled twelve feet into shale and extending at least 35 ft. above the normal water line (known as can dolphins) similar to the most recent dolphins constructed at the port and depicted in Photo 5 and Appendix D at locations near existing dolphins 4, 5, 14 and 15.
- The reconstruction plans and details should have new dolphins lined up with the front of existing dolphins and spaced as close to 100ft. centers as possible. The proposed location of these structures is shown in figure 3.

Phase II construction plans should be produced for the following items

- The removal of four existing dolphins, shown as dolphins 10-13 in Figure 1 at the north end of the channel. These existing dolphins are constructed with eight 24 inch diameter piers each with platforms at the normal water level and steel truss towers extending above, known as tower dolphins.
- Reconstruction of two seven ft. diameter dolphins near dolphins 12 and 13 with a platform between them constructed on smaller diameter piers. The platform would serve two industries with transport pipes for product, water and electricity and be equipped with at least one jib crane.

Add Alternates for Phase I or Phase II to include the following:

- Up to 13 additional can dolphins on the west bank in the space that is currently served by shore wires.

All design documents should include specifications for the removal of the existing dolphins that minimize the impact to the Spavinaw water lines and the adjacent industries but should not limit means and methods. And the documents should have construction sequencing that limits the impact to channel traffic and Port industries.

The estimated construction cost for the above recommendations with 20% contingency is:

- Phase I base amount: $1,800,000.00
- Phase II base amount: $1,400,000.00
- Add Alternate for Phase I or II (construction of 13 additional dolphins): $2,340,000.00

Introduction

The Port wishes to eventually remove and replace all of the original "tower" type mooring dolphins in the channel. The purpose of this study is to investigate construction methods for removal and replacement of the dolphins, determine the most feasible methods and the associated opinion of probable cost and recommend construction project phasing.

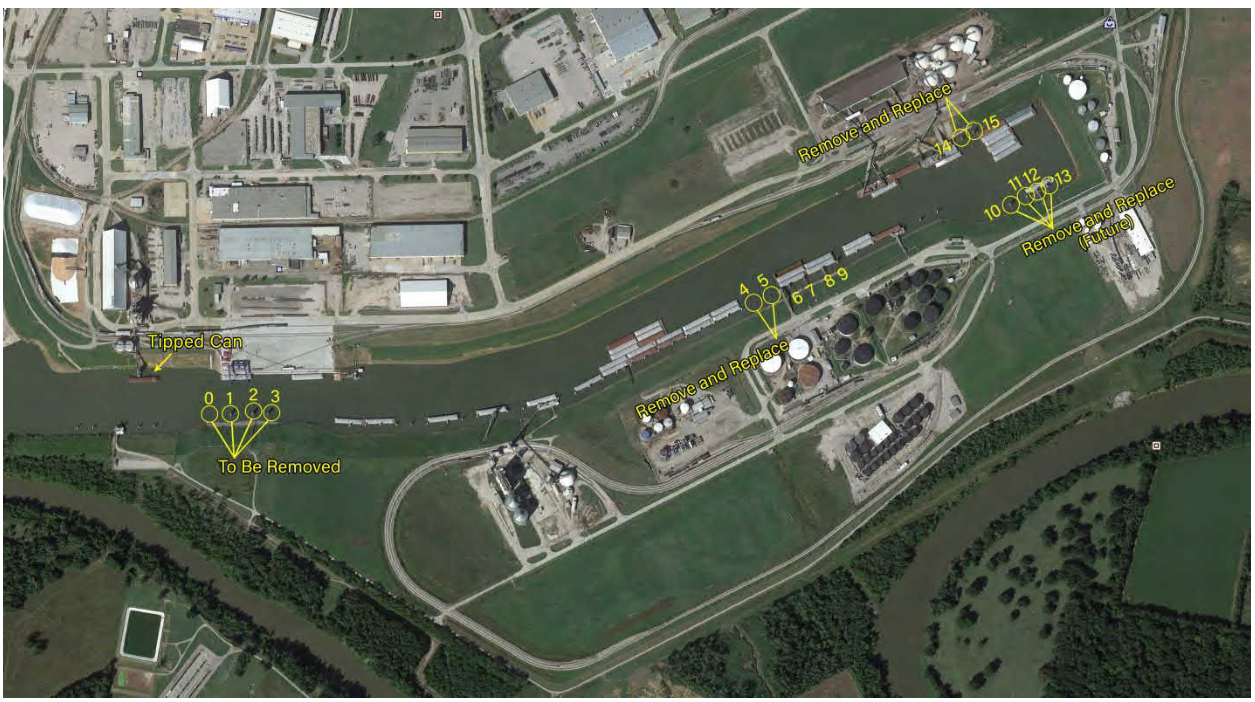
We began by reviewing the Marcan Report shown in Appendix A to determine the dolphins requiring the most immediate need of replacement. The aerial in Figure 1 depicts all of the dolphins inspected with yellow numbers. Two dolphins had clearly failed by the time of inspection and were not included in the 15 inspected. Dolphins 1, 2, and 3 have already been decommissioned due to disrepair These are tower structures on concrete piers with a concrete platform and truss type construction tying them together. Because they are in an area of the channel that is narrow, causing a bottleneck to the barge traffic, they are to be removed but not replaced. A forth dolphin, noted as "0", in this area has been removed above the water and the materials drug to the bank. This Dolphin also needs to be removed down to the stream bed and the steel superstructure removed from the site.

Dolphins 10-13 in the northeast corner of the channel are identified as needing to be replaced. They currently serve two port industries. Discussions with these industries and with the Port staff about future plans led us to propose replacing these four dolphins with two can dolphins connected by a platform.

The Port wishes to remove the failing can dolphin circled north of the Galvilon West loading structure but not replace it. There is another can dolphin south of the Galvilon West loading structure that has completely failed and is under water. Removal of this structure is not currently considered necessary.

Dolphins 4, 5, 14 and 15 are also tower structures and they are to be removed and replaced. The remaining dolphins inspected, 6 through 9 are currently serving industries and will be the last to be replaced.

Figure 1



Existing Structures

The existing tower structures are represented in Photos 1-3 and in the isometric drawing in Figure 2. They were constructed at the same time and in a similar fashion to the T-Head Wharf. Plans for the T-Head Wharf structure are included in Appendix B. We don't have access to as-built plans for the actual tower dolphins. In the summer of 2014 the Port conducted an underwater inspection of 15 dolphins. This report is in Appendix A and referred to as *Marcan Report.* All of the inspected Dolphins showed signs of deterioration, some requiring immediate repair or decommissioning. We know these structures were not constructed strictly according to the plans (they don't have a battered pile) so using the Marcan dive report and physical observations, we created the isometric drawing in Figure 2. They are in various states of disrepair as indicated in the photos and in the dive report. The Port has identified Dolphins 0-4, 4, 5, 14 and 15 as most needing to be removed or removed and replaced. Dolphins 10-13 have had some pier encasement done to prolong their life.

The existing tower structures appear to be platforms about two feet above the normal water elevation. The platforms are approximately 12 ft. by 16 ft. resting on eight 24 in. diameter piers that are socketed five ft. into rock and belled at the bottom. Above the platform, is a tower constructed of steel pipes with a wood bumper system tied to the channel face of the tower from the platform to the top of the tower.

The existing tipped can structure is shown in Photo 4 and in the details in Appendix C – 1973 Caisson Details. The can pictured is on the north side of the Galvilon West loading structure. The one on the south side is completely under water. These two structures were constructed in 1973 and both were hit by barges. The as-built plans indicated that they are made of steel casing with a concrete bottom and top with aggregate in between. The as-built plans called for them to be anchored to the channel bottom with eight six-inch diameter holes filled with concrete with one #11 rebar in each hole. According to the Marcan Report, the north can structure is still attached to one (or more) of the six-inch holes. The Port is not interested in moving the south structure but wants to remove the north structure.

Figure 2

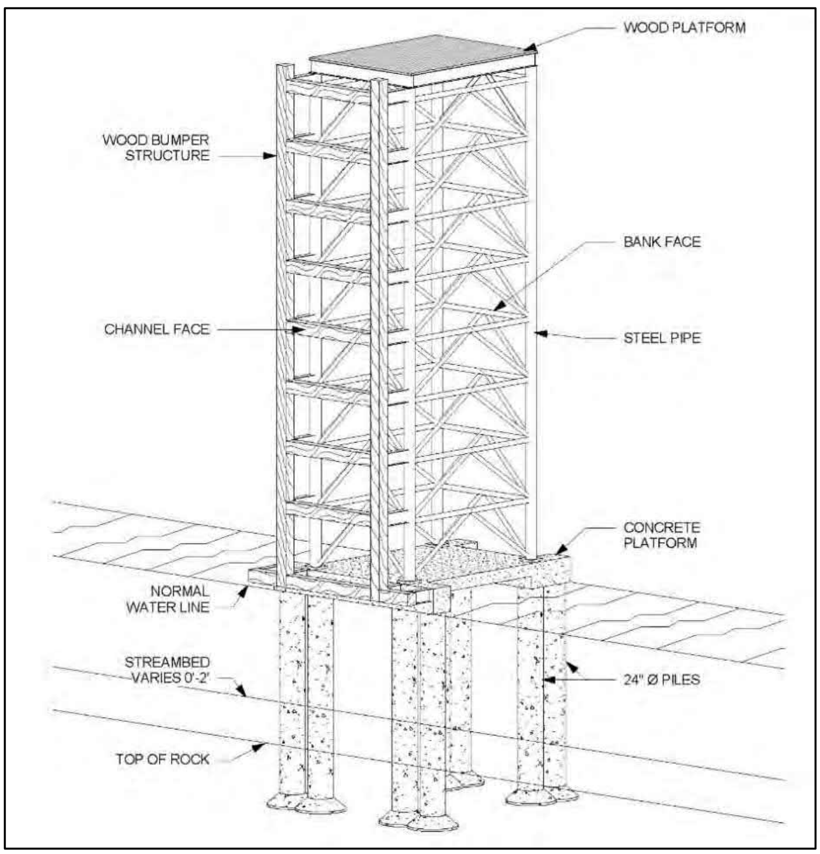


Photo 1 – Tower Dolphin

Photo 2 – Tower Dolphin

Photo 3 – Tower Dolphin

Photo 4 – Tipped Can Dolphin

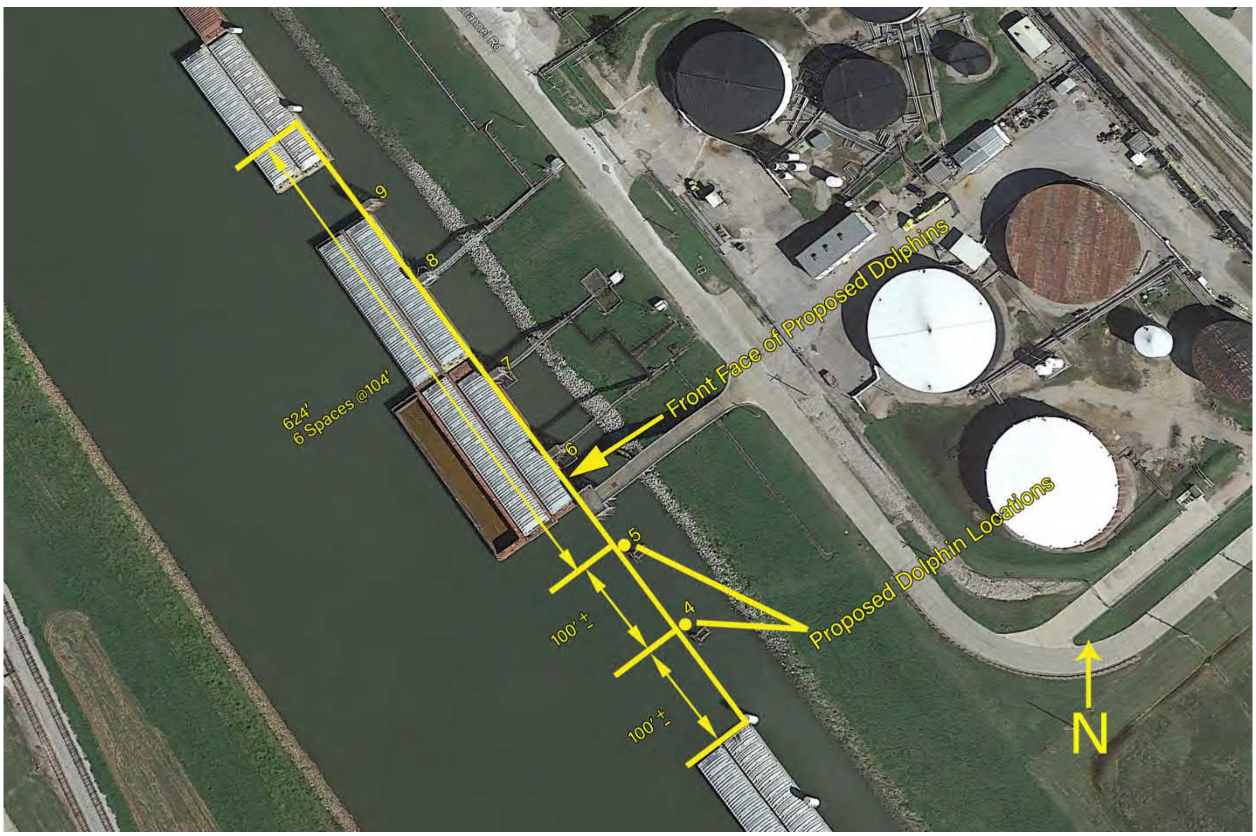
Proposed Structures

Location

Mooring dolphins constructed more recently at the Port of Catoosa are spaced close to 100ft. on center. The plans in Appendix D – Seven ft. Diameter "Can" Dolphin As-Built Plans, show the spacing varies from 98.28 ft. to 130.94 ft. but most spacings are close to 100 ft.

Dolphins 4 and 5: The distance between the two existing can dolphins flanking tower dolphins 4 and 5 is approximately 832 ft. When all of the tower dolphins are eventually replaced the desired spacing of new dolphins between these two existing can dolphins is approximately eight spaces at 104 ft. Replacing dolphins 4 and 5 at 104 ft. from the existing dolphin to the south and 104 ft between each new dolphin will put the replacements very close to the existing tower dolphin locations. New construction will probably conflict with the existing piers if they are left in place. The proposed locations for structures replacing Dolphins 3 and 4 are shown in Figure 3.

Figure 3

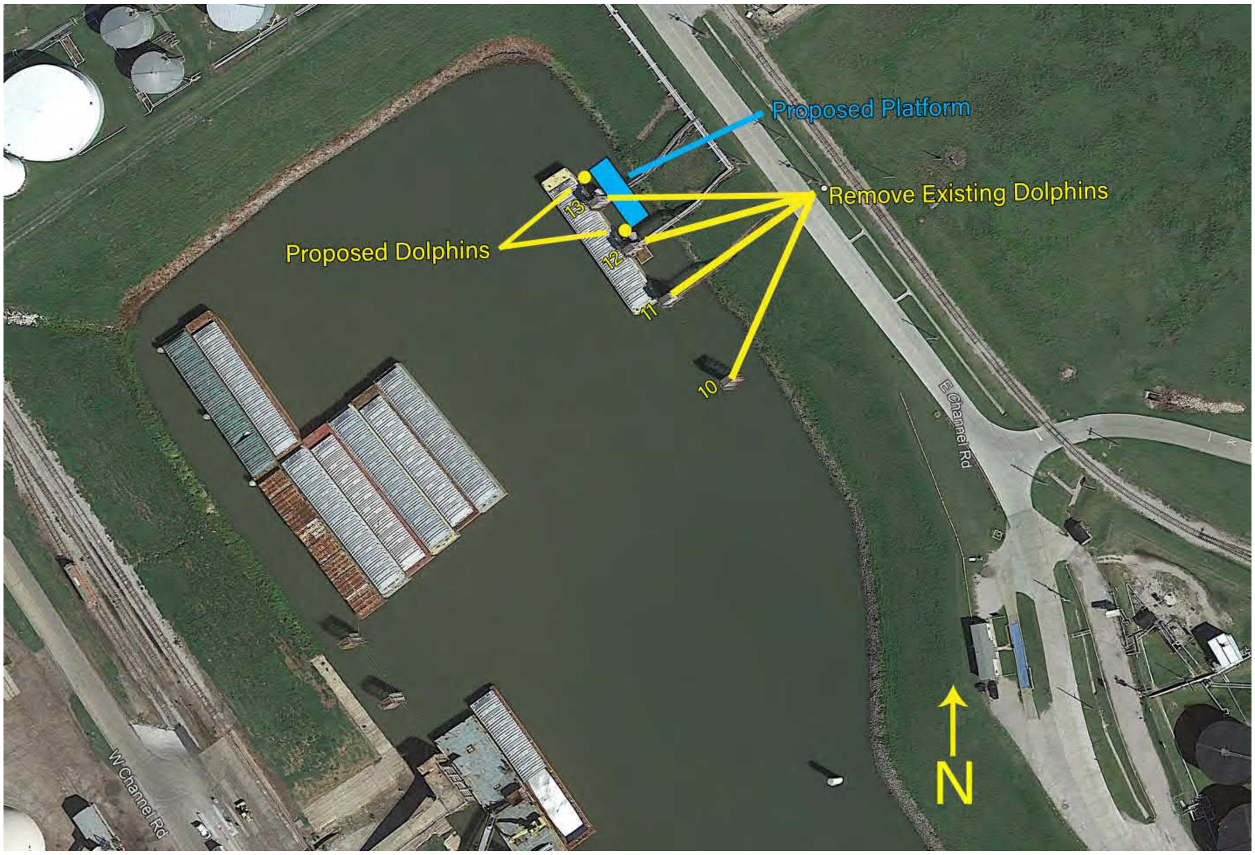


Dolphins 14 and 15: The spacing between the north Gavalon loading facility and the nearest seven ft. diameter can dolphin to the north is approximately 400 ft. Three new can dolphins installed at approximately 100ft centers between the loading facility and the next existing can dolphin to the north would allow continuous dolphins at approximately 100ft centers on the west side of the north channel. The proposed locations for structures replacing Dolphins 14 and 15 are shown in Figure 4.

Figure 4

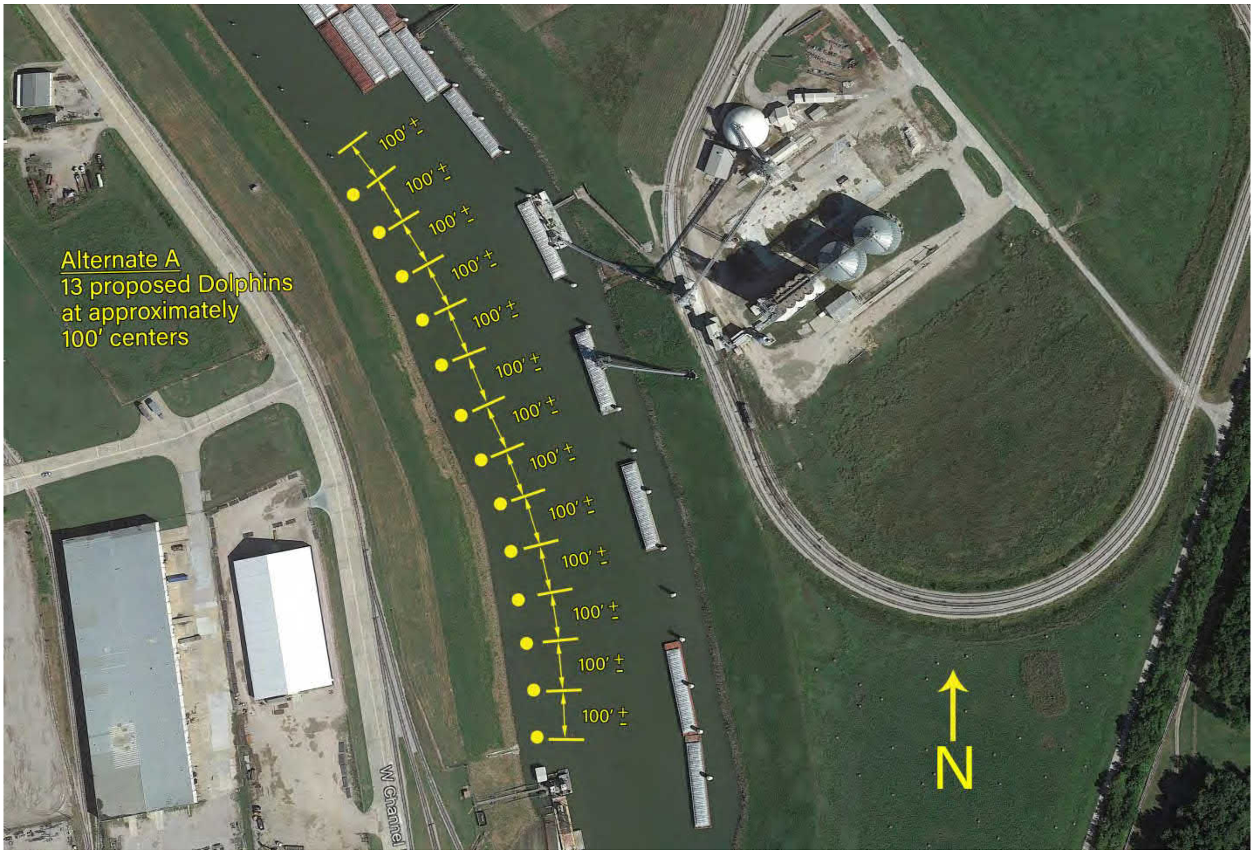
Dolphins 10-13: These four dolphins currently serve Brenntag and Holly Energy Partners. Currently only one barge can load or unload at these structures at a time. After meeting with Port staff and representatives from Brenntag and Holly Energy, we propose to replace dolphins 10-13 with two dolphins connected by a platform that would serve both industries similar to the platform north of these that currently serves Blue Knight Energy. The proposed location for new dolphins serving Brenntag and Holly Energy Partners are shown in Figure 5.

Figure 5



Additional Dolphins: The port would like to construct thirteen new dolphins on the west bank in the location currently served by shore wires from the north side of the main dock to the can dolphin closest to the main dock on the north. This project does not require removal of any existing structures and could be added to a removal and replacement construction phase as an alternate with a unit price per new dolphin.

Figure 6



Construction

The options considered for new dolphin construction are as follows:

1. Seven ft. diameter "can" dolphin similar to the ones most recently constructed at the port as the channel was widened. These are depicted in Photo 5 and the as-built plans for these are shown in Appendix D.
   a. Advantages
      i. They have been in operation for several years with little to no maintenance other than painting.
      ii. They are easy to see and contrast well with the water.
      iii. The circular design distributes impact load.
      iv. Larger diameter provides more protection from corrosion.
      v. The whole mooring dolphin from top to bottom is one type of construction.
   b. Disadvantages
      i. Some contractors may not have the equipment to drill seven feet diameter.
      ii. If placed close to the location of the existing "tower" dolphins, the pier would have a greater chance of hitting existing concrete from the existing piers if they are not completely removed.

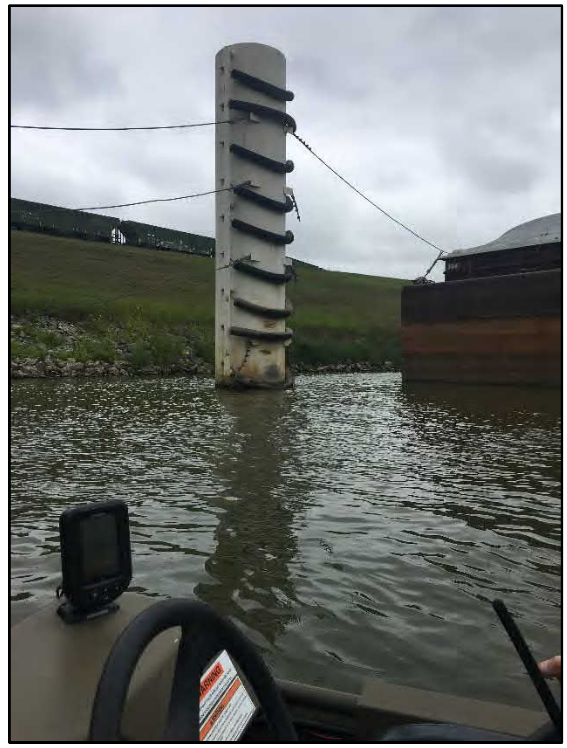


Photo 5 – Can Dolphin

2. A concrete platform one ft. above normal water elevation, placed on three to four 36" to 42" diameter piers, with a truss type tower structure above similar to the existing "tower" structures.
   a. Advantages
      i. The smaller 36" to 42" piers could be drilled around the existing 24" piers that may be left in place below the rock line.
      ii. The smaller 36" to 42" piers are more common and most bridge contractors are capable of constructing them.
      iii. Three to four piers instead of one provides some redundancy.
      iv. Impact to the platform or truss structure above could be distributed to the foundation in a wider area than seven ft.
   b. Disadvantages
      i. Drilling, encasing and placing concrete and reinforcing in three to four holes instead of one.
      ii. The dolphin is constructed in stages and involves several different types of construction.

The dolphins replacing existing structures 10-13 are anticipated to be two mooring dolphins with a platform resting on an independent pier system and extending between the two dolphins similar to the platform that currently serves Blue Knight Energy. We discussed this project with representatives from Holly Energy Partners and Brenntag. Based on our discussion and investigation of the current services at Dolphins 10-13 and of the configuration of the platform that serves Blue Knight Energy, we listed the following design considerations for this structure.

- Both industries are not using the dolphins regularly at this time. Brenntag has had only two barges in 2018 and Holly has had none. They are planning to use the facility in the future but the current rate of use would provide easy access for construction.

  - Currently, it is difficult for Brenntag to find barges for the product. The barges are booked weeks in advance for areas close to the ocean harbors.
  - Rail is currently cheaper than barges for Brenntag
  - Holly has contracted with a consultant to assess the existing dolphins for the feasibility of upgrading to be able to load barges in the near future.
- The barge size is the typical 35' x 195' and is limited to 3 million pounds due to the 9ft. draft.
- Both companies use a tank type barge.
- Brenntag only unloads; Holly only loads.
- A past high shipping average was two barges per month for Brenntag.
- Brenntag ships caustic soda. In the past, they have shipped methanol and may do so in the future.
- Holly only loads hydrocarbons including crude oil.
- The port would likely provide space for pipes and the industries would provide the pipes from the platform.
- The typical offload time is six hours.
- Currently neither company loads or offloads at night. Lights and other night appurtenances may be a consideration for future construction. Electricity should be provided.
- Both companies would like a shed or storage building approximately 6ft. x 8ft. for extinguishers, life preservers and other items that could be stored on the platform. Air conditioning is desired for the building but the electrical supply to the platform should be kept at a minimum to limit the possibility of sparks.
- The platform should have two elevations one at loaded barge level and one at empty barge level.
- Typically, there are four personnel on the platform during connection and disconnection and two during load and off-loading.
- Electrical service and water supply are desired for the platform.
- Everything must be explosion proof.
- Both companies need a jib crane with a free-swinging arm. The crane should be able to carry two tons and should have an electric motor to raise and lower a hose.
- The hose needs to have a containment structure with a 110 barrel capacity. They are currently using a tub.
- A gangway access to the platform is needed. The companies can share one gangway.
- All of the barges for both companies will have a dedicated tow.
- The port's "flushing" channel, a structure that connects the Verdigris River to the channel on the east, is located just south of dolphin 10.
- Advance notice for barges would be required with the shared platform but that is the condition presently. Brenntag's lead time is 10-14 days and Holly's is 8-10 days.
- We discussed having shared functions in the center of the platform with pipes and individual functions on each end. Security would need to meet Coast Guard standards but could likely be provided with fencing on the platform.
- The design rise in water level will be ten ft. Anything above would not support barge traffic.

Photo 6 – Dolphins 11 and 12

Photo 7 – Blue Knight Platform

Existing Conditions

All previous Mooring Dolphin projects have been constructed in the dry or mostly dry, before the adjacent bank was excavated. This project will require demolition and construction in up to twelve feet of water. We spoke to representatives from three local contracting companies and all said they would do at least some of the work from barges. Some of the work may be able to be done from the bank with outriggers or supports in the water.

The geotechnical exploration report in Appendix E shows that shale lies just below the stream bed at the location of the Main Dock. Based on discussions with Port staff and contractors that have worked in the channel in the past, the top of rock varies from inches below the stream bed at the north end of the channel to about two feet below the stream bed at the south end of the channel. In borings 3 and 4 of the report, the shale extends approximately twenty-six feet below the streambed where the borings in the channel were terminated. Immediately adjacent to the channel borings at the Main Dock location, borings 1 and 2 were drilled from the top of bank. These two borings showed fill to about twenty-six feet below the steam bed and limestone for twelve feet and then shale to the termination at approximately 81 feet from the surface.

Sherwood Construction had the contract to build the latest "can" dolphins. The contractors said that the rock below the stream bed is very hard.

Construction Methods

We spoke with representatives of three local contracting companies:

- Todd Saxton with Manhattan Road and Bridge;
- Brad Peterson, Mike Nissen and Gene Spitza with Jensen Bridge; and
- Ron Egge with Sherwood Construction.

We left a message with Becco but did not receive a response. Our discussion with each contractor was centered around methods that are available locally for both demolition and construction. The only local company, to our knowledge and theirs, that owns barges is Jensen Bridge. However, other local contractors can rent barges. Our findings from these discussions are summarized below:

Demolition

Removal of the existing dolphins consists of dismantling the steel truss structure above the platform, saw cutting and removing the concrete platform and removal of the piers. Demolition methods for removing the piers are described here:

Manhattan Road and Bridge – Diamond blade saw at just below the stream bed and leave the piers in place below the top of rock. The diamond cutting could be done from a barge and possibly from the bank with outriggers.

- Requires divers
- Could be barge mounted
- Prefer to shore mount and use outriggers
- Estimated $125K/dolphin to remove including material disposal
- Anything below mud has to be jackhammered
- Most likely need to leave everything below mud

Jensen Bridge –Would use either a crane mounted cutter to remove the piers or blast them.

Crane mounted cutter:

- Divers not required
- Could be barge mounted
- Cut piles at streambed

- Rig is about $50,000/month – Jensen has to rent it but they own the barges

Blasting

- Jensen does this on bridge piers and the impact of the blast is not noticeable to adjacent properties.
- COT Flowline probably not let us blast the piers for dolphins 0-4 because they are too close to the Spavinaw supply lines.
- We are not replacing 0-4 so the piers could just be cut at the streambed line.
- Cost of blasting would be $5-$10K per pier or $40,000-$80,000 per dolphin.

Blasting the piers is Jensen's preferred method and this would enable them to remove the concrete from below the top of rock assuming the piers are only socketed five feet into rock as the T-Head Wharf plans indicate. Jensen could also cut the piers at the top of rock if blasting is not allowed

For removal of the tipped-over can dolphin, they can hook on to the exposed top and drag it to the bank, cut it open and remove the gravel before hauling away.

Sherwood Construction – Didn't believe that the City of Tulsa would allow blasting anywhere in the channel because of the Spavinaw water supply lines that cross the channel at the south end.

- Ron thought that construction of the new dolphins would not be a problem as long at the drilled perimeter did not cut through existing concrete.
- Not specifying the removal of concrete below the top of rock but leaving that as a "means and methods" will keep more bidders in the project.

We spoke with Anthony Wilkins with the City of Tulsa Planning Department about blasting in the channel. He said that the City decides to allow or disallow blasting based on individual circumstances and that any contract for removal that allows blasting must require the contractor to be responsible for any damage. A City of Tulsa blasting specification is in Appendix F. In order for blasting to be allowed on this project, The Port's Engineers must submit the following documents and calculations to the City of Tulsa:

- The geotechnical report for the dolphin design project with borings at the new dolphin locations.
- A plan showing the locations of blasting and the location of the water supply lines crossing the channel.
- A cross section showing the proximity of the waterlines, horizontal and vertical, to the piers being blasted.
- A calculation of the impact zone from the blast(s) which is affected by the hardness of the rock holding the piers and all medium between the piers and the water supply lines.

Construction

Proposed construction of replacement dolphins consists of two types: seven ft. diameter cans similar to the more recently constructed dolphins and platforms built on three to four smaller diameter piers and supporting a steel tower type structure above the water. Most of the replacement dolphins can be placed between the existing dolphins for this phase of construction but the desirable location of some of the replacement dolphins may conflict with material left below the stream bed from the removed structures in Phase I or in future phases. Discussions with the three contractors about construction of replacement dolphins are described here:

Manhattan Road and Bridge –

- Drilling through existing concrete is difficult with unpredictable results.
- The Port may get better bids for the platform, tower type dolphin with smaller diameter piers because more contractors will have the equipment to drill the smaller piers and they could be placed between any existing piers left in place.
- A seven ft. diameter pier placed between existing piers would not line up with the other dolphins on the channel face so a cantilever structure would be required.

Jensen Bridge –

- Drilling through existing concrete is not recommended.
- Would prefer to construct the seven ft. diameter cans because it is all one type of construction.
- If the existing piers are blasted, they would not be a problem for drilling large diameter piers.

Sherwood Construction –

- Would also prefer to construct the seven ft. diameter cans. They constructed the last installation and they have the equipment to perform this work.
- As long as the perimeter of the seven ft. diameter can does not cut through existing concrete, Sherwood can drill the piers and install the casing so that the casing acts as a cofferdam to allow them to remove the existing piers from below rock.

General

Discussions with all three contractors and with Port staff involved general requirements for Phase I removal and reconstruction. These requirements are listed here:

- A greater number of new dolphins in the bid package will probably get better prices per dolphin. The Port suggested adding an additional 13 can type dolphins along the west bank at 100 ft. spacing in the area that is currently served by shore wires.
- Prequalifying the contractors is recommended. ODOT did this for the railroad bridge over SH 235 in Oklahoma City. Suggested qualifiers were experience with barge construction and port experience.
- A work exclusion area will be mapped out so the contractor will know where he can put barges, boats, equipment, etc. without disturbing navigation.
- All of the piers for both types of construction should be encased and filled with concrete and reinforcing cages. The casing for the seven ft. diameter piers should be at least 5/8" thick to prevent "ovaling" during shipping and storage.
- The pier casing should be painted with either Coal Tar Epoxy or a Marine quality epoxy paint. ForsField TZ-904 by Chevron,a polysulfide-modified novolac epoxy coating, is less harmful to the environment, easier to apply and on-going test results imply that it requires less maintenance over time. It is more expensive at $100/sf at 90 mils to $25/sf at 90mils for Coal Tar Epoxy.

Phasing

Replacement of the tower dolphins will require project phasing due to construction costs, barge traffic and impact to the industries. The phasing options discussed for this report are listed below:

1. Remove Dolphins 0-3, 4, 5, 15 and 16 and replace these with five new dolphins in the areas depicted in figures 3 and 4 in phase I. Construct thirteen additional dolphins as an ad-alternate to phase I. Replace Dolphins 10-13 with two new dolphins and a connecting platform in Phase II or a later phase. Replace dolphins 6-9 in a later phase.
    a. Advantages
        i. Removing Dolphins 0-3 would clear the bottleneck in the channel sooner.
        ii. Construction of the five new dolphins could be similar to recent dolphin construction but in wet conditions so the learning curve would be limited to the barge construction aspect.
        iii. No dolphins that currently serve industry would be impacted in the first phase.
        iv. Adding the thirteen additional dolphins in any construction phase would reduce the cost per dolphin.

b. Disadvantages
   i. The industries served by dolphins 10-13 may begin shipping product between phases 1 and 2 and would suffer greater impact from construction.
   ii. The thirteen additional dolphins may not be budgeted for in the first phase.

2. Remove Dolphins 1-3, 10-13 and the tipped over can dolphin. Replace Dolphins 10-13 with two new dolphins and a connecting platform in Phase I. Remove Dolphins 4, 5, 15 and 16 and replace with five new dolphins in Phase II or a later phase. Replace Dolphins 6-9 in a later phase.
   a. Advantages
      i. Dolphins 10-13, currently serving Brentag and Holly Energy Partners, could be removed and replaced in a year that they are not being used.
      ii. Holly Energy Partners has been tasked with updating their existing dolphin for future use and this construction project may prevent duplication of effort.
      iii. Removal of dolphins 0-3 in Phase I would clear the bottleneck in the channel sooner.
      iv. Dolphins 4, 5, 15 and 16 are not currently serving any industry so there is little demand for replacement.
   b. Disadvantages
      i. Construction of a shipping platform is a project that the Port has not undertaken themselves. Design time for this project would take longer and the learning curve for construction in wet conditions would be coupled with constructing a shipping platform.
      ii. Dolphins 10-13 have been rehabilitated to add additional life span, Dolphins 4, 5, 15 and 16 have not been rehabilitated.

Cost Estimate

With input from the Port staff, BKL sent the following scope of work to both Jensen Bridge and Sherwood Construction with associated exhibits.. The contractor's estimated costs are shown below.

Scope:

The scope of this phase will be to remove eight "tower" type dolphins and one tipped over can and replace 4 of the tower dolphins with "can" type structures. *We would also like to know the additional cost for construction 13 more "can" structures on the west bank in the space that is currently served by shore wires.*

Jensen Bridge Estimate:

$1,400,000.00 for Phase I work and if done under the same contract, each additional dolphin could be constructed for $150,000 each.
Total Base Bid = $1,400,000
Alternate A = $1,950,000

Sherwood Construction Estimate:

Dolphin installation $300,000 each x 4 = 1,200,000
Demolition of towers 4,5,14 and 15 $32,000 each = $128,000.00
Demolition of towers 1, 2 and 3 $32,000 each = $128,000.00 including dolphin 0
Demolition of tipped can dolphin $28,000
Installation of 13 additional can dolphins $300,000 each = $3,900,000.
Total Base Cost (no contingency) = $1,474,000.
Alternate A = $3,900.000

Holly Energy Partners and Brenntag Phase Construction Estimate:

ITEM NO.	SPEC. NO.	DESCRIPTION	UNITS	UNIT PRICE	ESTIMATED QUANTITY	EXTENSION
1		DEMOLITION EXISTING TOWERS	EA	$32,000.00	8	$256,000.00
2		DENIOLITION TIPPED CAN STRUCTURE	EA	$28,000.00	1	$28,000.00
3		SURVEY	LSUM	$10,000.00	1	$10,000.00
4		PIPE STUBOUTS	LSUM	$10,000.00	1	$10,000.00
5		MISC PIPE EQUIPMENT	LSUM	$20,000.00	1	$20,000.00
6		CONCRET BEAMS	LF	$850.00	67	$56,950.00
7		24" PIERS	LF	$240.00	160	$38,400.00
8		7' DIAMETER CAN DOLPHIN WITH CASING AND PAING	EA	$300,000.00	2	$600,000.00
9		CONCRETE PLATFORM AND PEDESTALS	CY	$850.00	10	$8,500.00
10		ALUMINUM GRATING	SY	$55.00	2500	$137,500.00
11		METAL GANGWWAY	EA	$30,000.00	1	$30,000.00
12		HANDRAIL	LF	$55.00	350	$19,250.00
13		CHAINLINK FENCE	LF	$50.00	100	$5,000.00
14		ALUIMINUM FRAMING	LBS	$16,000.00	4	$56,000.00
15		LADDERS	EA	$2.00	1000	$2,000.00
16		SIGNAGE	LSUM	$4,000.00	1	$4,000.00
17		12' X 12' SHED	EA	$30,000.00	1	$30,000.00
18		JIB CRANE AND HOIST	EA	$40,000.00	2	$80,000.00
19		ELECTRICAL/FIRE PROTECTION	LSUM	$30,000.00	1	$30,000.00

TOTAL ITEMS	**$1,165,600.00**
20% CONTINGENCY	**$233,120.00**
TOTAL W/ CONTINGENCY	**$1,398,720.00**

Conclusions

Based on our investigation we concluded that Phase I construction plans should be produced for the following items:

- The removal of Dolphins 0-3, 4 and 5, 14 and 15.
- Removal of the existing, tipped-over can dolphin near the Galvilon West loading structure.
- Reconstruction of five seven ft. diameter can dolphins drilled twelve feet into shale and extending at least 35 ft. above the normal water line at locations near existing dolphins 4, 5, 14 and 15.
- The reconstruction plans and details should have new dolphins lined up with the front of existing dolphins and spaced as close to 100ft. centers as possible. The proposed location of these structures is shown in figure 3.
- The cost of Phase I is estimated to be approximately $1.7 Million.

Phase II construction plans should be produced for the following items

- The removal of Dolphins 10-13 in Figure 1 at the north end of the channel.
- Reconstruction of two seven ft. diameter dolphins near dolphins 12 and 13 with a platform between them constructed on smaller diameter piers.
- The cost of Phase II construction is estimated to be approximately $1.4 Million.

Add Alternates for Phase I or Phase II to include the following:

- Up to 13 additional can dolphins on the west bank in the space that is currently served by shore wires.
- The cost of the additional dolphins is estimated to be between $150,000 and $300,000 each.

All design documents should include specifications for the removal of the existing dolphins that minimize the impact to the Spavinaw water lines and the adjacent industries but should not limit means and methods. Documents should include prequalification for barge construction and the documents should have construction sequencing that limits the impact to channel traffic and Port industries.

Appendix A

Marcan Report
Underwater Dolphin Inspections

MarCan Underwater Services LLC
PORT INSPECTION AT THE TULSA PORT OF CATOOSA

INSPECTED 15 MOORING STRUCTURES AND FRONT STRUCTURES FOR 200-TON CRANE

INSPECTION DATES: JULY 16, 2014- JULY 18,2014

MarCan

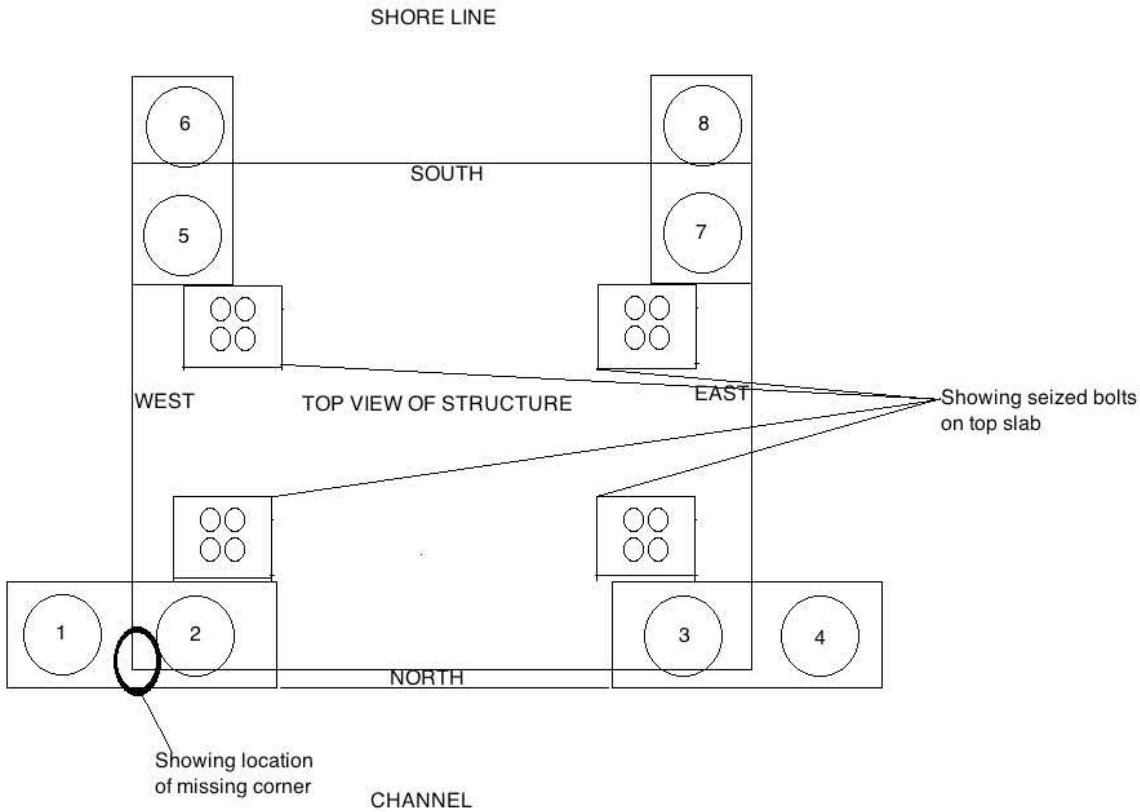
Underwater Services LLC.

Starting on July 16, 2014 MarCan Underwater Service started an inspection of the 15 structure mooring system at The Tulsa Port of Catoosa.

In this packet you will find a detailed report of our finding on each dolphin, along with a corresponding still life photograph in order to better indicate the structure under inspection.

After reviewing this report we urge you to contact our office at (936) 404-9514 in order to discuss your options for extending the longevity of your structures and measures that can be taken to protect the structures you currently have in use.

MOORING STRUCTURE #6



Top slab

WATERLINE TO MUD LINE IS ROUGHLY 10' DEEP ON THE CHANNEL SIDE

Note all bolt sets were rusted and appeared seized.

Debris was found submersed under the structured and consisted of logs and wire rope.

Northwest corner has been chipped away on top slab.

MOORING STRUCTURE #6

PILE #1

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

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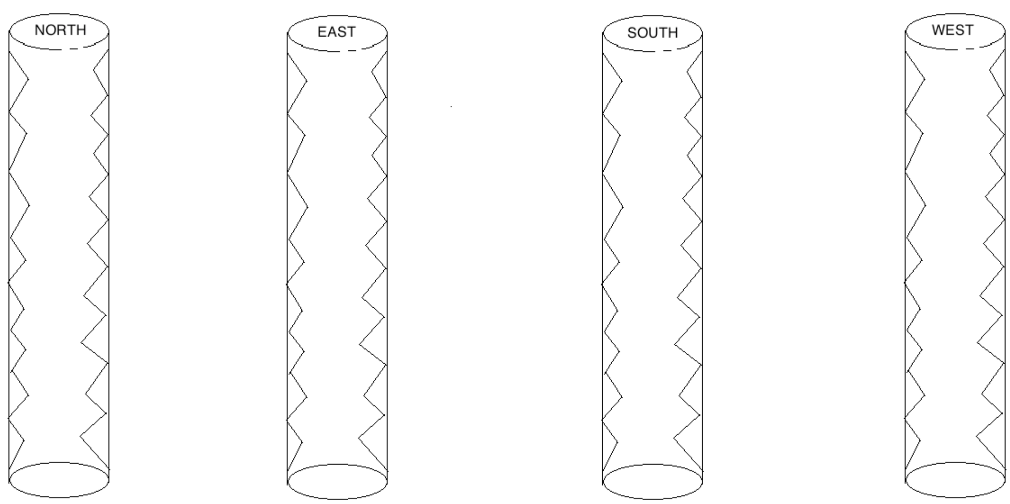

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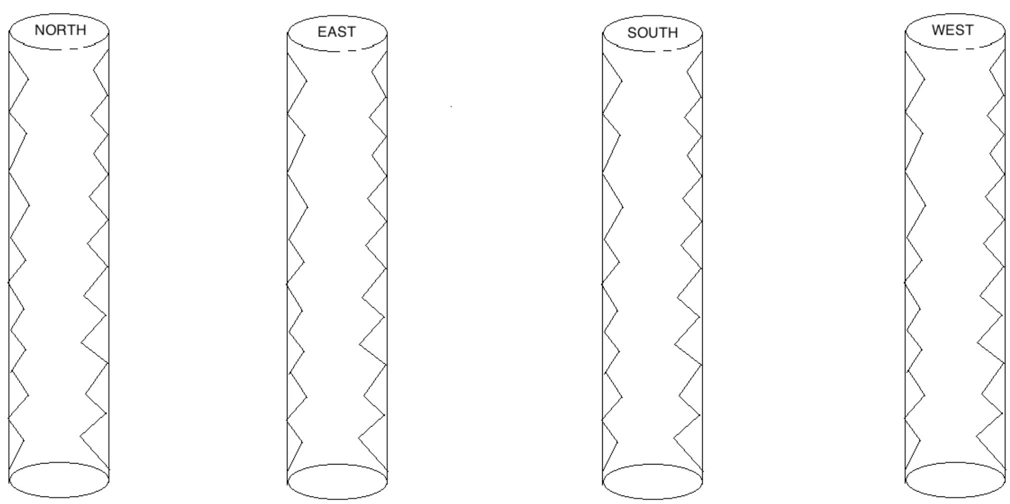

PILE #3

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East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, noted was a 5'' long by 5'' wide by 5'' deep hole, located 7'' and 10'' down from the bottom of the rectangular block.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

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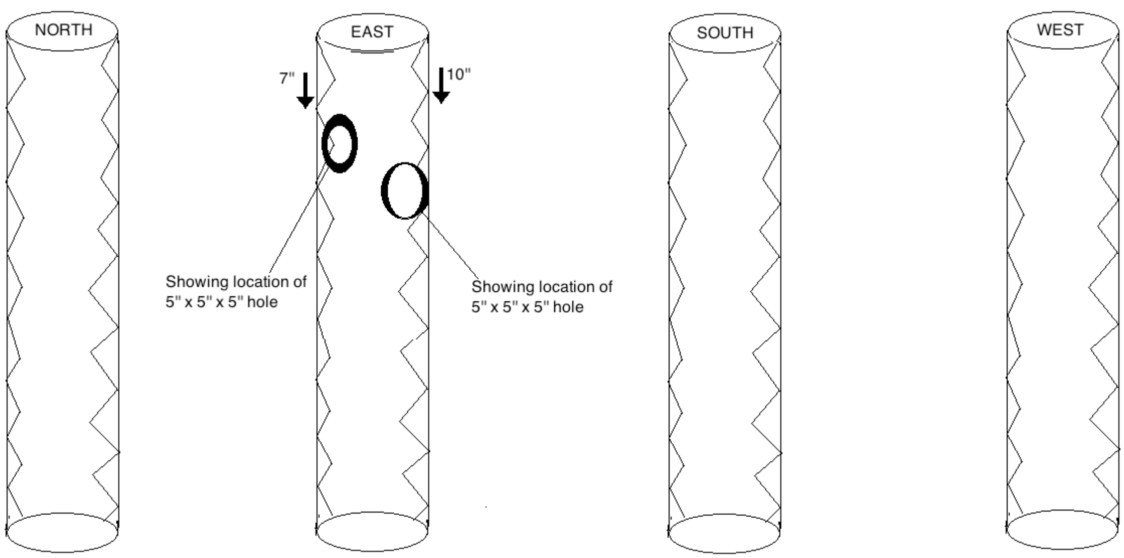

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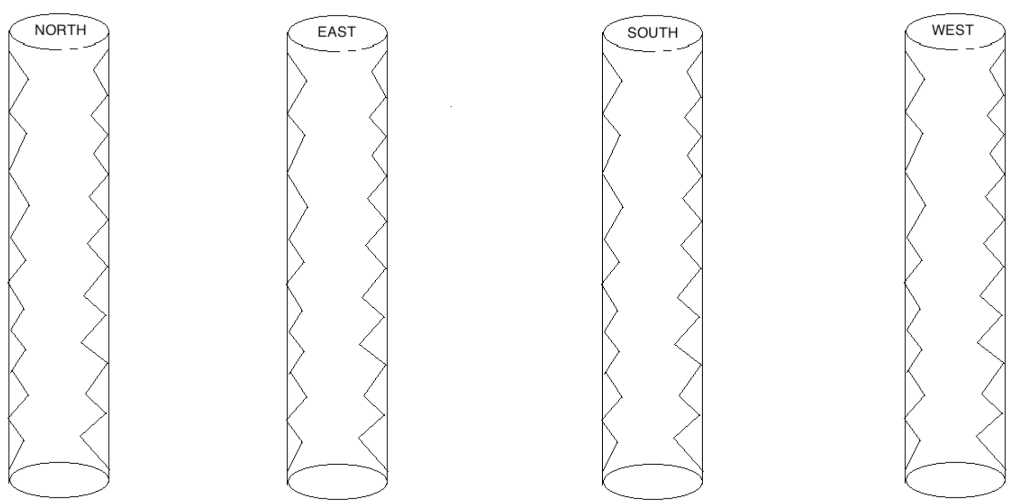

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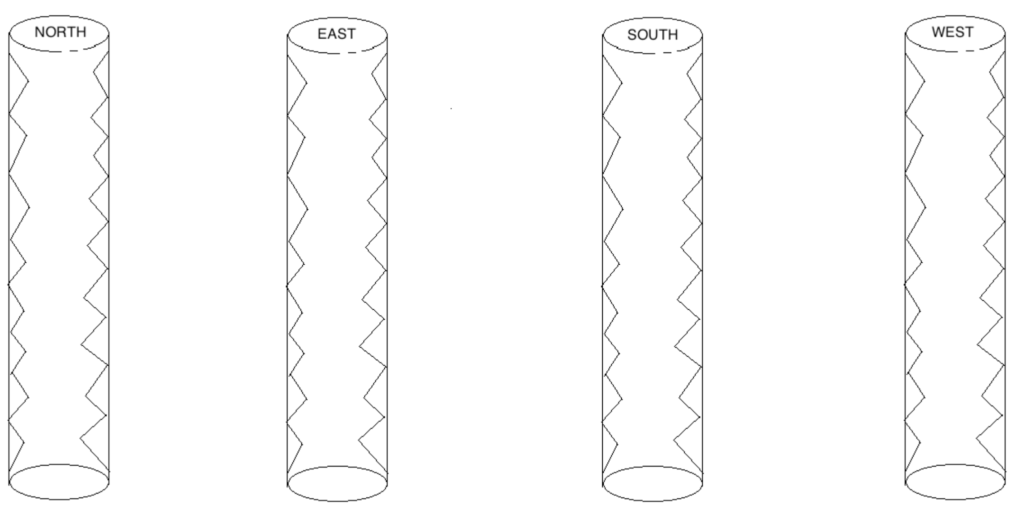

PILE #6

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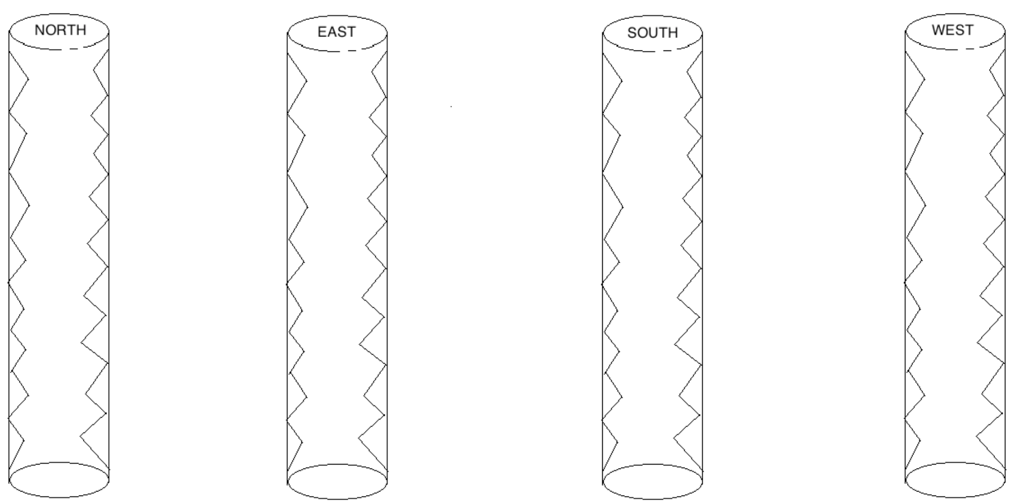

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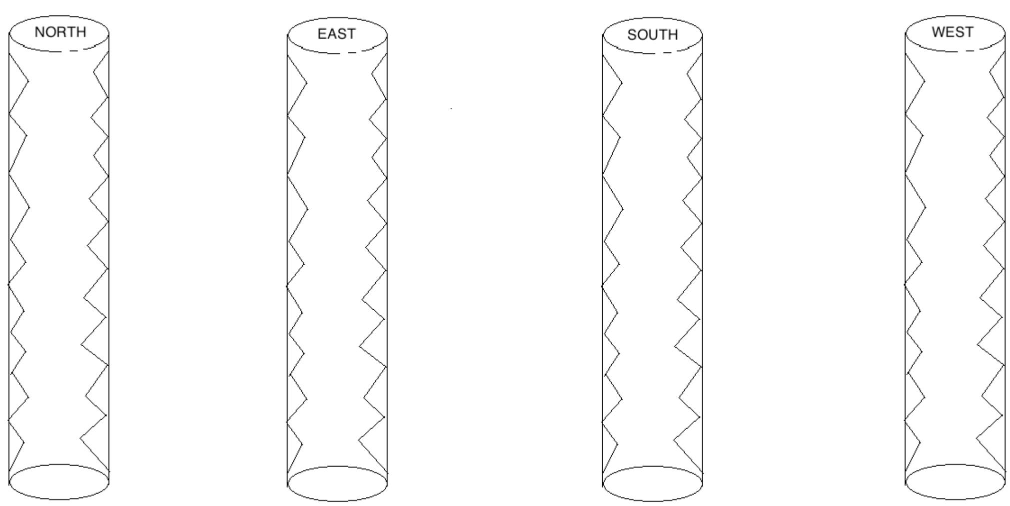

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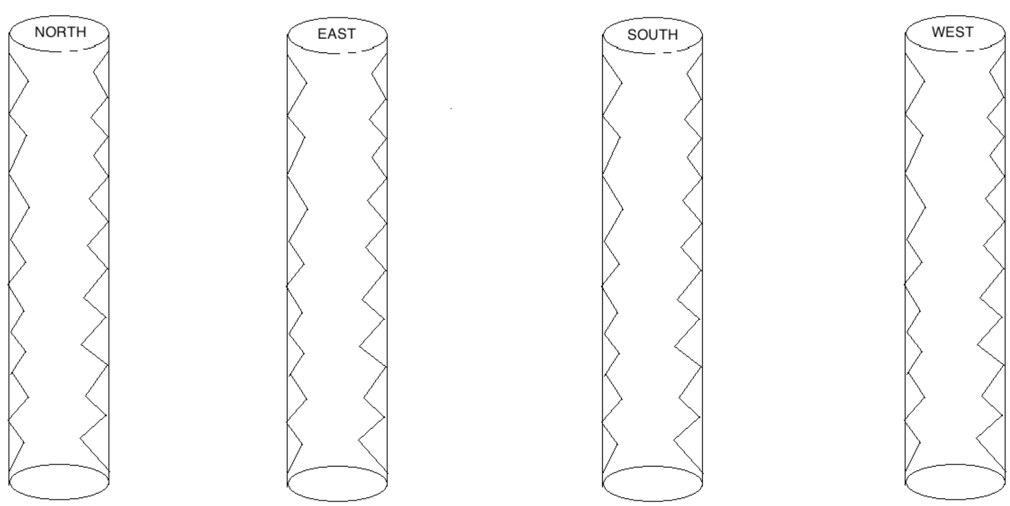

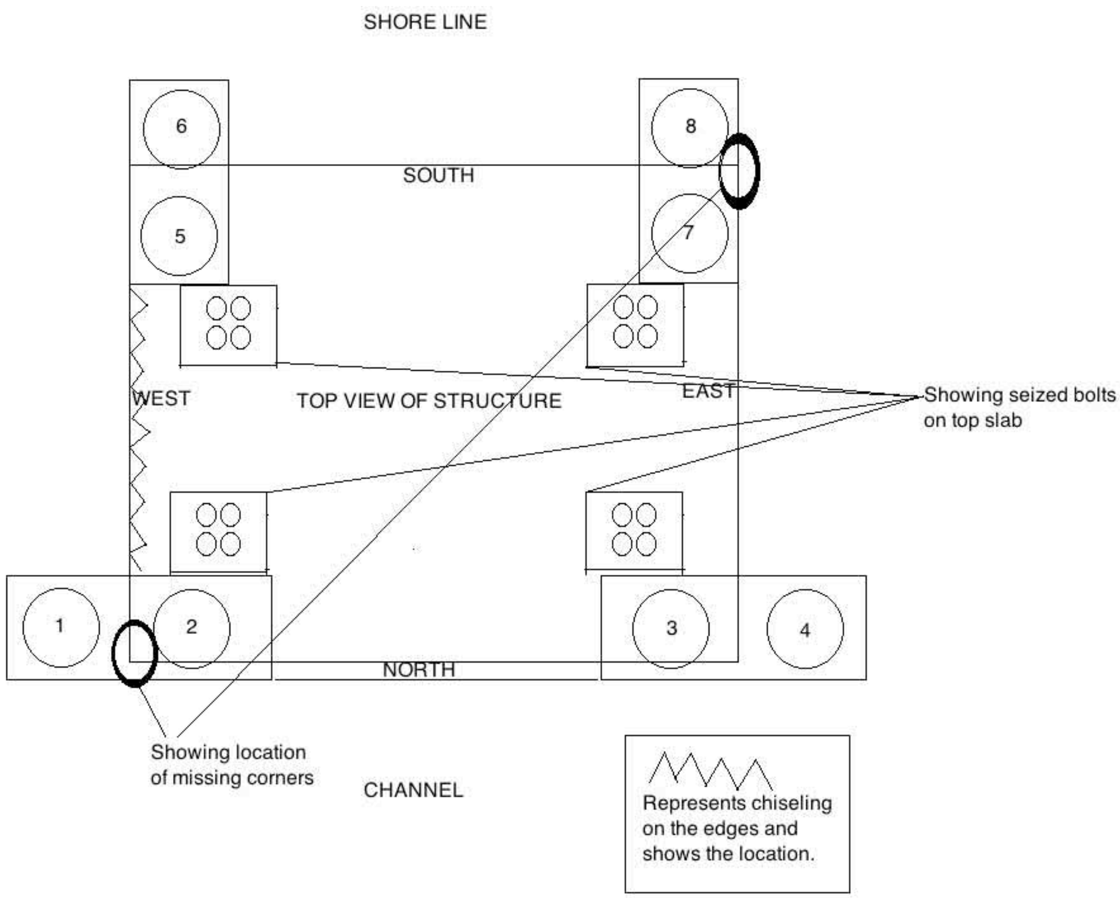

Top slab

WATERLINE TO MUD LINE IS ROUGHLY 10' DEEP ON THE CHANNEL SIDE

Note all bolt sets are rusted and appeared seized.

The west top edge of the top slab has chiseling and deterioration.

The northwest and the southeast corner have chipped away on the top slab.

MOORING STRUCTURE #7

PILE #1

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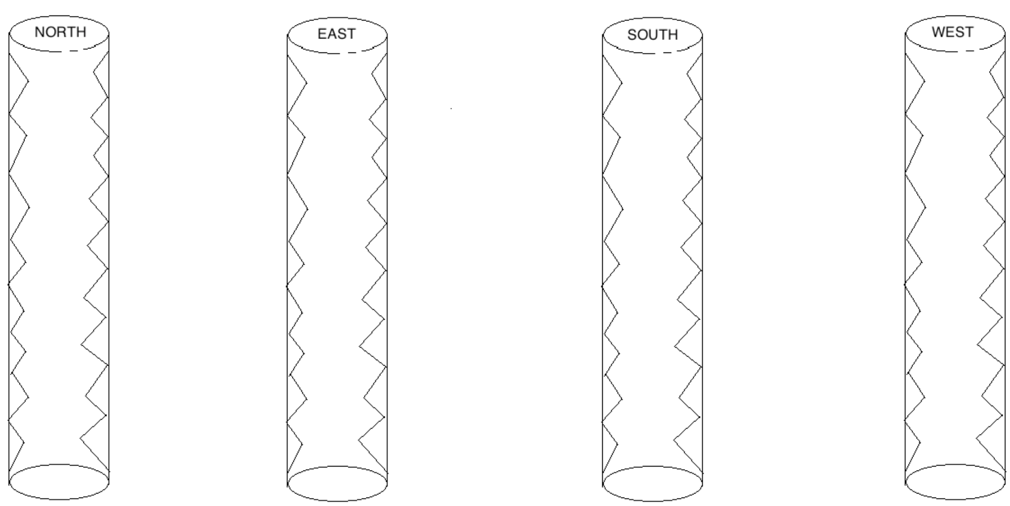

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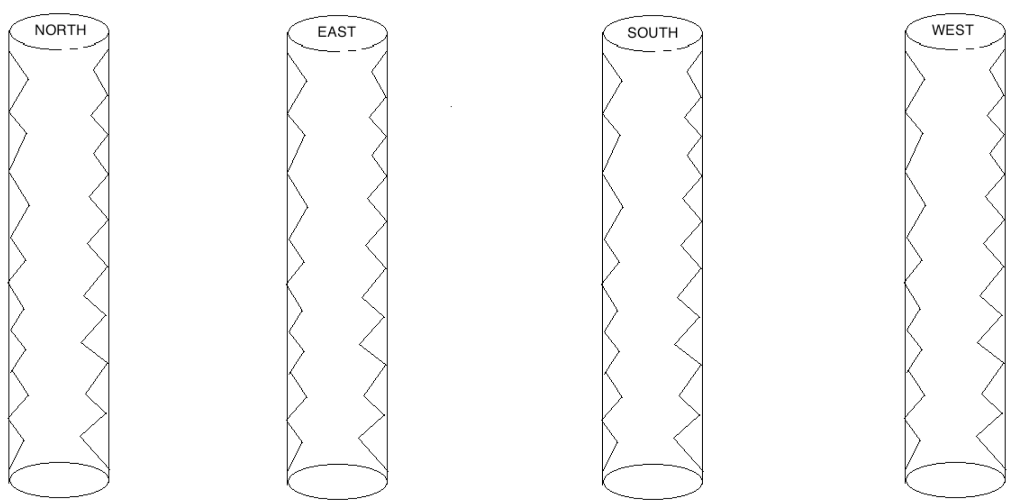

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South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 5'' long by 5'' wide by 5'' deep hole located 6'' below the bottom of the rectangular block.

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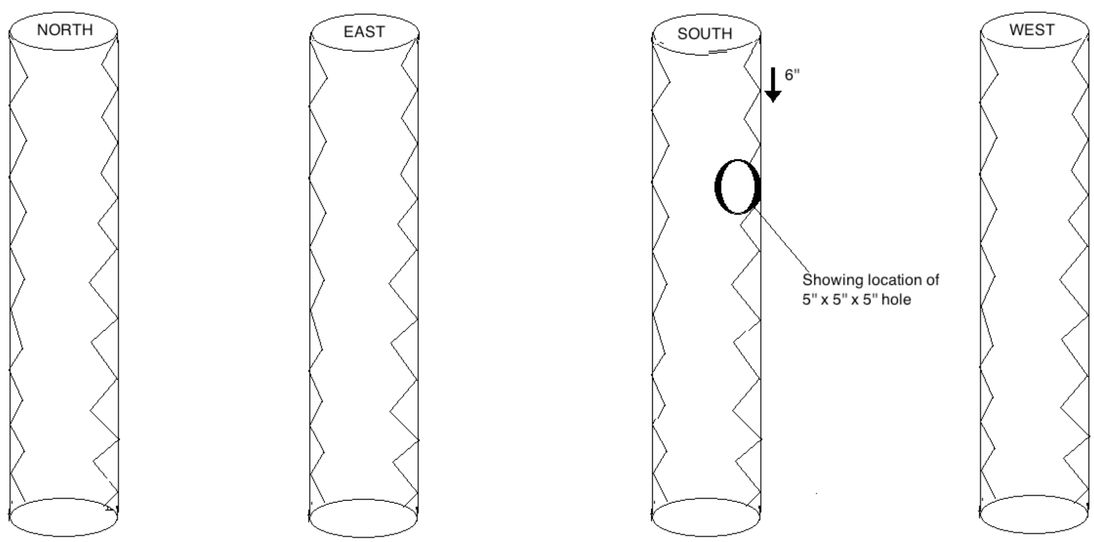

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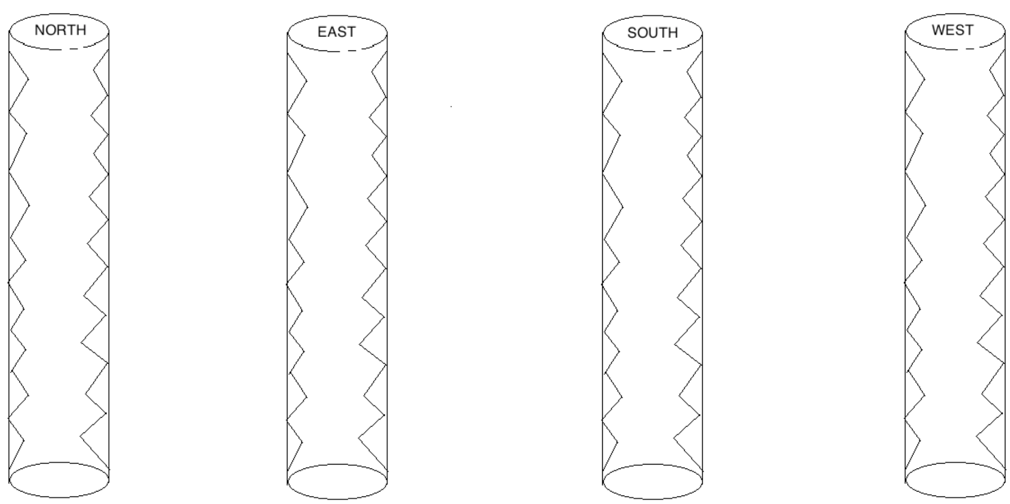

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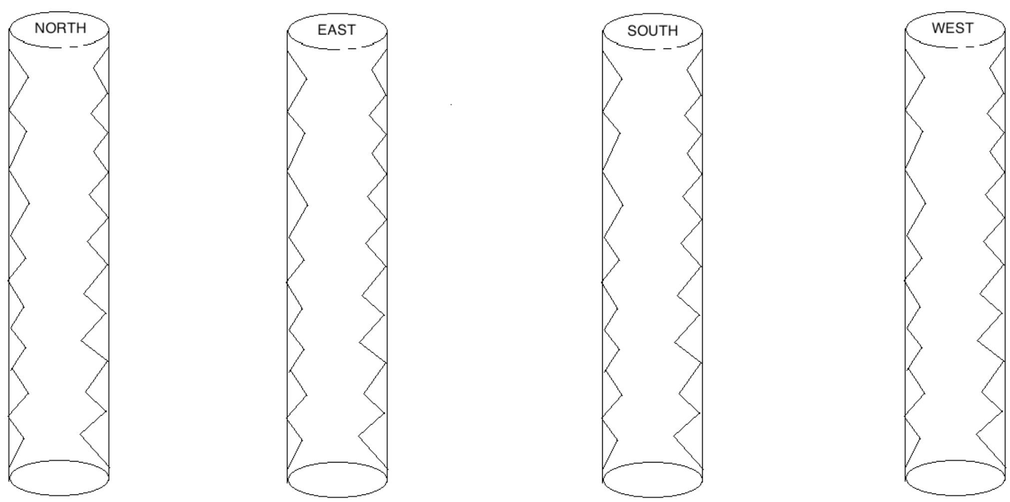

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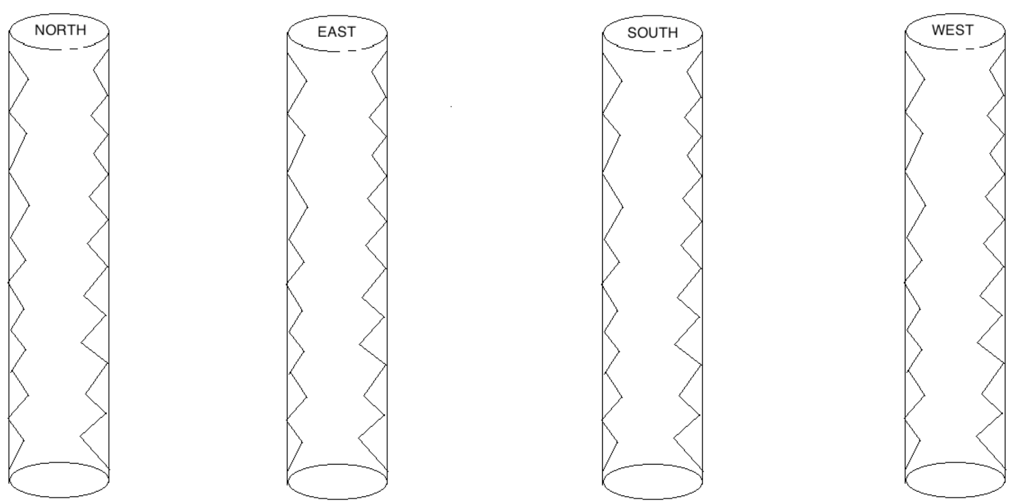

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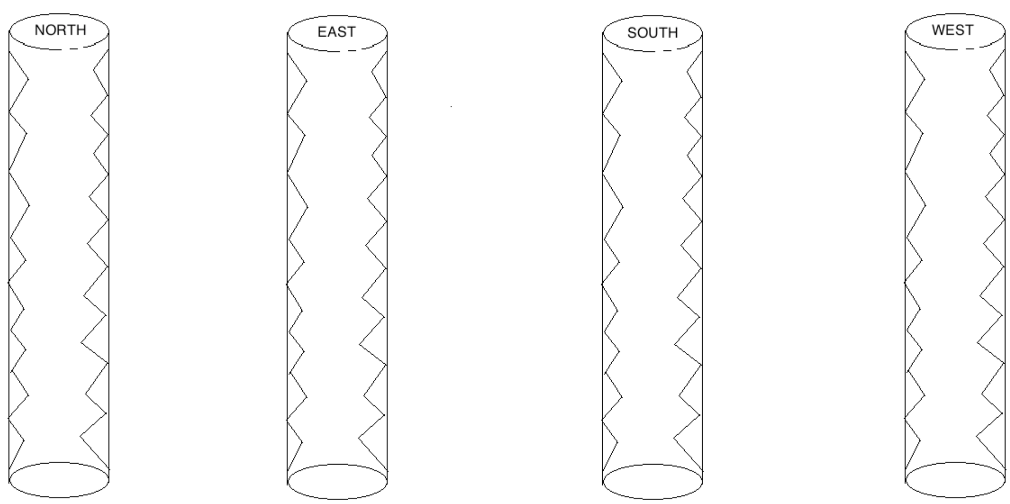

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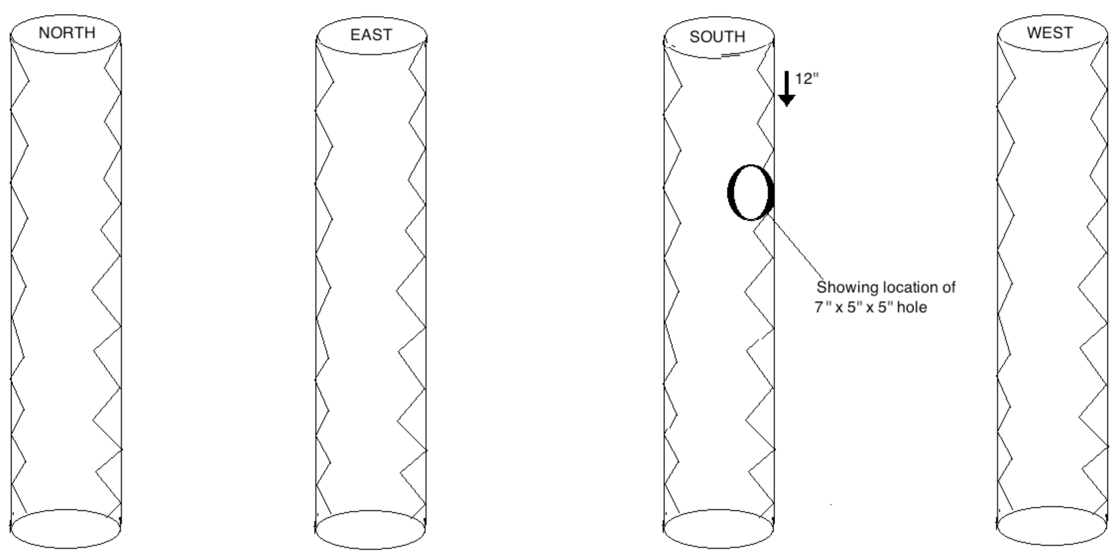
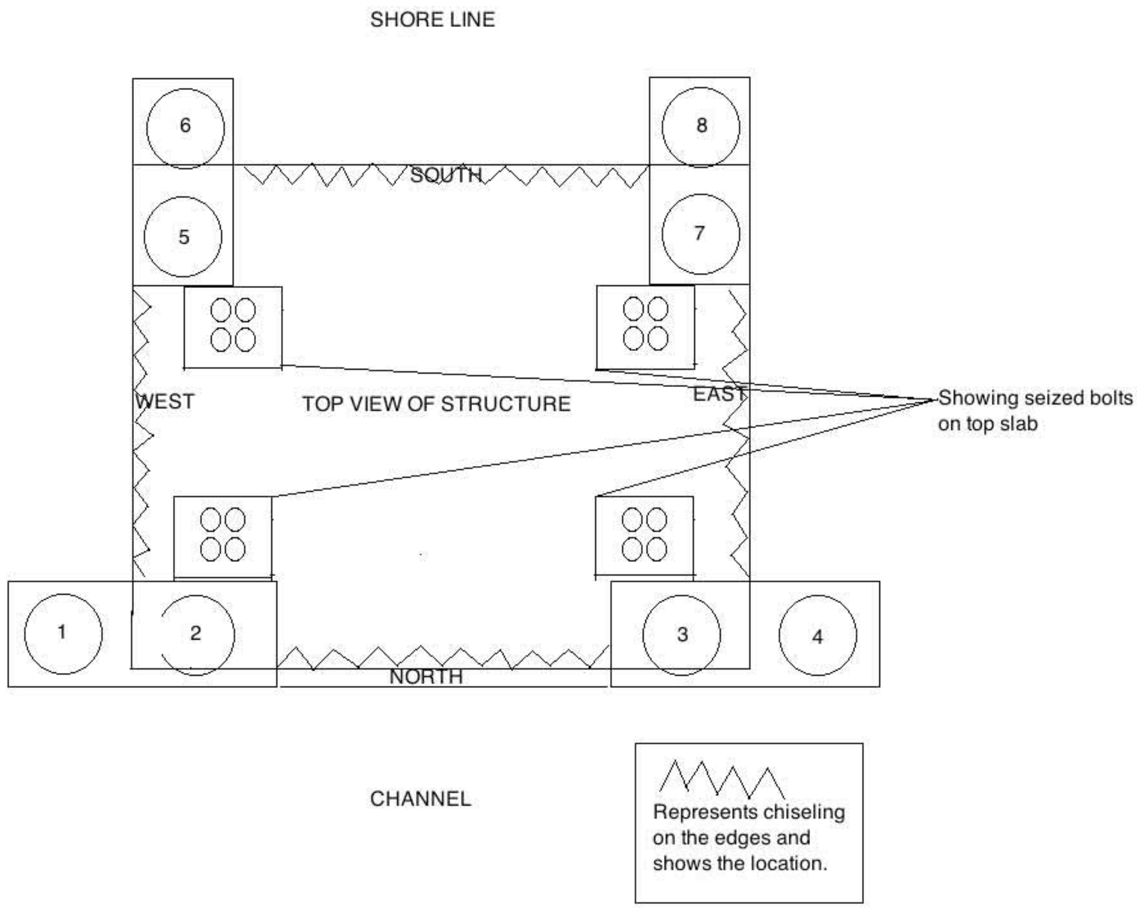
South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 7'' long by 5'' wide by 5'' deep, located 12'' below the bottom of the rectangular block.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



MOORING STRUCTURE #8



Top slab

WATERLINE TO MUD LINE IS ROUGHLY 10’ DEEP ON THE CHANNEL SIDE

Note all blot sets are rusted and appeared seized.

Chiseling has occurred on all top edges on all sides of the top slab.

MOORING STRUCTURE #8

PILE #1

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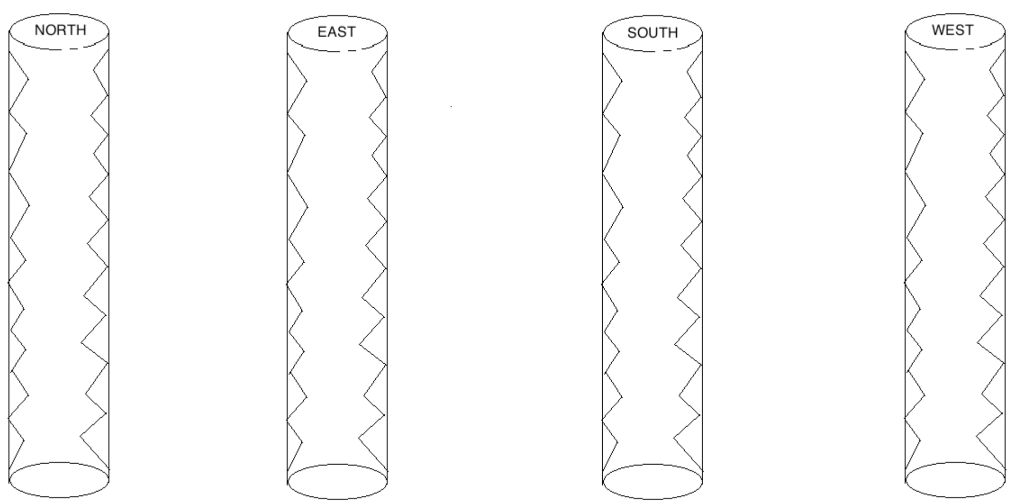

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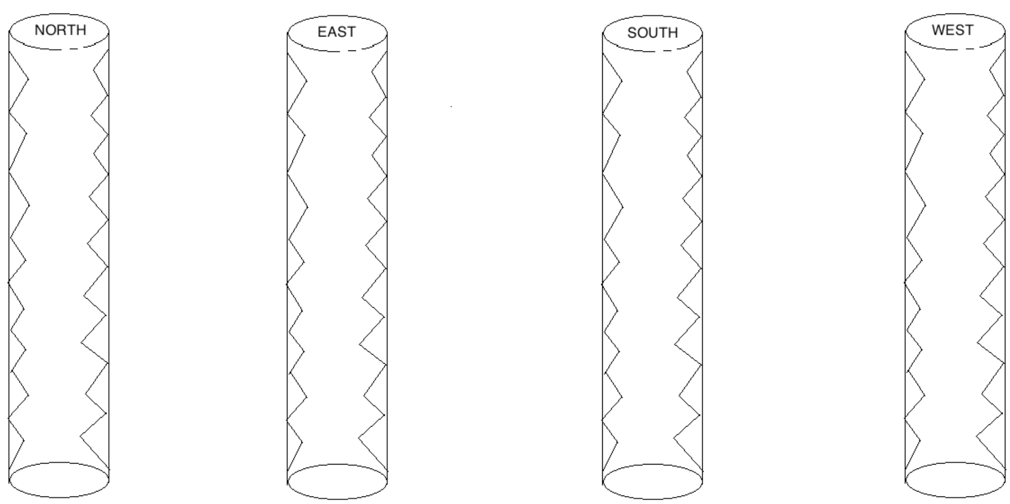
North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



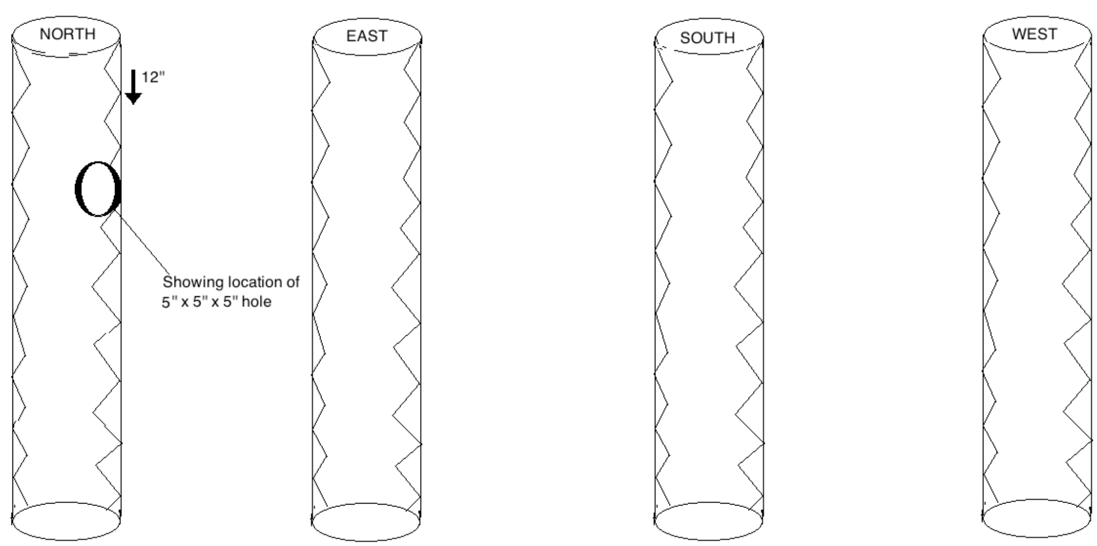
PILE #1

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 5'' long by 5'' wide by 5'' deep hole, located 12'' below the bottom of the rectangular block.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



MOORING STRUCTURE #8

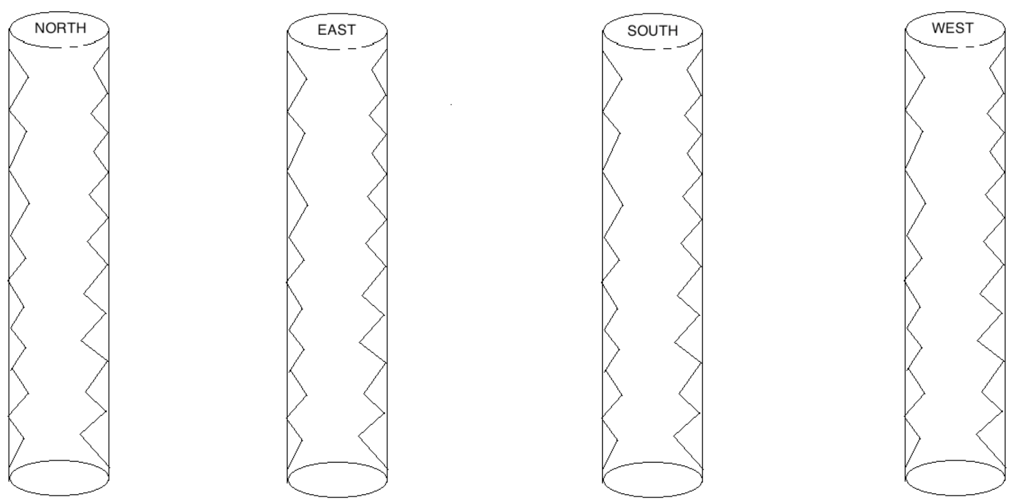
PILE #4

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



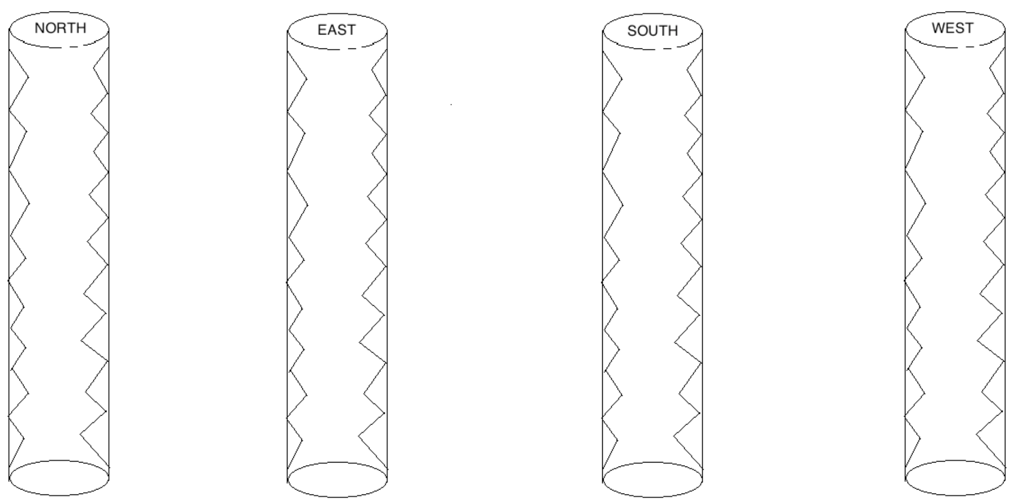
PILE #5

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



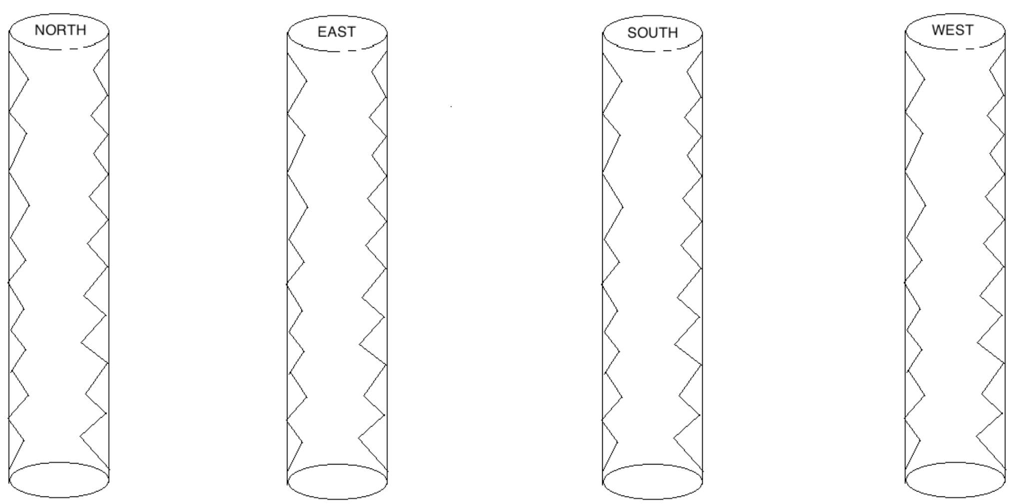
PILE #6

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



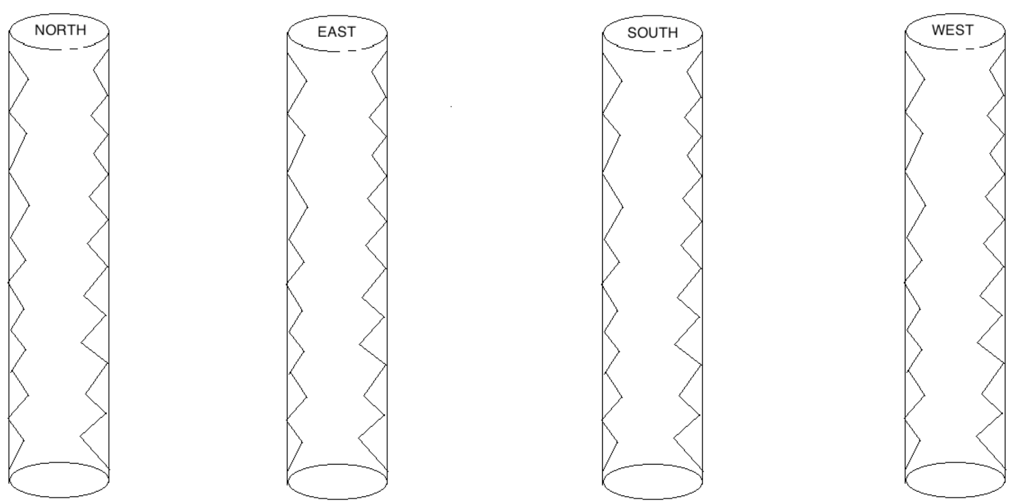
PILE #7

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



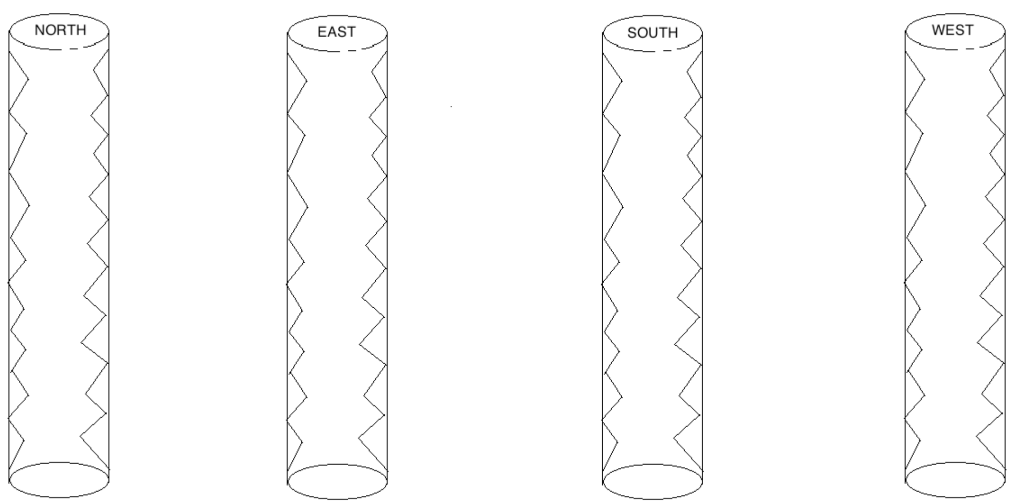
PILE #8

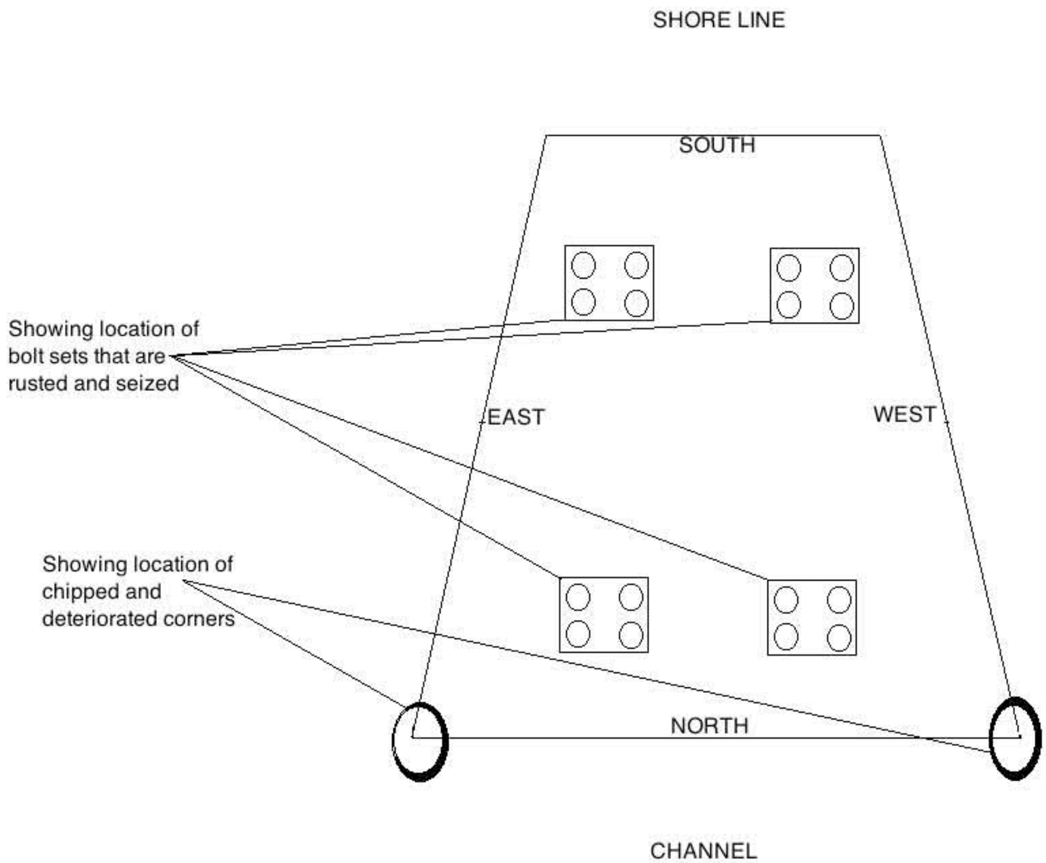
North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.





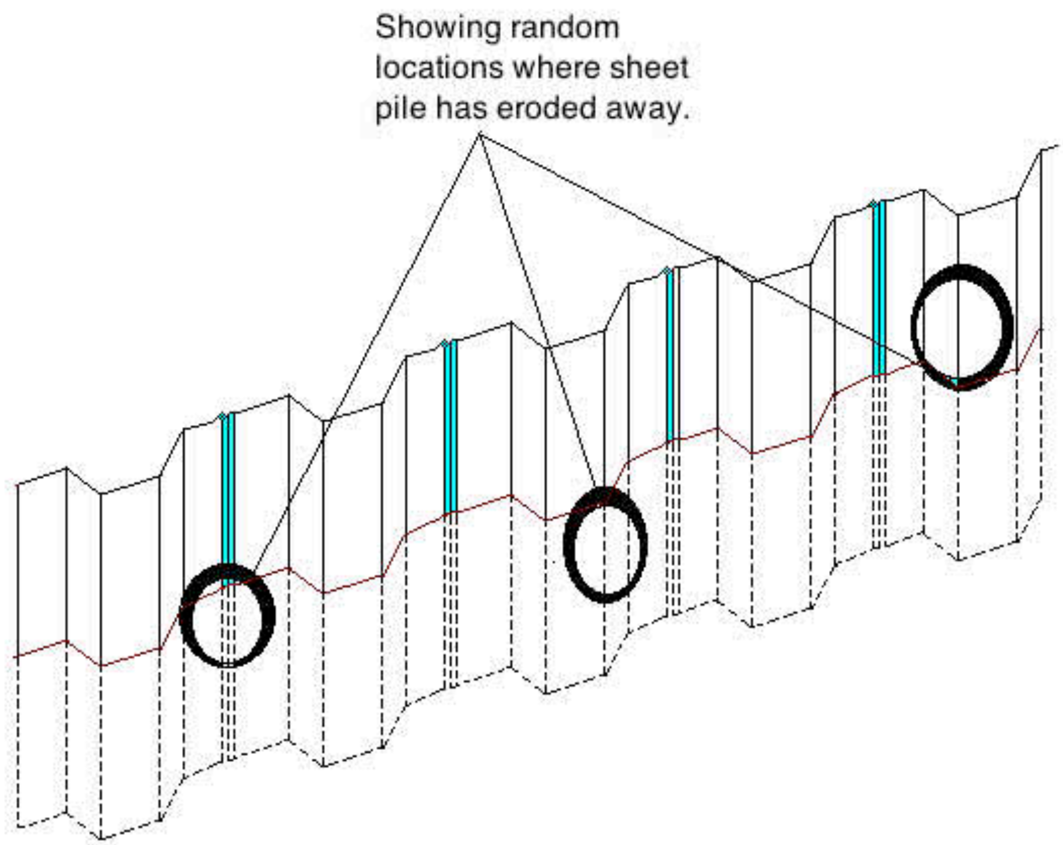
Top slab

WATERLINE TO MUD LINE IS ROUGHLY 10' 6'' DEEP ON CHANNEL SIDE

This top slab is a different design from mooring structures 1-10 and 12-15. The underneath of this mooring structure was inaccessible due to having been encased by interlocking sheet pile that extends beneath the mud line. There was erosion and deterioration to some areas of the sheet pile as soon on the next page.

Note all bolt sets are rusted and appeared seized.

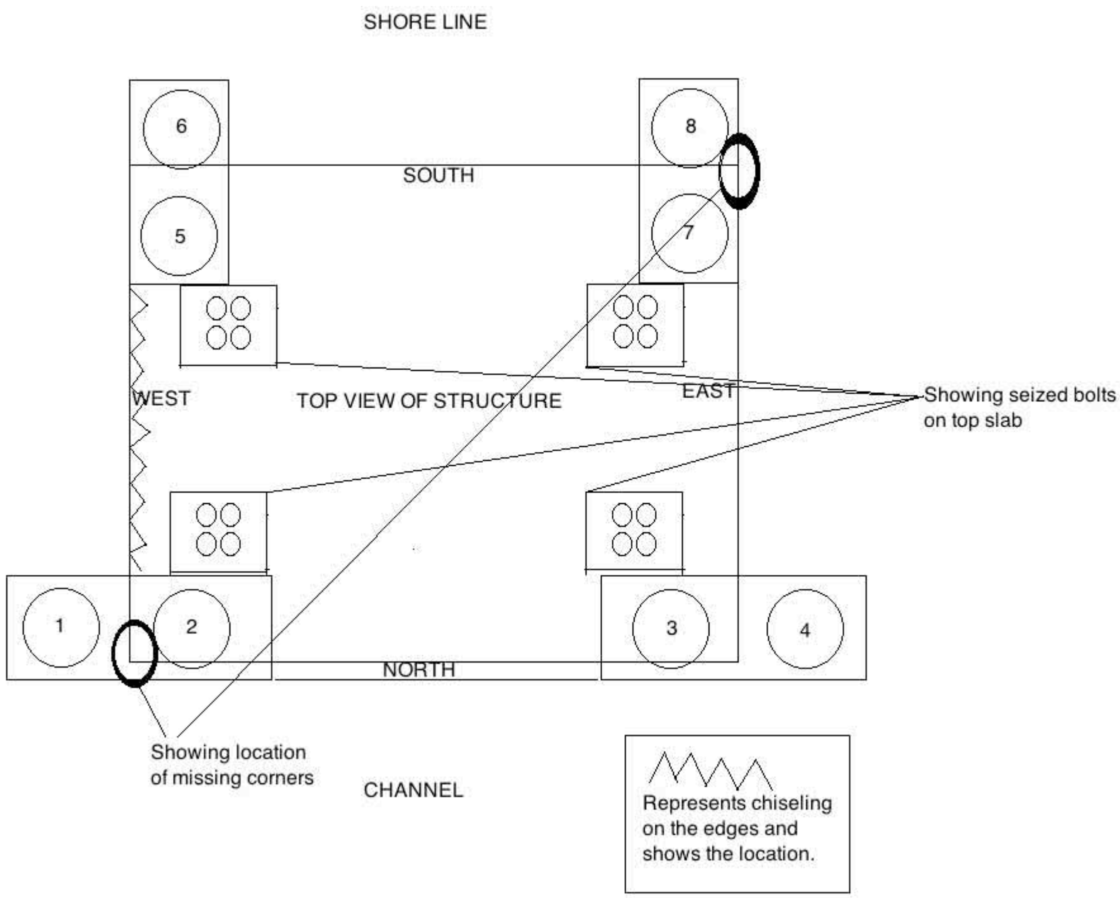
The northwest and northeast corners have been chiseled away.



After inspection the sheet pile, we located various spots where the sheet pile has eroded away, exposing concrete from the inside. An inspection was done on the exposed concrete exposed. Our finding were that the concrete seemed to be in decent condition, meaning it was not in soft form and stayed intact when gripped by hand.

The surface was rough showing some signs of deterioration, but was still compressed up against the inside of the sheet pile.

MOORING STRUCTURE #12



Top slab

WATERLINE TO MUD LINE IS ROUGHLY 10'6'' DEEP ON THE CHANNEL SIDE

Note all bolt sets are rusted and appeared seized.

The northwest and southeast corners have ben chiseled away.

There is chiseling along the west top edge on the top slab.

Major debris was found under and all around the structure and consisted of logs.

MOORING STRUCTURE #12

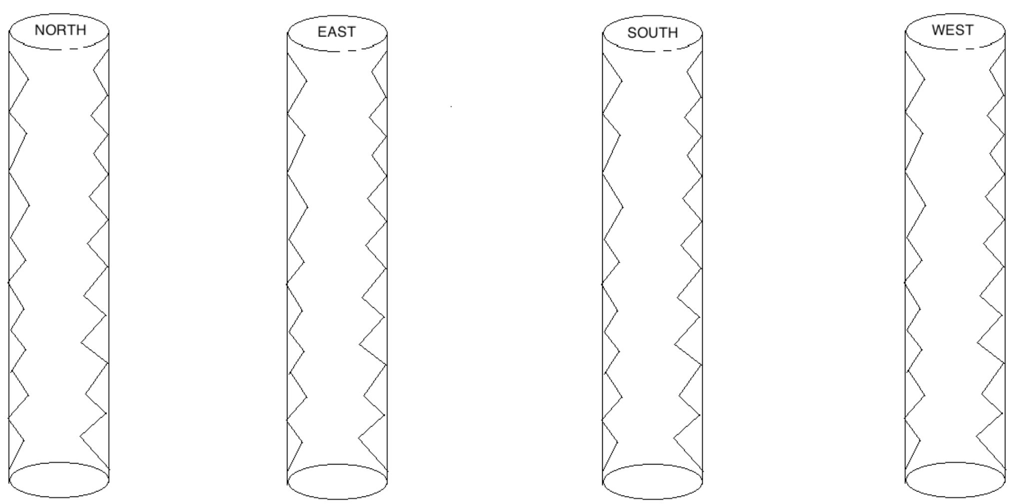
PILE #1

N□□□□ side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

E□□□side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

S□□□□ side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

W□□□side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



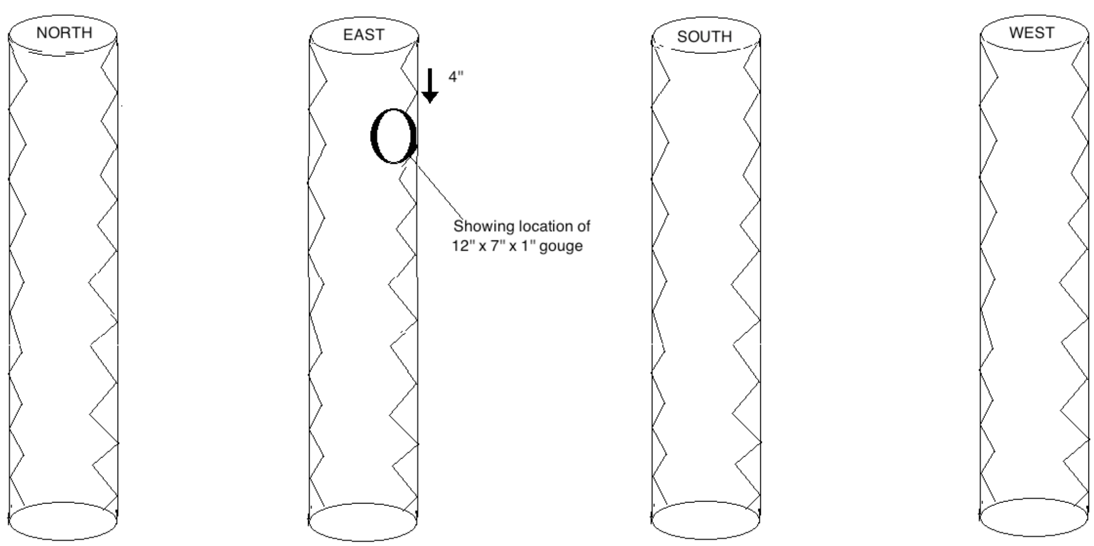
PILE #2

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 12'' long by 7'' wide by 1'' deep gouge, located 4'' below the rectangular block.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



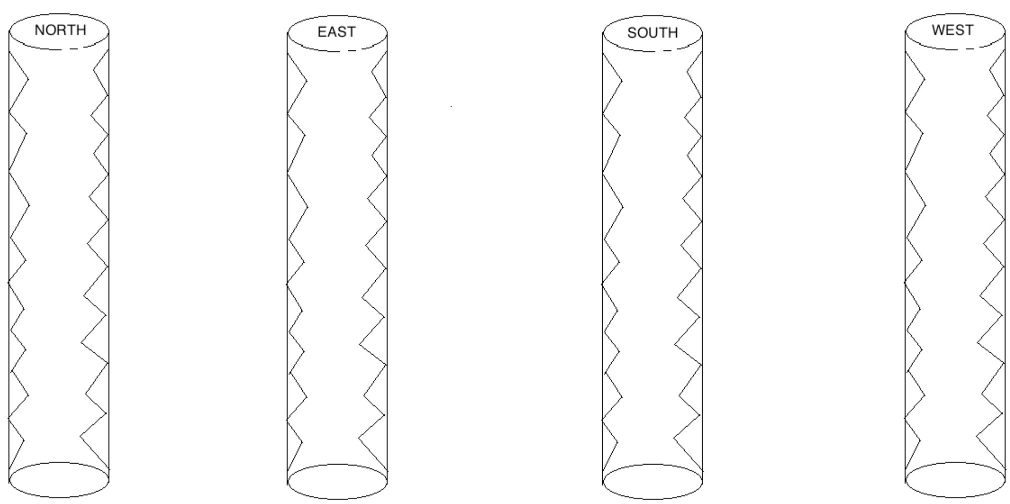
PILE #3

N□□□□ side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

E□□□side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

S□□□□ side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

W□□□side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



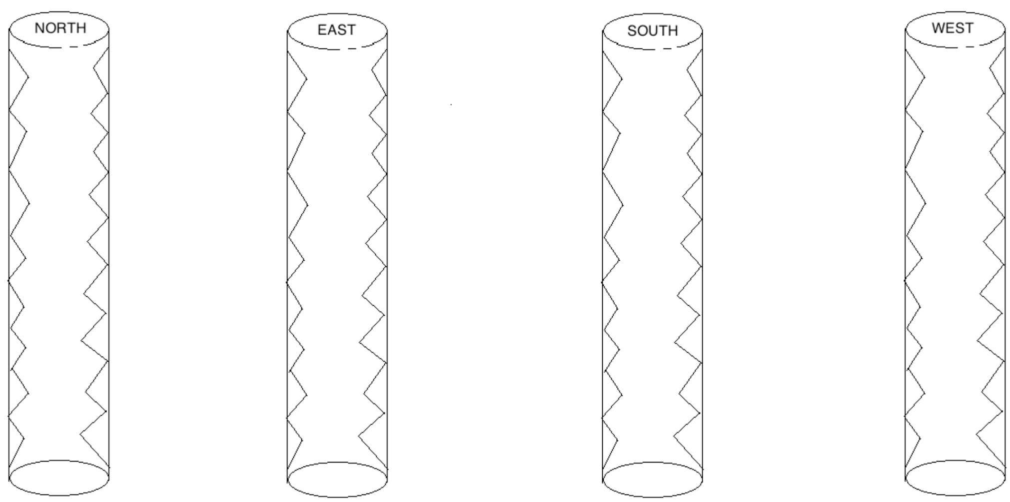
PILE #4

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



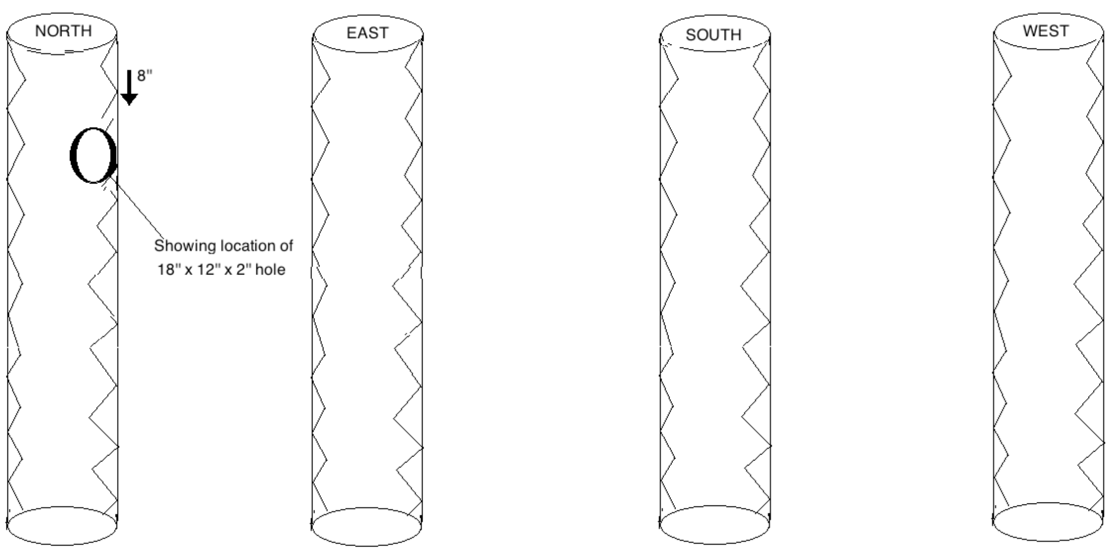
PILE #5

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 18'' long by 12'' wide by 2'' deep hole, located 8'' below the rectangular block.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



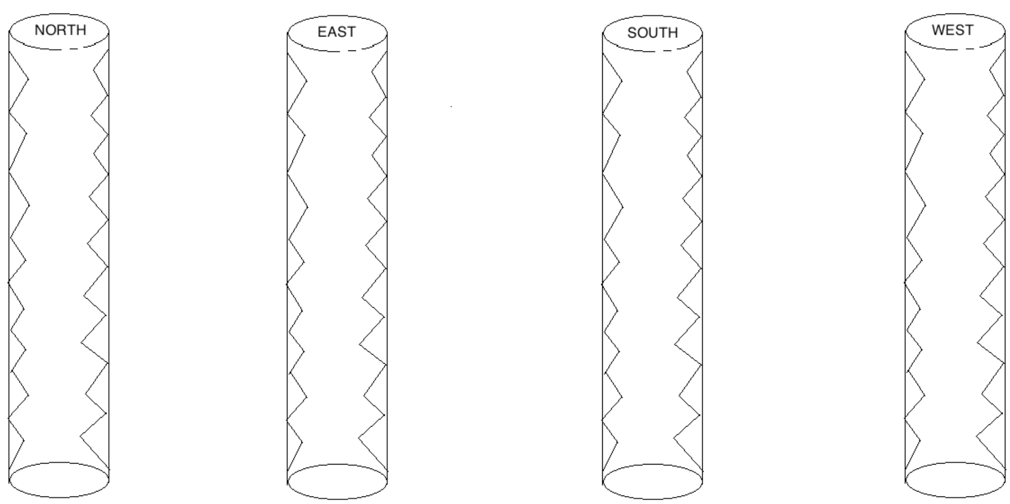
PILE #6

N□□□□ side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

E□□□side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

S□□□□ side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

W□□□side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



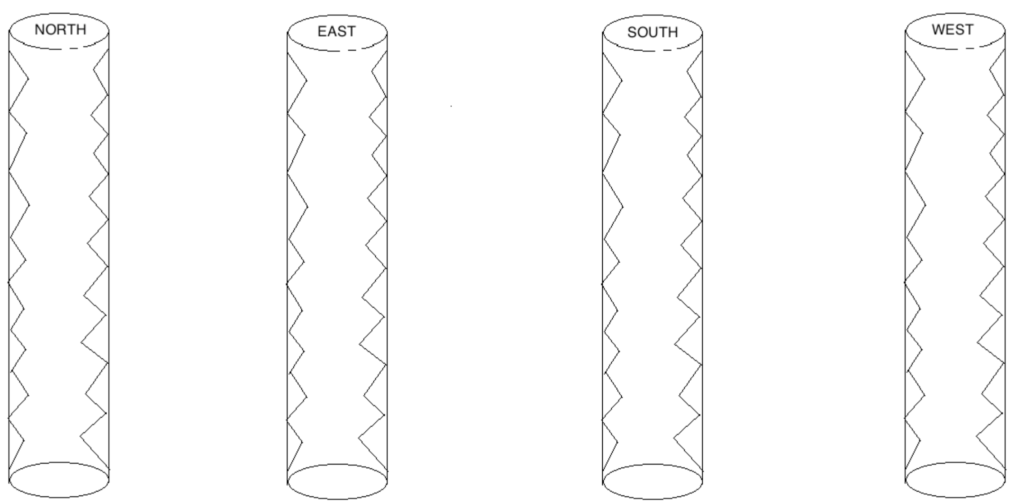
PILE #7

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



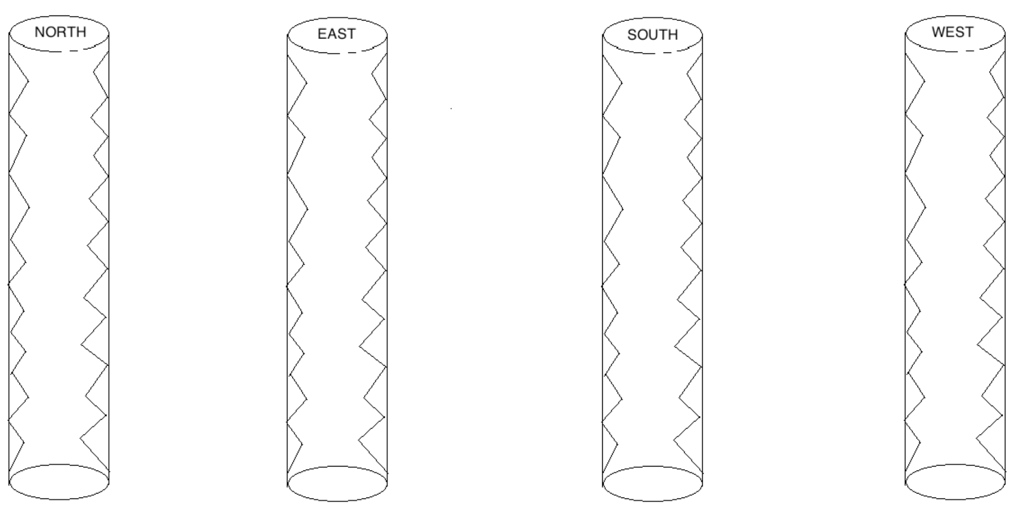
PILE #8

North side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

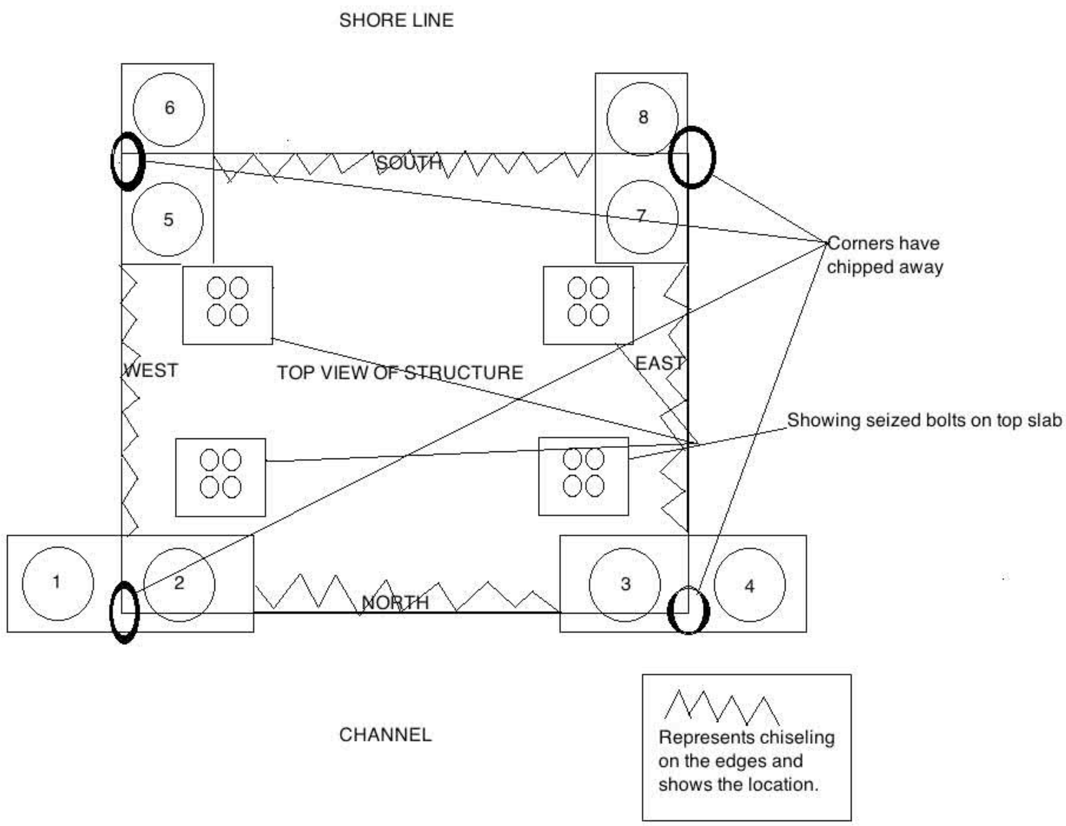
East side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6’’ and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.




5



Top slab

WATERLINE TO MUDLINE IS ROUGHLY 10' DEEP ON THE CHANNEL SIDE

Note all bolt sets were rusted and appeared seized.

Showed chiseling on all top edges of the top slab.

All four corners have chipped away on the top slab.

Debris was found submersed under the structure and all around and consisted of logs.

MOORING STRUCTURE #13

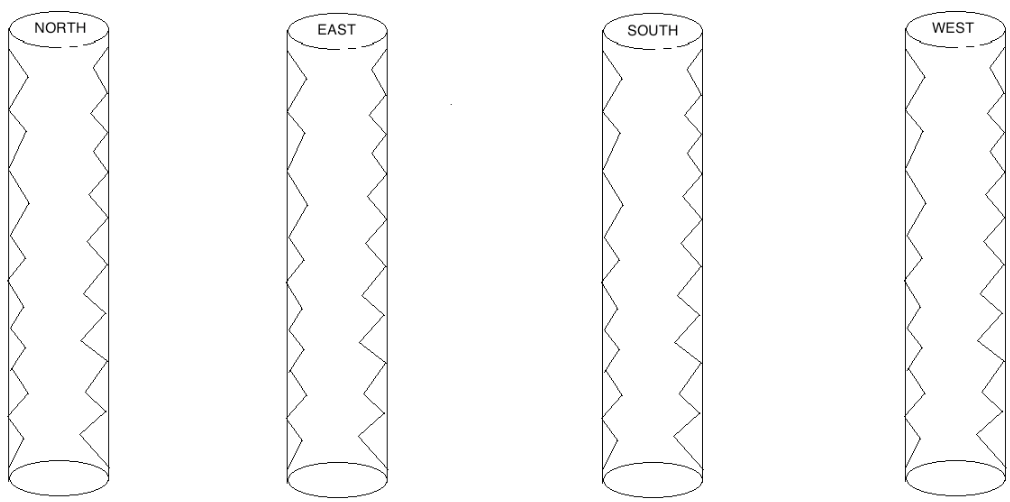
PILE #1

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



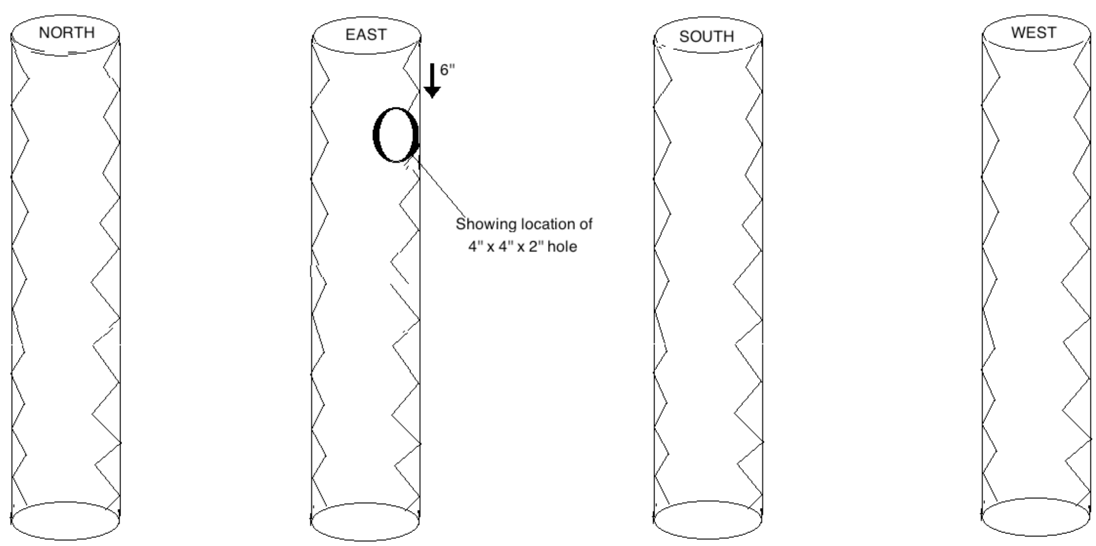
PILE #2

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 4'' long by 4'' wide by 2'' deep hole, located 6'' below the bottom of the rectangular block.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



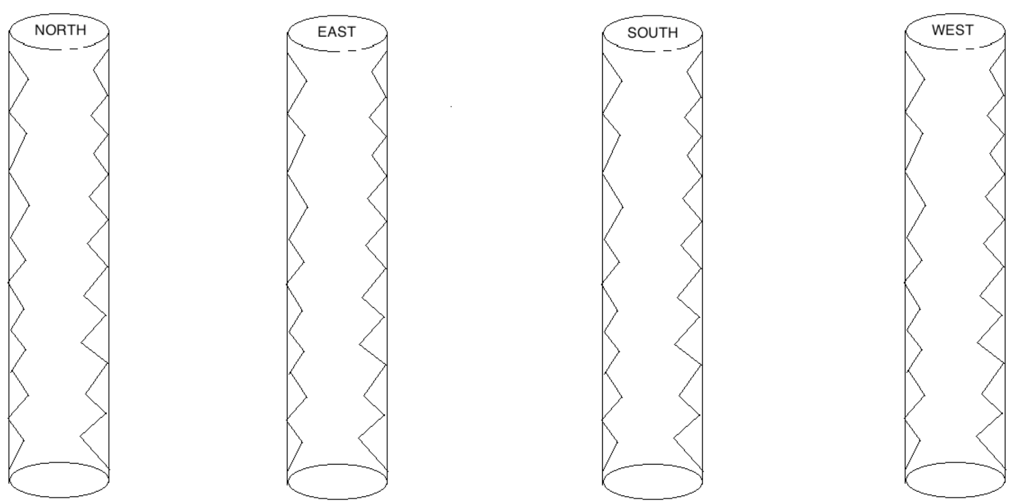
PILE #3

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



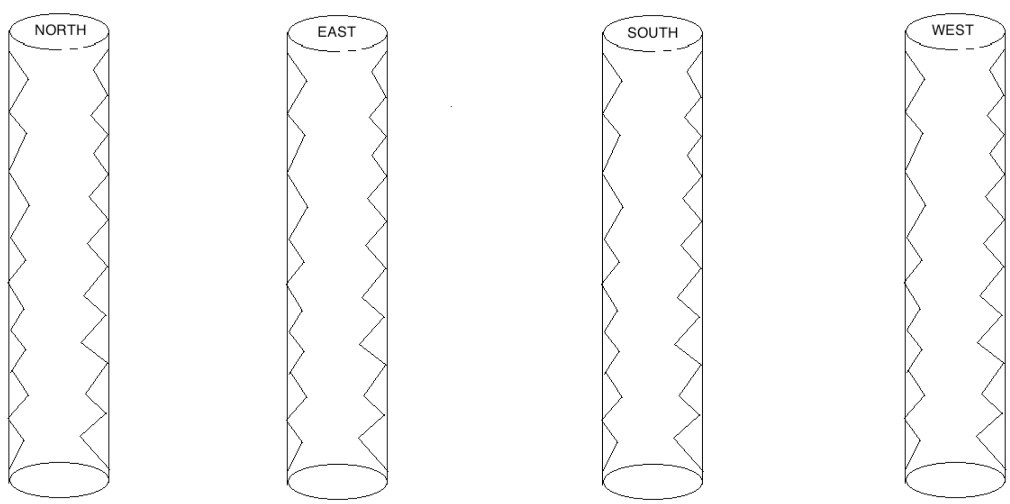
PILE #4

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



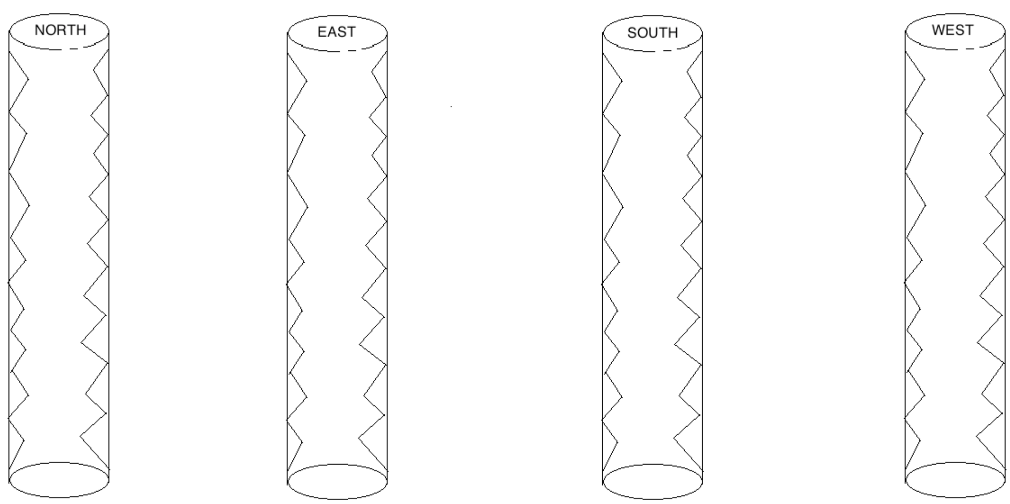
PILE #5

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



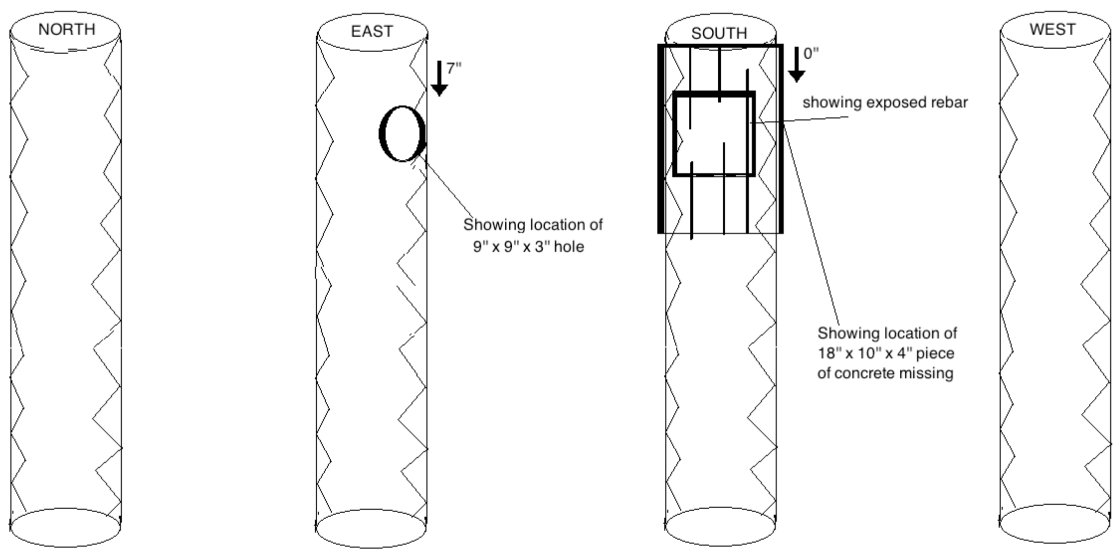
PILE #1

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 9'' long by 9'' wide by 3'' deep hole, located 7'' below the rectangular block.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, not a piece of concrete 18'' long 10'' wide 4'' deep is missing exposing rebar, located directly below the rectangular block.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



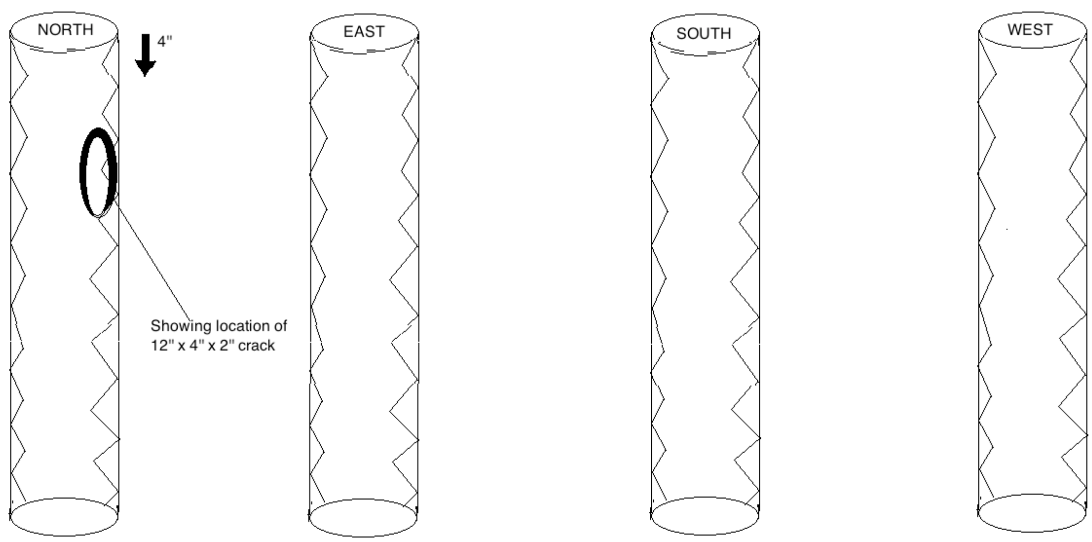
PILE #7

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, note the 12'' long by 4'' wide by 2'' deep crack, located 4'' below the bottom of the rectangular block.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch.



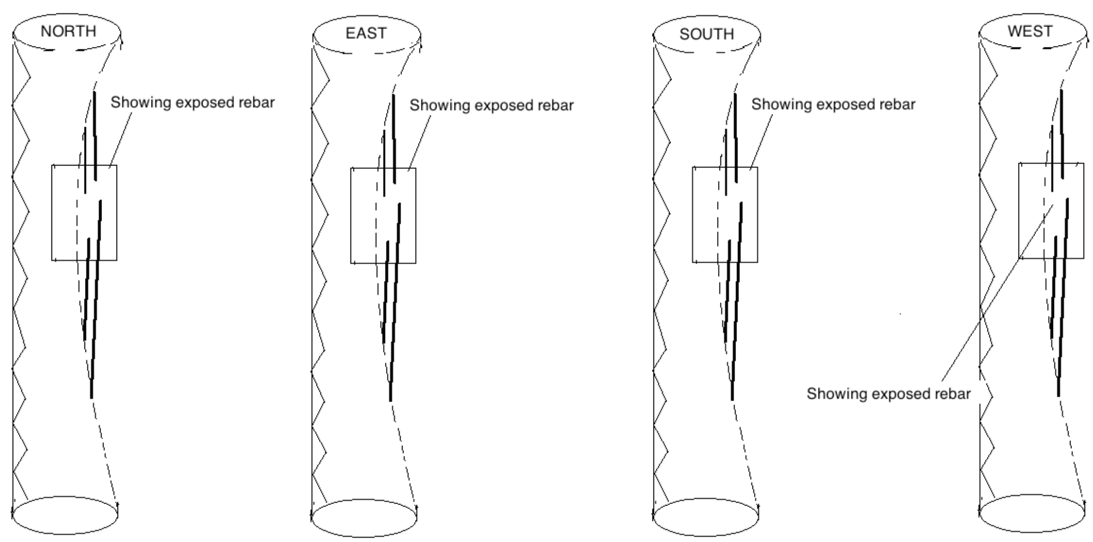
PILE #8

North side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, noted in illustration, half of piling has deteriorated away and revealed exposed rebar.

East side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, noted in illustration, half of piling has deteriorated away and revealed exposed rebar.

South side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, noted in illustration, half of piling has deteriorated away and revealed exposed rebar.

West side of pile one shows major deterioration, with a loss in circumference greater than 6'' and consisted of heavy chiseling and softening of concrete. Pieces were falling off by touch. Also, noted in illustration, half of piling has deteriorated away and revealed exposed rebar.



Appendix E - Geotechnical Reports

GEOTECHNICAL ENGINEERING SERVICES
MKARNS MOORING MODERNIZATION PROJECT
OAKLEY'S 33 GRAND RIVER AND PORT OF MUSKOGEE
CI-2320 STATE J/P NO. 35257(04)
MUSKOGEE COUNTY, OKLAHOMA

KLEINFELDER PROJECT NO.: 20220843.001A

FEBRUARY 18, 2022

A Report Prepared for:

Mr. Gregg A. Hostetler, PE
CONSOR Engineers, LLC
609 S. Kelly Avenue, Suite J-1
Edmond, Oklahoma 73003

GEOTECHNICAL ENGINEERING SERVICES
MKARNS MOORING MODERNIZATION PROJECT
OAKLEY'S 33 GRAND RIVER AND PORT OF MUSKOGEE
CI-2320 STATE J/P NO. 35257(04)
MUSKOGEE COUNTY, OKLAHOMA

Prepared by:

LICENSED PROFESSIONAL ENGINEER
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OKLAHOMA
02/18/2022

Shiyun (Simon) Wang, PE
Oklahoma: 27716

Reviewed by:

Xavier C. Barrett, PE
Principal Professional

KLEINFELDER
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Tulsa, Oklahoma 74146
Phone: 918.627.6161
Fax: 918.627.6262

February 18, 2022
Kleinfelder Project No. 20220843.001A

February 18, 2022
Kleinfelder Project No. 20220843.001A

Mr. Gregg A. Hostetler, PE
CONSOR Engineers, LLC
609 S. Kelly Avenue, Suite J-1
Edmond, Oklahoma 73003

Subject: **Geotechnical Engineering Services**
MKARNS Mooring Modernization Project
Oakley's 33 Grand River and Port Of Muskogee
CI-2320 State J/P No. 35257(04)
Muskogee County, Oklahoma

Dear Mr. Hostetler:

Kleinfelder has completed the authorized subsurface exploration and geotechnical engineering evaluation for the above-referenced project. The purpose of the geotechnical study was to explore and evaluate the subsurface conditions at the project site and develop geotechnical design and construction considerations for the proposed mooring system. The attached Kleinfelder report contains a description of the findings of our field exploration and laboratory testing program, our engineering interpretation of the results with respect to the design of the mooring system, and potential construction considerations for the planned project.

Information provided herein are contingent on the provisions outlined in the ADDITIONAL SERVICES and LIMITATIONS sections of this report. The project owner should become familiar with these provisions in order to assess further involvement by Kleinfelder and other potential impacts to the proposed project.

We appreciate the opportunity to be of service to you on this project and are prepared to provide the recommended additional services. Please call us if you have any questions concerning this report.

Sincerely,

KLEINFELDER, INC.
Certificate of Authorization #7292, Expires 6/30/23

Shiyun (Simon) Wang, PE
Senior Professional

Xavier C. Barett, PE
Principal Professional

SYW/XCB: LNK

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GEOTECHNICAL ENGINEERING SERVICES
MKARNS MOORING MODERNIZATION PROJECT
OAKLEY'S 33 GRAND RIVER AND PORT OF MUSKOGEE
CI-2320 STATE J/P NO. 35257(04)
MUSKOGEE COUNTY, OKLAHOMA

1. INTRODUCTION

1.1 GENERAL

Kleinfelder has completed the authorized subsurface exploration and geotechnical engineering evaluation for the proposed new moorings at the existing Port of Muskogee and Oakley's 33 Grand River locations in Muskogee County, Oklahoma. These services were provided in general accordance with our Scope of Work TUL21P124388 dated April 9, 2021, and TUL21P124388R3 dated October 21, 2021.

This report has been prepared, and the corresponding work performed, in general accordance with the "State of Oklahoma Department of Transportation (ODOT) Specifications for Geotechnical Investigation of Bridges and Related Structures (2017)".

This report includes our recommendations related to the geotechnical aspects of the mooring foundation design and construction. Conclusions and recommendations presented in the report are based on the subsurface information encountered at the locations of our exploration and the provisions and requirements outlined in the ADDITIONAL SERVICES and LIMITATIONS sections of this report. In addition, an article prepared by The Geoprofessional Business Association (GBA), *Important Information about This Geotechnical Engineering Report*, has been included in APPENDIX C. We recommend that all individuals read the report limitations along with the included GBA document.

1.2 PROPOSED CONSTRUCTION

The McClellan-Kerr Arkansas River Navigation System (MKARNS) Mooring Modernization Project (the Project) will construct monopile moorings in the waterway to replace obsolete anchors with a modernized mooring system. This new system will enable safe harbor for mariners, reliability in the event of a flood, and reduce ongoing maintenance costs at the ports. The Project will also expand much needed capacity for vessels within the waterway and prepare ports for forecasted increases in freight demand through the MKARNS.

Monopile mooring structures will be constructed at three locations: the Tulsa Port of Catoosa, the Port of Muskogee and in the Grand River to support Oakley's Port 33. The three locations have varied existing structures including deadman anchors and dolphin moorings. Deadman anchors (located at the Grand River location) consist of lines connected to buried timbers or bridge beams which are installed on dry land and buried to make use of earth pressure to resist pull forces. Dolphin moorings in the waterway today (located at the Tulsa Port of Catoosa and Port of Muskogee) consist of a combination of vertical and horizontal "batter" wood piles.

The project includes the following improvements:

- Tulsa Port of Catoosa – The Project will remove and replace 6 dolphin structures with new monopile mooring structures.
- Oakley's 33 Grand River Location – The project will replace 6 deadman anchors with new monopile mooring structures.
- Port of Muskogee – The project will replace 20 dolphin structures with new monopile mooring structures.

It is our understanding that no compressive axial load will be applied to those monopiles and only lateral and uplift load from barges will be applied. Permanent casing will also be installed for the monopiles. The magnitude of the lateral load is unknown at the time of this report. However, Kleinfelder could assist the monopile design using LPile if needed.

This report includes Kleinfelder's geotechnical engineering services for the Port of Muskogee and Oakley's 33 Grand River locations. The scope of the field exploration and engineering evaluation for this study, as well as the conclusions and recommendations in this report, are based on our understanding of the project as described above. If pertinent details of the project change or otherwise differ from our descriptions, we must be notified and engaged to review the changes and modify our recommendations, as necessary.

2. SITE CONDITIONS

2.1 SITE DESCRIPTION

The project is located along the Arkansas River and Grand River at Port of Muskogee in Muskogee, Muskogee County, Oklahoma. The general location of the site is shown on the top right corners of the Figures 1 and 2, Exploration Location Plan and Vicinity Map(s). The Oakley's Grand River location is located northeast of the Port of Muskogee.

2.2 GENERAL SITE GEOLOGY

According to the "Engineering Classification of Geologic Materials – Division 1" from the ODOT (1969), the proposed mooring structures appear to be located within the **Alluvium (Qas)** and **Atoka (Pa) Units**.

Alluvium Unit (Qas): This unit consists of deposits of sand, silt, clay, gravel, and/or combinations of materials. Alluvium is found along the flood plains (bottom land) of streams and is normally present along all streams.

Atoka Unit (Pa): This unit consists of sandstone, siltstone, shale, and a few thin beds of limestone. The sandstone beds are soft to hard, brown to gray in color, locally limy, and are from a few inches thick to approximately 20 feet thick with sequences of beds, separated by thin stringers of shale, up to 115 feet thick. The siltstone beds are generally hard, brown to gray in color, and usually less than 1 foot thick. The shales for the most part are fissile, locally clayey, brown to black in color, and range in thickness from a few inches to 300 feet or more. Generally, most shale zones will contain thin siltstone, sandstone, and/or limestone beds less than one foot thick.

2.3 SUBSURFACE CONDITIONS

Kleinfelder explored the subsurface conditions at the site by drilling and sampling 27 borings (including one constructability boring) between January 5 and 26, 2022. Approximate boring locations (designated B-1 through B-26) are shown on Figures 1 and 2, Exploration Location Plan and Vicinity Map(s). The field exploration and laboratory testing programs are presented in

APPENDIX A and APPENDIX B, respectively. The Subsurface Cross Sections, Figures A-1 through A-4 in APPENDIX A, depict the generalized subsurface profiles across the project site based on the information obtained from the borings. The stratification lines shown on the logs and subsurface cross-sections represent the approximate boundaries between material types; in-situ, the transitions may vary or be gradual.

Table 2-1 indicates the ground surface elevations and the approximate depth and elevation to the top of competent bedrock at the respective boring locations. Depth to competent bedrock is defined as the depth at which the penetration from a Standard Penetration test (SPT), conducted in accordance with ASTM D1586, is less than or equal to 6 inches with 50 blows. The current "State of Oklahoma Department of Transportation (ODOT) Specifications for Geotechnical Investigation of Bridges and Related Structures (2017)", requires that at least 30 feet of competent bedrock be evaluated in borings. We understand that the required rock penetration does not begin until competent bedrock is encountered. Thus, the depths to top of competent rock and the corresponding elevations shown in Table 2-1 do not necessarily coincide with the depths to the top of weathered rock and the corresponding elevations shown on the boring logs.

Table 2-1. Summary of Subsurface Information

Boring Number	Water Elevation (ft.)	Mudline Depth (ft.)	Mudline Elevation (ft.)	Depth to Competent Bedrock (ft.)	Competent Bedrock Elevation (ft.)	Competent Bedrock Material
B-1	490.0	7	483.0	19.5	470.5	Shale
B-2	490.2	7	483.2	22.5	467.7	Shale
B-3	490.2	7.5	482.7	22	468.2	Shale
B-4	489.9	7	482.9	23.5	466.4	Shale
B-5	489.9	7	482.9	22	467.9	Shale
B-6	489.9	7	482.9	23	466.9	Shale
B-7	489.6	11	478.6	21	468.6	Shale
B-8	489.6	14	475.6	21	468.6	Shale
B-9	490.4	11	479.4	19	471.4	Shale
B-10	490.2	14	476.2	21	469.2	Shale
B-11	490.2	13	477.2	19	471.2	Shale
B-12	489.7	8	481.7	21	468.7	Shale
B-13	489.6	12	477.6	21	468.6	Shale
B-14	489.6	10	479.6	21.5	468.1	Shale
B-15	489.5	10	479.5	21	468.5	Shale

Table 2-1. Summary of Subsurface Information						
Boring Number	**Water Elevation (ft.)**	**Mudline Depth (ft.)**	**Mudline Elevation (ft.)**	**Depth to Competent Bedrock (ft.)**	**Competent Bedrock Elevation (ft.)**	**Competent Bedrock Material**
B-16	491.0	10	481.0	21.5	469.5	Shale
B-17A	489.8	15	474.8	22.5	467.3	Shale
B-17B	490.2	14	476.2	24.5	465.7	Shale
B-18	489.5	14	475.5	22	467.5	Shale
B-19	489.5	7.5	482.0	23	466.5	Shale
B-20	489.5	10	479.5	24.5	465.0	Shale
B-21	489.5	8	481.5	22.5	467.0	Shale
B-22	489.5	9	480.5	24	465.5	Shale
B-23	489.7	5	484.7	23	466.7	Shale
B-24	489.5	9	480.5	24.5	465.0	Shale
B-25	489.5	9	480.5	25	464.5	Shale
B-26	490.3	6	484.3	24	466.3	Shale

Table 2-2 provides specific information from rock coring operations in Boring B-17A. This table includes the ground surface elevation, the test number, the starting and ending elevation at which, the test was performed, and the results of each test. The rock core pictures are provided in Appendix A.

Table 2-2. Bedrock Coring Sample Intervals and Results							
Boring No.	**Water Elev. (feet)**	**Rock Coring Test No.**	**Coring Depth (feet)**	**Coring Elevation (feet)**	**Recovery (in)**	**% RQD**	**Unconfined Compressive Strength Test (psi) @ Depth/Elevation (ft.)**
B-17A	489.8	NQ-5	23 – 28	466.8 – 461.8	26	42	No suitable sample
		NQ-6	28 – 33	461.8 – 456.8	4	0	No suitable sample
		NQ-7	33 – 38	456.8 – 451.8	20	0	No suitable sample
		NQ-8	38 – 43	451.8 – 446.8	58	63	1,280 psi @ 38'/451.8' 530 psi @ 41.5'/448.3'
		NQ-9	43 – 48	446.8 – 441.8	54	18	780 psi @ 43.5'/446.3' 720 @ 47'/442.8'
		NQ-10	48 – 53	441.8 – 436.8	60	32	910 @ 49.5'/440.3' 3,260 @ 52.5'/437.3'

Table 2-3 provides specific information for Texas Cone Penetrometer (TCP) tests taken within competent bedrock in five of the borings. This table includes the ground surface elevation at the boring location, test number, starting depth at which, the test was performed, starting elevation at which, the test was performed, and the result of each test.

Table 2-3. TCP Test Intervals and Results					
Boring No.	**Ground Elevation (ft.)**	**Test No.**	**Depth (feet)**	**Elevation (feet)**	**TCP Results (blows/inch)**
B-1	490.0	TC-8	20.0	470.0	100/1.50
		TC-9	25.0	465.0	100/0.25
		TC-10	30.0	460.0	100/0.25
		TC-11	35.0	455.0	100/0.25
		TC-12	40.0	450.0	100/0.25
		TC-13	45.0	445.0	100/0.50
		TC-14	50.0	440.0	100/0.75
B-6	489.9	TC-10	23.5	466.4	100/4.50
		TC-11	28.5	461.4	100/0.75
		TC-12	33.5	456.4	100/0.50
		TC-13	38.5	451.4	100/0.00
		TC-14	43.5	446.4	100/0.25
B-7	489.6	TC-7	22.0	467.6	100/2.00
		TC-8	27.0	462.6	100/1.50
		TC-9	32.0	457.6	100/0.50
		TC-10	37.0	452.6	100/0.00
		TC-11	42.0	447.6	100/0.50
		TC-12	47.0	442.6	100/1.00
		TC-13	52.0	437.6	100/0.50
B-17B	490.2	TC-3	25.5	464.7	100/9.00
		TC-4	30.5	459.7	100/0.50
		TC-5	35.5	454.7	100/0.00
		TC-6	40.5	449.7	100/2.00
		TC-7	45.5	444.7	100/0.50
		TC-8	50.5	439.7	100/0.00
		TC-9	55.5	434.7	100/0.25
B-26	490.3	TC-11	24.5	465.8	100/3.00
		TC-12	29.5	460.5	100/5.50
		TC-13	34.5	455.8	100/5.75
		TC-14	39.5	450.8	100/0.25
		TC-15	44.5	445.8	100/0.50
		TC-16	49.5	440.8	100/0.75
		TC-17	54.5	435.8	100/0.25

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 GENERAL

Based on the information provided, the monopiles can be supported on straight-sided drilled shafts extending into the competent bedrock. Recommendations regarding the geotechnical aspects of the proposed foundation design and construction are presented below. The foundation recommendations are based on our interpretation of the rock mass characteristics and results of laboratory tests evaluated in general accordance with applicable Load and Resistance Factor Design (LRFD) methods.

The recommendations submitted herein are based on the data obtained from the subsurface exploration and Kleinfelder's understanding of the proposed construction. The nature and extent of subsurface variations that may exist at the proposed project site will not become evident until construction. If variations appear evident, the recommendations presented in this report should be re-evaluated, based on the revised knowledge of the site. In the event that any changes in the nature, design, or location of the proposed project occur, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed by Kleinfelder and our recommendations modified in writing, as necessary.

3.2 DRILLED SHAFT FOUNDATIONS

Drilled shafts should have a minimum diameter of three feet and should be installed at a minimum center-to-center spacing of three diameters. No reduction in individual shaft axial capacity for group action is needed for a spacing of three diameters or greater. Lateral capacity of the drilled shafts should be reduced for a center-to-center spacing of less than six diameters. Once the foundation design spacing is determined, reduction factors can be developed that reflect the spacing(s).

3.2.1 Allowable Bearing Pressure

Subsurface conditions encountered in the borings are suitable for support of the proposed monopiles on straight-sided drilled shafts. The straight-sided drilled shafts should extend through the alluvial soils and be founded at a depth that provides a minimum penetration of at least 2 times the drilled shaft diameters into shale elevation, which is summarized in Table 2-1.

The drilled shafts founded in shale may be sized using a factored end bearing resistance and factored skin friction resistance as shown in Table 3-1. No side resistance should be assigned to the alluvial soils, or weathered bedrock or in the zone of permanent casing.

Table 3-1. Drilled Shaft Design Parameters

Bedrock Penetration (ft)	Shaft Bottom Elevation (ft)	Bedrock Material	End Bearing Resistance (ksf)	Side Resistance (ksf)[1]	
			Factored[1] ($\phi_{r\text{-end}}$=0.7)	Compression Factored ($\phi_{r\text{-side comp}}$=0.45)	Uplift Factored ($\phi_{r\text{-side uplift}}$=0.40)
Oakley's 33 Grand River Location (Boring B-1)					
20	450.0	Shale	86.8	8.8	7.8
Oakley's 33 Grand River Location (Boring B-6)					
10	456.4	Shale	86.8	7.2	6.4
15	451.4	Shale	86.8	7.6	6.7
20	446.4	Shale	86.8	7.8	7.0
Port of Muskogee (Boring B-7)					
20	447.6	Shale	86.8	8.8	7.8
Port of Muskogee (Boring B-17B)					
10	454.7	Shale	86.8	6.6	5.9
15	449.7	Shale	86.8	7.2	6.4
20	444.7	Shale	86.8	7.5	6.5
Port of Muskogee (Boring B-26)					
10	455.8	Shale	67.8	4.1	3.6
15	450.8	Shale	86.8	5.3	4.7
20	445.8	Shale	86.8	6.0	5.3

[1] Based on Figures 5-3 and 5-4 of the Geotechnical Manual from TxDOT, July 2020. Nominal End Bearing determined using a FOS=2.0 and Nominal Skin friction determined using a FOS=3.0.

3.2.2 Estimated Settlements

Long-term structural settlement for drilled shafts designed and constructed as outlined above are anticipated to be ½ inch or less.

3.2.3 LPILE Design Parameters

Recommended geotechnical parameters for use in the evaluation of lateral load capacity and deflection of monopole foundations are presented in Table 3-2. The parameters provided are based on input requirements of LPILE by Ensoft, Inc. We have provided recommended parameters including: the effective unit weight (γ'), the undrained cohesion (C), and the strain at 50 percent of peak strength value (E_{50}). The values given in Table 3-2 are based on our analysis of the existing subsurface conditions and were estimated, or calculated, based on generally accepted engineering correlations. Design parameters for other methods of analysis can be provided, should a different method of analyzing lateral drilled shaft capacity be chosen for this design. As indicated in Table 3-2, we recommend that the shale bedrock be modelled as stiff clay without free water.

Table 3-2. L-Pile Design Parameters

Subsurface Stratum**	**Material Type***	**Effective Angle of Internal Friction ϕ,' (degrees)**	**Undrained Cohesion C, (psf)**	**Strain Factor E_{50}**	**Soil Modulus Parameter *k*, (Static) (pci)**	**Effective Total Unit Weight γ', (pcf)**
Water	N/A	N/A	N/A	N/A	N/A	N/A
Alluvial Soils	N/A	N/A	N/A	N/A	N/A	N/A
Competent Shale	1	N/A	8,000	0.004	N/A	78

* 1-Stiff Clay without Free Water, 2-Sand, 3 – Soft clay, 4 – Strong rock
**Refer to Table 2-1 for competent bedrock elevations at each location.

3.2.4 Construction Considerations

Conventional drilling equipment should be able to penetrate the alluvial soils and the weathered to decomposed shale. However, based on the TCP penetration results, excavation for the drilled shafts into the competent shale may be difficult. Drilling equipment, such as a core barrel with rock teeth, may be required. The drilled shaft contractor should make their own assessment of the appropriate drilling technique based on the available information. Construction of the monopiles should be in accordance with Section 516 of the ODOT "Standard Specifications for Highway Construction, 2019".

Dry Excavation Method: It may be possible to construct the shaft using the dry excavation method within the casing if water seepage can be prevented. If the drilled shaft excavations are performed in the dry, the drilled shaft excavations should have depth of groundwater seepage less than 6 inches and no caving, sloughing, or swelling conditions should exist. Shafts completed in the dry should be observed by an experienced geotechnical engineer to evaluate the suitability of the bearing materials. The dry excavation method should be in accordance with Section 516.04.C(1)(a) of the ODOT "Standard Specifications for Highway Construction, 2019".

Wet Excavation Method: Use the wet construction method or casing construction method for shafts that do not meet the requirements for dry construction. For the wet method, use water or slurry to maintain the stability of the shaft excavation while advancing the excavation to final depth, placing the reinforcing cage, and concreting the shaft. The wet excavation method should be performed in accordance with Section 516.04.C(1)(b) of the ODOT "Standard Specifications for Highway Construction, 2019".

Casing Method: The casing should be advanced to the contract required depth or into a nearly impervious formation, whichever is deepest. Excavation below the casing can be advanced with either the dry or wet method. The use of the casing method should be in accordance with Section 516.04.C(1)(c) of the ODOT "Standard Specifications for Highway Construction, 2019" .

Concrete Placement: To reduce to potential for disturbance to the bearing surfaces and shaft walls caused by ponding of water, it is recommended that concrete be placed within two hours after hole excavation for the shaft bottom has been approved. Ensure that the static water or slurry level is properly maintained in the excavation when the wet method is used and before placing concrete. Concrete placement should be continuous from the bottom to the top of the shaft using a watertight tremie in wet or dry excavation. For wet holes, use a device at the end of the discharge tremie to seal out water while the tremie fills with concrete. Concrete placement should be in accordance with Sections 516.04.C(5), 516.04.C(6), and 516.04.C(7) of the ODOT "Standard Specifications for Highway Construction, 2019".

3.3 SEISMIC HAZARDS DETERMINATION

We have evaluated the seismic hazard based on the 2020 AASHTO LRFD Bridge Design Specification, 9th Edition. Based on our subsurface information and evaluation of the data, we recommend a Site Class "D" be used in design.

4. ADDITIONAL SERVICES

4.1 PLANS AND SPECIFICATIONS REVIEW

We recommend that Kleinfelder conduct a general review of the final plans and specifications to evaluate that the subsurface information and any design recommendations provided has been properly incorporated into project documents.

4.2 CONSTRUCTION OBSERVATION AND TESTING

We recommend that all monopiles installation be monitored by a representative from Kleinfelder, including drilled pier excavations and concrete casing. The purpose of these services would be to provide Kleinfelder the opportunity to observe the subsurface conditions encountered during construction, evaluate the conditions for consistency with those encountered during exploration, and notify the owner where appropriate changes in design or construction procedures may be considered or advisable.

5. LIMITATIONS

This work was performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services are provided. Our conclusions, opinions, and recommendations are based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no other representation, guarantee, or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided. The scope of our services did not include any environmental assessment or exploration for the presence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on, below or around this site.

This report may be used only by the Client and the registered design professional in responsible charge and only for the purposes stated for this specific engagement within a reasonable time from its issuance, but in no event later than two (2) years from the date of the report. Land use, site conditions (both on-site and off-site), regulations, or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold harmless Kleinfelder from any claim or liability associated with such unauthorized or non-compliance.

The work performed was based on project information provided by Client. If Client does not retain Kleinfelder to review any plans and specifications, including any revisions or modifications to the plans and specifications, Kleinfelder assumes no responsibility for the suitability of our recommendations. In addition, if there are any changes in the field to the plans and specifications, Client must obtain written approval from Kleinfelder's engineer that such changes do not affect our recommendations. Failure to do so will vitiate Kleinfelder's recommendations.

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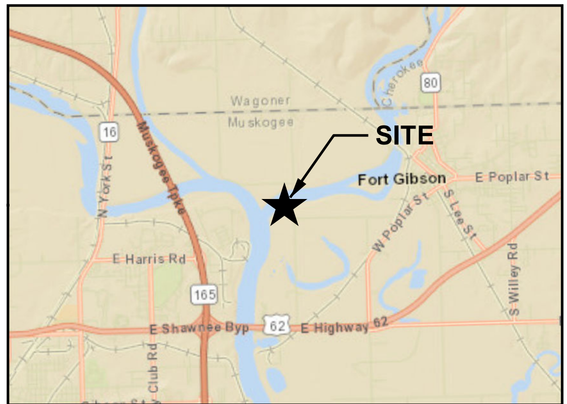
Figures

N

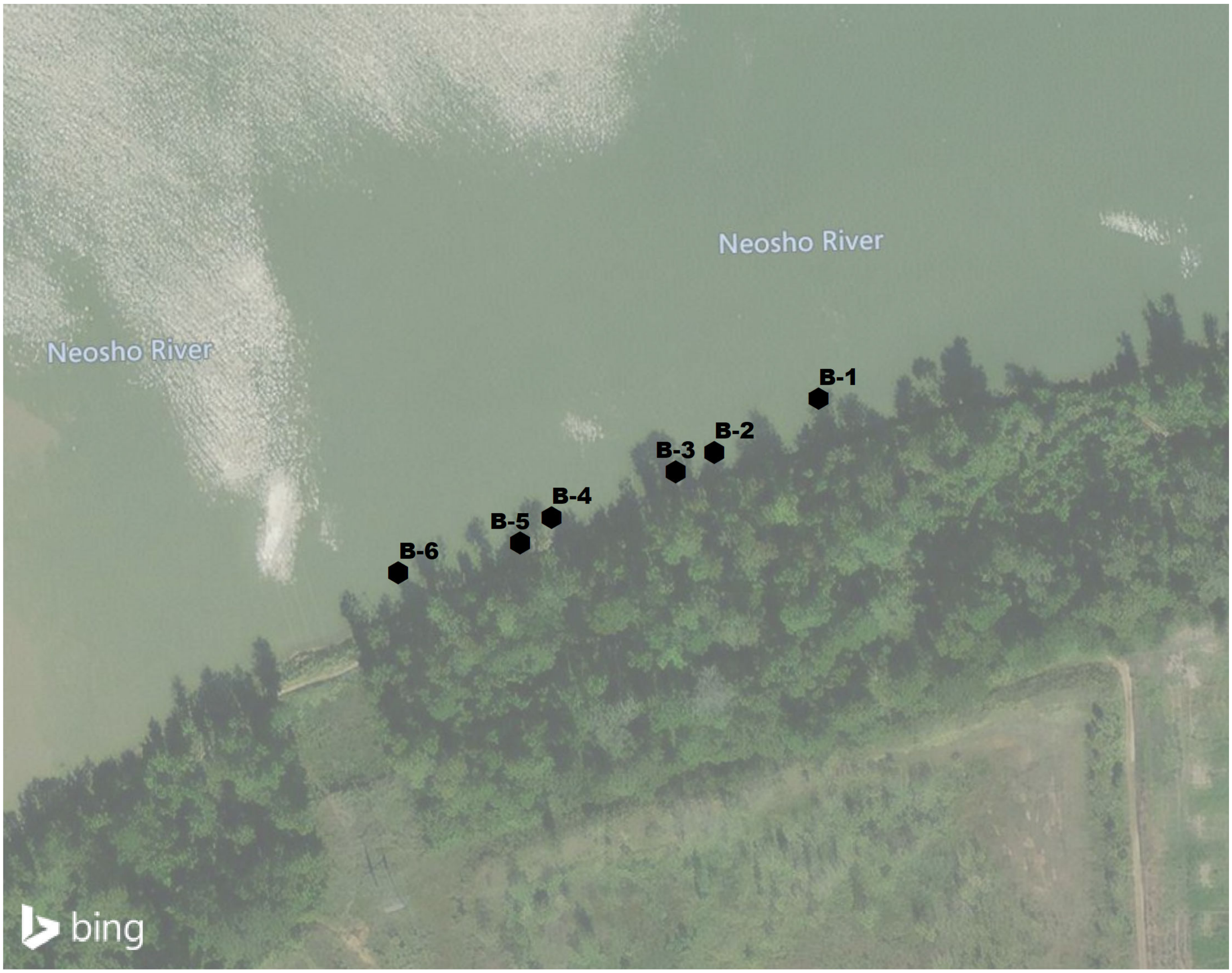
LEGEND

⬢	SOIL BORING

NOTE:
BASE MAPPING AND VICINITY MAP CREATED FROM LAYERS COMPILED BY ESRI PRODUCTS AND 2022 MICROSOFT CORPORATION.
COORDINATE SYSTEM: NAD 1983 2011 STATEPLANE OKLAHOMA NORTH FIPS 3501



VICINITY MAP NOT TO SCALE



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0 200 400

1 " = 200 SCALE IN FEET

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PROJECT NO. 20220843.001A		EXPLORATION LOCATION PLAN AND VICINITY MAP	FIGURE
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	1
CHECKED BY:	SYW		
DATE:	02-08-2022		

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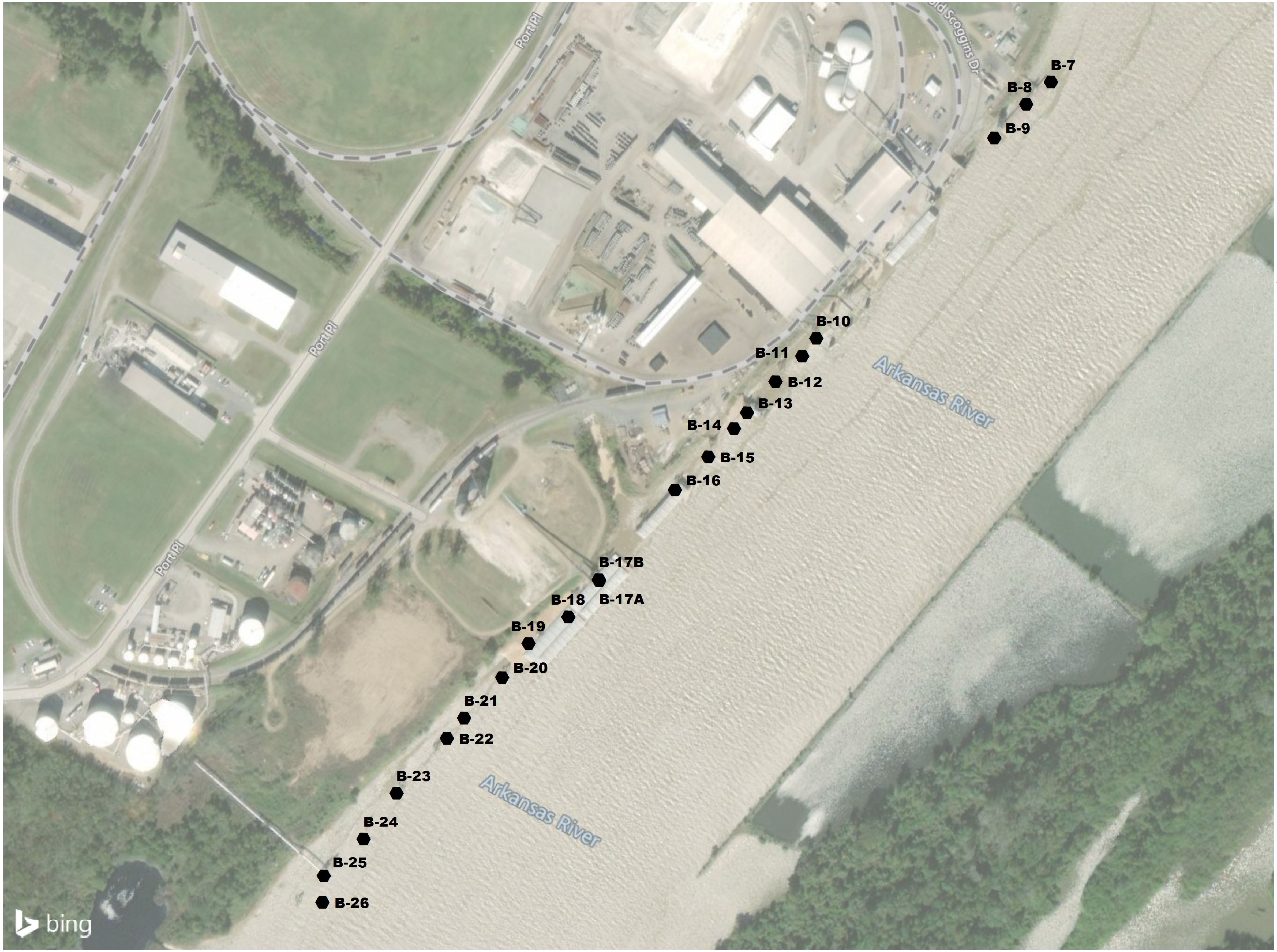

VICINITY MAP

NOT TO SCALE

NOTE:
BASE MAPPING AND VICINITY MAP CREATED FROM LAYERS COMPILED BY ESRI PRODUCTS AND 2022 MICROSOFT CORPORATION.
COORDINATE SYSTEM: NAD 1983 2011 STATEPLANE OKLAHOMA NORTH FIPS 3501

LEGEND
⬢ SOIL BORING

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1 " = 300 SCALE IN FEET

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PLOTTED: 2/9/2022 8:22:52 AM BY: MPALMER

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PROJECT NO. 20220843.001A		EXPLORATION LOCATION PLAN AND VICINITY MAP	FIGURE 2
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	
CHECKED BY:	SYW		
DATE:	02-08-2022		

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Appendix A

FIELD EXPLORATION PROGRAM

Kleinfelder conducted the field work for this study between January 5 and 26, 2022. The exploration consisted of 27 borings drilled near the locations indicated on Figures 1 and 2, Exploration Location Plan and Vicinity Map(s). The borings were drilled on the river channel with a barge-mounted drill rig and terminated at approximate depth ranging from 20 to 55 feet below the water level.

Boring locations were established in the field by a representative of Kleinfelder by using an GPS with an accuracy of approximately 15 feet. The ground elevations at the borings were determined through use of an engineer's level referenced to multiple benchmarks (BM2, BM3, BM4, BM5, CP M-51-1062 and BM14) provided by Keystone Engineering & Surveying. Locations and elevations of the borings should be considered accurate only to the degree implied by the methods used.

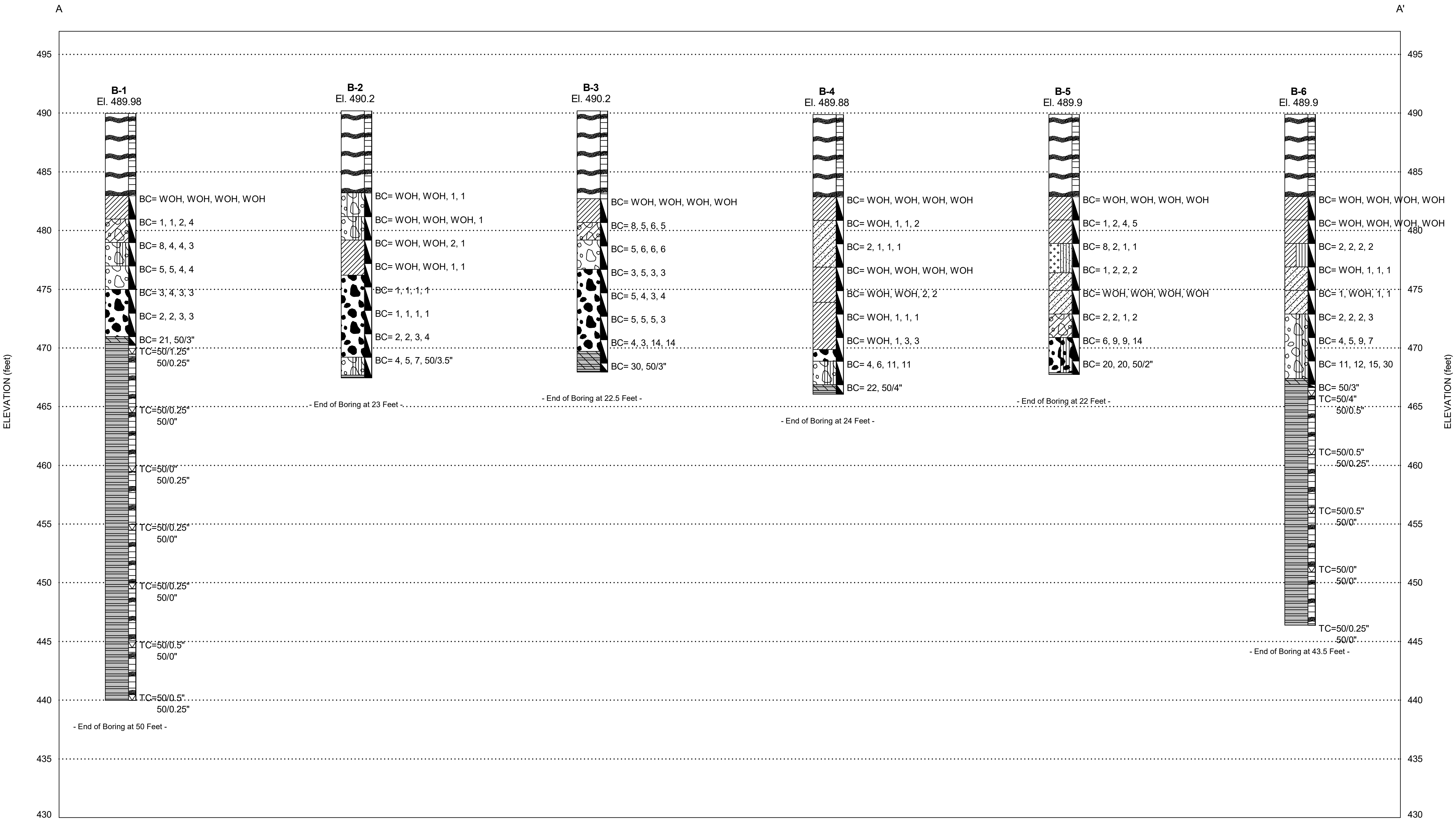
The borings were performed with an barge-mounted (CME-55) rotary drill rig using casing, mud rotary, and/or rock coring techniques. Soil samples were obtained by Standard Penetration test (SPT) using a 2-inch split-barrel sampler. Split-barrel sampling was conducted in general accordance with ASTM D1586 (Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of Soils). The split-barrel sampler is driven into the bottom of the boring over an 18-inch sampling interval by a 140-pound hammer that is dropped a distance of 30 inches. An automatic SPT hammer was used to advance the split-barrel sampler and the Texas Cone Penetrometer (TCP). The SPT N-value, recorded on the boring logs, is the number of blows required to drive the split-barrel sampler the final 12 inches of the 18-inch sampling interval. The samples were sealed and returned to our laboratory for further examination, classification, and testing. The borings were backfilled in accordance with the appropriate Oklahoma Water Resources Board Regulations.

The bedrock encountered in the Boring B-17A was cored using NQ-diamond bit coring procedures. This diameter core barrel provides a sample having an approximate diameter of 2 inches. Descriptions of the rock core are presented on the boring log in addition to recovery and Rock Quality Designation (RQD). Recovery for a core run is defined as the length of core recovered/length of the core run, expressed as a percentage. Rock Quality Designation is defined as the total length of core pieces, 4 inches or greater in length. Rock Quality

Designation provides an indication of the integrity of the rock mass and relative extent of seams and bedding planes. Rock core photographs are also attached in Figures.

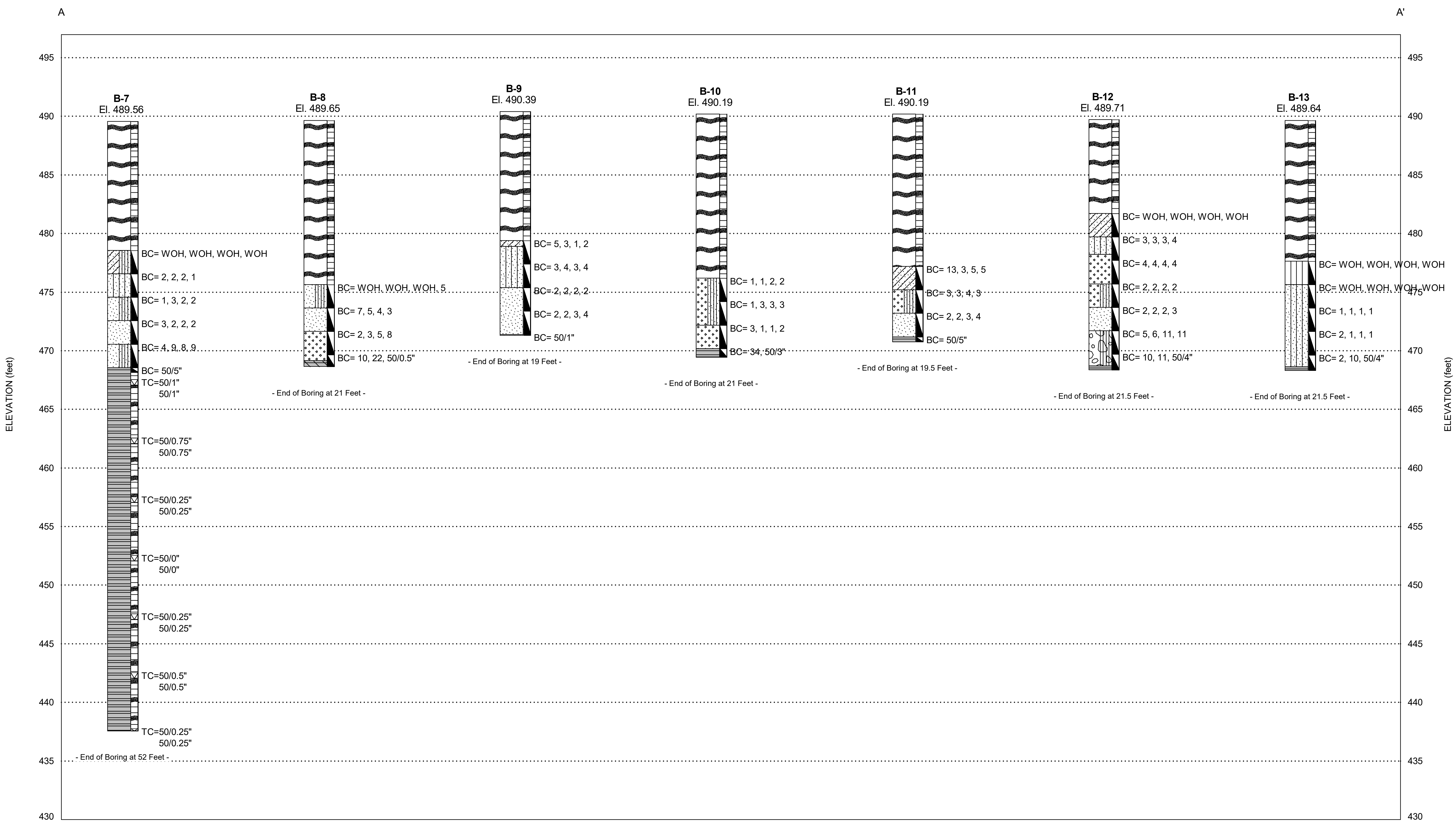
Bedrock in Borings (B-1, B-6, B-7, B-17B, and B-26) were tested by using Texas Cone Penetrometer (TCP) test. This test utilizes a 3-inch diameter cone with a height of 2.5 inches and an angle of 60 degrees from the horizontal. After seating the cone with 10 blows, the amount of penetration for two consecutive sets of 50 blows is recorded. A passing TCP test consists of two consecutive sets of 50 blows with less than or equal to 6 inches of penetration per 50 blow set. A failing TCP test would consist of the penetration of 6 inches before 50 blows are applied. These values are indicated on the boring logs at the depth of occurrence. Seven continuous passing TCP tests at 5-foot intervals for a total of 30 feet of bedrock penetration, except 20 feet in Boring B-6, were performed.

Boring logs included in this appendix present such data as soil and bedrock descriptions, consistency, relative density, and relative hardness evaluations, depths, sampling intervals, and observed groundwater conditions. Conditions encountered in each of the borings were monitored and recorded by field engineer. Field logs included visual classification of the materials encountered during drilling, as well as drilling characteristics. Our final boring logs, as presented in this appendix, represent an interpretation of the field logs combined with laboratory observation and testing of the samples. Visual classifications were made in accordance with the Unified Soil Classification System presented on the Graphics Key, Soil Description Key, and Rock Description Key that are also presented as figures in this appendix. The Subsurface Cross Sections, Figures A-1 through A-4, depict the generalized subsurface profile across the project site based on the information obtained from the borings. Stratification boundaries indicated on the boring logs and cross section were based on observations during our fieldwork, an extrapolation of information obtained by examining samples from the borings and comparisons of soils with similar engineering characteristics. Locations of these boundaries are approximate, and the transitions between material types may be gradual rather than clearly defined.



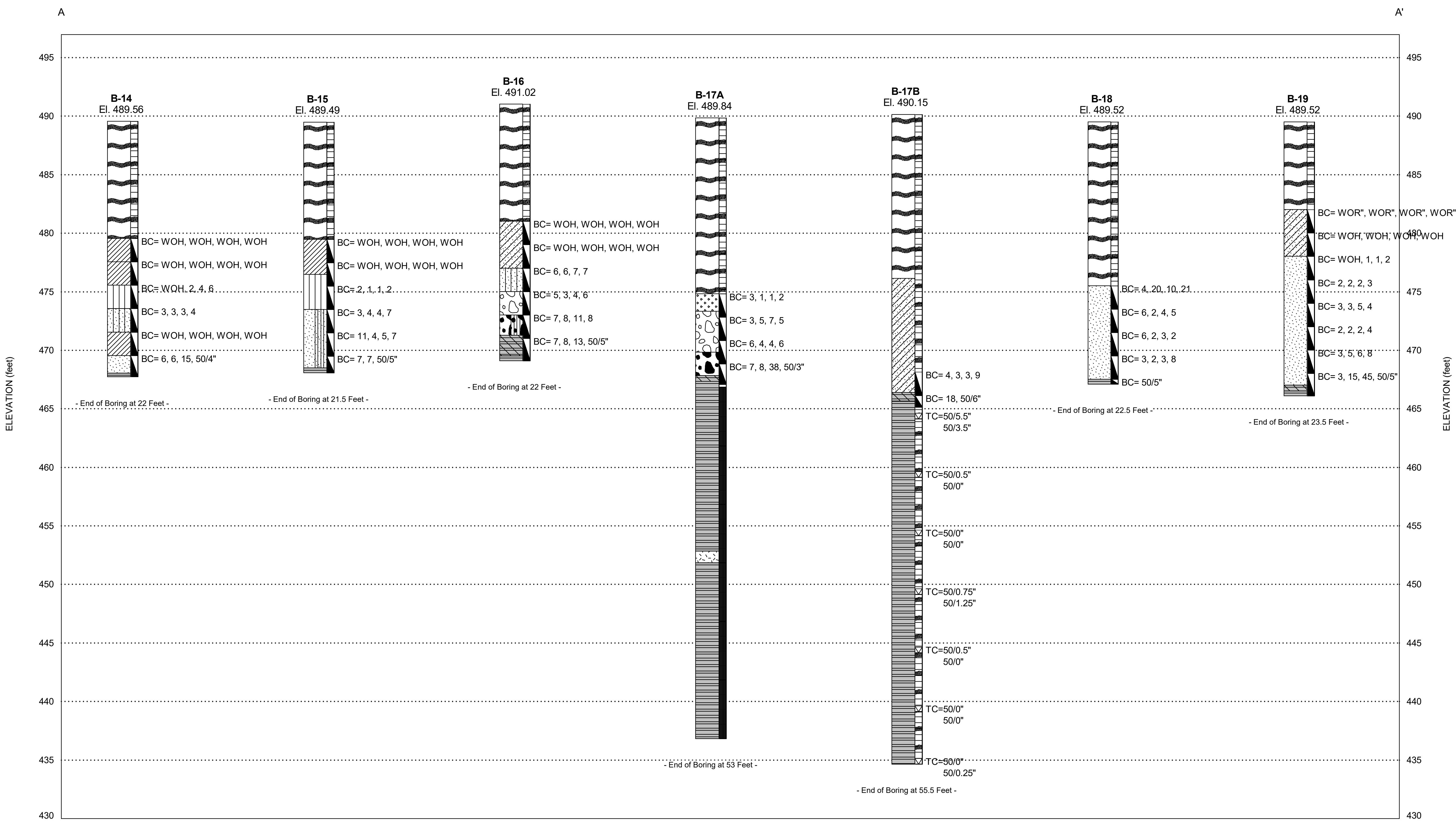
NOTE:
REFER TO INDIVIDUAL LOGS FOR DETAILED INFORMATION AND THE GRAPHIC LEGEND KEYS FOR GRAPHICAL SYMBOL INFORMATION.

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20220843.001A	SUBSURFACE CROSS-SECTION	PLATE
	DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	A-1
	CHECKED BY: SYW		
	DATE: 2/8/2022		



NOTE:
REFER TO INDIVIDUAL LOGS FOR DETAILED INFORMATION AND THE GRAPHIC LEGEND KEYS FOR GRAPHICAL SYMBOL INFORMATION.

KLEINFELDER *Bright People. Right Solutions.*	PROJECT NO.: 20220843.001A	SUBSURFACE CROSS-SECTION	PLATE
	DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	A-2
	CHECKED BY: SYW		
	DATE: 2/8/2022		



NOTE:
REFER TO INDIVIDUAL LOGS FOR DETAILED INFORMATION AND THE GRAPHIC LEGEND KEYS FOR GRAPHICAL SYMBOL INFORMATION.

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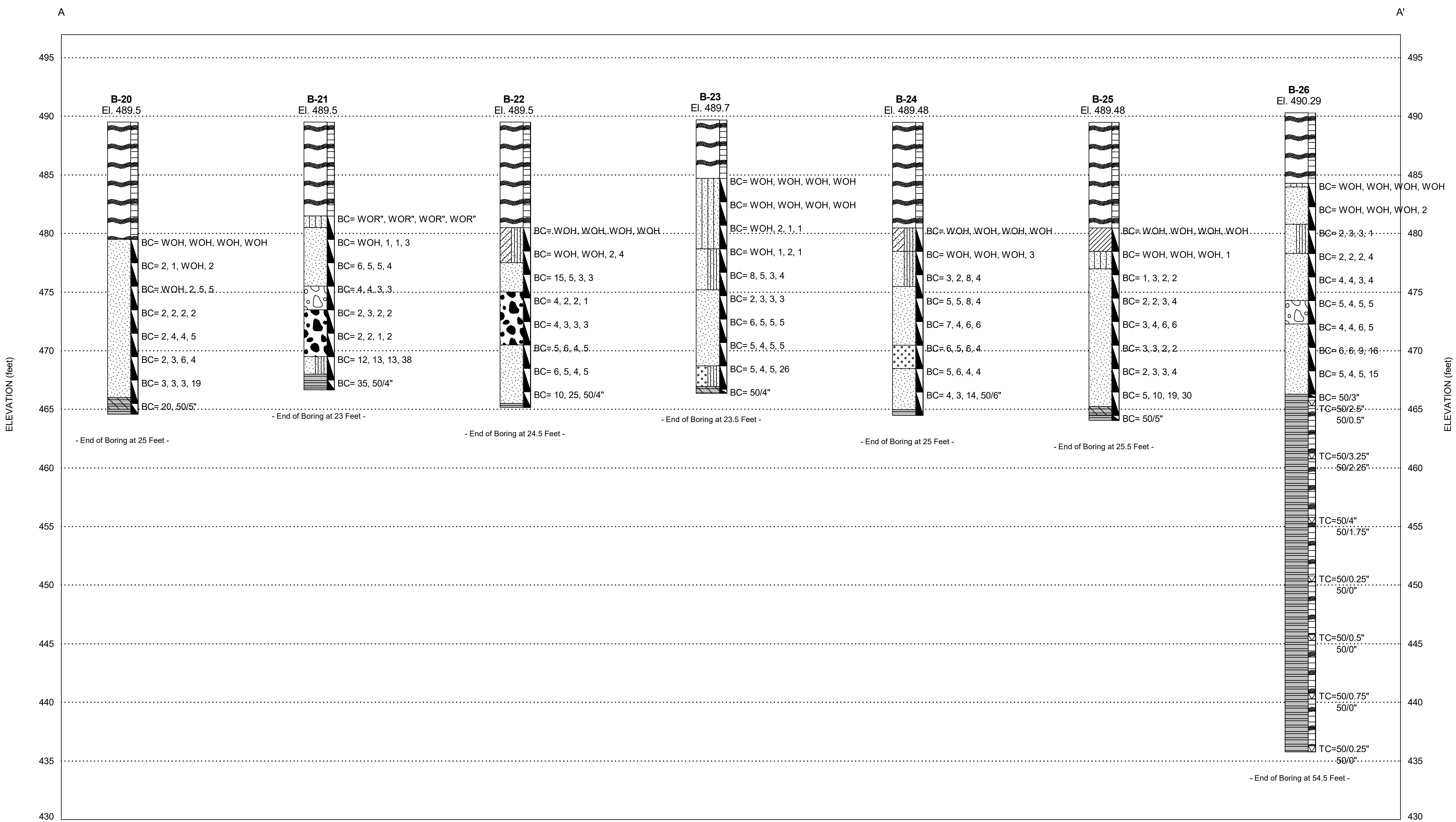
PROJECT NO.: 20220843.001A		SUBSURFACE CROSS-SECTION	PLATE
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	A-3
CHECKED BY:	SYW		
DATE:	2/8/2022		



NOTE:
REFER TO INDIVIDUAL LOGS FOR DETAILED INFORMATION AND THE GRAPHIC LEGEND KEYS FOR GRAPHICAL SYMBOL INFORMATION.

KLEINFELDER
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PROJECT NO.: 20220843.001A	SUBSURFACE CROSS-SECTION	PLATE
DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	A-4
CHECKED BY: SYW		
DATE: 2/8/2022		

SAMPLE/SAMPLER TYPE GRAPHICS

- NQ CORE SAMPLE (1.874 in. (47.6 mm.) core diameter)
- MUD ROTARY
- STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)
- TEXAS CONE PENETRATION

GROUND WATER GRAPHICS

- WATER LEVEL (level where first observed)
- WATER LEVEL (level after exploration completion)
- WATER LEVEL (additional levels after exploration)
- OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.
- TCP-Texas Cone Penetrometer: A 3 inch diameter by 2.5 inch long 60 degree conical point driven with a 140 pound hammer dropped 30 inches.

ABBREVIATIONS
WOH - Weight of Hammer
WOR - Weight of Rod

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

Major Division			Criteria	Symbol	Description
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	**GRAVELS** (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu≥4 and 1≤Cc≤3	**GW**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			Cu<4 and/ or 1>Cc>3	**GP**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH 5% TO 12% FINES	Cu≥4 and 1≤Cc≤3	**GW-GM**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
			Cu<4 and/ or 1>Cc>3	**GP-GM**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		GRAVELS WITH > 12% FINES		**GM**	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
	SANDS (Half or more of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu≥6 and 1≤Cc≤3	**SW**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			Cu<6 and/ or 1>Cc>3	**SP**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH 5% TO 12% FINES	Cu≥6 and 1≤Cc≤3	**SW-SM**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
			Cu<6 and/ or 1>Cc>3	**SP-SM**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		SANDS WITH > 12% FINES		**SM**	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES

Major Division		Symbol	Description
FINE GRAINED SOILS (Half or more of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)	**ML**	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid Limit 50 or greater)	**MH**	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

NOTE: USE MATERIAL DESCRIPTION ON THE LOG TO DEFINE A GRAPHIC THAT MAY NOT BE PROVIDED ON THIS LEGEND.

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20220843.001A	GRAPHICS KEY	PLATE
	DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	A-5
	CHECKED BY: SYW		
	DATE: 2/8/2022		

PLOTTED: 02/08/2022 04:02 PM BY: MPalmer
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PROJECT NUMBER: 20220843.001A
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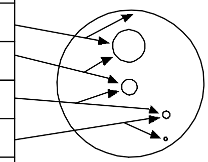
GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles		3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse	3/4 -3 in. (19 - 76.2 mm.)	3/4 -3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine	#4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines		Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller



SECONDARY CONSTITUENT

	AMOUNT	
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N_{60} (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25 ≤ PP <0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5 ≤ PP <1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1 ≤ PP <2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2 ≤ PP <4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4 ≤ PP	>8000	Thumbnail will not indent soil.

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT-N_{60} (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

PLASTICITY

DESCRIPTION	LL		PI
Non-Plastic	NP	Either the LL or the PI (or both) may be used to describe the soil plasticity. The ranges of numbers shown here do not imply that the LL ranges correlate with the PI ranges for all soils.	NP
Low	< 30		< 15
Medium	30 - 50		15 - 25
High	> 50		> 25

LL is from Casagrande, 1948. PI is from Holtz , 1959.

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

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PROJECT NO.: 20220843.001A		SOIL DESCRIPTION KEY	PLATE
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	A-6
CHECKED BY:	SYW		
DATE:	2/8/2022		

INFILLING TYPE

NAME	ABBR	NAME	ABBR
Albite	Al	Muscovite	Mus
Apatite	Ap	None	No
Biotite	Bi	Pyrite	Py
Clay	Cl	Quartz	Qz
Calcite	Ca	Sand	Sd
Chlorite	Ch	Sericite	Ser
Epidote	Ep	Silt	Si
Iron Oxide	Fe	Talc	Ta
Manganese	Mn	Unknown	Uk

DENSITY/SPACING OF DISCONTINUITIES

DESCRIPTION	SPACING CRITERIA
Unfractured	>6 ft. (>1.83 meters)
Slightly Fractured	2 - 6 ft. (0.061 - 1.83 meters)
Moderately Fractured	8 in - 2 ft. (203.20 - 609.60 mm)
Highly Fractured	2 - 8 in (50.80 - 203.30 mm)
Intensely Fractured	<2 in (<50.80 mm)

ADDITIONAL TEXTURAL ADJECTIVES

DESCRIPTION	RECOGNITION
Pit (Pitted)	Pinhole to 0.03 ft. (3/8 in.) (>1 to 10 mm.) openings
Vug (Vuggy)	Small openings (usually lined with crystals) ranging in diameter from 0.03 ft. (3/8 in.) to 0.33 ft. (4 in.) (10 to 100 mm.)
Cavity	An opening larger than 0.33 ft. (4 in.) (100 mm.), size descriptions are required, and adjectives such as small, large, etc., may be used
Honeycombed	If numerous enough that only thin walls separate individual pits or vugs, this term further describes the preceding nomenclature to indicate cell-like form.
Vesicle (Vesicular)	Small openings in volcanic rocks of variable shape and size formed by entrapped gas bubbles during solidification.

ADDITIONAL TEXTURAL ADJECTIVES

DESCRIPTION	CRITERIA
Unweathered	No evidence of chemical / mechanical alternation; rings with hammer blow.
Slightly Weathered	Slight discoloration on surface; slight alteration along discontinuities; <10% rock volume altered.
Moderately Weathered	Discoloring evident; surface pitted and alteration penetration well below surface; Weathering "halos" evident; 10-50% rock altered.
Highly Weathered	Entire mass discolored; Alteration pervading most rock, some slight weathering pockets; some minerals may be leached out.
Decomposed	Rock reduced to soil with relic rock texture/structure; Generally molded and crumbled by hand.

RELATIVE HARDNESS / STRENGTH DESCRIPTIONS

GRADE		UCS (Mpa)	FIELD TEST
R0	Extremely Weak	0.25 - 1.0	Indented by thumbnail
R1	Very Weak	1.0 - 5.0	Crumbles under firm blows of geological hammer, can be peeled by a pocket knife.
R2	Weak	5.0 - 25	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.
R3	Medium Strong	25 - 50	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single firm blow of a geological hammer.
R4	Strong	50 - 100	Specimen requires more than one blow of geological hammer to fracture it.
R5	Very Strong	100 - 250	Specimen requires many blows of geological hammer to fracture it.
R6	Extremely Strong	> 250	Specimen can only be chipped with a geological hammer.

ROCK QUALITY DESIGNATION (RQD)

DESCRIPTION	RQD (%)
Very Poor	0 - 25
Poor	25 - 50
Fair	50 - 75
Good	75 - 90
Excellent	90 - 100

APERTURE

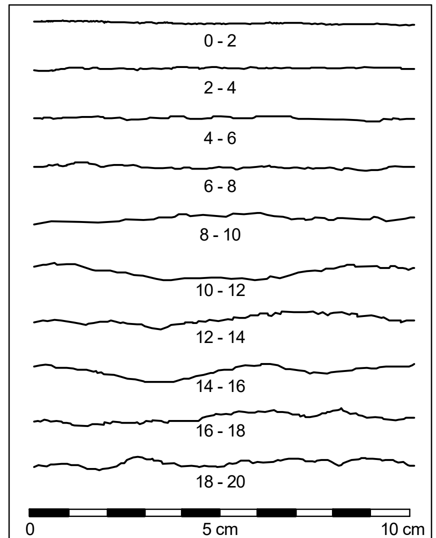
DESCRIPTION	CRITERIA [in (mm)]
Tight	<0.04 (<1)
Open	0.04 - 0.20 (1 - 5)
Wide	>0.20 (>5)

BEDDING CHARACTERISTICS

DESCRIPTION	Thickness [in (mm)]
Very Thick Bedded	>36 (>915)
Thick Bedded	12 - 36 (305 - 915)
Moderately Bedded	4 - 12 (102 - 305)
Thin Bedded	1 - 4 (25 - 102)
Very Thin Bedded	0.4 - 1 (10 - 25)
Laminated	0.1 - 0.4 (2.5 - 10)
Thinly Laminated	<0.1 (<2.5)

Bedding Planes — Planes dividing the individual layers, beds, or stratigraphy of rocks.
Joint — Fracture in rock, generally more or less vertical or traverse to bedding.
Seam — Applies to bedding plane with unspecified degree of weather.

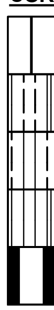
JOINT ROUGHNESS COEFFICIENT (JRC)



From Barton and Choubey, 1977

RQD — Rock-quality designation (RQD) Rough measure of the degree of jointing or fracture in a rock mass, measured as a percentage of the drill core in lengths of 10 cm. or more.

CORE SAMPLER TYPE GRAPHICS



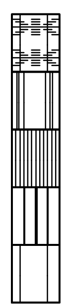
CORE SAMPLER

AQ CORE BARREL
(1.067 in. (27.1 mm.) core diameter)

AX CORE BARREL
(1.185 in. (30.1 mm.) core diameter)

BQ CORE BARREL
(1.433 in. (36.4 mm.) core diameter)

CONTINUOUS CORE SAMPLE
(2.000 in. (50.8 mm.) core diameter)



EX CORE BARREL
(0.846 in. (21.5 mm.) core diameter)

HQ CORE SAMPLE
(2.500 in. (63.5 mm.) core diameter)

NQ CORE SAMPLE
(1.874 in. (47.6 mm.) core diameter)

NO RECOVERY CORE SAMPLE

NX CORE SAMPLE
(2.154 in. (54.7 mm.) core diameter)

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PROJECT NO.: 20220843.001A		ROCK DESCRIPTION KEY	PLATE
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	A-7
CHECKED BY:	SYW		
DATE:	2/8/2022		

PLOTTED: 02/08/2022 04:03 PM BY: MPalmer
OFFICE FILTER: TULSA
PROJECT NUMBER: 20220843.001A
gINT FILE: Klf_gint_master_2022
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2022.GLB [_KLF_GEO-LEG 3 (ROCK DESC KEY)]

Date Begin - End:	1/24/2022 - 1/25/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	36 °F Sunny	**Exploration Diameter:**	4 in. O.D.

BORING LOG B-1

Hammer Type - Drop: 140 lb. Auto - 30 in.

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.79437°
Longitude: -95.28850°
Approximate Ground Surface Elevation (ft.): 489.98
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			WATER: 7 feet												
485	5														
			Sandy Lean CLAY with Gravel (CL): dark gray, wet, very soft	SS-1		BC=WOH WOH WOH WOH	18"	CL	26.8		77	53	32	14	
480	10		**Clayey GRAVEL with Sand (GC)**: dark gray, loose	SS-2		BC=1 1 2 4	10"		19.5		48	19			
			Poorly Graded GRAVEL with Silt and Sand (GP-GM): dark gray and reddish brown, wet, loose	SS-3		BC=8 4 4 3	6"	GP-GM	17.3		47	9.2			
			Poorly Graded GRAVEL (GP): dark gray and reddish brown, loose	SS-4		BC=5 5 4 4	3"	GP	15.9		4	1.3			
475	15		**Well-Graded GRAVEL with Sand (GW)**: dark gray and reddish brown, loose	SS-5		BC=3 4 3 3	5"	GW	13.1		16	0.3			
				SS-6		BC=2 2 3 3	9"	GW	15.3		22	1.3			
			Highly Weathered SHALE interbedded with Sandstone: dark gray, laminated, extremely weak	SS-7		BC=21 50/3"	9"		9.5		74	33	27	9	
470	20		**SHALE interbedded with Sandstone**: dark gray, highly weathered, laminated, extremely weak	TC-8		TC=50/1.25" 50/0.25"									
			- 2-inch hard rock layer at 23.5 feet												
465	25			TC-9		TC=50/0.25" 50/0"									
			- 1-inch hard rock layer at 26 feet												

Date Begin - End:	1/24/2022 - 1/25/2022	Drilling Company:	AM Drill, Inc		**BORING LOG B-1**
Logged By:	S. Bhandari	Drill Crew:	D. McKenzy		
Hor.-Vert. Datum:	Not Available	Drilling Equipment:	Barge-Mounted CME-55	Hammer Type - Drop:	140 lb. Auto - 30 in.
Plunge:	-90 degrees	Drilling Method:	Mud Rotary		
Weather:	36 °F Sunny	Exploration Diameter:	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.79437°
Longitude: -95.28850°
Approximate Ground Surface Elevation (ft.): 489.98
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			SHALE interbedded with Sandstone: dark gray, highly weathered, laminated, extremely weak												
460	30			TC-10		TC=50/0" 50/0.25"									
455	35			TC-11		TC=50/0.25" 50/0"									
450	40			TC-12		TC=50/0.25" 50/0"									
445	45			TC-13		TC=50/0.5" 50/0"									
440	50			TC-14		TC=50/0.5" 50/0.25"									

The boring was terminated at approximately 50 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A	BORING LOG B-1	BORING
DRAWN BY: MAP	MKARNS Mooring Modernization Project	B-1
CHECKED BY: SYW	Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04)	
DATE: 2/8/2022	Muskogee County, Oklahoma	PAGE: 2 of 2

BORING LOG B-2

Date Begin - End:	1/23/2022	**Drilling Company:**	AM Drill, Inc		
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	55 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.79420°
Longitude: -95.28893°
Approximate Ground Surface Elevation (ft.): 490.20
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490		**WATER**: 7 feet												
485	5													
		Silty GRAVEL with Sand (GM): dark gray and reddish brown, wet, very loose	SS-1		BC=WOH WOH 1 1	11"	GM	16.8		40	15			
480	10	**Poorly Graded GRAVEL with Silt and Sand (GP-GM)**: dark gray and reddish brown, very loose	SS-2		BC=WOH WOH WOH 1	2"	GP-GM	16.0		32	8.1			
		Sandy Lean CLAY (CL): dark gray and reddish brown, soft	SS-3		BC=WOH WOH 2 1	3"		32.1		87	62			
			SS-4		BC=WOH WOH 1 1	18"	GC	28.6		69	48	44	20	
475	15	**Well-Graded GRAVEL (GW)**: dark gray and gray, very loose to loose	SS-5		BC=1 1 1 1	NR"								
			SS-6		BC=1 1 1 1	2"		12.6		15				
470	20		SS-7		BC=2 2 3 4	2"	GW	9.1		11	3.3			
		Poorly Graded GRAVEL with Silt and Sand (GP-GM): reddish brown, wet, medium dense	SS-8		BC=4 5 7 50/3.5"	10"	GP-GM	10.8		46	11			
		SHALE interbedded with Sandstone: dark gray, extremely weak, laminated												
465	25	The boring was terminated at approximately 23 ft. below ground surface.												

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A	BORING LOG B-2		BORING
DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma		B-2
CHECKED BY: SYW			
DATE: 2/8/2022			PAGE: 1 of 1

BORING LOG B-3

Date Begin - End:	1/23/2022	**Drilling Company:**	AM Drill, Inc		
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	50 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.79414°
Longitude: -95.28909°
Approximate Ground Surface Elevation (ft.): 490.20
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490	0	**WATER**: 7.5 feet											
		Lean CLAY (CL): dark gray, wet, very soft	SS-1	BC=WOH WOH WOH WOH	10"	CL	43.9		100	92	38	17	
480	10	**Clayey GRAVEL with Sand (GC)**: dark gray, medium dense	SS-2	BC=8 5 6 5	18"		18.6		45	23			
		Poorly Graded GRAVEL with Sand (GP): dark gray and reddish brown, wet, medium dense	SS-3	BC=5 6 6 6	16"	GP	14.3		33	4.3			
		Well-Graded GRAVEL with Sand (GW): reddish brown and yellowish brown, loose	SS-4	BC=3 5 3 3	8"	GW	19.8		19	2.1			
475	15		SS-5	BC=5 4 3 4	8"	GW	14.0		24	1.3			
			SS-6	BC=5 5 5 3	3"	GW	13.0		14	0.6			
470	20		SS-7	BC=4 3 14 14	10"	GW	17.6		20	3.6			
		Highly Weathered SHALE: dark gray, extremely weak											
		SHALE: dark gray, highly weathered, very weak	SS-8	BC=30 50/3"	7"		10.7		90	39	24	5	
465	25												

The boring was terminated at approximately 22.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-3	BORING B-3
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

Date Begin - End:	1/23/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-4**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	35 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.79400°
Longitude: -95.28960°
Approximate Ground Surface Elevation (ft.): 489.88
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
485	5		**WATER**: 7 feet												
			Sandy Lean CLAY (CL): dark gray, wet, very soft	SS-1		BC=WOH WOH WOH WOH	9"		35.8		92	70			
480	10		**Clayey SAND with Gravel (SC)**: dark gray, very loose	SS-2		BC=WOH 1 1 2	4"		27.4		72	44			
				SS-3		BC=2 1 1 1	12"		20.1		70	15			
			- 4-inch layer of coarse-grained sand and gravel at 12.5 feet												
			Lean CLAY (CL): dark gray, very soft to soft	SS-4		BC=WOH WOH WOH WOH	20"	CL	45.2		100	91	40	17	
475	15		- 3-inch layer of lean to fat clay interbedded with sand/gravel at 14.5 feet	SS-5		BC=WOH WOH 2 2	11"		49.0		100	91			
			Sandy Lean CLAY with Gravel (CL): dark gray, soft	SS-6		BC=WOH 1 1 1	5"		42.4		82	70			
				SS-7		BC=WOH 1 3 3	3"	GW	21.7		14	3.2			
470	20		**Well-Graded GRAVEL with Sand (GW)**: gray and dark gray, loose												
			Poorly Graded GRAVEL with Silt and Sand (GP-GM): dark gray and dark yellowish brown, wet, medium dense	SS-8		BC=4 6 11 11	9"	GP-GM	14.5		33	5.5			
			Highly Weathered SHALE: dark gray with olive seams, extremely weak	SS-9		BC=22 50/4"	10"		15.5		87	48	27	9	
465	25		**SHALE**: dark gray with olive seams, highly weathered, very weak												

The boring was terminated at approximately 24 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-4	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-4
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

BORING LOG B-5

Date Begin - End:	1/25/2022	**Drilling Company:**	AM Drill, Inc		
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	36 °F Cloudy	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION — Latitude: 35.79392° Longitude: -95.28973° Approximate Ground Surface Elevation (ft.): 489.90 Surface Condition: Water

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
485	5		**WATER**: 7 feet												
			Lean CLAY with Sand (CL): dark gray, wet, very soft, trace gravel	SS-1		BC=WOH WOH WOH WOH	8"	CL	35.6		100	85	47	21	
480	10		**Lean CLAY (CL)**: dark gray, stiff	SS-2		BC=1 2 4 5	20"	CL	34.8		92	89	46	22	
			Well-Graded SAND with Silt and Gravel (SW-SM): dark gray, wet, very loose	SS-3		BC=8 2 1 1	12"	SW-SM	19.3		76	6.0			
			Clayey SAND with Gravel (SC): dark gray, loose	SS-4		BC=1 2 2 2	6"		32.6		79	46			
475	15		**Clayey SAND (SC)**: dark gray, wet, very loose, trace gravel	SS-5		BC=WOH WOH WOH WOH	18"	SC	34.7		98	46	25	9	
			Clayey GRAVEL with Sand (GC): very loose	SS-6		BC=2 2 1 2	4"		21.3		48	22			
470	20		**Well-Graded GRAVEL with Silt and Sand (GW-GM)**: dark gray, yellowish brown, and reddish brown, wet, medium dense	SS-7		BC=6 9 9 14	13"	GW-GM	11.8		48	6.6			
				SS-8		BC=20 20 50/2"	14"		14.5		59	16			
			SHALE interbedded with Sandstone: dark gray, laminated, extremely weak												

The boring was terminated at approximately 22 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-5	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-5
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

Date Begin - End: 1/25/2022
Logged By: S. Bhandari
Hor.-Vert. Datum: Not Available
Plunge: -90 degrees
Weather: 40 °F Cloudy
Drilling Company: AM Drill, Inc
Drill Crew: D. McKenzy
Drilling Equipment: Barge-Mounted CME-55
Drilling Method: Mud Rotary
Exploration Diameter: 4 in. O.D.
Hammer Type - Drop: 140 lb. Auto - 30 in.

BORING LOG B-6

Latitude: 35.79383°
Longitude: -95.29023°
Approximate Ground Surface Elevation (ft.): 489.90
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		WATER: 7 feet											
485	5												
		Lean CLAY with Sand (CL): dark gray, wet, very soft	SS-1	BC=WOH WOH WOH WOH	18"	CL	36.9		100	81	39	18	
480	10	**Sandy Lean CLAY (CL)**: dark gray, very soft	SS-2	BC=WOH WOH WOH WOH	20"	CL	38.0		94	66	32	15	
		Sandy Silty CLAY (CL-ML): dark gray and light brown, soft	SS-3	BC=2 2 2 2	24"	CL-ML	32.6		99	56	19	4	
		Clayey SAND (SC): dark gray, very loose	SS-4	BC=WOH 1 1 1	4"		30.9		98	43			
475	15	**Clayey SAND with Gravel (SC)**: dark gray, wet, very loose	SS-5	BC=1 WOH 1 1	3"		22.4		65	19			
		Poorly Graded GRAVEL with Silt and Sand (GP-GM): dark gray, reddish brown, and yellowish brown, loose to medium dense	SS-6	BC=2 2 2 3	3"	GP-GM	17.7		21	9.3			
470	20		SS-7	BC=4 5 9 7	6"	GP-GM	13.1		30	5.0			
			SS-8	BC=11 12 15 30	18"	GC	11.0		59	25	29	11	
		Highly Weathered SHALE interbedded with Sandstone: dark gray, extremely weak	SS-9	BC=50/3"	3"		8.6		89	45	29	10	
		SHALE interbedded with Sandstone: dark gray, very weak to weak	TC-10	TC=50/4" 50/0.5"									

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PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

BORING LOG B-6

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

BORING
B-6

Date Begin - End:	1/25/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-6**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	40 °F Cloudy	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.79383°
Longitude: -95.29023°
Approximate Ground Surface Elevation (ft.): 489.90
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			SHALE interbedded with Sandstone: dark gray, very weak to weak												
				TC-11		TC=50/0.5" 50/0.25"									
460	30														
				TC-12		TC=50/0.5" 50/0"									
455	35														
				TC-13		TC=50/0" 50/0"									
450	40														
			The boring was terminated at approximately 43.5 ft. below ground surface.	TC-14		TC=50/0.25" 50/0"									
445	45														

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A	BORING LOG B-6	BORING	
DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-6	
CHECKED BY: SYW			
DATE: 2/8/2022		PAGE: 2 of 2	

Date Begin - End:	1/21/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-7**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	36 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

Latitude: 35.78715°
Longitude: -95.29786°
Approximate Ground Surface Elevation (ft.): 489.56
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description (FIELD EXPLORATION)	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol (LABORATORY RESULTS)	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
485	5		**WATER**: 11 feet												
480	10														
			Silty Clayey SAND (SC-SM): dark gray, very loose	SS-1		BC=WOH WOH WOH WOH	18"	SC-SM	27.1		97	36	22	5	
			Silty SAND (SM): dark gray, very loose	SS-2		BC=2 2 2 1	20"	SM	23.4		100	26	NP	NP	
475	15		**Poorly Graded SAND with Silt (SP-SM)**: light gray, loose	SS-3		BC=1 3 2 2	24"	SP-SM	19.3		100	5.1	NP	NP	
			Poorly Graded SAND (SP): light gray, loose	SS-4		BC=3 2 2 2	24"	SP	15.7		99	2.9	NP	NP	
470	20		**Poorly Graded SAND with Silt (SP-SM)**: light gray, medium dense - 1-inch layer of dark gray shaly lean clay at 20.5 feet	SS-5		BC=4 9 8 9	12"	SP-SM	14.5		83	5.9			
				SS-6		BC=50/5"	5"		15.6		98	81	36	13	
			SHALE: dark gray with olive stains, highly weathered to decomposed, very weak to weak	TC-7		TC=50/1" 50/1"									
465	25														
				TC-8		TC=50/0.75" 50/0.75"									

Date Begin - End:	1/21/2022	**Drilling Company:**	AM Drill, Inc			**BORING LOG B-7**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.	
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary			
Weather:	36 °F Sunny	**Exploration Diameter:**	4 in. O.D.			

FIELD EXPLORATION — LABORATORY RESULTS

Latitude: 35.78715°
Longitude: -95.29786°
Approximate Ground Surface Elevation (ft.): 489.56
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
460	30		**SHALE**: dark gray with olive stains, highly weathered to decomposed, very weak to weak												
				TC-9		TC=50/0.25" 50/0.25"									
455	35														
				TC-10		TC=50/0" 50/0"									
450	40														
				TC-11		TC=50/0.25" 50/0.25"									
445	45														
				TC-12		TC=50/0.5" 50/0.5"									
440	50														
				TC-13		TC=50/0.25" 50/0.25"									
435	55														

The boring was terminated at approximately 52 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-7	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-7
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 2 of 2

PLOTTED: 02/08/2022 03:01 PM BY: MPalmer
OFFICE FILTER: TULSA
PROJECT NUMBER: 20220843.001A
gINT FILE: Klf_gint_master_2022
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2022.GLB [_KLF_BORING/TEST PIT SOIL LOG]

BORING LOG B-8

Date Begin - End: 1/21/2022
Logged By: S. Bhandari
Hor.-Vert. Datum: Not Available
Plunge: -90 degrees
Weather: 35 °F Sunny

Drilling Company: AM Drill, Inc
Drill Crew: D. McKenzy
Drilling Equipment: Barge-Mounted CME-55
Drilling Method: Mud Rotary
Exploration Diameter: 4 in. O.D.

Hammer Type - Drop: 140 lb. Auto - 30 in.

Latitude: 35.78690°
Longitude: -95.29797°
Approximate Ground Surface Elevation (ft.): 489.65
Surface Condition: Water

		FIELD EXPLORATION				LABORATORY RESULTS							
Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	0	**WATER**: 14 feet											
485	5												
480	10												
475	15	**Poorly Graded SAND with Silt and Gravel (SP-SM)**: dark gray, wet	SS-1	BC=WOH WOH WOH 5	10"	SP-SM	15.7		82	7.8			
		Poorly Graded SAND with Gravel (SP): dark gray and tan, loose, medium to coarse-grained with trace black coal	SS-2	BC=7 5 4 3	20"	SP	12.1		67	3.9	NP	NP	
470		**Well-Graded SAND with Gravel (SW)**: light gray, medium dense, coarse-grained	SS-3	BC=2 3 5 8	24"	SW	13.2		74	3.0	NP	NP	
	20	- trace gravel with olive green sandstone fragments below 19.75 feet	SS-4	BC=10 22 50/0.5"	12"		11.1		54	24	29	9	
		Highly Weathered SHALE interbedded Sandstone: light gray and olive, extremely weak, laminated											

The boring was terminated at approximately 21 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

BORING LOG B-8

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

BORING
B-8

PLOTTED: 02/08/2022 03:01 PM BY: MPalmer
OFFICE FILTER: TULSA
PROJECT NUMBER: 20220843.001A
gINT FILE: Klf_gint_master_2022
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2022.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/08/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-9**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	42 °F Misty	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION | LABORATORY RESULTS

Latitude: 35.78654°
Longitude: -95.29809°
Approximate Ground Surface Elevation (ft.): 490.39
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490	0		**WATER**: 11 feet												
485	5														
480	10														
			Clayey SAND (SC): dark gray, wet, trace of olive rock fragments	SS-1		BC=5 3 1 2	4"								
			Silty SAND (SM): dark gray, wet, loose, fine to coarse-grained												
			- 3 inch layer of dark brown clayey sand below 13 feet	SS-2		BC=3 4 3 4	24"	SM	19.9		99	22	NP	NP	
475	15		**Poorly Graded SAND (SP)**: dark gray, loose, fine to coarse-grained	SS-3		BC=2 2 2 2	9"	SP	18.4		95	1.3			
				SS-4		BC=2 2 3 4	9"	SP	16.3		95	1.4			
			SANDSTONE: dark bluish gray, highly weathered to decomposed, weakly cemented, extremely weak	SS-5		BC=50/1"	1"		12.0		36	11			
470	20														

The boring was terminated at approximately 19 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
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PROJECT NO.: 20220843.001A		BORING LOG B-9	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-9
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

Date Begin - End:	1/08/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-10**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	42 °F Misty	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.78445°
Longitude: -95.29869°
Approximate Ground Surface Elevation (ft.): 490.19
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490	0	**WATER**: 14 feet											
475	15	**Well-Graded SAND with Silt (SW-SM)**: light brown, wet, loose	SS-1	BC=1 1 2 2	12"		15.9		97	19			
		- multiple 2 inch layer of dark brown, silty clayey sand layer below 16 feet	SS-2	BC=1 3 3 3	12"	SW-SM	16.8		99	9.2	NP	NP	
		Well-Graded SAND with Gravel (SW): light brown and tan, loose	SS-3	BC=3 1 1 2	7"	SW	14.7		76	2.0			
470	20	**SHALE**: dark gray, highly weathered to decomposed, laminated, extremely weak	SS-4	BC=34 50/3"	9"		12.7		80	16	21	6	

The boring was terminated at approximately 21 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
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PROJECT NO.: 20220843.001A	BORING LOG B-10		BORING B-10
DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma		
CHECKED BY: SYW			
DATE: 2/8/2022			PAGE: 1 of 1

Date Begin - End:	1/08/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	43 °F Cloudy	**Exploration Diameter:**	4 in. O.D.

BORING LOG B-11

Hammer Type - Drop: 140 lb. Auto - 30 in.

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.78427°
Longitude: -95.29873°
Approximate Ground Surface Elevation (ft.): 490.19
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490	0	**WATER**: 13 feet											
477	13	**Clayey SAND (SC)**: dark brown, wet, medium dense	SS-1	BC=13 3 5 5	12"		16.7		99	38			
475	15	**Well-Graded SAND with Silt (SW-SM)**: dark gray and light brown, wet, loose, fine to coarse-grained	SS-2	BC=3 3 4 3	24"	SW-SM	15.1		97	8.9	NP	NP	
		Poorly Graded SAND (SP): light brown, loose	SS-3	BC=2 2 3 4	12"	SP	16.9		93	2.2	NP	NP	
		SHALE interbedded with Sandstone: dark gray, highly weathered to decomposed, laminated, extremely weak	SS-4	BC=50/5"	5"		8.7		45	15			

The boring was terminated at approximately 19.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

gINT FILE: Klf_gint_master_2022 gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2022.GLB [_KLF_BORING/TEST PIT SOIL LOG] PROJECT NUMBER: 20220843.001A OFFICE FILTER: TULSA PLOTTED: 02/08/2022 03:01 PM BY: MPalmer

BORING LOG B-12

Date Begin - End:	1/10/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	28 °F Sunny	**Exploration Diameter:**	4 in. O.D.

Hammer Type - Drop: 140 lb. Auto - 30 in.

Latitude: 35.78399°
Longitude: -95.29884°
Approximate Ground Surface Elevation (ft.): 489.71
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	0	**WATER**: 8 feet											
485	5												
	8	**Clayey SAND (SC)**: dark gray, wet, very loose, trace of gravel	SS-1	BC=WOH WOH WOH WOH	11"		37.2		100	43			
480	10	**Silty SAND with Gravel (SM)**: dark gray, loose	SS-2	BC=3 3 3 4	24"	SM	19.0		76	15	19	2	
		Well-Graded SAND (SW): light brown, wet, loose, fine to coarse-grained, trace of gravel	SS-3	BC=4 4 4 4	14"	SW	15.1		89	3.6	NP	NP	
475	15	**Well-Graded SAND with Silt and Gravel (SW-SM)**: light brown, loose	SS-4	BC=2 2 2 2	4"	SW-SM	16.5		84	12			
		Poorly Graded SAND (SP): light gray and brown, loose	SS-5	BC=2 2 2 3	20"	SP	20.7		100	1.9	NP	NP	
		Poorly Graded GRAVEL with Silt and Sand (GP-GM): brown and light gray, medium dense	SS-6	BC=5 6 11 11	2"		8.4		32	7.3			
470	20		SS-7	BC=10 11 50/4"	21"	GC-GM	15.6		64	37	25	7	
		SHALE: dark gray, highly weathered to decomposed, laminated, extremely weak											
465													

The boring was terminated at approximately 21.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
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PROJECT NO.: 20220843.001A	BORING LOG B-12	BORING
DRAWN BY: MAP	MKARNS Mooring Modernization Project	B-12
CHECKED BY: SYW	Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04)	
DATE: 2/8/2022	Muskogee County, Oklahoma	PAGE: 1 of 1

Date Begin - End:	1/10/2022	Drilling Company:	AM Drill, Inc		**BORING LOG B-13**
Logged By:	S. Bhandari	Drill Crew:	D. McKenzy		
Hor.-Vert. Datum:	Not Available	Drilling Equipment:	Barge-Mounted CME-55	Hammer Type - Drop:	140 lb. Auto - 30 in.
Plunge:	-90 degrees	Drilling Method:	Mud Rotary		
Weather:	39 °F Sunny	Exploration Diameter:	4 in. O.D.		

Latitude: 35.78366°
Longitude: -95.29894°
Approximate Ground Surface Elevation (ft.): 489.64
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	0	**WATER**: 12 feet												
485	5													
480	10													
	12	**Sandy SILT (ML)**: dark gray and light brown, wet, very soft, trace of gravel	SS-1		BC=WOH WOH WOH WOH	20"	ML	35.6		98	69	NP	NP	
475	14	**Silty SAND (SM)**: light brown, wet, very loose	SS-2		BC=WOH WOH WOH WOH	16"		30.9		100	36			
	16	- 3 inch layer of clayey sand below 16.5 feet	SS-3		BC=1 1 1 1	24"	SM	35.4		100	37	NP	NP	
	18	- trace of gravel content below 18 feet	SS-4		BC=2 1 1 1	24"	SM	30.8		99	30	NP	NP	
470	20	- coarse-grained below 20 feet	SS-5		BC=2 10 50/4"	16"		26.6		87	63	27	9	
	21	**SHALE**: dark gray, highly weathered to decomposed, laminated, extremely weak												
465														

The boring was terminated at approximately 21.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A	BORING LOG B-13	BORING
DRAWN BY: MAP	MKARNS Mooring Modernization Project	B-13
CHECKED BY: SYW	Oakley's Grand River, and Port of Muskogee	
DATE: 2/8/2022	State J/P No. 35257(04) Muskogee County, Oklahoma	PAGE: 1 of 1

BORING LOG B-14

Date Begin - End:	1/10/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	46 °F Sunny	**Exploration Diameter:**	4 in. O.D.

Hammer Type - Drop: 140 lb. Auto - 30 in.

Latitude: 35.78350°
Longitude: -95.29898°
Approximate Ground Surface Elevation (ft.): 489.56
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		WATER: 10 feet											
485	5												
480	10	**Lean CLAY with Sand (CL)**: dark gray, wet, very soft	SS-1	BC=WOH WOH WOH WOH	11"		45.8		100	75			
		Sandy Lean CLAY (CL): dark gray, very soft	SS-2	BC=WOH WOH WOH WOH	12"		45.3		99	62			
475	15	**Sandy SILT (ML)**: dark gray to light brown, very soft to medium stiff	SS-3	BC=WOH 2 4 6	24"	ML	32.2		100	51	NP	NP	
		Silty SAND (SM): light brown, loose	SS-4	BC=3 3 3 4	24"	SM	20.0		100	16	NP	NP	
470	20	**Lean CLAY with Sand (CL)**: dark gray, wet, very soft, trace of twigs	SS-5	BC=WOH WOH WOH WOH	24"	CL	40.3		100	85	32	11	
		Poorly Graded SAND (SP): light brown, wet, medium dense, fine to coarse-grained	SS-6	BC=6 6 15 50/4"	20"		17.2		88	19	22	7	
465		**SHALE**: dark gray, highly weathered, laminated, extremely weak											

The boring was terminated at approximately 22 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-14	BORING B-14
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

Date Begin - End: 1/10/2022	**Drilling Company:** AM Drill, Inc		**BORING LOG B-15**	
Logged By: S. Bhandari	**Drill Crew:** D. McKenzy			
Hor.-Vert. Datum: Not Available	**Drilling Equipment:** Barge-Mounted CME-55		**Hammer Type - Drop:** 140 lb. Auto - 30 in.	
Plunge: -90 degrees	**Drilling Method:** Mud Rotary			
Weather: 49 °F Sunny	**Exploration Diameter:** 4 in. O.D.			

Latitude: 35.78320°
Longitude: -95.29907°
Approximate Ground Surface Elevation (ft.): 489.49
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
485	5	**WATER**: 10 feet											
480	10	**Lean CLAY with Sand (CL)**: dark gray, wet, very soft	SS-1	BC=WOH WOH WOH WOH	14"		51.5		100	80			
			SS-2	BC=WOH WOH WOH WOH	22"		44.7		100	50			
475	15	**Sandy SILT (ML)**: light brown, wet, very soft, fine-grained - 6 inch seam of clayey sand below 14 feet	SS-3	BC=2 1 1 2	24"	ML	53.2		100	80	NP	NP	
		Poorly Graded SAND with Silt and Gravel (SP-SM): brown and light brown, medium dense, coarse-grained	SS-4	BC=3 4 4 7	11"	SP-SM	13.2		73	8.2	NP	NP	
470	20		SS-5	BC=11 4 5 7	17"	SP-SM	10.8		67	7.3	NP	NP	
			SS-6	BC=7 7 50/5"	20"		12.5		71	24	21	6	
465		**SHALE**: dark gray, highly weathered to decomposed, laminated, extremely weak											

The boring was terminated at approximately 21.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
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PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

BORING LOG B-15

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

BORING
B-15

Date Begin - End:	1/11/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-16**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	34 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.78284°
Longitude: -95.29920°
Approximate Ground Surface Elevation (ft.): 491.02
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490			**WATER**: 10 feet												
485	5														
480	10		**Clayey SAND (SC)**: dark brown, light brown, wet, very loose	SS-1		BC=WOH WOH WOH WOH	11"		40.0		100	44			
				SS-2		BC=WOH WOH WOH WOH	13"		36.8		100	43			
			Silty SAND (SM): medium dense	SS-3		BC=6 6 7 7	24"	SM	37.6		93	49	NP	NP	
475	15		**Poorly Graded GRAVEL with Sand (GP)**: light gray, wet, fine-grained	SS-4		BC=5 3 4 6	3"		13.3		39	3.1			
			Well-Graded GRAVEL with Silt and Sand (GW-GM): light gray, medium dense, coarse-grained	SS-5		BC=7 8 11 8	10"	GW-GM	11.3		41	7.4			
470	20		**Highly Weathered SHALE interbedded with Sandstone**: dark gray and olive green, highly weathered, laminated, extremely weak	SS-6		BC=7 8 13 50/5"	14"		11.4		34	6.6			
			SHALE: dark gray, highly weathered, very weak												

The boring was terminated at approximately 22 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20220843.001A	BORING LOG B-16	BORING
	DRAWN BY: MAP	MKARNS Mooring Modernization Project	B-16
	CHECKED BY: SYW	Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04)	
	DATE: 2/8/2022	Muskogee County, Oklahoma	PAGE: 1 of 1

BORING LOG B-17A

Date Begin - End:	1/11/2022 - 1/13/2022	**Drilling Company:**	AM Drill, Inc		
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	46 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

Latitude: 35.78191°
Longitude: -95.29943°
Approximate Ground Surface Elevation (ft.): 489.84
Location Offset: Offset 30 feet south due to access issues
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description (FIELD EXPLORATION)	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol (LABORATORY RESULTS)	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			WATER: 15 feet												
485	5														
480	10														
475	15		**Well-Graded SAND (SW)**: dark gray, wet, very loose	SS-1		BC=3 1 1 2	13"	SW	18.4		89	2.9			
			Poorly Graded GRAVEL with Sand (GP): dark gray, wet, medium dense	SS-2		BC=3 5 7 5	13"	GP	10.2		50	3.3	NP	NP	
				SS-3		BC=6 4 4 6	12"	GW	15.0		51	3.5			
470	20		**Well-Graded GRAVEL with Sand (GW)**: light brown, medium dense, coarse-grained	SS-4		BC=7 8 38 50/3"	18"	SC	17.3		75	40	34	12	
			Highly Weathered SHALE: dark gray, extremely weak												
			SHALE: dark gray, highly weathered, highly to moderately fractured, extremely weak to very weak	NQ-5		RQD=42	26"								
465	25														

KLEINFELDER
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PROJECT NO.: 20220843.001A		BORING LOG B-17A	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-17A
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 2

Date Begin - End: 1/11/2022 - 1/13/2022 **Drilling Company:** AM Drill, Inc **BORING LOG B-17A**

Logged By: S. Bhandari **Drill Crew:** D. McKenzy

Hor.-Vert. Datum: Not Available **Drilling Equipment:** Barge-Mounted CME-55 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Mud Rotary

Weather: 46 °F Sunny **Exploration Diameter:** 4 in. O.D.

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.78191°
Longitude: -95.29943°
Approximate Ground Surface Elevation (ft.): 489.84
Location Offset: Offset 30 feet south due to access issues
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			SHALE: dark gray, highly weathered, highly to moderately fractured, extremely weak to very weak	NQ-6		RQD=0	4"								
460	30														
			- highly weathered, intensely to highly fractured below 33 feet	NQ-7		RQD=0	20"								
455	35														
			GRANITE: dark gray with light gray spots, intensely to moderately fractured, medium strong												
			SHALE interbedded with Sandstone: dark gray and light gray, highly weathered, intensely to moderately fractured, very weak to weak	NQ-8		RQD=63	58"								**Unc. Comp. Str.=** q_u: 1280 psi
450	40														
															Unc. Comp. Str.= q_u: 530 psi
				NQ-9		RQD=18	54"								**Unc. Comp. Str.=** q_u: 780 psi
445	45														
															Unc. Comp. Str.= q_u: 720 psi
				NQ-10		RQD=32	60"								
440	50														**Unc. Comp. Str.=** q_u: 910 psi
															Unc. Comp. Str.= q_u: 3260 psi
435	55														

The boring was terminated at approximately 53 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A	BORING LOG B-17A	BORING
DRAWN BY: MAP	MKARNS Mooring Modernization Project	B-17A
CHECKED BY: SYW	Oakley's Grand River, and Port of Muskogee	
	State J/P No. 35257(04)	
DATE: 2/8/2022	Muskogee County, Oklahoma	PAGE: 2 of 2

Date Begin - End:	1/13/2022 - 1/14/2022	Drilling Company:	AM Drill, Inc	BORING LOG B-17B
Logged By:	S. Bhandari	Drill Crew:	D. McKenzy	
Hor.-Vert. Datum:	Not Available	Drilling Equipment:	Barge-Mounted CME-55	Hammer Type - Drop: 140 lb. Auto - 30 in.
Plunge:	-90 degrees	Drilling Method:	Mud Rotary	
Weather:	53 °F Sunny	Exploration Diameter:	4 in. O.D.	

Latitude: 35.78192°
Longitude: -95.29944°
Approximate Ground Surface Elevation (ft.): 490.15
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490			**WATER**: 14 feet												
485	5														
480	10														
			Clayey SAND with Gravel (SC): dark gray, wet												
475	15														
470	20		- light gray to dark gray, medium dense below 20 feet												
			- light gray and light brown, wet below 22 feet - 6 inch seam of lean clay with sand, light brown at 22.5 feet	SS-1		BC=4 3 3 9	16"	SC	16.0		71	26	23	10	
			Highly Weathered SHALE: dark gray, laminated, extremely weak	SS-2		BC=18 50/6"	12"		12.6		84	38	35	11	
465	25		**SHALE**: dark gray, highly weathered to decomposed, intensely to highly fractured, laminated, extremely weak to very weak	TC-3		TC=50/5.5" 50/3.5"									

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PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

BORING LOG B-17B

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

BORING
B-17B

Date Begin - End:	1/13/2022 - 1/14/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-17B**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	53 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.78192°
Longitude: -95.29944°
Approximate Ground Surface Elevation (ft.): 490.15
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
460			**SHALE**: dark gray, highly weathered to decomposed, intensely to highly fractured, laminated, extremely weak to very weak	TC-4		TC=50/0.5" 50/0"									
455	35			TC-5		TC=50/0" 50/0"									
450	40			TC-6		TC=50/0.75" 50/1.25"									
445	45			TC-7		TC=50/0.5" 50/0"									
440	50			TC-8		TC=50/0" 50/0"									
435	55			TC-9		TC=50/0" 50/0.25"									

The boring was terminated at approximately 55.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-17B	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-17B
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 2 of 2

BORING LOG B-18

Date Begin - End:	1/14/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	56 °F Cloudy	**Exploration Diameter:**	4 in. O.D.

Hammer Type - Drop: 140 lb. Auto - 30 in.

FIELD EXPLORATION — Latitude: 35.78154°; Longitude: -95.29953°; Approximate Ground Surface Elevation (ft.): 489.52; Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	0	**WATER**: 14 feet											
475	14	**Poorly Graded SAND with Gravel (SP)**: dark gray, wet, dense to loose, fine-grained	SS-1	BC=4 20 10 21	8"								
	16	- loose below 16 feet	SS-2	BC=6 2 4 5	12"	SP	15.0		53	4.3			
	18	- 3 inch seam of clayey sand at 17.75 feet - increase in gravel content, light olive sandstone fragments below 18 feet	SS-3	BC=6 2 3 2	14"	GW	17.2		40	3.0			
470	20		SS-4	BC=3 2 3 8	18"	SP	12.6		59	4.5	NP	NP	
	22	**SHALE interbedded with Sandstone**: light gray, highly weathered, very weak	SS-5	BC=50/5"	5"		10.6		97	70	24	6	

The boring was terminated at approximately 22.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A	BORING LOG B-18		BORING B-18
DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma		
CHECKED BY: SYW			
DATE: 2/8/2022			PAGE: 1 of 1

Date Begin - End:	1/17/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-19**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	39 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION | LABORATORY RESULTS

Latitude: 35.78120°
Longitude: -95.29975°
Approximate Ground Surface Elevation (ft.): 489.52
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
485	5		**WATER**: 7.5 feet												
			Clayey SAND (SC): dark gray, wet, very soft, trace of twigs	SS-1		BC=WOR WOR WOR WOR	11"		40.4		100	30			
480	10			SS-2		BC=WOH WOH WOH WOH	10"		36.3		100	16			
			Poorly Graded SAND (SP): light brown, wet, very loose to medium dense, fine-grained	SS-3		BC=WOH 1 1 2	10"	SP	19.3		89	3.9			
475	15		- fine to medium-grained below 13.5 feet	SS-4		BC=2 2 2 3	18"	SP	18.1		100	2.6	NP	NP	
			- fine to coarse-grained sand, trace of gravel and twigs below 15.5 feet	SS-5		BC=3 3 5 4	24"	SP-SM	19.7		95	5.6	NP	NP	
			- coarse-grained, with gravel below 17.5 feet	SS-6		BC=2 2 2 4	12"	SP	12.9		73	4.2			
470	20		- fine to medium grained, with gravel below 19.5 feet	SS-7		BC=3 5 6 8	15"	SP	13.3		60	2.1	NP	NP	
			- 1-inch layer of highly weathered, dark gray shale at 21 feet	SS-8		BC=3 15 45 50/5"	20"	SC	11.4		87	23	23	9	
			Highly Weathered SHALE: dark gray, extremely weak												
465	25		**SHALE**: dark gray, highly weathered, very weak												

The boring was terminated at approximately 23.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-19	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-19
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

Date Begin - End:	1/17/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	39 °F Sunny	**Exploration Diameter:**	4 in. O.D.

BORING LOG B-20

Hammer Type - Drop: 140 lb. Auto - 30 in.

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.78086°
Longitude: -95.29982°
Approximate Ground Surface Elevation (ft.): 489.50
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	0	**WATER**: 10 feet												
485	5													
480	10	**Poorly Graded SAND (SP)**: light brown, wet, very loose to loose, fine-grained	SS-1		BC=WOH WOH WOH WOH	NR								
			SS-2		BC=2 1 WOH 2	17"	SP	23.9		100	2.9	NP	NP	
475	15		SS-3		BC=WOH 2 5 5	20"	SP-SM	16.7		93	5.1	NP	NP	
		- fine to coarse-grained sand with olive green sandstone fragments below 15.5 feet - 1-inch layer of dark gray clay mixed with coarse-grained sand below 16 feet	SS-4		BC=2 2 2 2	10"	SW-SM	15.9		76	6.1			
			SS-5		BC=2 4 4 5	13"	SP	15.5		78	3.9	18	3	
470	20	- coarse-grained sand below 20 feet	SS-6		BC=2 3 6 4	10"	SP	16.1		89	1.5	NP	NP	
		- 1-inch layer of dark gray clay at 21.5 feet	SS-7		BC=3 3 3 19	12"	SC-SM	16.5		93	29	25	6	
465		**Highly Weathered SHALE**: dark gray, extremely weak	SS-8		BC=20 50/5"	10"		13.3		95	38	29	8	
	25	**SHALE**: dark gray, highly weathered, very weak												
460														

The boring was terminated at approximately 25 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
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PROJECT NO.: 20220843.001A		BORING LOG B-20	BORING B-20
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

Date Begin - End:	1/17/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-21**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	39 °F Sunny	**Exploration Diameter:**	4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.78043°
Longitude: -95.29996°
Approximate Ground Surface Elevation (ft.): 489.50
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			WATER												
485	5														
			Silty SAND (SM): dark gray, wet, very loose, trace of twigs	SS-1		BC=WOR WOR WOR WOR	20"	SM	45.7		100	40	NP	NP	
480	10		**Poorly Graded SAND with Gravel (SP)**: light brown, wet, very loose to loose, fine-grained	SS-2		BC=WOH 1 1 3	20"	SP	15.5		79	4.2			
			- fine to coarse-grained sand with gravel below 11.5 feet - trace of olive green and light brown sandstone fragments below 12 feet	SS-3		BC=6 5 5 4	18"	SP	12.7		78	3.3	NP	NP	
475	15		**Poorly Graded GRAVEL with Sand (GP)**: light brown, loose	SS-4		BC=4 4 3 3	4"	GP	17.0		28	4.0			
			Well-Graded GRAVEL with Sand (GW): light brown, very loose	SS-5		BC=2 3 2 2	NR								
470				SS-6		BC=2 2 1 2	4"	GW	22.1		48	1.9			
	20		**Poorly Graded SAND with Silt and Gravel (SP-SM)**: light brown, medium dense	SS-7		BC=12 13 13 38	24"	SP-SM	11.6		78	8.2	NP	NP	
			Highly Weathered SHALE: dark gray, laminated, extremely weak	SS-8		BC=35 50/4"	10"		13.9		75	33	29	7	
			SHALE: dark gray, highly weathered, very weak, laminated												
465	25		The boring was terminated at approximately 23 ft. below ground surface.												

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20220843.001A	BORING LOG B-21	BORING
	DRAWN BY: MAP CHECKED BY: SYW DATE: 2/8/2022	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-21 PAGE: 1 of 1

BORING LOG B-22

Date Begin - End:	1/16/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	31 °F Cloudy	**Exploration Diameter:**	4 in. O.D.

Hammer Type - Drop: 140 lb. Auto - 30 in.

FIELD EXPLORATION

Latitude: 35.78022°
Longitude: -95.30001°
Approximate Ground Surface Elevation (ft.): 489.50
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
489.5	0	**WATER**: 9 feet											
480	10	**Silty Clayey SAND (SC-SM)**: dark gray and light brown, wet, very loose, trace of twig	SS-1	BC=WOH WOH WOH WOH	6"								
			SS-2	BC=WOH WOH 2 4	12"	SP-SM	19.1		100	7.7	NP	NP	
		Poorly Graded SAND with Gravel (SP): light brown, wet, loose, fine-grained	SS-3	BC=15 5 3 3	24"	SP	12.2		54	3.5	NP	NP	
475	15	**Well-Graded GRAVEL with Sand (GW)**: light brown and olive green, very loose to loose	SS-4	BC=4 2 2 1	13"								
			SS-5	BC=4 3 3 3	3"	GW	11.0		35	1.7			
470	20	**Poorly Graded SAND with Gravel (SP)**: light brown and olive green, loose, coarse-grained	SS-6	BC=5 6 4 5	13"	SP	18.8		77	3.1			
			SS-7	BC=6 5 4 5	18"	SP	16.4		70	2.3	NP	NP	
		- trace olive green sandstone fragments below 22.75 feet	SS-8	BC=10 25 50/4"	18"		13.5		90	31	16	2	
465	25	**SHALE**: dark gray, highly weathered, very weak											

The boring was terminated at approximately 24.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
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PROJECT NO.: 20220843.001A	BORING LOG B-22	BORING	
DRAWN BY: MAP	MKARNS Mooring Modernization Project	B-22	
CHECKED BY: SYW	Oakley's Grand River, and Port of Muskogee		
DATE: 2/8/2022	State J/P No. 35257(04)		
	Muskogee County, Oklahoma	PAGE: 1 of 1	

BORING LOG B-23

Date Begin - End: 1/21/2022
Logged By: S. Bhandari
Hor.-Vert. Datum: Not Available
Plunge: -90 degrees
Weather: 29 °F Sunny
Drilling Company: AM Drill, Inc
Drill Crew: D. McKenzy
Drilling Equipment: Barge-Mounted CME-55
Drilling Method: Mud Rotary
Exploration Diameter: 4 in. O.D.
Hammer Type - Drop: 140 lb. Auto - 30 in.

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.77964°
Longitude: -95.30019°
Approximate Ground Surface Elevation (ft.): 489.70
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
485	5	**Silty SAND (SM)**: dark gray and light brown, wet, very loose, fine-grained	SS-1	BC=WOH WOH WOH WOH	NR"								
			SS-2	BC=WOH WOH WOH WOH	10"	SM	23.1		100	14			
480	10		SS-3	BC=WOH 2 1 1	24"	SM	21.3		100	20	NP	NP	
		Poorly Graded SAND with Silt (SP-SM): light brown, very loose to loose	SS-4	BC=WOH 1 2 1	24"	SP-SM	21.6		100	11	NP	NP	
		- 4" layers of clayey sand, dark gray at 13.5 feet	SS-5	BC=8 5 3 4	24"	SP-SM	15.6		69	8.6	NP	NP	
475	15	**Poorly Graded SAND with Gravel (SP)**: olive green and light gray, loose, coarse-grained	SS-6	BC=2 3 3 3	10"	SP	14.4		57	3.5			
			SS-7	BC=6 5 5 5	10"	SP	10.5		66	3.0			
470	20		SS-8	BC=5 4 5 5	10"	SP	10.1		52	1.7			
		Well-Graded SAND with Silt (SW-SM): light gray, trace olive green, loose	SS-9	BC=5 4 5 26	17"	SW-SM	11.9		87	5.2	NP	NP	
		Highly Weathered SHALE: dark gray, extremely weak	SS-10	BC=50/4"							32	11	
465	25	The boring was terminated at approximately 23.5 ft. below ground surface.											

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

BORING LOG B-23

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

BORING B-23

Date Begin - End:	1/14/2022	**Drilling Company:**	AM Drill, Inc		**BORING LOG B-24**
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary		
Weather:	57 °F Partly Cloudy	**Exploration Diameter:**	4 in. O.D.		

Latitude: 35.77919°
Longitude: -95.30026°
Approximate Ground Surface Elevation (ft.): 489.48
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	0		**WATER**: 9 feet												
485	5														
480	10		**Silty Clayey SAND (SC-SM)**: dark gray and brown, wet, very loose, trace of twigs	SS-1		BC=WOH WOH WOH WOH	8"								
			Poorly Graded SAND with Silt (SP-SM): dark gray and light brown, wet, very loose, fine-grained	SS-2		BC=WOH WOH WOH 3	9"	SP-SM	26.7		100	7.4			
				SS-3		BC=3 2 8 4	24"	SP-SM	22.5		92	8.9			
475	15		**Poorly Graded SAND with Gravel (SP)**: light gray and trace of olive green, medium dense, coarse-grained	SS-4		BC=5 5 8 4	7"	SP	13.2		65	3.1			
				SS-5		BC=7 4 6 6	16"	SP	9.9		52	2.2	NP	NP	
470	20		**Well-Graded SAND with Gravel (SW)**: light gray and trace of olive green, medium dense, coarse-grained	SS-6		BC=6 5 6 4	18"	SW	12.4		80	3.2	NP	NP	
			Poorly Graded SAND (SP): light gray and trace of olive green, loose, coarse-grained	SS-7		BC=5 6 4 4	8"	SP	16.7		94	3.3			
				SS-8		BC=4 3 14 50/6"	18"		8.7		91	5.7	24	7	
465	25		**SHALE**: dark gray, highly weathered, very weak												

The boring was terminated at approximately 25 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20220843.001A	BORING LOG B-24	BORING
	DRAWN BY: MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-24
	CHECKED BY: SYW		
	DATE: 2/8/2022		PAGE: 1 of 1

BORING LOG B-25

Date Begin - End:	1/16/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	28 °F Cloudy	**Exploration Diameter:**	4 in. O.D.

Hammer Type - Drop: 140 lb. Auto - 30 in.

Latitude: 35.77878°
Longitude: -95.30043°
Approximate Ground Surface Elevation (ft.): 489.48
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Blow Counts(BC)= Uncorr. Blows/6 in. / Texas Cone(TC)= blows/6 in / RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
485	0–9	**WATER**: 9 feet											
480	9–11	**Lean CLAY with Sand (CL)**: dark gray, wet, very soft	SS-1	BC=WOH WOH WOH WOH	3"		45.2		100	78			
	11–12.5	**Silty SAND (SM)**: dark gray, very loose	SS-2	BC=WOH WOH WOH 1	21"	SM	39.0		100	47	NP	NP	
475	12.5–24.5	**Poorly Graded SAND (SP)**: light brown, moist, loose to medium dense, fine-grained	SS-3	BC=1 3 2 2	14"	SP	20.9		80	4.6	NP	NP	
	15	- increase in medium to coarse-grained sand content, fragments of olive green below 14.5 feet	SS-4	BC=2 2 3 4	5"								
			SS-5	BC=3 4 6 6	13"	SP	15.3		89	3.3			
470	20		SS-6	BC=3 3 2 2	NR								
		- coarse-grained sand with gravel, light gray below 21 feet	SS-7	BC=2 3 3 4	13"	SP	11.0		70	1.2	NP	NP	
			SS-8	BC=5 10 19 30	18"		8.7		63	7.9	24	6	
465	24.5–25	**Highly Weathered SHALE**: dark gray, laminated, extremely weak											
	25	**SHALE**: dark gray, highly weathered to decomposed, laminated, very weak	SS-9	BC=50/5"	5"		10.9		90	41	30	10	
460													

The boring was terminated at approximately 25.5 ft. below ground surface.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

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PROJECT NO.: 20220843.001A		BORING LOG B-25	BORING
DRAWN BY:	MAP	MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	B-25
CHECKED BY:	SYW		
DATE:	2/8/2022		PAGE: 1 of 1

Date Begin - End: 1/18/2022 - 1/19/2022	**Drilling Company:** AM Drill, Inc		**BORING LOG B-26**
Logged By: S. Bhandari	**Drill Crew:** D. McKenzy		
Hor.-Vert. Datum: Not Available	**Drilling Equipment:** Barge-Mounted CME-55	**Hammer Type - Drop:** 140 lb. Auto - 30 in.	
Plunge: -90 degrees	**Drilling Method:** Mud Rotary		
Weather: 43 °F Sunny, Windy	**Exploration Diameter:** 4 in. O.D.		

FIELD EXPLORATION / LABORATORY RESULTS

Latitude: 35.77859°
Longitude: -95.30032°
Approximate Ground Surface Elevation (ft.): 490.29
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
490	0	**WATER**: 6 feet												
485	5													
		Silty SAND (SM): dark gray, wet, very loose	SS-1		BC=WOH WOH WOH WOH	17"	SM	23.2		100	13			
		Poorly Graded SAND (SP): light brown, wet, fine-grained	SS-2		BC=WOH WOH WOH 2	20"	SM	24.0		100	26	NP	NP	
480	10	**Poorly Graded SAND with Silt (SP-SM)**: light brown and dark gray, very loose	SS-3		BC=2 3 3 1	20"	SP-SM	24.1		100	5.6	NP	NP	
		Poorly Graded SAND with Gravel (SP): light brown and dark gray, loose, coarse-grained	SS-4		BC=2 2 2 4	24"	SP	12.1		70	4.9	NP	NP	
475	15		SS-5		BC=4 4 3 4	24"	SP	10.4		60	4.7	NP	NP	
		Poorly Graded GRAVEL with Sand (GP): light brown and dark gray, medium dense - seam of dark gray shale at 17.5 feet	SS-6		BC=5 4 5 5	15"	GP	7.9		45	1.7	NP	NP	
		Poorly Graded SAND (SP): light brown and dark gray, medium dense, coarse-grained	SS-7		BC=4 4 6 5	17"	SP	14.6		90	2.5	NP	NP	
470	20	- fine to medium-grained sand, trace of coal below 21 feet	SS-8		BC=6 6 9 16	24"	SP	10.1		74	4.0	NP	NP	
			SS-9		BC=5 4 5 15	13"	SP	12.1		89	3.7			
		- trace of olive green sandstone fragments below 23.5 feet	SS-10		BC=50/3"	3"		9.5		100	75	29	10	
465	25	**SHALE**: dark gray, highly weathered, extremely weak, laminated	TC-11		TC=50/2.5" 50/0.5"									
			TC-12		TC=50/3.25" 50/2.25"									

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20220843.001A DRAWN BY: MAP CHECKED BY: SYW DATE: 2/8/2022	BORING LOG B-26 MKARNS Mooring Modernization Project Oakley's Grand River, and Port of Muskogee State J/P No. 35257(04) Muskogee County, Oklahoma	BORING B-26 PAGE: 1 of 2

Date Begin - End:	1/18/2022 - 1/19/2022	**Drilling Company:**	AM Drill, Inc
Logged By:	S. Bhandari	**Drill Crew:**	D. McKenzy
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Barge-Mounted CME-55
Plunge:	-90 degrees	**Drilling Method:**	Mud Rotary
Weather:	43 °F Sunny, Windy	**Exploration Diameter:**	4 in. O.D.

Hammer Type - Drop: 140 lb. Auto - 30 in.

BORING LOG B-26

FIELD EXPLORATION — LABORATORY RESULTS

Latitude: 35.77859°
Longitude: -95.30032°
Approximate Ground Surface Elevation (ft.): 490.29
Surface Condition: Water

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Texas Cone(TC)= blows/6 in RQD=%	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
460			**SHALE**: dark gray, highly weathered, extremely weak, laminated												
455	35			TC-13		TC=50/4" 50/1.75"									
			- 4-inch layer of hard rock below 37 feet												
450	40			TC-14		TC=50/0.25" 50/0"									
445	45			TC-15		TC=50/0.5" 50/0"									
440	50			TC-16		TC=50/0.75" 50/0"									
				TC-17		TC=50/0.25" 50/0"									
435	55		The boring was terminated at approximately 54.5 ft. below ground surface.												

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.
A handheld GPS unit was used to locate the exploration with an accuracy of 15 feet.

KLEINFELDER
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PROJECT NO.: 20220843.001A	BORING LOG B-26		BORING
DRAWN BY: MAP	MKARNS Mooring Modernization Project		B-26
CHECKED BY: SYW	Oakley's Grand River, and Port of Muskogee		
DATE: 2/8/2022	State J/P No. 35257(04) Muskogee County, Oklahoma		PAGE: 2 of 2

PROJECT NO.	20220843
DRAWN:	2/10/2022
DRAWN BY:	SYW
CHECKED BY:	SYW
FILE NAME:	20220843_ROCK CORE PIC

KLEINFELDER
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BORING B-17A
ROCK CORE PHOTOGRAPH

MKARNS Mooring System
Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

FIGURE

A-8

PROJECT NO.	20220843
DRAWN:	2/10/2022
DRAWN BY:	SYW
CHECKED BY:	SYW
FILE NAME:	
20220843_ROCK CORE PIC	

KLEINFELDER
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BORING B-17A
ROCK CORE PHOTOGRAPH

MKARNS Mooring System
Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

FIGURE

A-9

Appendix B

LABORATORY TESTING PROGRAM

Laboratory tests were performed on select, representative samples to evaluate pertinent engineering properties of these materials. We directed our laboratory testing program primarily toward classifying the subsurface materials and measuring index values of the on-site materials. Laboratory tests were performed in general accordance with applicable standards. The results of the laboratory tests are presented on the respective boring logs and on Table B-1 in this APPENDIX. The laboratory testing program consisted of the following:

- **Moisture Content**, AASHTO T 265, Standard Method of Test for Laboratory Determination of Moisture Content of Soils.
- **Soil Classification:**
  - AASHTO T 87, Standard Method of Test for Dry preparation of Disturbed Soil and Soil Aggregate Samples for Test.
  - AASHTO T 88, Standard Method of Test for Particle Size Analysis of Soils.
  - AASHTO T 89, Standard Method of Test for Determining the Liquid Limit of Soils.
  - AASHTO T 90, Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils.
- **Visual Classification,** ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%) Passing 3/4"	Sieve Analysis (%) Passing #4	Sieve Analysis (%) Passing #200	Atterberg Limits Liquid Limit	Atterberg Limits Plastic Limit	Atterberg Limits Plasticity Index	Additional Tests
B-1	7.0 - 9.0	SS-1	SANDY LEAN CLAY WITH GRAVEL (CL)	26.8		100	77	53	32	18	14	
B-1	9.0 - 11.0	SS-2		19.5		100	48	19				
B-1	11.0 - 13.0	SS-3		17.3		100	47	9.2				
B-1	13.0 - 15.0	SS-4	POORLY GRADED GRAVEL (GP)	15.9		73	4	1.3				
B-1	15.0 - 17.0	SS-5	WELL-GRADED GRAVEL WITH SAND (GW)	13.1		80	16	0.3				
B-1	17.0 - 19.0	SS-6	WELL-GRADED GRAVEL WITH SAND (GW)	15.3		87	22	1.3				
B-1	19.0 - 21.0	SS-7	CLAYEY SAND WITH GRAVEL (SC)	9.5		100	74	33	27	18	9	
B-2	7.0 - 9.0	SS-1		16.8		100	40	15				
B-2	9.0 - 11.0	SS-2		16.0		77	32	8.1				
B-2	11.0 - 13.0	SS-3		32.1		100	87	62				
B-2	13.0 - 15.0	SS-4	CLAYEY GRAVEL WITH SAND (GC)	28.6		94	69	48	44	24	20	
B-2	17.0 - 19.0	SS-6		12.6		68	15					
B-2	19.0 - 21.0	SS-7	WELL-GRADED GRAVEL (GW)	9.1		63	11	3.3				
B-2	21.0 - 22.8	SS-8		10.8		83	46	11				
B-3	7.5 - 9.5	SS-1	LEAN CLAY (CL)	43.9		100	100	92	38	21	17	
B-3	9.5 - 11.5	SS-2		18.6		88	45	23				
B-3	11.5 - 13.5	SS-3	POORLY GRADED GRAVEL WITH SAND (GP)	14.3		88	33	4.3				
B-3	13.5 - 15.5	SS-4	WELL-GRADED GRAVEL WITH SAND (GW)	19.8		83	19	2.1				
B-3	15.5 - 17.5	SS-5	WELL-GRADED GRAVEL WITH SAND (GW)	14.0		70	24	1.3				
B-3	17.5 - 19.5	SS-6	WELL-GRADED GRAVEL (GW)	13.0		75	14	0.6				
B-3	19.5 - 21.5	SS-7	WELL-GRADED GRAVEL WITH SAND (GW)	17.6		86	20	3.6				
B-3	21.5 - 22.25	SS-8	SILTY, CLAYEY SAND (SC-SM)	10.7		100	90	39	24	19	5	
B-4	7.0 - 9.0	SS-1		35.8		100	92	70				
B-4	9.0 - 11.0	SS-2		27.4		100	72	44				
B-4	11.0 - 13.0	SS-3		20.1		100	70	15				
B-4	13.0 - 15.0	SS-4	LEAN CLAY (CL)	45.2		100	100	91	40	23	17	
B-4	15.0 - 17.0	SS-5		49.0		100	100	91				
B-4	17.0 - 19.0	SS-6		42.4		82	82	70				

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

LABORATORY TEST RESULT SUMMARY

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

TABLE
B-1

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%) Passing 3/4"	Sieve Analysis (%) Passing #4	Sieve Analysis (%) Passing #200	Atterberg Limits Liquid Limit	Atterberg Limits Plastic Limit	Atterberg Limits Plasticity Index	Additional Tests
B-4	19.0 - 21.0	SS-7	WELL-GRADED GRAVEL (GW)	21.7		88	14	3.2				
B-4	21.0 - 23.0	SS-8		14.5		76	33	5.5				
B-4	23.0 - 23.8	SS-9	CLAYEY SAND (SC)	15.5		100	87	48	27	18	9	
B-5	7.0 - 9.0	SS-1	LEAN CLAY WITH SAND (CL)	35.6		100	100	85	47	26	21	
B-5	9.0 - 11.0	SS-2	LEAN CLAY (CL)	34.8		100	92	89	46	24	22	
B-5	11.0 - 13.0	SS-3		19.3		100	76	6.0				
B-5	13.0 - 15.0	SS-4		32.6		89	79	46				
B-5	15.0 - 17.0	SS-5	CLAYEY SAND (SC)	34.7		100	98	46	25	16	9	
B-5	17.0 - 19.0	SS-6		21.3		75	48	22				
B-5	19.0 - 21.0	SS-7		11.8		86	48	6.6				
B-5	21.0 - 22.2	SS-8		14.5		81	59	16				
B-6	7.0 - 9.0	SS-1	LEAN CLAY WITH SAND (CL)	36.9		100	100	81	39	21	18	
B-6	9.0 - 11.0	SS-2	SANDY LEAN CLAY (CL)	38.0		100	94	66	32	17	15	
B-6	11.0 - 13.0	SS-3	SANDY SILTY CLAY (CL-ML)	32.6		100	99	56	19	15	4	
B-6	13.0 - 15.0	SS-4		30.9		100	98	43				
B-6	15.0 - 17.0	SS-5		22.4		100	65	19				
B-6	17.0 - 19.0	SS-6		17.7		69	21	9.3				
B-6	19.0 - 21.0	SS-7		13.1		73	30	5.0				
B-6	21.0 - 23.0	SS-8	CLAYEY GRAVEL WITH SAND (GC)	11.0		72	59	25	29	18	11	
B-6	23.0 - 23.25	SS-9	CLAYEY SAND (SC)	8.6		100	89	45	29	19	10	
B-7	11.0 - 13.0	SS-1	SILTY, CLAYEY SAND (SC-SM)	27.1		100	97	36	22	17	5	
B-7	13.0 - 15.0	SS-2	SILTY SAND (SM)	23.4		100	100	26	NP	NP	NP	
B-7	15.0 - 17.0	SS-3	POORLY GRADED SAND WITH SILT (SP-SM)	19.3		100	100	5.1	NP	NP	NP	
B-7	17.0 - 19.0	SS-4	POORLY GRADED SAND (SP)	15.7		100	99	2.9	NP	NP	NP	
B-7	19.0 - 21.0	SS-5		14.5		100	83	5.9				
B-7	21.0 - 21.4	SS-6	LEAN CLAY WITH SAND (CL)	15.6		100	98	81	36	23	13	
B-8	14.0 - 16.0	SS-1		15.7		82	82	7.8				
B-8	16.0 - 18.0	SS-2	POORLY GRADED SAND WITH GRAVEL (SP)	12.1		75	67	3.9	NP	NP	NP	

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

LABORATORY TEST RESULT SUMMARY

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

TABLE B-2

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-8	18.0 - 20.0	SS-3	WELL-GRADED SAND WITH GRAVEL (SW)	13.2		85	74	3.0	NP	NP	NP	
B-8	20.0 - 21.0	SS-4	CLAYEY GRAVEL WITH SAND (GC)	11.1		62	54	24	29	20	9	
B-9	13.0 - 15.0	SS-2	SILTY SAND (SM)	19.9		100	99	22	NP	NP	NP	
B-9	15.0 - 17.0	SS-3	POORLY GRADED SAND (SP)	18.4		100	95	1.3				
B-9	17.0 - 19.0	SS-4	POORLY GRADED SAND (SP)	16.3		100	95	1.4				
B-9	19.0 - 19.1	SS-5		12.0		100	36	11				
B-10	14.0 - 16.0	SS-1		15.9		100	97	19				
B-10	16.0 - 18.0	SS-2	WELL-GRADED SAND WITH SILT (SW-SM)	16.8		100	99	9.2	NP	NP	NP	
B-10	18.0 - 20.0	SS-3	WELL-GRADED SAND WITH GRAVEL (SW)	14.7		88	76	2.0				
B-10	20.0 - 20.75	SS-4	SILTY, CLAYEY SAND WITH GRAVEL (SC-SM)	12.7		100	80	16	21	15	6	
B-11	13.0 - 15.0	SS-1		16.7		100	99	38				
B-11	15.0 - 17.0	SS-2	WELL-GRADED SAND WITH SILT (SW-SM)	15.1		100	97	8.9	NP	NP	NP	
B-11	17.0 - 19.0	SS-3	POORLY GRADED SAND (SP)	16.9		100	93	2.2	NP	NP	NP	
B-11	19.0 - 19.4	SS-4		8.7		66	45	15				
B-12	8.0 - 10.0	SS-1		37.2		100	100	43				
B-12	10.0 - 12.0	SS-2	SILTY SAND WITH GRAVEL (SM)	19.0		85	76	15	19	17	2	
B-12	12.0 - 14.0	SS-3	WELL-GRADED SAND (SW)	15.1		93	89	3.6	NP	NP	NP	
B-12	14.0 - 16.0	SS-4		16.5		84	84	12				
B-12	16.0 - 18.0	SS-5	POORLY GRADED SAND (SP)	20.7		100	100	1.9	NP	NP	NP	
B-12	18.0 - 20.0	SS-6		8.4		58	32	7.3				
B-12	20.0 - 21.3	SS-7	SILTY, CLAYEY GRAVEL WITH SAND (GC-GM)	15.6		90	64	37	25	18	7	
B-13	12.0 - 14.0	SS-1	SANDY SILT (ML)	35.6		100	98	69	NP	NP	NP	
B-13	14.0 - 16.0	SS-2		30.9		100	100	36				
B-13	16.0 - 18.0	SS-3	SILTY SAND (SM)	35.4		100	100	37	NP	NP	NP	
B-13	18.0 - 20.0	SS-4	SILTY SAND (SM)	30.8		100	99	30	NP	NP	NP	
B-13	20.0 - 21.3	SS-5	SANDY LEAN CLAY (CL)	26.6		100	87	63	27	18	9	
B-14	10.0 - 12.0	SS-1		45.8		100	100	75				
B-14	12.0 - 14.0	SS-2		45.3		100	99	62				

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20220843.001A
DRAWN BY: MAP
CHECKED BY: SYW
DATE: 2/8/2022

LABORATORY TEST RESULT SUMMARY

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

TABLE
B-3

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-14	14.0 - 16.0	SS-3	SANDY SILT (ML)	32.2		100	100	51	NP	NP	NP	
B-14	16.0 - 18.0	SS-4	SILTY SAND (SM)	20.0		100	100	16	NP	NP	NP	
B-14	18.0 - 20.0	SS-5	LEAN CLAY WITH SAND (CL)	40.3		100	100	85	32	21	11	
B-14	20.0 - 21.8	SS-6	SILTY, CLAYEY SAND (SC-SM)	17.2		100	88	19	22	15	7	
B-15	10.0 - 12.0	SS-1		51.5		100	100	80				
B-15	12.0 - 14.0	SS-2		44.7		100	100	50				
B-15	14.0 - 16.0	SS-3	SILT WITH SAND (ML)	53.2		100	100	80	NP	NP	NP	
B-15	16.0 - 18.0	SS-4	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	13.2		95	73	8.2	NP	NP	NP	
B-15	18.0 - 20.0	SS-5	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	10.8		96	67	7.3	NP	NP	NP	
B-15	20.0 - 21.4	SS-6	SILTY, CLAYEY SAND WITH GRAVEL (SC-SM)	12.5		79	71	24	21	15	6	
B-16	10.0 - 12.0	SS-1		40.0		100	100	44				
B-16	12.0 - 14.0	SS-2		36.8		100	100	43				
B-16	14.0 - 16.0	SS-3	SILTY SAND (SM)	37.6		100	93	49	NP	NP	NP	
B-16	16.0 - 18.0	SS-4		13.3		59	39	3.1				
B-16	18.0 - 20.0	SS-5		11.3		73	41	7.4				
B-16	20.0 - 21.9	SS-6		11.4		72	34	6.6				
B-17A	15.0 - 17.0	SS-1	WELL-GRADED SAND (SW)	18.4		100	89	2.9				
B-17A	17.0 - 19.0	SS-2	POORLY GRADED GRAVEL WITH SAND (GP)	10.2		85	50	3.3	NP	NP	NP	
B-17A	19.0 - 21.0	SS-3	WELL-GRADED GRAVEL WITH SAND (GW)	15.0		93	51	3.5				
B-17A	21.0 - 22.8	SS-4	CLAYEY SAND WITH GRAVEL (SC)	17.3		100	75	40	34	22	12	
B-17A	38.0	NQ-8										**Unconfined Compressive Strength=**
												q_u: 1280 psi
B-17A	41.5											**Unconfined Compressive Strength=**
												q_u: 530 psi
B-17A	43.5											**Unconfined Compressive Strength=**
												q_u: 780 psi
B-17A	47.0											**Unconfined Compressive Strength=**
												q_u: 720 psi

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LABORATORY TEST RESULT SUMMARY

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

TABLE B-4

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-17A	49.5											**Unconfined Compressive Strength=**
												q_u: 910 psi
B-17A	52.5											**Unconfined Compressive Strength=**
												q_u: 3260 psi
B-17B	22.0 - 24.0	SS-1	CLAYEY SAND WITH GRAVEL (SC)	16.0		82	71	26	23	13	10	
B-17B	24.0 - 25.0	SS-2	CLAYEY SAND WITH GRAVEL (SC)	12.6		100	84	38	35	24	11	
B-18	16.0 - 18.0	SS-2	POORLY GRADED SAND WITH GRAVEL (SP)	15.0		76	53	4.3				
B-18	18.0 - 20.0	SS-3	WELL-GRADED GRAVEL WITH SAND (GW)	17.2		96	40	3.0				
B-18	20.0 - 22.0	SS-4	POORLY GRADED SAND WITH GRAVEL (SP)	12.6		94	59	4.5	NP	NP	NP	
B-18	22.0 - 22.4	SS-5	SILTY CLAY WITH SAND (CL-ML)	10.6		100	97	70	24	18	6	
B-19	7.5 - 9.5	SS-1		40.4		100	100	30				
B-19	9.5 - 11.5	SS-2		36.3		100	100	16				
B-19	11.5 - 13.5	SS-3	POORLY GRADED SAND (SP)	19.3		91	89	3.9				
B-19	13.5 - 15.5	SS-4	POORLY GRADED SAND (SP)	18.1		100	100	2.6	NP	NP	NP	
B-19	15.5 - 17.5	SS-5	POORLY GRADED SAND WITH SILT (SP-SM)	19.7		100	95	5.6	NP	NP	NP	
B-19	17.5 - 19.5	SS-6	POORLY GRADED SAND WITH GRAVEL (SP)	12.9		100	73	4.2				
B-19	19.5 - 21.5	SS-7	POORLY GRADED SAND WITH GRAVEL (SP)	13.3		81	60	2.1	NP	NP	NP	
B-19	21.5 - 23.4	SS-8	CLAYEY SAND (SC)	11.4		100	87	23	23	14	9	
B-20	12.0 - 14.0	SS-2	POORLY GRADED SAND (SP)	23.9		100	100	2.9	NP	NP	NP	
B-20	14.0 - 16.0	SS-3	POORLY GRADED SAND WITH SILT (SP-SM)	16.7		100	93	5.1	NP	NP	NP	
B-20	16.0 - 18.0	SS-4		15.9		93	76	6.1				
B-20	18.0 - 20.0	SS-5	POORLY GRADED SAND WITH GRAVEL (SP)	15.5		100	78	3.9	18	15	3	
B-20	20.0 - 22.0	SS-6	POORLY GRADED SAND (SP)	16.1		100	89	1.5	NP	NP	NP	
B-20	22.0 - 24.0	SS-7	SILTY, CLAYEY SAND (SC-SM)	16.5		100	93	29	25	19	6	
B-20	24.0 - 24.9	SS-8	CLAYEY SAND (SC)	13.3		100	95	38	29	21	8	
B-21	8.0 - 10.0	SS-1	SILTY SAND (SM)	45.7		100	100	40	NP	NP	NP	
B-21	10.0 - 12.0	SS-2	POORLY GRADED SAND WITH GRAVEL (SP)	15.5		100	79	4.2				
B-21	12.0 - 14.0	SS-3	POORLY GRADED SAND WITH GRAVEL (SP)	12.7		92	78	3.3	NP	NP	NP	

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DATE: 2/8/2022

LABORATORY TEST RESULT SUMMARY

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

TABLE B-5

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-21	14.0 - 16.0	SS-4	POORLY GRADED GRAVEL WITH SAND (GP)	17.0		78	28	4.0				
B-21	18.0 - 20.0	SS-6	WELL-GRADED GRAVEL WITH SAND (GW)	22.1		91	48	1.9				
B-21	20.0 - 22.0	SS-7	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	11.6		87	78	8.2	NP	NP	NP	
B-21	22.0 - 22.8	SS-8	SILTY, CLAYEY SAND WITH GRAVEL (SC-SM)	13.9		78	75	33	29	22	7	
B-22	11.0 - 13.0	SS-2	POORLY GRADED SAND WITH SILT (SP-SM)	19.1		100	100	7.7	NP	NP	NP	
B-22	13.0 - 15.0	SS-3	POORLY GRADED SAND WITH GRAVEL (SP)	12.2		78	54	3.5	NP	NP	NP	
B-22	17.0 - 19.0	SS-5	WELL-GRADED GRAVEL WITH SAND (GW)	11.0		66	35	1.7				
B-22	19.0 - 21.0	SS-6	POORLY GRADED SAND WITH GRAVEL (SP)	18.8		88	77	3.1				
B-22	21.0 - 23.0	SS-7	POORLY GRADED SAND WITH GRAVEL (SP)	16.4		87	70	2.3	NP	NP	NP	
B-22	23.0 - 24.3	SS-8	SILTY SAND (SM)	13.5		92	90	31	16	14	2	
B-23	7.0 - 9.0	SS-2		23.1		100	100	14				
B-23	9.0 - 11.0	SS-3	SILTY SAND (SM)	21.3		100	100	20	NP	NP	NP	
B-23	11.0 - 13.0	SS-4	POORLY GRADED SAND WITH SILT (SP-SM)	21.6		100	100	11	NP	NP	NP	
B-23	13.0 - 15.0	SS-5	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	15.6		72	69	8.6	NP	NP	NP	
B-23	15.0 - 17.0	SS-6	POORLY GRADED SAND WITH GRAVEL (SP)	14.4		90	57	3.5				
B-23	17.0 - 19.0	SS-7	POORLY GRADED SAND WITH GRAVEL (SP)	10.5		82	66	3.0				
B-23	19.0 - 21.0	SS-8	POORLY GRADED SAND WITH GRAVEL (SP)	10.1		75	52	1.7				
B-23	21.0 - 23.0	SS-9	WELL-GRADED SAND WITH SILT (SW-SM)	11.9		100	87	5.2	NP	NP	NP	
B-23	23.0 - 23.3	SS-10							32	21	11	
B-24	11.0 - 13.0	SS-2		26.7		100	100	7.4				
B-24	13.0 - 15.0	SS-3		22.5		95	92	8.9				
B-24	15.0 - 17.0	SS-4	POORLY GRADED SAND WITH GRAVEL (SP)	13.2		86	65	3.1				
B-24	17.0 - 19.0	SS-5	POORLY GRADED SAND WITH GRAVEL (SP)	9.9		65	52	2.2	NP	NP	NP	
B-24	19.0 - 21.0	SS-6	WELL-GRADED SAND WITH GRAVEL (SW)	12.4		86	80	3.2	NP	NP	NP	
B-24	21.0 - 23.0	SS-7	POORLY GRADED SAND (SP)	16.7		95	94	3.3				
B-24	23.0 - 25.0	SS-8	WELL-GRADED SAND WITH SILTY CLAY (SW-SC)	8.7		100	91	5.7	24	17	7	
B-25	9.0 - 11.0	SS-1		45.2		100	100	78				
B-25	11.0 - 13.0	SS-2	SILTY SAND (SM)	39.0		100	100	47	NP	NP	NP	

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LABORATORY TEST
RESULT SUMMARY

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

TABLE
B-6

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-25	13.0 - 15.0	SS-3	POORLY GRADED SAND WITH GRAVEL (SP)	20.9		80	80	4.6	NP	NP	NP	
B-25	17.0 - 19.0	SS-5	POORLY GRADED SAND (SP)	15.3		100	89	3.3				
B-25	21.0 - 23.0	SS-7	POORLY GRADED SAND WITH GRAVEL (SP)	11.0		100	70	1.2	NP	NP	NP	
B-25	23.0 - 25.0	SS-8	WELL-GRADED SAND WITH SILTY CLAY AND GRAVEL (SW-SC)	8.7		85	63	7.9	24	18	6	
B-25	25.0 - 25.4	SS-9	CLAYEY SAND (SC)	10.9		100	90	41	30	20	10	
B-26	6.0 - 8.0	SS-1		23.2		100	100	13				
B-26	8.0 - 10.0	SS-2	SILTY SAND (SM)	24.0		100	100	26	NP	NP	NP	
B-26	10.0 - 12.0	SS-3	POORLY GRADED SAND WITH SILT (SP-SM)	24.1		100	100	5.6	NP	NP	NP	
B-26	12.0 - 14.0	SS-4	POORLY GRADED SAND WITH GRAVEL (SP)	12.1		82	70	4.9	NP	NP	NP	
B-26	14.0 - 16.0	SS-5	POORLY GRADED SAND WITH GRAVEL (SP)	10.4		74	60	4.7	NP	NP	NP	
B-26	16.0 - 18.0	SS-6	POORLY GRADED GRAVEL WITH SAND (GP)	7.9		64	45	1.7	NP	NP	NP	
B-26	18.0 - 20.0	SS-7	POORLY GRADED SAND (SP)	14.6		100	90	2.5	NP	NP	NP	
B-26	20.0 - 22.0	SS-8	POORLY GRADED SAND WITH GRAVEL (SP)	10.1		88	74	4.0	NP	NP	NP	
B-26	22.0 - 24.0	SS-9	POORLY GRADED SAND (SP)	12.1		100	89	3.7				
B-26	24.0 - 24.25	SS-10	LEAN CLAY WITH SAND (CL)	9.5		100	100	75	29	19	10	

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LABORATORY TEST RESULT SUMMARY

MKARNS Mooring Modernization Project
Oakley's Grand River, and Port of Muskogee
State J/P No. 35257(04)
Muskogee County, Oklahoma

TABLE B-7

Appendix C

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

RED ROCK
CONSULTING

Report of Geotechnical Investigation

OF THE

MKARNS MOORINGS MODERNIZATION
TULSA PORT OF CATOOSA
ROGERS COUNTY, OKLAHOMA

35257(04)

Prepared For:

CONSOR Engineers, LLC
609 South Kelly Avenue, Suite J-1
Edmond, Oklahoma 73003
Attention: Mr. Gregg Hostetler, PE

Prepared By:

Red Rock Consulting, LLC
PO Box 30591
Edmond, Oklahoma 73003
(405) 562-3328

January 11, 2022
Project No. 21057

RED ROCK
CONSULTING

January 11, 2022

CONSOR Engineers, LLC
609 South Kelly Avenue, Suite J-1
Edmond, Oklahoma 73003

Attention: Mr. Gregg Hostetler, PE

Re: Report of Geotechnical Investigation
MKARNS Moorings Modernization
Tulsa Port of Catoosa
Rogers County, Oklahoma
35257(04)
Project No. 21057

Dear Mr. Hostetler:

I am pleased to submit herewith this report entitled "Geotechnical Investigation, MKARNS Moorings Modernization, Tulsa Port of Catoosa, Rogers County, Oklahoma, 35257(04)".

In an effort to provide a more environmentally friendly service, this report has been provided electronically.

It has been our pleasure to assist you with this project. Should you have any questions regarding the contents of this report, please contact Red Rock Consulting.

Yours very truly,
RED ROCK CONSULTING, LLC
CA No. 5707 Exp. 06/30/23

Emma Coggin

Emma Coggin, EI
Project Specialist

REGISTERED PROFESSIONAL ENGINEER
JEREMY BASLER
1-11-2022
20233
OKLAHOMA

Jeremy Basler, PE
Geotechnical Manager
Oklahoma PE No. 20233

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REPORT OF GEOTECHNICAL INVESTIGATION

MKARNS MOORINGS MODERNIZATION
TULSA PORT OF CATOOSA
ROGERS COUNTY, OKLAHOMA
35257(04)

PROJECT NO. 21057

APPENDICES

REPORT OF GEOTECHNICAL INVESTIGATION

MKARNS MOORINGS MODERNIZATION
TULSA PORT OF CATOOSA
ROGERS COUNTY, OKLAHOMA
35257(04)

PROJECT NO. 21057

INTRODUCTION

General

This report presents the results of the geotechnical investigation performed for the construction of six monopile mooring structures at the Tulsa Port of Catoosa in Rogers County, Oklahoma. The purpose of this investigation is to evaluate the subsurface conditions at the site and to provide information pertaining to the geotechnical aspects of the proposed project.

Proposed Construction

The project will include the construction of six monopile mooring structures.

Scope of Work

The scope of this investigation includes the following:

1. Review of previous geotechnical and geological information of sites near this site. This was augmented with data obtained during the field investigation phase of the project.

2. Investigation of the subsurface soils by drilling and testing a total of 6 boreholes within the planned project area

3. A laboratory testing program consisting of moisture content, Atterberg limits, and sieve analysis on the soils encountered. Also included were unconfined compressive strength tests, which were performed on select rock core samples.

4. AASHTO LRFD Bridge Design Specifications site classification for seismic design.

5. L-pile parameters

6. Recommendations regarding foundation support for the proposed structures

FIELD AND LABORATORY INVESTIGATIONS

Field Exploration

Subsurface exploration was performed on November 9 and 10, 2021. The borings were located in the field by a representative of Red Rock Consulting from known site reference points. The locations of the borings should be considered accurate only to the degree implied by the methods used to define them.

The subsurface exploration program consisted of drilling 6 borings under the full-time supervision of an engineer. One boring was drilled at each of the proposed mooring locations. A self-propelled draft jack barge was used to access the borings. The borings are shown on the Boring Location Diagram, which is included in Appendix A.

Three borings were advanced 31.5 to 33.5 feet into bedrock using wet rotary with casing drilling methods from an all-terrain vehicle (ATV) mounted CME-750 drill rig equipped with an automatic hammer. Representative samples of the overburden materials were obtained by split-barrel sampling procedures (Standard Penetration Test, SPT) in general accordance with ASTM Specifications D-1586.

Following SPT refusal, TCP or rock coring was performed. In the softer shale, TCP tests were performed. In the harder limestone with drilling refusal, a 3 inch diameter continuous sampler was used to obtain bedrock samples in three borings. The bedrock in the borings was cored in 5 foot sections to the boring termination depths. The sampling procedures and subsurface conditions are shown on the Boring Logs in Appendix A and are explained in greater detail in the Subsurface Conditions section of this report.

The SPT test uses a standard, 2-inch outside diameter, split-barrel sampling spoon that is driven into the bottom of the boring with a 140-pound automatic drive hammer that falls 30 inches. The blows per foot, N, is the number of hammer blows required to advance the sampling spoon the last 12 inches, or less, of an 18-inch sampling interval. The N value is used to estimate the in-situ relative density of granular soils, the consistency of cohesive soils, and the hardness of weathered bedrock.

The TCP test was developed by the Texas Highway Department in accordance with the AASHTO Manual on Subsurface Investigation and was modified by the Oklahoma Department Transportation. The TCP test is a dynamic penetration test performed to determine the in-situ properties of subsurface soils and to evaluate the consistency or hardness of the bedrock material. The TCP test drives a penetrometer cone into the undisturbed cohesive overburden soil or bedrock material with a 140-pound automatic drive hammer that falls 30 inches. The cone is seated into the undisturbed cohesive soil or bedrock material by driving the cone 10 blows or 12 inches, whichever is achieved first, into the soil/bedrock. The cone is then driven an additional 12 inches or 100 blows, whichever is reached first. If the cone is driven the full 12 inches, the number of blows required to drive each 6 inches of penetration up to 12 inches is recorded. The total number of blows required for the two 6-inch increments are then recorded as the TCP blow count. If the cone is unable to be driven the full 12 inches, the penetration is recorded after every 50 blows up to 100 blows.

After performing SPT and TCP tests as well as collecting rock cores, the holes were backfilled with grout and cuttings as required by the Oklahoma State Statutes for Geotechnical drilling.

Samples were collected and transported back to the lab for further classification and testing. The final boring logs were developed from the draft logs, observations and test results of the samples returned to the laboratory. The stratigraphic contacts indicated are only for the specific dates and locations reported, and therefore, are not necessarily representative of other locations and times. The Boring Logs, presenting conditions encountered at each location explored, are included in Appendix A.

Laboratory Testing

Representative soil and rock core samples were tested to refine the field classifications and evaluate physical properties of the soils which may affect the geotechnical aspects of project design and construction.

The laboratory testing program included the following tests:

- Moisture content (ASTM D2216)
- Liquid and plastic limit (ASTM D4318)
- Full sieve (ASTM D422)
- Uniaxial compressive strength (ASTM D7012 Method C)

The results of the physical laboratory tests conducted are shown on the boring logs in Appendix A and are summarized in Appendix B.

The above laboratory tests were performed in general accordance with applicable ASTM procedures, or generally accepted practice. It should be noted that reference to ASTM procedures does not imply that all cross-referenced procedures in ASTM standards have been used, or that all ASTM procedures used have been followed exactly. Only those ASTM procedures and/or portions of procedures, which, in the professional judgment of the geotechnical engineer of record for this report, are applicable, appropriate, and necessary for this project, have been used or followed.

SITE DESCRIPTION

Surface Conditions

At the time of the field investigation the area surrounding the Tulsa Port of Catoosa was industrial. The navigation channel water ranged in depth from approximately 9 to 10 feet deep. Surrounding banks were significantly higher and sloped down to the navigation channel. A low water wharf was located at the southern end of the port. Outside of the port were mostly rural areas with grass and tree covered areas with a few residential and commercial properties.

The elevation of the water level of the navigation channel was determined using differential leveling procedures. Benchmark 7400 was used and had an elevation of 578.396 feet. Based on this benchmark, the elevation of the water was 530.7 feet during field exploration. The approximate elevation at each boring location is shown on the Boring Logs and on the Boring Location Diagram in Appendix A.

Site Geology

The geology of the project site was researched using the “Division Eight Engineering Classification of Geological Materials”, published by the Oklahoma Department of Transportation (ODOT) and the Geologic Map of the “Hydrologic Atlas 2 of Oklahoma,” Reconnaissance of the Water Resources of the Tulsa quadrangle, northeastern Oklahoma,” by Melvin V. Marcher and Roy H. Bingham, 1971.

ODOT PUBLICATION

Division One of the “Engineering Classification of Geological Materials”, published by the Oklahoma Department of Transportation (ODOT) indicates the project site, beneath alluvium, is underlain by the Senora Unit (Psn).

Alluvium consists of terrace deposits of sands, silts, clays, gravels, or mixtures of these. These deposits are present along stream beds and floodplains.

The Senora unit consists predominantly of shale containing some thin bedded to massive buff sandstone and two beds of limestone. The Shale is black to gray, fissile, and contains considerable clay shale. The sandstones are up to 25 feet thick. The limestones are 2 to 8 feet thick, hard, and massive.

The Senora unit varies in thickness. It is about 160 feet thick in northern Craig County, 300 to 350 feet in Southern Craig County, 200 feet thick in northern Rogers County, and 140 feet thick in southern Rogers County.

The Senora unit outcrops in Craig, Mayes, Nowata, Rogers, and Tulsa Counties of Division 8. The sandstones from escarpments and hills, while the shales from slightly rolling plains and valleys.

USGS MAP

The USGS map indicates the project site is underlain by Alluvium (Qal) and the Senora Formation (Psn).

Alluvium consists of gravel, sand, silt and clay. Yields moderate to large amounts of fair- to good-quality water along the Arkansas River and small to moderate amounts of fair- to good-quality water locally along the Verdigis and Neosho Rivers.

The Senora Formation consists of shale with thin and lenticular sandstone, minor limestone, and coal. Yields only small amounts of fair- to poor-quality water, except for the Chelsea Sandstone Member near the base of the formation in Craig, Mayes, and Rogers Counties, which probably will yield small to moderate amounts of fair-quality water locally.

Subsurface Conditions

A self-propelled draft jack barge was used to access the borings. The barge had 50-foot-long steel spuds that were pushed hydraulically into the navigation channel bed to stabilize the barge.

The barge deck was approximately 5 feet above the surface of the water. The water depths in the boring locations ranged between approximately 9 and 10 feet. Steel casing was pushed through the water and sediment, then driven to the top of bedrock in order to drill the borings.

A very soft layer (sediment) was encountered at the bottom of the navigation channel in all of the borings. The sediment layer ranged between 0.5 and 1 feet thick and had very low N values, including some zeros. This means only the weight of the drill pipe was required to advance the split spoon 18 inches, which is an indication of very soft soil.

In general, the sediment consisted of lean clay with various amounts of sand and gravel from the surface to the top of bedrock.

The top of bedrock was encountered at elevations ranging between 519.7 and 520.9 feet. The bedrock encountered in the borings consisted predominately of soft to very hard shale underlain by strong to very strong limestone. The approximate depths to bedrock and conditions are summarized in Table 1.

The unconfined compressive strength of the bedrock cores recovered ranged between 12,497 to 18,108 psi. These results are shown in Table 1, on the Boring Logs in Appendix A and in the Lab Results in Appendix B.

Table 1 – Depth to Bedrock and Conditions

Boring	Depth to Bedrock (ft)	Elevation (ft)	Type of Bedrock	Hardness	UC Compressive Strength (psi)
B-1	15.2	520.5	Shale	Hard	
B-2	15.5	520.2	Shale	Very hard	12,497 to 14,526
	34	501.7	Limestone	Strong	
	45	490.7	Shale		
B-3	16	519.7	Shale	Soft	
B-4	14.8	520.9	Shale	Very hard	
	38.5	497.2	Limestone	Very strong	18,076 to 18,108
B-5	16	519.7	Shale	Soft	
B-6	15.5	520.2	Shale	Very hard	
	38.5	497.2	Limestone	Very strong	15,351 to 17,102

Note: Depths are from barge deck

Subsurface conditions are described in greater detail on the Boring Logs, which are included in Appendix A. Photographs of the rock cores collected are presented in Appendix C.

Water Elevation

The water elevation of the navigation channel was determined daily. The water elevation remained at 530.7 feet throughout drilling operations.

International Building Code Site Class

From the geotechnical investigation and subsequent laboratory tests, the onsite soils yield an **International Building Code (IBC) Site Class "C".** This site class is based on an average standard penetration resistance (SPT) procedure, a maximum boring depth of 49 feet and the assumption that the bedrock encountered in the borings is consistent across the site and extends at least to 100 feet. **This site class does not account for induced earth movement, such as the recent earthquakes due to**

injection wells. To obtain a more accurate site class, more extensive testing must be used to evaluate the subsurface conditions.

L-Pile Parameters

Lateral load analysis on the drilled piers can be performed using the LPILE computer program. Design parameters for use in the LPILE computer program are included in Table 2.

Table 2 – L-Pile Parameters

Boring	Layer Number	LPILE Soil/Rock Type Abbr.	Depth to Top of Layer (feet)	Depth to Bottom of Layer (feet)	Elevation of Top of Layer (feet)	Elevation of Bottom of Layer (feet)	Effective Unit Weight (pcf)	Undrained Shear Strength (psf)	Internal Friction Angle (degrees)	Uniaxial Compressive Strength (psi)	Soil/Rock Modulus k or E_r (pci or psi)	RQD (%)	Soil/Rock Strain Factor E_{50} or k_{rm}
B-1	1	--	14.2	15.2	521.5	520.5	--	--	--	--	--	--	--
	2	WR	15.2	16	520.5	519.7	70	--	--	2,500	15,000	50	0.0005
B-2	1	--	14.5	15.5	521.2	520.2	--	--	--	--	--	--	--
	2	WR	15.5	34	520.2	501.7	70	--	--	2,500	15,000	50	0.0005
	3	WR	34	45	501.7	490.7	90	--	--	12,000	650,000	90	0.0005
	4	WR	45	49	490.7	486.7	70	--	--	2,500	15,000	50	0.0005
B-3	1	--	15	16	520.7	519.7	--	--	--	--	--	--	0.005
	2	WR	16	16.5	519.7	519.2	70	--	--	2,500	15,000	50	0.0005
B-4	1	--	13.8	14.8	521.9	520.9	--	--	--	--	--	--	--
	2	WR	14.8	38.5	520.9	497.2	70	--	--	2,500	15,000	50	0.0005
	3	WR	38.5	46.7	497.2	489	90	--	--	12,000	650,000	90	0.0005
B-5	1	--	15	16	520.7	519.7	--	--	--	--	--	--	--
	2	WR	16	16.5	519.7	519.2	70	--	--	2,500	15,000	50	0.0005
B-6	1	--	15	15.5	520.7	520.2	--	--	--	--	---	--	--
	2	WR	15.5	38.5	520.2	497.2	70	--	--	2,500	15,000	50	0.0005
	3	WR	38.5	47	497.2	488.7	90	--	--	12,000	650,000	90	0.0005

Notes:
1. WR ≡ Weak Rock (Reese).
2. Lateral soil resistance should be ignored for the soil sediment on top of the bedrock
3. Depths are from barge deck

The uniaxial compression and RQD values of the WR in Table 2 are based on the results of rock cores obtained from this project.

FOUNDATION RECOMMENDATIONS

Drilled Shafts

The moorings can be supported by drilled shafts. The following design information is based on borings B-2, B-4 and B-6.

Straight shaft drilled piers that derive their support from end bearing and skin friction could be used to support the proposed structures. Based on the TCP test results, drilled shafts founded a minimum of 2 feet into the shale can be designed using an allowable end bearing of 70,000 psf and a side resistance of 7,000 psf. The bearing and side resistance values have a factor of safety of 2 and 3, respectively.

The drilled shafts should have a minimum diameter of 18 inches. The drilled shafts should be designed with enough steel reinforcement to provide adequate structural integrity. ODOT recommends neglecting a minimum of one pier diameter of the top of the bedrock for skin friction capacity calculations.

A heavy-duty pier drilling rig equipped with a rock auger and a core barrel will likely be required to penetrate the bedrock for a rock socket. The pier bottoms and sockets should be checked for continuity and to determine that the material is acceptable for support of structural loads and consistent with the material identified in the borings. Loose material should be removed from the pier bottom and the socket should be clean.

Due to construction in the navigation channel and the sand/gravel encountered, casing for the pier excavations will be necessary.

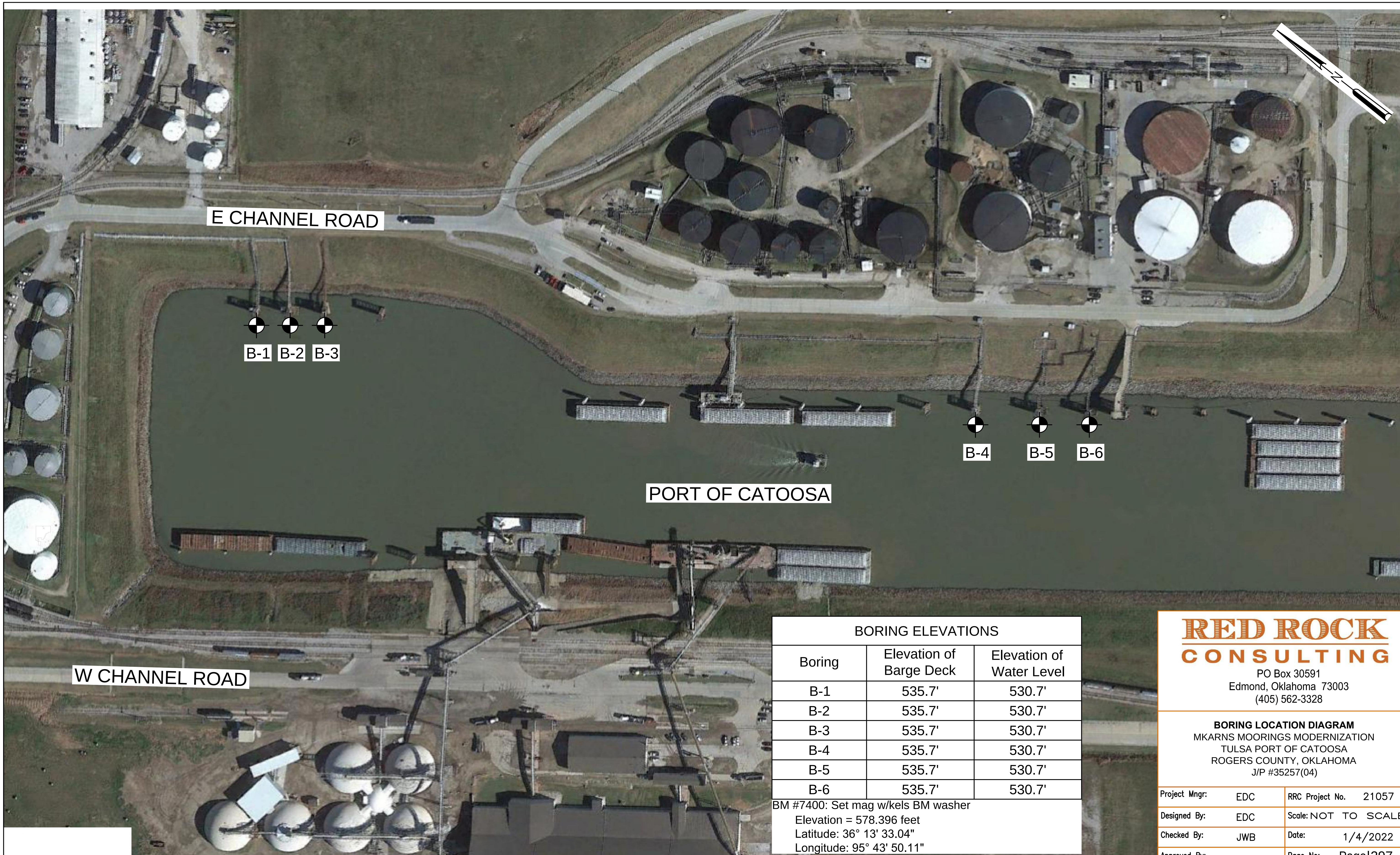
Once the casing is in place, the remaining soils can be removed and the excess water pumped out. If all the water cannot be removed, concrete should be pumped using a tremie pipe and placed from the bottom of the pier excavation to the top, displacing the water to the surface. To facilitate pier construction, concrete should be onsite and ready for placement as pier excavations are completed. In no event should a pier excavation be allowed to remain open overnight.

CLOSURE

The data presented in this report are based on the negotiated scope for this project and site conditions as they existed at the time of the field exploration. The conditions encountered in the exploratory borings are representative subsurface conditions within the study area.

This report was prepared for the exclusive use of CONSOR Engineers, LLC, ODOT and their agents and consultants. It should be made available to prospective contractors for information and factual data only and not as a warranty of subsurface conditions similar to those interpreted from the boring logs or discussions presented herein.

APPENDIX A



BORING ELEVATIONS		
Boring	Elevation of Barge Deck	Elevation of Water Level
B-1	535.7'	530.7'
B-2	535.7'	530.7'
B-3	535.7'	530.7'
B-4	535.7'	530.7'
B-5	535.7'	530.7'
B-6	535.7'	530.7'

BM #7400: Set mag w/kels BM washer
Elevation = 578.396 feet
Latitude: 36° 13' 33.04"
Longitude: 95° 43' 50.11"

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BORING LOCATION DIAGRAM
MKARNS MOORINGS MODERNIZATION
TULSA PORT OF CATOOSA
ROGERS COUNTY, OKLAHOMA
J/P #35257(04)

Project Mngr:	EDC	RRC Project No.	21057
Designed By:	EDC	Scale:	NOT TO SCALE
Checked By:	JWB	Date:	1/4/2022
Approved By:	JWB	Page No:	Page|297

RED ROCK CONSULTING

PO Box 30591
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BORING NUMBER B-01

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION 535.7 ft **STATION** **OFFSET**
DRILLING CONTRACTOR DSO - Drilling Services of Oklahoma
GROUND WATER LEVELS:
DRILLING METHOD wet rotary with casing - CME 750 ATV
▽ **DURING DRILLING** 5 ft / Elev 530.7 ft
LOGGED BY MAJ **CHECKED BY** JWB
▼ **0 hrs AFTER DRILLING** 5 ft / Elev 530.7 ft
NOTES J/P# 35257(04)

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE	BLOW COUNTS	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	PASSING #200 SIEVE (%)
535	0		**BARGE DECK**	535.7'							
530	5		**WATER**	530.7'							
525	10										
520	15		**LEAN CLAY with SAND**, grayish brown, very soft	521.5'	SPT	0 0 50/4"	48	39	20	19	83.8
			SHALE, dark grayish blue, hard	520.5'	GB		7	48	19	29	75.3
515											
510											
505											

Boring Termination Depth = 16 feet
Boring Completed and Grouted on 11/9/2021

BORING NUMBER B-02

RED ROCK CONSULTING
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CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma
DATE STARTED 11/10/21 **COMPLETED** 11/10/21
GROUND ELEVATION 535.7 ft **STATION** **OFFSET**
DRILLING CONTRACTOR DSO - Drilling Services of Oklahoma
GROUND WATER LEVELS:
DRILLING METHOD wet rotary with casing - CME 750 ATV
∇ **DURING DRILLING** 5 ft / Elev 530.7 ft
LOGGED BY MAJ **CHECKED BY** JWB
▼ **0 hrs AFTER DRILLING** 5 ft / Elev 530.7 ft
NOTES J/P# 35257(04)

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE	BLOW COUNTS & CORE RECOVERY	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	PASSING #200 SIEVE (%)
535	0		**BARGE DECK**	535.7'							
530	5		**WATER**	530.7'							
520	15		**LEAN CLAY with SAND**, grayish brown, very soft	521.2'	SPT	0 0 50/5.8"	31	40	18	22	74.6
			SHALE, dark grayish blue, very hard	520.2'	GB		7	33	23	10	77.1
					TC	50/0.3" 50/0.1"					
515	20										
					TC	50/0.4" 50/0.1"					
510	25										
					TC	50/0.4" 50/0.1"					
505	30										
					TC	50/0.3" 50/0.1"					
	35		**LIMESTONE**, gray, strong	501.7'							

(Continued Next Page)

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BORING NUMBER B-02

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS & CORE RECOVERY	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	PASSING #200 SIEVE (%)
500	35		**LIMESTONE**, gray, strong *(continued)* * Compressive strength at 36 feet = 12,497 psi *	RC	Total= 54 in. Rec= 90% RQD= 90%					
495	40		* Compressive strength at 40 feet = 14,526 psi *	RC	Total= 60 in. Rec= 100% RQD= 100%					
490	45		490.7 **SHALE**, dark grayish blue	RC	Total= 52 in. Rec= 87% RQD= 8%					
			Boring Termination Depth = 49 feet Boring Completed and Grouted on 11/10/2021							

485, 480, 475, 470, 465, 460.

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BORING NUMBER B-03

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION 535.7 ft **STATION** **OFFSET**
DRILLING CONTRACTOR DSO - Drilling Services of Oklahoma
GROUND WATER LEVELS:
DRILLING METHOD wet rotary with casing - CME 750 ATV
▽ **DURING DRILLING** 5 ft / Elev 530.7 ft
LOGGED BY MAJ **CHECKED BY** JWB
▼ **0 hrs AFTER DRILLING** 5 ft / Elev 530.7 ft
NOTES J/P# 35257(04)

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE	BLOW COUNTS	MOISTURE CONTENT (%)	ATTERBERG LIMITS			PASSING #200 SIEVE (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
535	0		**BARGE DECK**	535.7'							
530	5	▼	**WATER**	530.7'							
520	15		**LEAN CLAY with SAND**, grayish brown, stiff	520.7'	SPT	10 12 50/6"	47 8	40 33	17 21	23 12	84.8 84.1
			SHALE, dark grayish blue, soft	519.7'							

Boring Termination Depth = 16.5 feet
Boring Completed and Grouted on 11/9/2021

Elevation scale: 535, 530, 525, 520, 515, 510, 505. Depth scale: 0, 5, 10, 15.

1 RED ROCK LOG 21057 LOGS.GPJ REDROCK.GDT 1/11/22

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BORING NUMBER B-04

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION 535.7 ft **STATION** **OFFSET**
DRILLING CONTRACTOR DSO - Drilling Services of Oklahoma
GROUND WATER LEVELS:
DRILLING METHOD wet rotary with casing - CME 750 ATV
DURING DRILLING 5 ft / Elev 530.7 ft
LOGGED BY MAJ **CHECKED BY** JWB
0 hrs AFTER DRILLING 5 ft / Elev 530.7 ft
NOTES J/P# 35257(04)

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION		SAMPLE TYPE	BLOW COUNTS & CORE RECOVERY	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	PASSING #200 SIEVE (%)
535	0	**BARGE DECK**	535.7'							
530	5	**WATER**	530.7'							
525	10									
	15	**LEAN CLAY with GRAVEL**, grayish brown, very soft	521.9'	SPT	0 0 50/5"	53 11	47 32	23 22	24 10	70.5 64.6
520		**SHALE**, dark grayish blue, very hard	520.9'							
				TC	50/0.4" 50/0.3"					
515	20			TC	50/0.5" 50/0.4"					
510	25			TC	50/0.6" 50/0.3"					
505	30			TC	50/0.4" 50/0.3"					
	35									

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BORING NUMBER B-04

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS & CORE RECOVERY	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	PASSING #200 SIEVE (%)
500	35		**SHALE**, dark grayish blue, very hard *(continued)*	TC	50/0.5" 50/0.3"					
497.2			**LIMESTONE**, gray, very strong * Compressive strength at 39 feet = 18,108 * * Compressive strength at 41 feet = 18,076 *	RC	Total= 38 in. Rec= 100% RQD= 100%					
495	40			RC	Total= 60 in. Rec= 100% RQD= 100%					
490	45									

Boring Termination Depth = 46.7 feet
Boring Completed and Grouted on 11/9/2021

Elevation scale: 500, 495, 490, 485, 480, 475, 470, 465, 460

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BORING NUMBER B-05

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION 535.7 ft **STATION** **OFFSET**
DRILLING CONTRACTOR DSO - Drilling Services of Oklahoma
GROUND WATER LEVELS:
DRILLING METHOD wet rotary with casing - CME 750 ATV
▽ **DURING DRILLING** 5 ft / Elev 530.7 ft
LOGGED BY MAJ **CHECKED BY** JWB
▼ **0 hrs AFTER DRILLING** 5 ft / Elev 530.7 ft
NOTES J/P# 35257(04)

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE	BLOW COUNTS	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	PASSING #200 SIEVE (%)
535	0		**BARGE DECK**	535.7'							
530	5		**WATER**	530.7'							
520	15		**LEAN CLAY with SAND**, grayish brown, very soft	520.7'	SPT	0 0 50/6"	65 10	49 28	20 21	29 7	82.3 50.2
			SHALE, dark grayish blue, soft	519.7'							
			Boring Termination Depth = 16.5 feet Boring Completed and Grouted on 11/9/2021								

Elevation scale: 535, 530, 525, 520, 515, 510, 505. Depth scale: 0, 5, 10, 15.

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BORING NUMBER B-06

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma
DATE STARTED 11/9/21 **COMPLETED** 11/9/21
GROUND ELEVATION 535.7 ft **STATION** **OFFSET**
DRILLING CONTRACTOR DSO - Drilling Services of Oklahoma
GROUND WATER LEVELS:
DRILLING METHOD wet rotary with casing - CME 750 ATV
▽ **DURING DRILLING** 5 ft / Elev 530.7 ft
LOGGED BY MAJ **CHECKED BY** JWB
▼ **0 hrs AFTER DRILLING** 5 ft / Elev 530.7 ft
NOTES J/P# 35257(04)

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE	BLOW COUNTS & CORE RECOVERY	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	PASSING #200 SIEVE (%)
535	0		**BARGE DECK**	535.7'							
530	5	▼	**WATER**	530.7'							
520	15		**GRAVELLY LEAN CLAY with SAND**, grayish brown, hard	520.7'	SPT	35 50/4.5"	20	37	21	16	64.4
			SHALE, dark grayish blue, very hard	520.2'	TC	50/0.4" 50/0.1"					
					TC	50/0.1" 50/0.1"					
					TC	50/0.4" 50/0.1"					
					TC	50/0.4" 50/0.1"					

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35. Elevation scale: 535, 530, 525, 520, 515, 510, 505.

(Continued Next Page)

RED ROCK CONSULTING
PO Box 30591
Edmond, OK 73003
405-562-3268

BORING NUMBER B-06

CLIENT CONSOR Engineers, LLC
PROJECT NAME MKARNS Moorings Modernization
PROJECT NUMBER 21057
PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS & CORE RECOVERY	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	PASSING #200 SIEVE (%)
500	35		**SHALE**, dark grayish blue, very hard *(continued)*							
				TC	50/0.5" 50/0.3"					
497.2			**LIMESTONE**, gray, very strong							
495	40			RC	Total= 30 in. Rec= 100% RQD= 100%					
			* Compressive strength at 43 feet = 17,102 *	RC	Total= 60 in. Rec= 100% RQD= 95%					
490	45		* Compressive strength at 45 feet = 15,351 *							
			Boring Termination Depth = 47 feet Boring Completed and Grouted on 11/9/2021							
485										
480										
475										
470										
465										
460										

APPENDIX B

RED ROCK CONSULTING
PO Box 30591
Edmond, OK 73003
405-562-3268

SUMMARY OF LABORATORY RESULTS

CLIENT CONSOR Engineers, LLC

PROJECT NAME MKARNS Moorings Modernization

PROJECT NUMBER 21057

PROJECT LOCATION Tulsa Port of Catoosa, Rogers County, Oklahoma

Borehole	Depth (ft)	% Moist.	Liquid Limit	Plastic Limit	Plasticity Index	-3" Sieve	- 3/4" Sieve	-1/2" Sieve	-4 Sieve	-10 Sieve	-40 Sieve	-200 Sieve
B-01	14.2	47.7	39	20	19	100	100	100	100	98	98	83.8
B-01	15.7	7.1	48	19	29	100	100	100	89	81	77	75.3
B-02	14.5	30.7	40	18	22	100	100	100	90	87	83	74.6
B-02	16.0	7.1	33	23	10	100	100	100	93	85	80	77.1
B-03	15.0	47.2	40	17	23	100	100	100	100	99	99	84.8
B-03	16.0	7.9	33	21	12	100	100	100	93	90	88	84.1
B-04	13.8	52.7	47	23	24	100	100	93	83	82	81	70.5
B-04	14.8	10.7	32	22	10	100	100	94	76	70	68	64.6
B-05	15.0	65.3	49	20	29	100	100	100	97	95	93	82.3
B-05	16.0	10.0	28	21	7	100	81	74	59	54	52	50.2
B-06	15.0	20.2	37	21	16	100	100	92	77	71	67	64.4

Note: Depths are from barge deck

SUMMARY OF UNIAXIAL COMPRESSIVE STRENGTH TEST RESULTS

RED ROCK CONSULTING
PO Box 30591
Edmond, OK 73003
405-562-3328

PROJECT NAME MKARNS Moorings Modernization

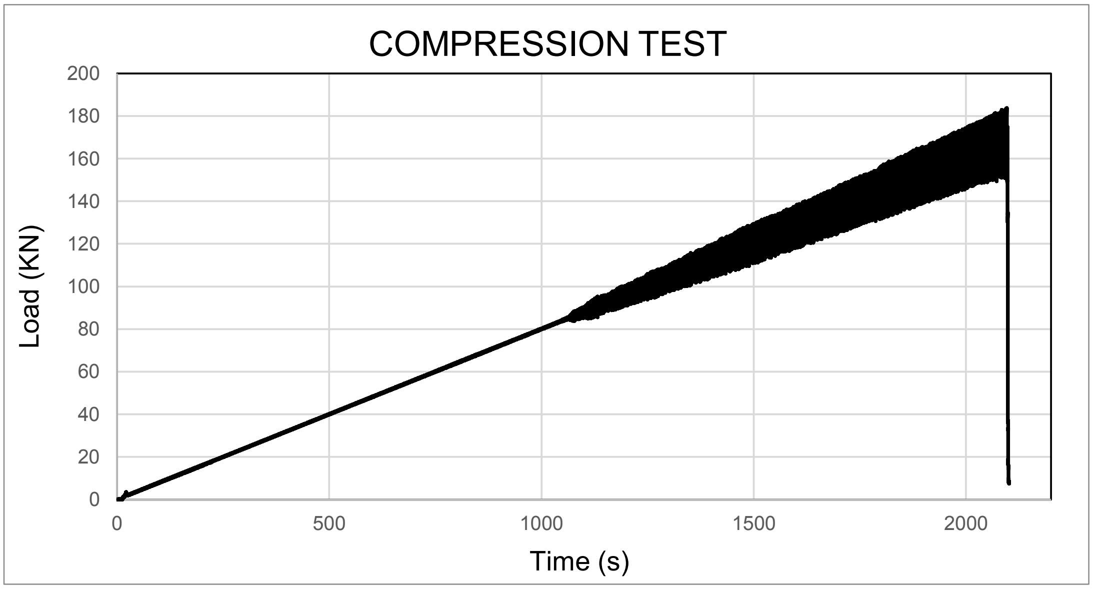
RRC PROJECT NO 21057 **CLIENT** CONSOR Engineers, LLC

Boring	Depth	Length	Diameter	L/D	Moisture	Unit Weight	Loading Rate	Un Comp Strength	Un Comp Strength	Correction Factor Applied	Straight	Flat	Perpend
	(ft)	(in)	(in)		%	(pcf)	(KN/sec)	(Mpa)	(psi)		Pass / Fail		
B-2	36	4.045	2.052	2	1.0%	159.9	0.09	86.2	12,497	1	Pass	Pass	Pass
B-2	40	4.194	2.054	2	0.3%	165.1	0.03	100.2	14,526	1	Pass	Pass	Pass
B-4	39	4.16	2.055	2	0.3%	163.2	0.09	124.8	18,108	1	Pass	Pass	Pass
B-4	41	4.17	2.057	2	0.7%	161.6	1.01	124.6	18,076	1	Pass	Pass	Pass
B-6	43	4.095	2.053	2	0.3%	162.9	0.09	117.9	17,102	1	Pass	Pass	Pass
B-6	45	4.096	2.053	2	0.2%	165.7	0.09	105.8	15,351	1	Pass	Pass	Pass

Note: Depths are from barge deck

UC Compressive Strength

ASTM D 7012 Method C



Compressive Strength =	**12,497**	**psi**

Photo After Test

Test Conditions

Procedure S1 - Side Staighiness =	Pass	
Procedure FP2 - Flatness =	Pass	
Procedure P2 - Perpendicularity =	Pass	
Load Direction =	Vertical	
Loading Rate =	0.09	KN/sec
Time of Failure =	2122.6	seconds
Temperature at Testing =	25	°C

ASTM Tolerance Limits

Prcedures: S1, FP2, P2
Side Tolerance (Straightness): Not to exceed 0.020 inch
Perpendicularity Deviation: Not to exceed 0.250°
Deviation from Flatness: Not to exceed 0.001 inch
Parallelism Deviation: Not to exceed 0.25°

Equipment Used

Cut Saw - Chicago Electric 46225
Caliper - General No. 143
Feeler Gauge
Compression Machine - Besmak BCO-113/3

SAMPLE DATA

SAMPLE LOCATION:	B-2 at 36 ft
SAMPLE DESCRIPTION:	Gray limestone
MOISTURE CONTENT:	1.0%
UNIT WEIGHT (PCF):	159.9
DIAMETER (IN):	2.052
LENGTH (IN):	4.045
L/D RATIO:	2

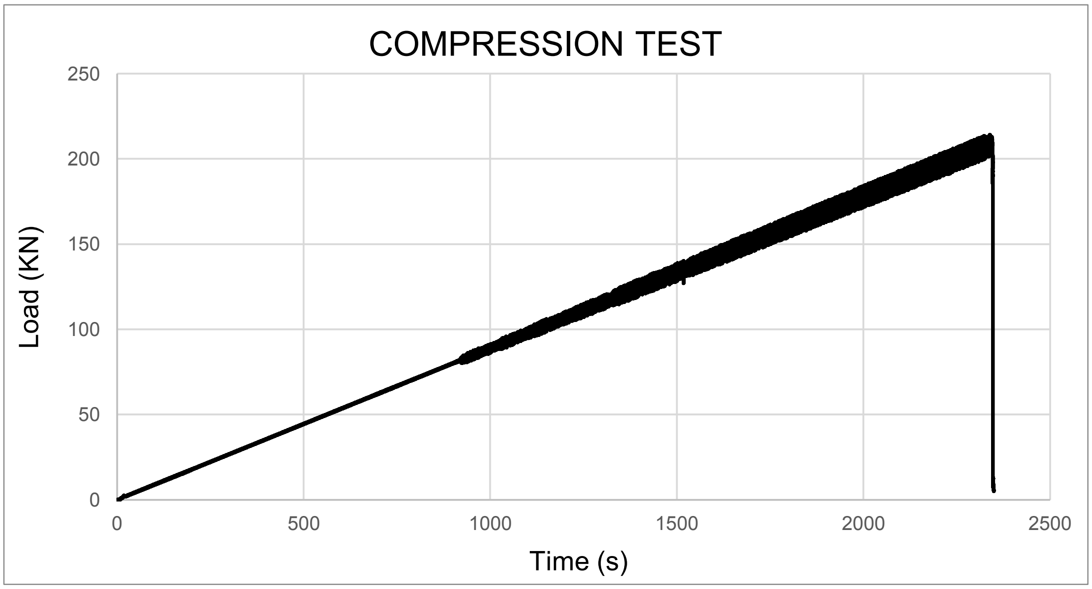
PROJECT INFORMATION

PROJECT:	MKARNS Moorings Modernization
LOCATION:	Tulsa Port of Catoosa, Rogers County, Oklahoma
PROJECT NO.:	21057
CLIENT:	CONSOR Engineers, LLC
TESTED BY:	MAJ
DATE:	11/30/2021

RED ROCK CONSULTING

UC Compressive Strength

ASTM D 7012 Method C



Compressive Strength =	14,526	psi

Photo After Test

Test Conditions

Procedure S1 - Side Staightness =	Pass	
Procedure FP2 - Flatness =	Pass	
Procedure P2 - Perpendicularity =	Pass	
Load Direction =	Vertical	
Loading Rate =	0.09	KN/sec
Time of Failure =	2372.7	seconds
Temperature at Testing =	25	°C

ASTM Tolerance Limits

Prcedures: S1, FP2, P2
Side Tolerance (Straightness): Not to exceed 0.020 inch
Perpendicularity Deviation: Not to exceed 0.250°
Deviation from Flatness: Not to exceed 0.001 inch
Parallelism Deviation: Not to exceed 0.25°

Equipment Used

Cut Saw - Chicago Electric 46225
Caliper - General No. 143
Feeler Gauge
Compression Machine - Besmak BCO-113/3

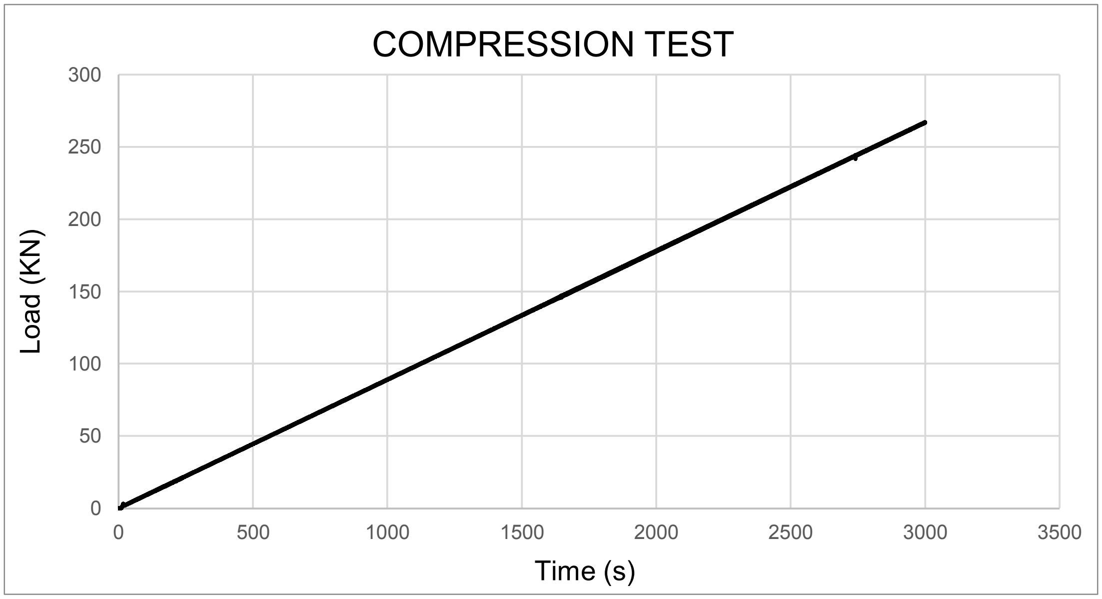
SAMPLE DATA	
SAMPLE LOCATION:	B-2 at 40 ft
SAMPLE DESCRIPTION:	Gray limestone
MOISTURE CONTENT:	0.3%
UNIT WEIGHT (PCF):	165.1
DIAMETER (IN):	2.054
LENGTH (IN):	4.194
L/D RATIO:	2

PROJECT INFORMATION	
PROJECT:	MKARNS Moorings Modernization
LOCATION:	Tulsa Port of Catoosa, Rogers County, Oklahoma
PROJECT NO.:	21057
CLIENT:	CONSOR Engineers, LLC
TESTED BY:	MAJ
DATE:	11/30/2021

RED ROCK CONSULTING

UC Compressive Strength

ASTM D 7012 Method C



Compressive Strength =	**18,108**	**psi**	**Photo After Test**

Test Conditions

Procedure S1 - Side Staightness =	Pass	
Procedure FP2 - Flatness =	Pass	
Procedure P2 - Perpendicularity =	Pass	
Load Direction =	Vertical	
Loading Rate =	0.09	KN/sec
Time of Failure =	3030	seconds
Temperature at Testing =	25	°C

ASTM Tolerance Limits

Prcedures: S1, FP2, P2
Side Tolerance (Straightness): Not to exceed 0.020 inch
Perpendicularity Deviation: Not to exceed 0.250°
Deviation from Flatness: Not to exceed 0.001 inch
Parallelism Deviation: Not to exceed 0.25°

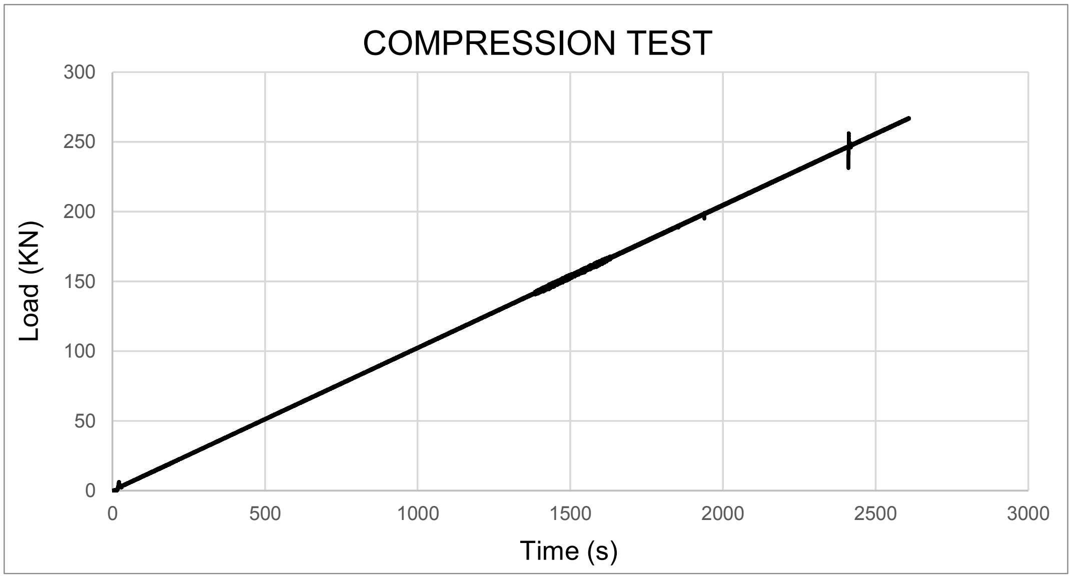
Equipment Used

Cut Saw - Chicago Electric 46225
Caliper - General No. 143
Feeler Gauge
Compression Machine - Besmak BCO-113/3

SAMPLE DATA		**PROJECT INFORMATION**	
SAMPLE LOCATION:	B-4 at 39 ft	PROJECT:	MKARNS Moorings Modernization
SAMPLE DESCRIPTION:	Gray limestone	LOCATION:	Tulsa Port of Catoosa, Rogers County, Oklahoma
		PROJECT NO.:	21057
MOISTURE CONTENT:	0.3%	CLIENT:	CONSOR Engineers, LLC
UNIT WEIGHT (PCF):	163.2	TESTED BY:	MAJ
DIAMETER (IN):	2.055	DATE:	11/30/2021
LENGTH (IN):	4.16		RED ROCK CONSULTING
L/D RATIO:	2		

UC Compressive Strength

ASTM D 7012 Method C



Compressive Strength =	18,076	psi	Photo After Test

Test Conditions

Procedure S1 - Side Staightness =			Pass
Procedure FP2 - Flatness =			Pass
Procedure P2 - Perpendicularity =			Pass
Load Direction =	Vertical		
Loading Rate =	1.01	KN/sec	
Time of Failure =	263.46	seconds	
Temperature at Testing =	25	°C	

ASTM Tolerance Limits

Prcedures: S1, FP2, P2
Side Tolerance (Straightness): Not to exceed 0.020 inch
Perpendicularity Deviation: Not to exceed 0.250°
Deviation from Flatness: Not to exceed 0.001 inch
Parallelism Deviation: Not to exceed 0.25°

Equipment Used

Cut Saw - Chicago Electric 46225
Caliper - General No. 143
Feeler Gauge
Compression Machine - Besmak BCO-113/3

SAMPLE DATA	
SAMPLE LOCATION:	B-4 at 41 ft
SAMPLE DESCRIPTION:	Gray limestone
MOISTURE CONTENT:	0.7%
UNIT WEIGHT (PCF):	161.6
DIAMETER (IN):	2.057
LENGTH (IN):	4.17
L/D RATIO:	2

PROJECT INFORMATION	
PROJECT:	MKARNS Moorings Modernization
LOCATION:	Tulsa Port of Catoosa, Rogers County, Oklahoma
PROJECT NO.:	21057
CLIENT:	CONSOR Engineers, LLC
TESTED BY:	MAJ
DATE:	11/30/2021

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UC Compressive Strength

ASTM D 7012 Method C

Compressive Strength =	17,102	psi

Photo After Test

Test Conditions

Procedure S1 - Side Staightness =	Pass	
Procedure FP2 - Flatness =	Pass	
Procedure P2 - Perpendicularity =	Pass	
Load Direction =	Vertical	
Loading Rate =	0.09	KN/sec
Time of Failure =	2826.8	seconds
Temperature at Testing =	25	°C

ASTM Tolerance Limits

Prcedures: S1, FP2, P2
Side Tolerance (Straightness): Not to exceed 0.020 inch
Perpendicularity Deviation: Not to exceed 0.250°
Deviation from Flatness: Not to exceed 0.001 inch
Parallelism Deviation: Not to exceed 0.25°

Equipment Used

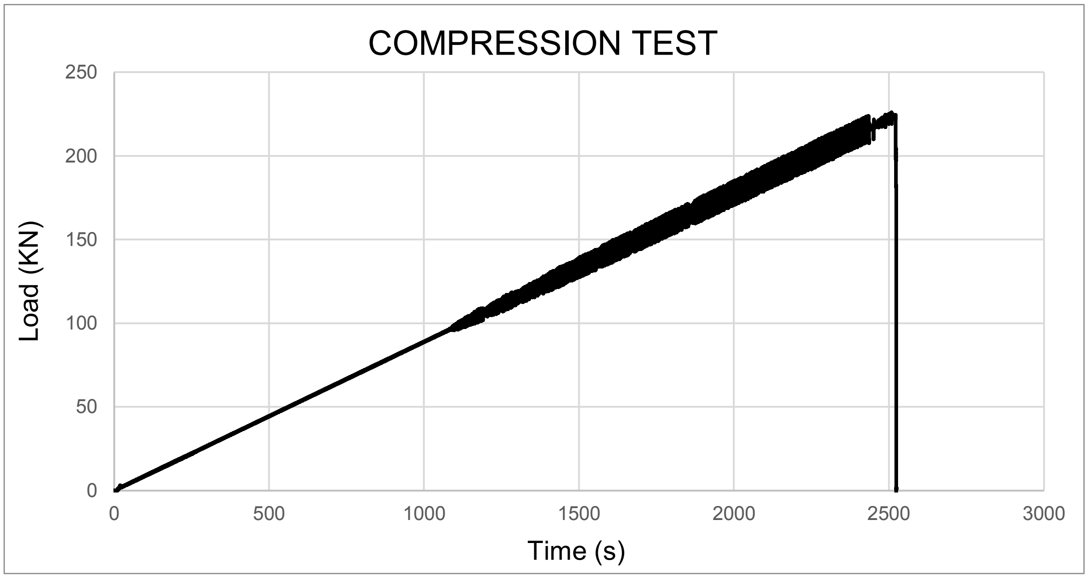
Cut Saw - Chicago Electric 46225
Caliper - General No. 143
Feeler Gauge
Compression Machine - Besmak BCO-113/3

SAMPLE DATA		PROJECT INFORMATION	
SAMPLE LOCATION:	B-6 at 43 ft	PROJECT:	MKARNS Moorings Modernization
SAMPLE DESCRIPTION:	Gray limestone	LOCATION:	Tulsa Port of Catoosa, Rogers County, Oklahoma
		PROJECT NO.:	21057
MOISTURE CONTENT:	0.3%	CLIENT:	CONSOR Engineers, LLC
UNIT WEIGHT (PCF):	162.9	TESTED BY:	MAJ
DIAMETER (IN):	2.053	DATE:	11/30/2021
LENGTH (IN):	4.095		
L/D RATIO:	2		

RED ROCK CONSULTING

UC Compressive Stength

ASTM D 7012 Method C



Compressive Strength = 15,351 psi

Photo After Test

Test Conditions

Procedure S1 - Side Staightness =	Pass	
Procedure FP2 - Flatness =	Pass	
Procedure P2 - Perpendicularity =	Pass	
Load Direction =	Vertical	
Loading Rate =	0.09	KN/sec
Time of Failure =	2549.8	seconds
Temperature at Testing =	25	°C

ASTM Tolerance Limits

Prcedures: S1, FP2, P2
Side Tolerance (Straightness): Not to exceed 0.020 inch
Perpendicularity Deviation: Not to exceed 0.250°
Deviation from Flatness: Not to exceed 0.001 inch
Parallelism Deviation: Not to exceed 0.25°

Equipment Used

Cut Saw - Chicago Electric 46225
Caliper - General No. 143
Feeler Gauge
Compression Machine - Humboldt 1348

SAMPLE DATA	
SAMPLE LOCATION:	B-6 at 45 ft
SAMPLE DESCRIPTION:	Gray limestone
MOISTURE CONTENT:	0.2%
UNIT WEIGHT (PCF):	165.7
DIAMETER (IN):	2.053
LENGTH (IN):	4.096
L/D RATIO:	2

PROJECT INFORMATION	
PROJECT:	MKARNS Moorings Modernization
LOCATION:	Tulsa Port of Catoosa, Rogers County, Oklahoma
PROJECT NO.:	21057
CLIENT:	CONSOR Engineers, LLC
TESTED BY:	MAJ
DATE:	11/30/2021

RED ROCK CONSULTING

APPENDIX C

Rock Core Photographs

RUN 1

Photo # 1 Run 1 of boring B-2 was from 34 to 39 feet. Run 1 had a recovery of 90% and an RQD of 90%.

RUN 2

Photo # 2 Run 2 of boring B-2 was from 39 to 44 feet. Run 2 had a recovery of 100% and an RQD of 100%.

RUN 3

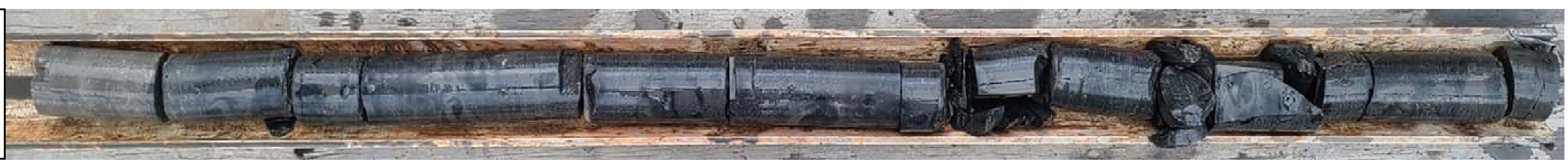


Photo # 3 Run 3 of boring B-2 was from 44 to 49 feet. Run 3 had a recovery of 87% and an RQD of 8%.

Rock Core Photographs

RUN 4

Photo # 4 Run 1 of boring B-4 was from 38.5 to 41.7 feet. Run 1 had a recovery of 100% and an RQD of 100%.

RUN 5

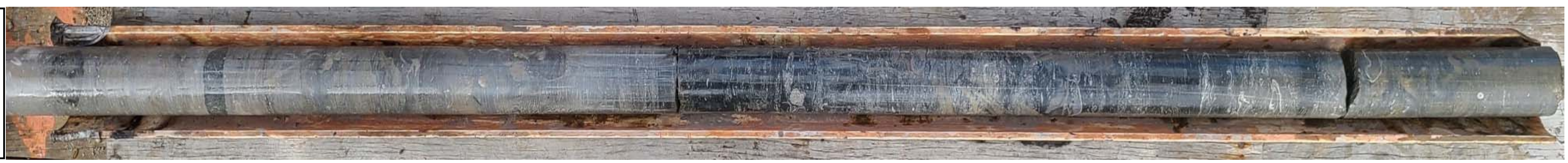



Photo # 5 Run 2 of boring B-4 was from 41.7 to 46.7 feet. Run 2 had a recovery of 100% and an RQD of 100%.

RUN 6

Photo # 6 Run 1 of boring B-6 was from 39.5 to 42 feet. Run 1 had a recovery of 100% and an RQD of 100%.

Rock Core Photographs

RUN 7

Photo # 7 Run 1 of boring B-6 was from 42 to 47 feet. Run 2 had a recovery of 100% and an RQD of 95%.

APPENDIX D

RED ROCK CONSULTING

GENERAL NOTES

SOIL PROPERTY ABBREVIATIONS

N	Uncorrected SPT Penetration, blows per foot
N_{60}	Corrected SPT Penetration, blows per foot
Q_u	Unconfined Compressive Strength, psf
Mc	Moisture Content, %
LL	Liquid Limit, %
PL	Plastic Limit, %
PI	Plasticity Index, %

DRILLING & SAMPLING ABBREVIATIONS

BS	Bag Sample
SPT	Split Spoon Sample
ST	Shelby Tube Sample
AU	Auger Sample
TC	Texas Cone Penetrometer
DCP	Dynamic Cone Penetrometer

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)
-- used to classify all soils unless otherwise noted --

Major Divisions			Group Symbol	Typical Names
Course-Grained Soils >50% retained on #200 sieve	Gravels 50% + of course fraction retained on #4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sands 50% + of course fraction passes #4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly graded sands and gravelly sands, little or no fines
		Sands with Fines	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils <50% passes #200 sieve	Silts and Clays Liquid Limit ≤ 50%		ML	Inorganic silts, very fine sands, rock four, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly/sandy/silty/lean clays
			OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays Liquid Limit > 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays or high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils

Prefix: G = Gravel, S = Sand, M = Silt, C = Clay, O = Organic **Suffix:** W = Well Graded, P = Poorly Graded, M = Silty, L = Clay, LL < 50%, H = Clay, LL > 50%

PLASTICITY OF COHESIVE SOIL

Degree of Plasticity	Plasticity Index	Swell Potential
None	0 to 4	Very Low
Slight	5 to 9	Low
Medium	10 to 19	Low to Medium
High	20 to 39	Medium to High
Very High	40+	Very High

MOISTURE OF COHESIVE SOIL

Description	Condition	Moisture Content
Dry, Dusty	Dry	0 to 10%
Damp	Moist	10 to 30%
Free Water	Wet	30 to 70%

CONSISTENCY - COHESIVE SOILS

Consistency	SPT
Very Soft	<2
Soft	2 to 4
Medium Stiff	5 to 8
Stiff	9 to 14
Very Stiff	15 to 30
Hard	31+

DENSITY – COHESIONLESS SOILS

Relative Density	SPT
Very Loose	<4
Loose	4 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	51+

ROCK HARDNESS

SPT (in/50)	TCP (in/100)	Rock Description
6+	6+	Very Soft / Very Poorly Cemented
5 - 6	3 - 6	Soft / Poorly Cemented
4 - 5	2 - 3	Moderately Hard / Cemented
3 - 4	1 - 2	Hard / Well Cemented
<3	<1	Very Hard / Very Well Cemented

ROCK CORE QUALITY

Core Quality	RQD
Excellent Quality	90 – 100%
Good Quality	75 – 90%
Fair Quality	50 – 75%
Poor Quality	25 – 50%
Very Poor Quality	<25%

Appendix F - Hydraulic Report

Oklahoma Department of Transportation
MKARNS Mooring Modernization Project

HYDRAULIC REPORT

Utley & Associates LLC

for

CONSOR Engineers, LLC

January 24, 2022

Oklahoma Department of Transportation
MKARNS Mooring Modernization Project

HYDRAULIC REPORT

PREPARED BY:

Utley & Associates LLC

P.O. BOX 14294; OKLAHOMA CITY, OKLAHOMA 73113
(405) 213-0529 • E-MAIL marc@utleyengr.com
CA NO. 4202 EXP. 06/30/2023

for

CONSOR Engineers, LLC
609 S. Kelly Ave., Ste. J-1
Edmond, Oklahoma 73003

REGISTERED PROFESSIONAL ENGINEER
MARC
R.
UTLEY
18202
OKLAHOMA

1/24/22

Marc R. Utley, P.E. #18202

January 24, 2022

HYDRAULIC REPORT

MKARNS Mooring Modernization Project

TABLE OF CONTENTS

HYDRAULIC REPORT

MKARNS Mooring Modernization Project

I. INTRODUCTION

This report contains the hydrologic and hydraulic analysis necessary to provide the information required to design new moorings at three locations within the McClellan-Kerr Arkansas Navigation System. Specifically, this report will determine the hydraulic characteristics for the design discharge (50-year) water surface elevation and maximum velocity at each site.

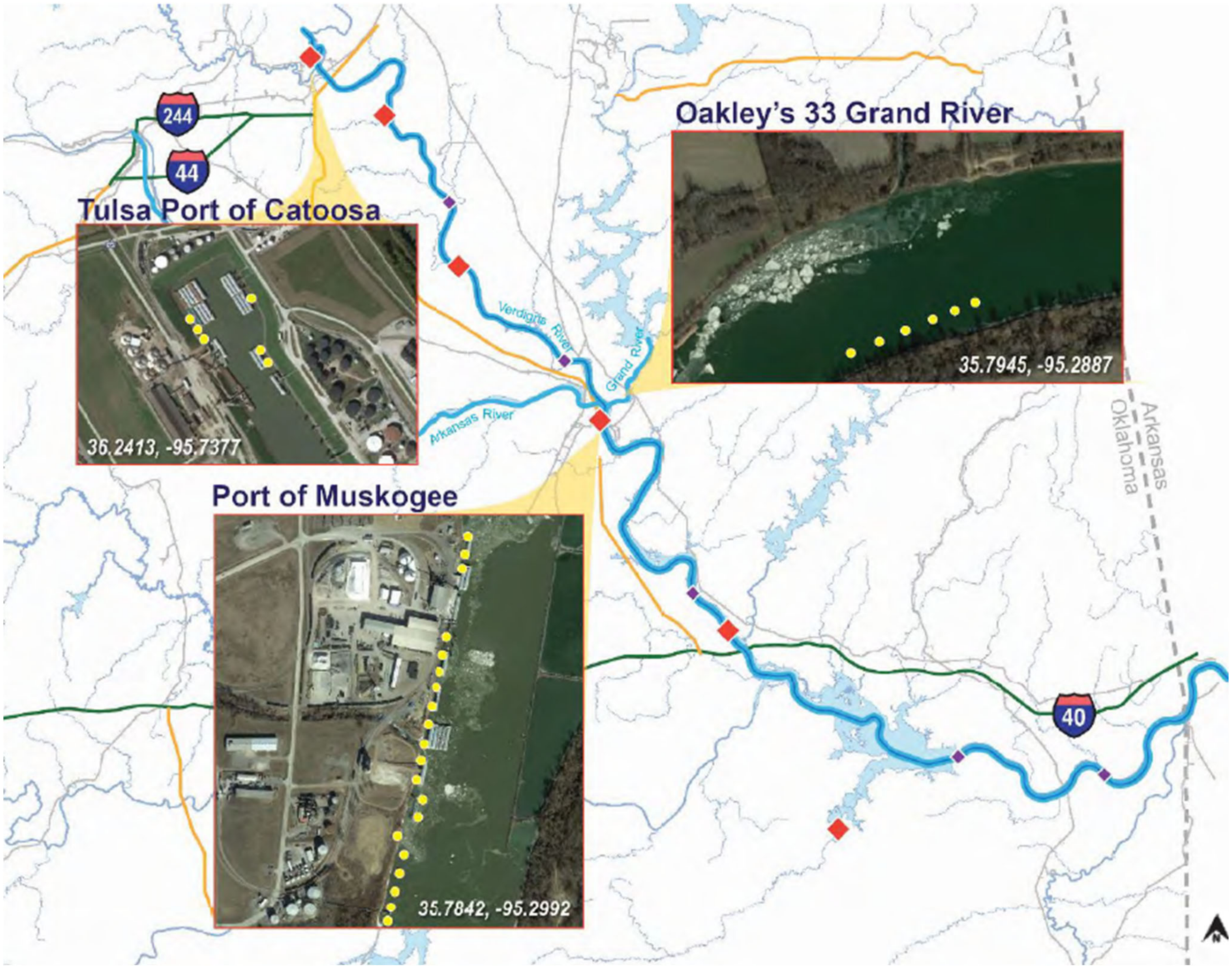
The first site is the Port of Catoosa, located within Section 5 Township 20 North and Range 15 East in Rogers County Oklahoma adjacent to the Verdigris River. Since the port is in a backwater area (no exposure to main river flow) the velocity was not determined. A nominal value (1-3 fps) should be assumed for flushing. The required water surface information was determined from the flood profiles included in the Rogers County Flood Insurance Study. The 50-year water surface elevation was determined to be 568.3 ft (NAVD88) based on FIS cross section AP. The effective FIS modeling for the site could not be located

The second site is the Port of Muskogee, located within Sections 9 and 16 Township 15 North and Range 19 East in Muskogee County Oklahoma along the Arkansas River. The third site is Oakley's 33 located near the Port of Muskgogee along the Neosho River just above the confluence with the Arkansas River. A new hydraulic model covering both sites has been developed as a part of this study. The effective FIS modeling for the site could not be located. Modeling was necessary to determine the maximum flow velocity at each site.

II. FLOWS

No flow data was required at the Catoosa site. The discharge values used in the new modeling of the Muskogee and Oakley's were taken directly from USGS Gage data. The flow in the Arkansas River was taken from Gage Number 07194500 (Arkansas River near Muskogee). The flow in the Neosho River was taken from Gage Number 07193500 (Neosho River below Ft. Gibson Lake)

Project Location Map



III. HYDRAULIC ANALYSIS

The hydraulic analysis for this site employs the U.S. Army Corps of Engineers water surface profile program HEC-RAS version 5.0.7. The topographic data used in the model was derived from on-site survey supplemented with USGS Lidar Data published in 2018. A single hydraulic model has been developed covering both the Port of Muskogee and the Oakley's 33 sites. The maximum velocity was determined using the velocity distribution option in HEC-RAS. The channel was divided into 20 conveyance tubes. The maximum velocity is reported as the maximum velocity occurring in all sections within each site. The modeling is summarized in the following section with further detail in Appendix A.

IV. RESULTS

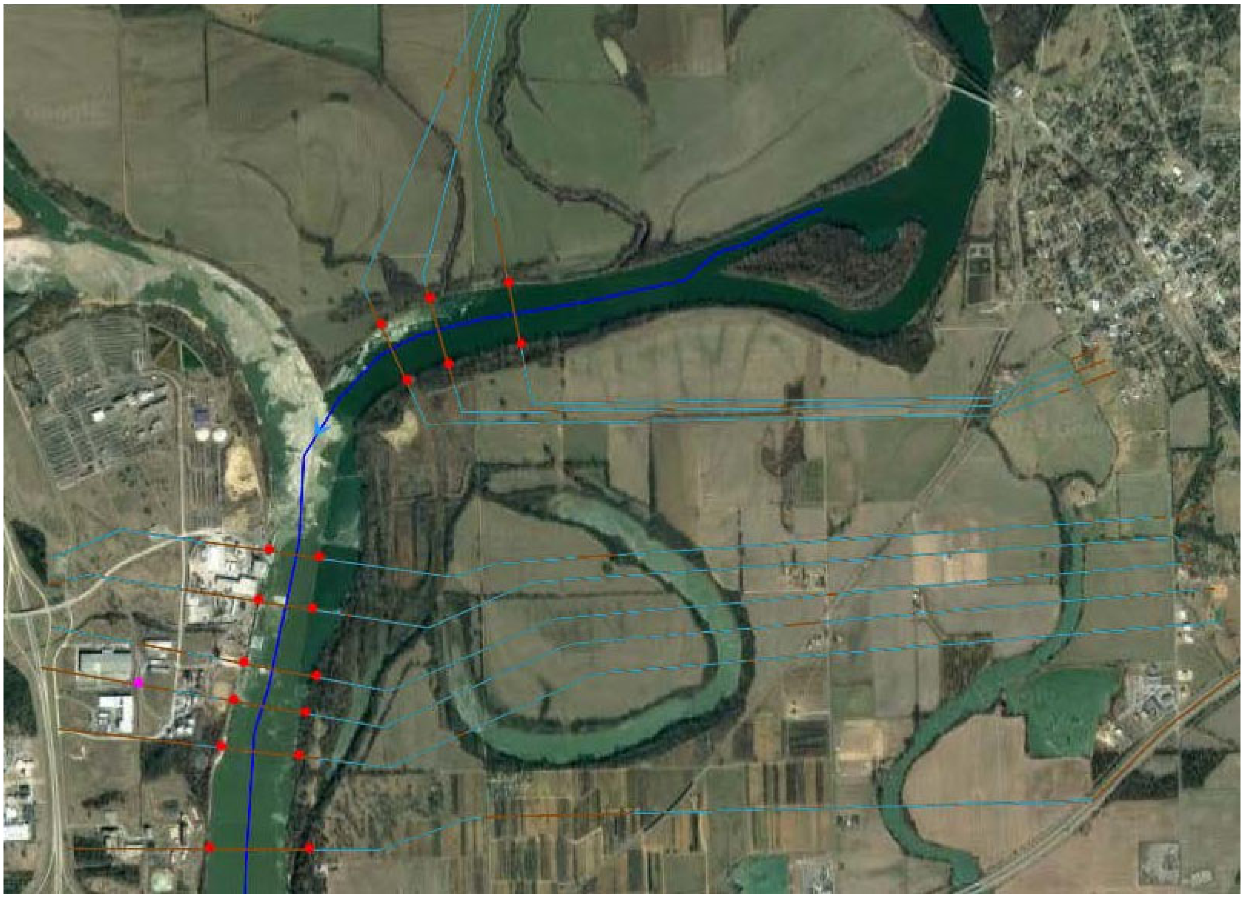
The relevant results of the modeling are shown in the following table. The cross-section locations are shown on the following page.

Section	50 yr. Storm			Location
	Water Surface Elev.	Avg. Channel Velocity	Maximum Velocity	
389.2743	515.62	8.68	9.46	Port of Muskogee
389.4088	515.74	9.62	10.49	Port of Muskogee
389.5203	515.97	9.84	11.05	Port of Muskogee
389.7080	517.03	8.22	**11.15**	Port of Muskogee
389.8578	**517.61**	5.95	7.87	Port of Muskogee
390.5508	518.07	1.83	**9.36**	Oakleys
390.6975	518.08	1.92	8.92	Oakleys
390.9232	**518.10**	2.30	9.23	Oakleys

The recommeded hydraulic characteristics, to be used in mooring design, are shown in the following table.

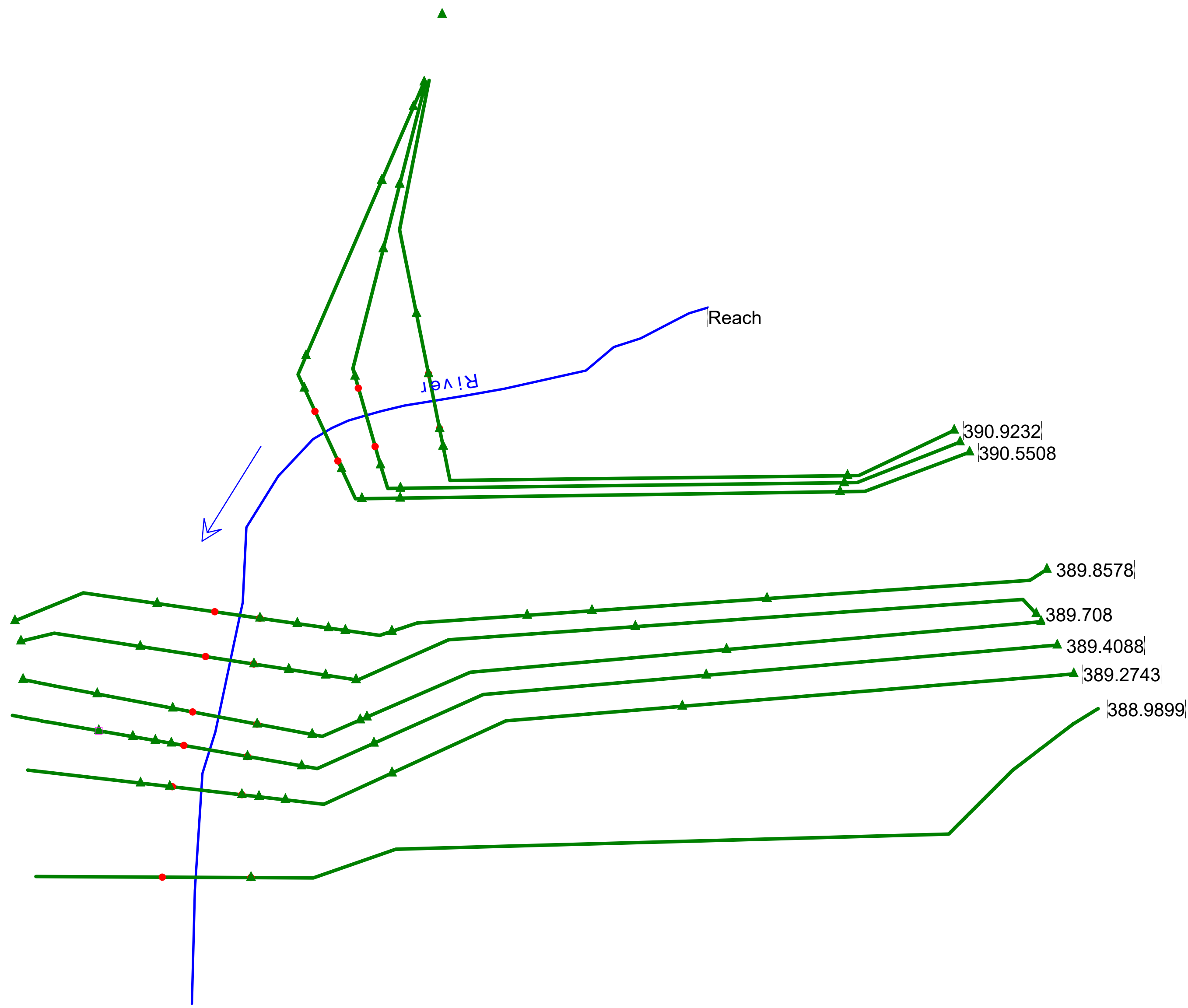
Site	50 yr Water Surface (ft)	50 yr Max. Velocity (fps)
Port of Catoosa	568.3	3.00
Port of Muskogee	517.6	11.15
Oakley's 33	518.1	9.36

CROSS SECTION LOCATIONS

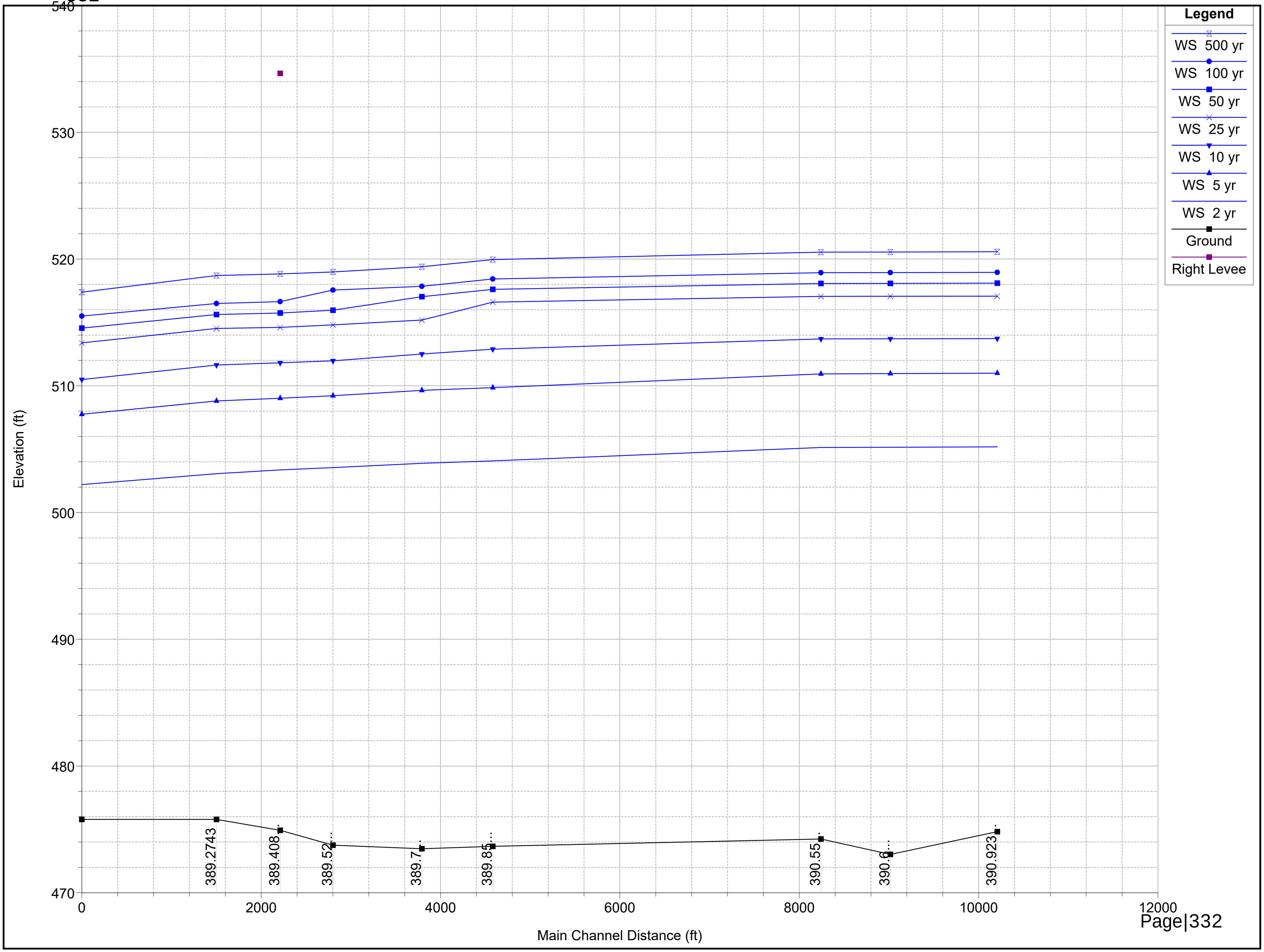


APPENDIX A

HEC-RAS MODELING
PORT OF MUSKOGEE / OAKLEY'S 33



Some schematic data outside default extents (see View/Set Schematic Plot Extents...)


Legend
WS 500 yr
WS 100 yr
WS 50 yr
WS 25 yr
WS 10 yr
WS 5 yr
WS 2 yr
Ground
Right Levee
Elevation (ft)
Main Channel Distance (ft)
540
530
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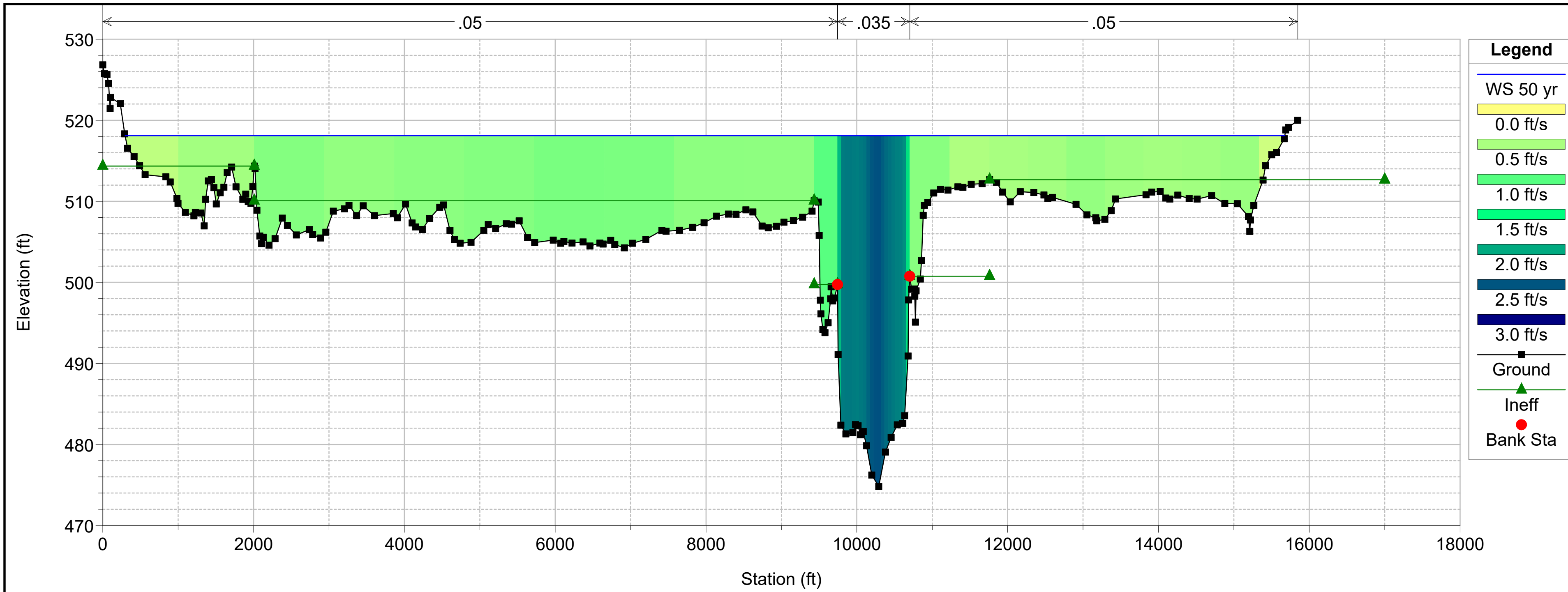
510
500
490
480
470
0
2000
4000
6000
8000
10000
12000
389.2743
389.408
389.52...
389.7
389.85...
390.55
390.6...
390.923

HEC-RAS Plan: Default Scenario River: River Reach: Reach

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	388.9899	2 yr	168000.00	475.79	502.20	491.54	502.94	0.000600	6.87	24471.90	2229.96	0.29
Reach	388.9899	5 yr	265000.00	475.79	507.75	494.76	508.79	0.000600	8.16	32487.63	6797.01	0.31
Reach	388.9899	10 yr	317000.00	475.79	510.49	496.23	511.66	0.000601	8.67	36549.85	9207.30	0.31
Reach	388.9899	25 yr	394000.00	475.79	513.39	498.22	514.67	0.000601	9.27	58461.25	16216.78	0.32
Reach	388.9899	50 yr	452000.00	475.79	514.55	499.65	515.83	0.000601	9.54	77415.89	16332.03	0.32
Reach	388.9899	100 yr	509000.00	475.79	515.50	500.88	516.76	0.000601	9.75	92945.44	16414.31	0.32
Reach	388.9899	500 yr	645000.00	475.79	517.39	503.52	518.60	0.000601	10.17	124067.10	16555.63	0.32
Reach	389.2743	2 yr	168000.00	475.79	503.06	489.05	503.63	0.000352	6.17	29909.06	4050.80	0.23
Reach	389.2743	5 yr	265000.00	475.79	508.81	492.62	509.47	0.000328	6.97	46207.13	11270.42	0.23
Reach	389.2743	10 yr	317000.00	475.79	511.64	494.17	512.34	0.000312	7.26	60589.77	13279.11	0.23
Reach	389.2743	25 yr	394000.00	475.79	514.53	496.31	515.39	0.000348	8.15	77609.56	15799.26	0.25
Reach	389.2743	50 yr	452000.00	475.79	515.62	497.95	516.57	0.000378	8.68	88125.96	16190.42	0.26
Reach	389.2743	100 yr	509000.00	475.79	516.49	499.37	517.52	0.000411	9.20	96534.37	16263.67	0.27
Reach	389.2743	500 yr	645000.00	475.79	518.70	502.56	519.25	0.000274	7.82	181455.50	16380.79	0.23
Reach	389.4088	2 yr	168000.00	474.93	503.36	488.72	503.87	0.000316	6.01	32903.58	3813.26	0.22
Reach	389.4088	5 yr	265000.00	474.93	509.02	492.63	509.72	0.000332	7.14	44551.37	10033.41	0.24
Reach	389.4088	10 yr	317000.00	474.93	511.81	494.18	512.59	0.000331	7.60	50547.94	12732.23	0.24
Reach	389.4088	25 yr	394000.00	474.93	514.61	496.38	515.75	0.000426	9.13	70556.59	15206.93	0.28
Reach	389.4088	50 yr	452000.00	474.93	515.74	497.92	516.94	0.000453	9.62	81487.25	15788.05	0.29
Reach	389.4088	100 yr	509000.00	474.93	516.64	500.28	517.91	0.000483	10.10	90278.45	15936.18	0.30
Reach	389.4088	500 yr	645000.00	474.93	518.83	502.88	519.49	0.000319	8.54	170391.70	16181.65	0.24
Reach	389.5203	2 yr	168000.00	473.75	503.54	488.55	504.07	0.000343	6.12	32378.63	3851.79	0.23
Reach	389.5203	5 yr	265000.00	473.75	509.22	493.03	509.92	0.000352	7.20	44334.55	9604.71	0.24
Reach	389.5203	10 yr	317000.00	473.75	511.97	494.66	512.82	0.000375	7.91	52730.57	12158.26	0.25
Reach	389.5203	25 yr	394000.00	473.75	514.80	496.87	516.04	0.000473	9.44	66504.77	15665.81	0.29
Reach	389.5203	50 yr	452000.00	473.75	515.97	498.43	517.24	0.000491	9.84	79499.65	15808.03	0.30
Reach	389.5203	100 yr	509000.00	473.75	517.55	499.98	518.19	0.000303	7.97	140540.50	16399.26	0.23
Reach	389.5203	500 yr	645000.00	473.75	518.98	503.46	519.71	0.000351	8.81	163162.70	16752.78	0.25
Reach	389.708	2 yr	168000.00	473.47	503.88	488.60	504.39	0.000298	6.30	36801.75	4398.25	0.22
Reach	389.708	5 yr	265000.00	473.47	509.64	492.74	510.25	0.000294	7.17	51861.84	10217.05	0.23
Reach	389.708	10 yr	317000.00	473.47	512.51	495.83	513.16	0.000286	7.51	59503.03	13140.58	0.23
Reach	389.708	25 yr	394000.00	473.47	515.19	498.17	516.56	0.000495	10.38	69002.36	16361.76	0.30
Reach	389.708	50 yr	452000.00	473.47	517.03	499.75	517.67	0.000291	8.22	133341.70	16907.93	0.23
Reach	389.708	100 yr	509000.00	473.47	517.85	500.77	518.50	0.000302	8.50	146040.20	17394.50	0.24
Reach	389.708	500 yr	645000.00	473.47	519.39	504.34	520.05	0.000326	9.06	179303.00	17536.57	0.25
Reach	389.8578	2 yr	168000.00	473.66	504.08	488.12	504.65	0.000302	6.58	33150.28	4192.27	0.22
Reach	389.8578	5 yr	265000.00	473.66	509.86	492.35	510.49	0.000296	7.42	61757.05	11833.54	0.23

HEC-RAS Plan: Default Scenario River: River Reach: Reach (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	389.8578	10 yr	317000.00	473.66	512.88	495.18	513.38	0.000236	7.03	95750.80	13805.52	0.21
Reach	389.8578	25 yr	394000.00	473.66	516.60	497.36	516.86	0.000138	5.75	165140.10	17277.94	0.16
Reach	389.8578	50 yr	452000.00	473.66	517.61	498.87	517.87	0.000143	5.95	188237.20	17648.41	0.16
Reach	389.8578	100 yr	509000.00	473.66	518.43	500.20	518.70	0.000152	6.22	202734.20	17734.50	0.17
Reach	389.8578	500 yr	645000.00	473.66	519.96	504.20	520.27	0.000178	6.89	230000.20	17881.00	0.19
Reach	390.5508	2 yr	48000.00	474.24	505.13	483.68	505.18	0.000028	1.89	30462.58	5372.61	0.07
Reach	390.5508	5 yr	83100.00	474.24	510.94	485.99	511.00	0.000027	2.16	64623.51	16403.70	0.07
Reach	390.5508	10 yr	110000.00	474.24	513.70	487.36	513.73	0.000017	1.83	141535.10	17004.30	0.06
Reach	390.5508	25 yr	146000.00	474.24	517.06	489.01	517.08	0.000013	1.69	207182.70	17955.15	0.05
Reach	390.5508	50 yr	174000.00	474.24	518.07	490.20	518.10	0.000015	1.83	225224.20	18041.27	0.05
Reach	390.5508	100 yr	204000.00	474.24	518.92	491.40	518.95	0.000017	2.00	241186.70	18110.39	0.06
Reach	390.5508	500 yr	280000.00	474.24	520.54	494.13	520.58	0.000023	2.40	270597.50	18234.68	0.07
Reach	390.6975	2 yr	48000.00	473.03	505.15	483.73	505.20	0.000028	1.86	27534.68	5673.55	0.07
Reach	390.6975	5 yr	83100.00	473.03	510.96	485.93	511.02	0.000029	2.20	56480.00	15290.36	0.07
Reach	390.6975	10 yr	110000.00	473.03	513.71	487.23	513.74	0.000019	1.89	130026.50	16140.70	0.06
Reach	390.6975	25 yr	146000.00	473.03	517.06	488.82	517.09	0.000015	1.76	190336.50	16620.80	0.05
Reach	390.6975	50 yr	174000.00	473.03	518.08	489.95	518.11	0.000017	1.92	207310.00	16741.39	0.06
Reach	390.6975	100 yr	204000.00	473.03	518.93	491.06	518.96	0.000019	2.09	221603.80	16849.97	0.06
Reach	390.6975	500 yr	280000.00	473.03	520.56	493.75	520.60	0.000027	2.52	249042.00	16993.58	0.07
Reach	390.9232	2 yr	48000.00	474.82	505.18	484.78	505.24	0.000033	2.01	25870.39	3170.03	0.07
Reach	390.9232	5 yr	83100.00	474.82	510.99	486.84	511.06	0.000032	2.31	65395.44	12610.17	0.07
Reach	390.9232	10 yr	110000.00	474.82	513.72	488.20	513.78	0.000028	2.27	104188.00	14801.50	0.07
Reach	390.9232	25 yr	146000.00	474.82	517.08	489.84	517.11	0.000021	2.13	158466.10	15311.65	0.06
Reach	390.9232	50 yr	174000.00	474.82	518.10	491.02	518.14	0.000024	2.30	174128.10	15378.84	0.07
Reach	390.9232	100 yr	204000.00	474.82	518.95	492.19	519.00	0.000028	2.49	187261.40	15424.14	0.07
Reach	390.9232	500 yr	280000.00	474.82	520.58	494.91	520.64	0.000037	2.98	212563.60	15591.22	0.08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Ground
Ineff
Bank Sta
Elevation (ft)
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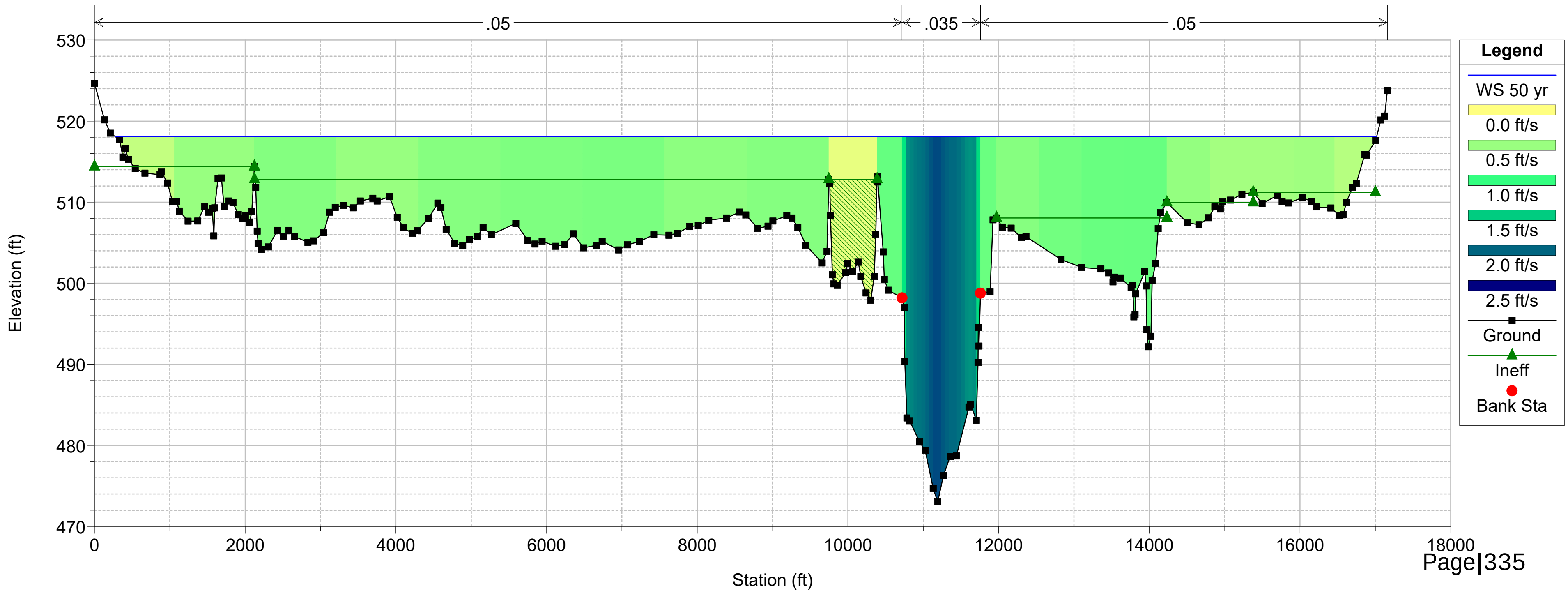
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WS 50 yr
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Bank Sta
Elevation (ft)
Station (ft)
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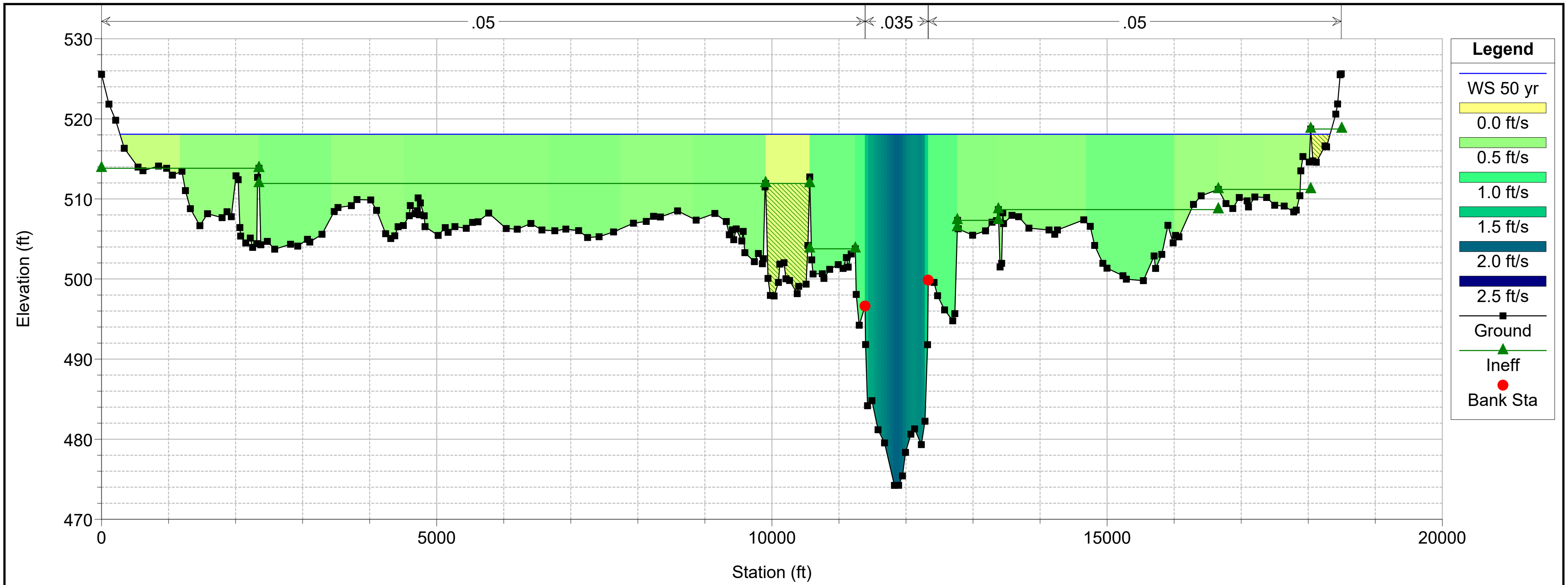
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Legend
WS 50 yr
0.0 ft/s
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Ground
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Station (ft)
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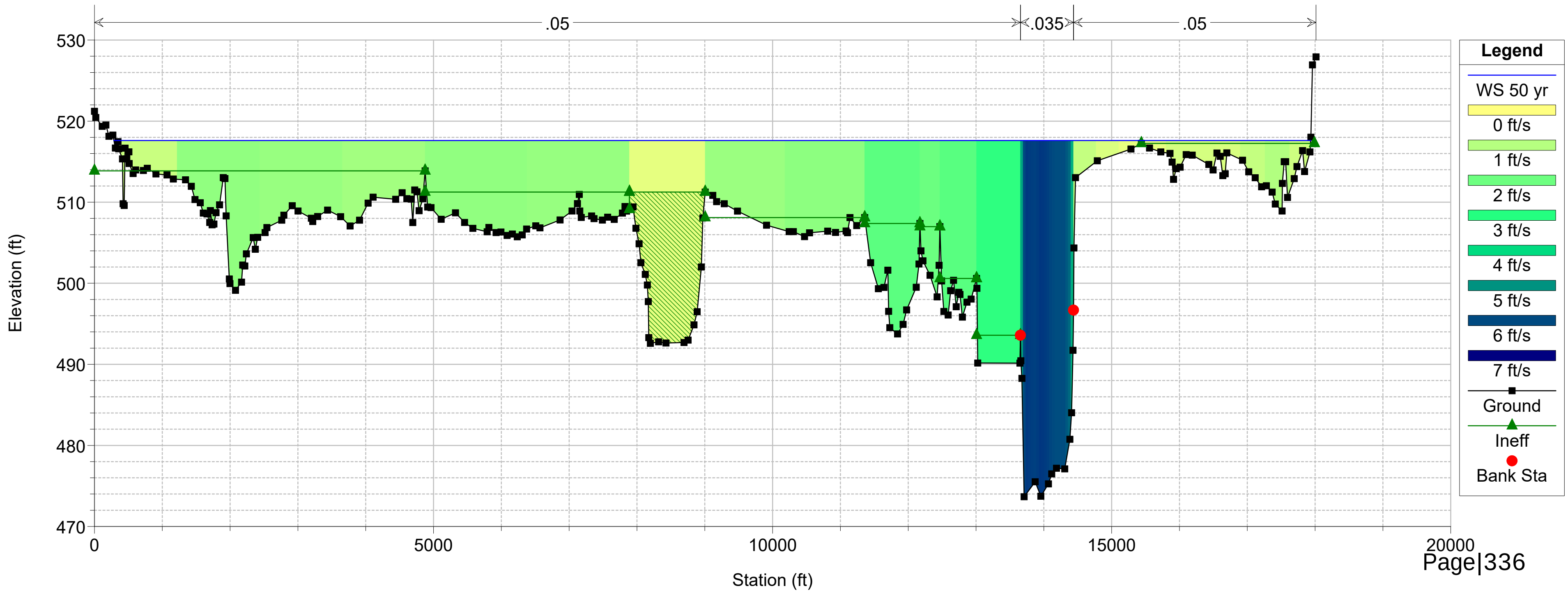
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Legend
WS 50 yr
0 ft/s
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
7 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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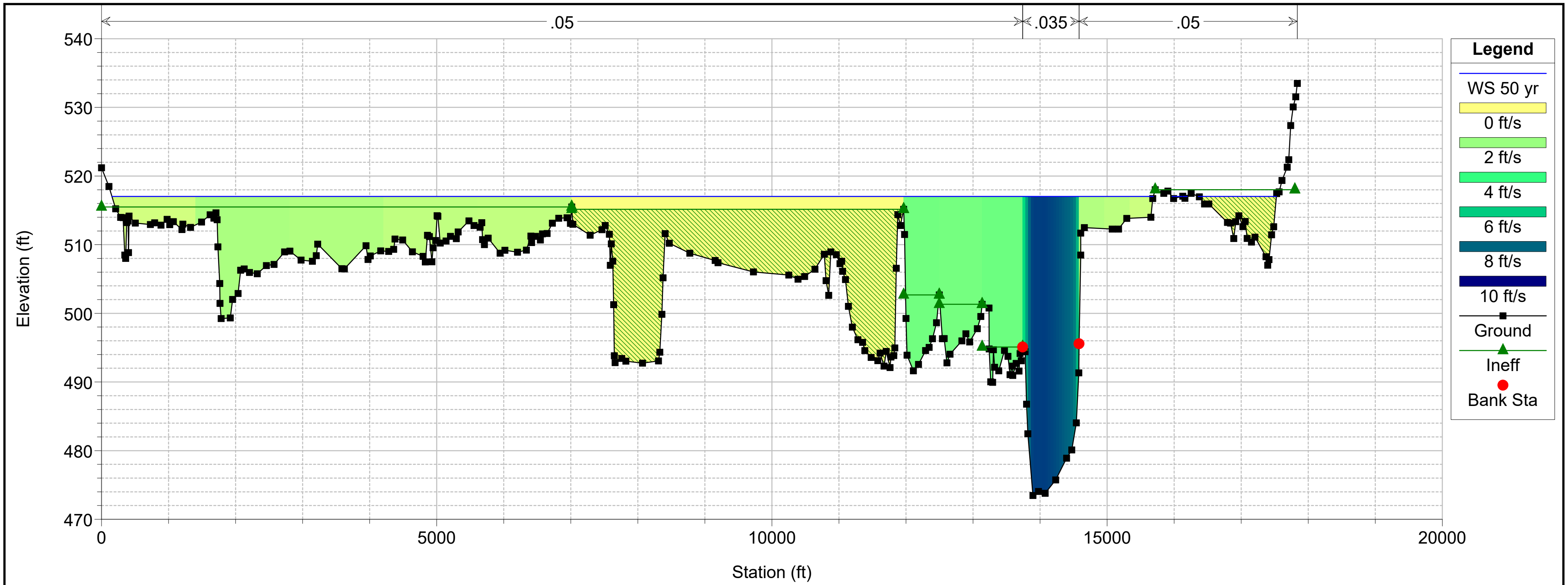
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Elevation (ft)
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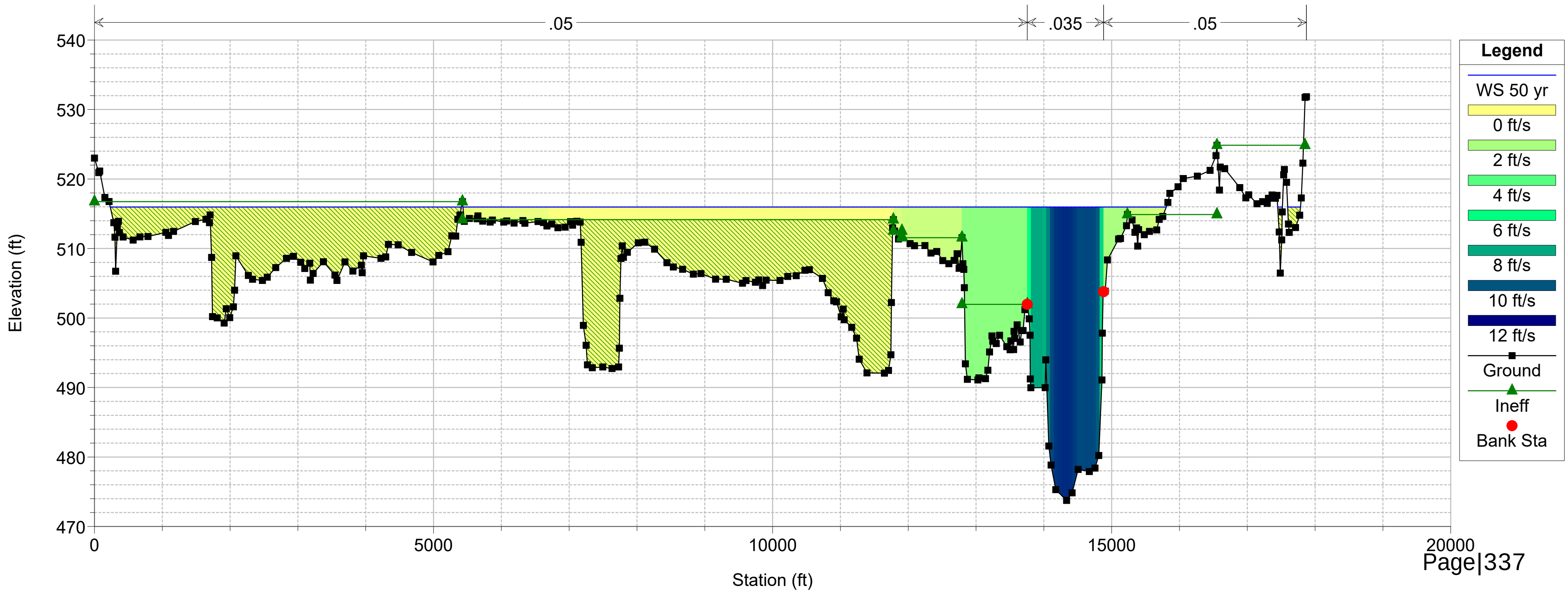
Station (ft)
Legend
WS 50 yr
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
Ground
Ineff
Bank Sta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Elevation (ft)
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Station (ft)
Legend
WS 50 yr
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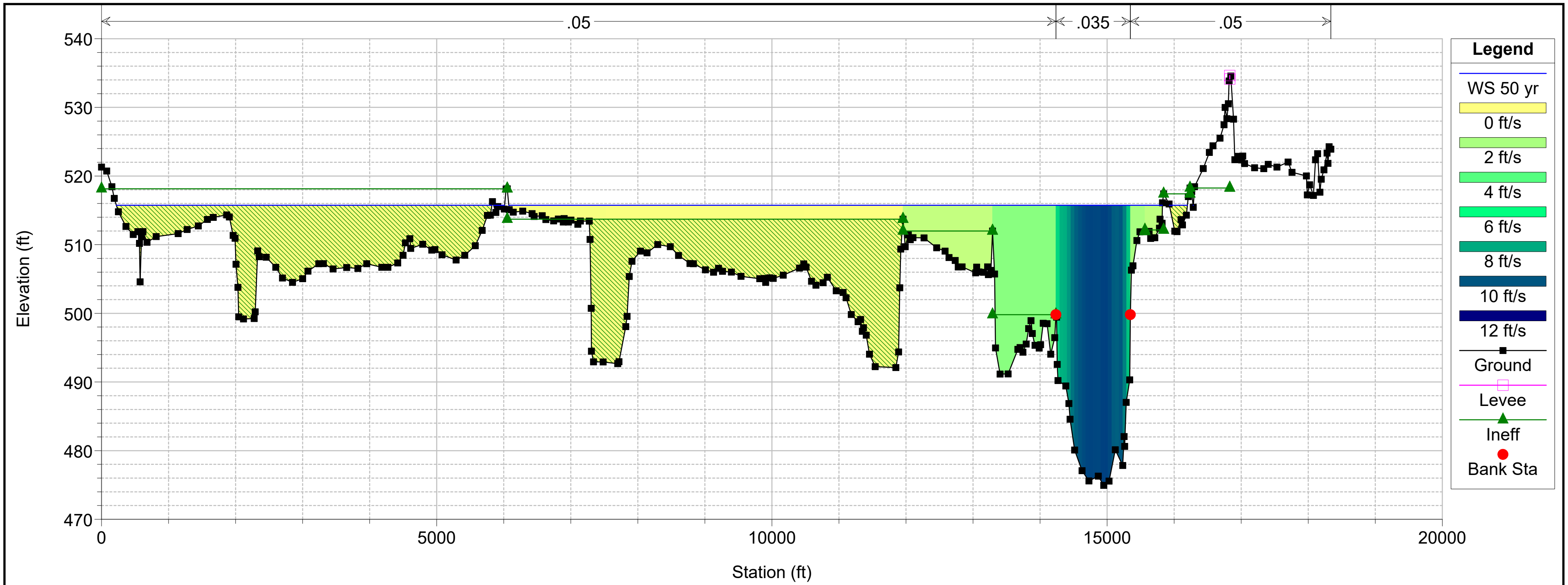
10 ft/s
12 ft/s
Ground
Ineff
Bank Sta



.05
.035
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Legend
WS 50 yr
0 ft/s
2 ft/s
4 ft/s
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8 ft/s
10 ft/s
12 ft/s
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
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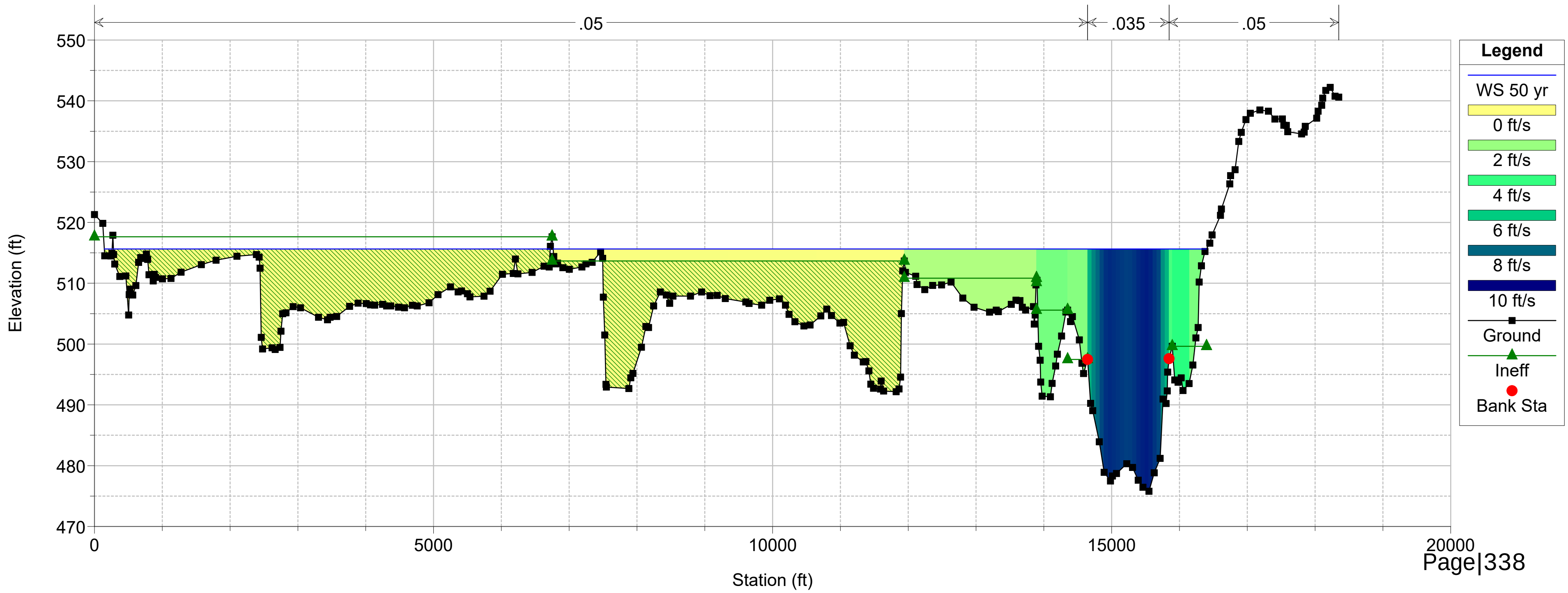

.05
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Legend
WS 50 yr
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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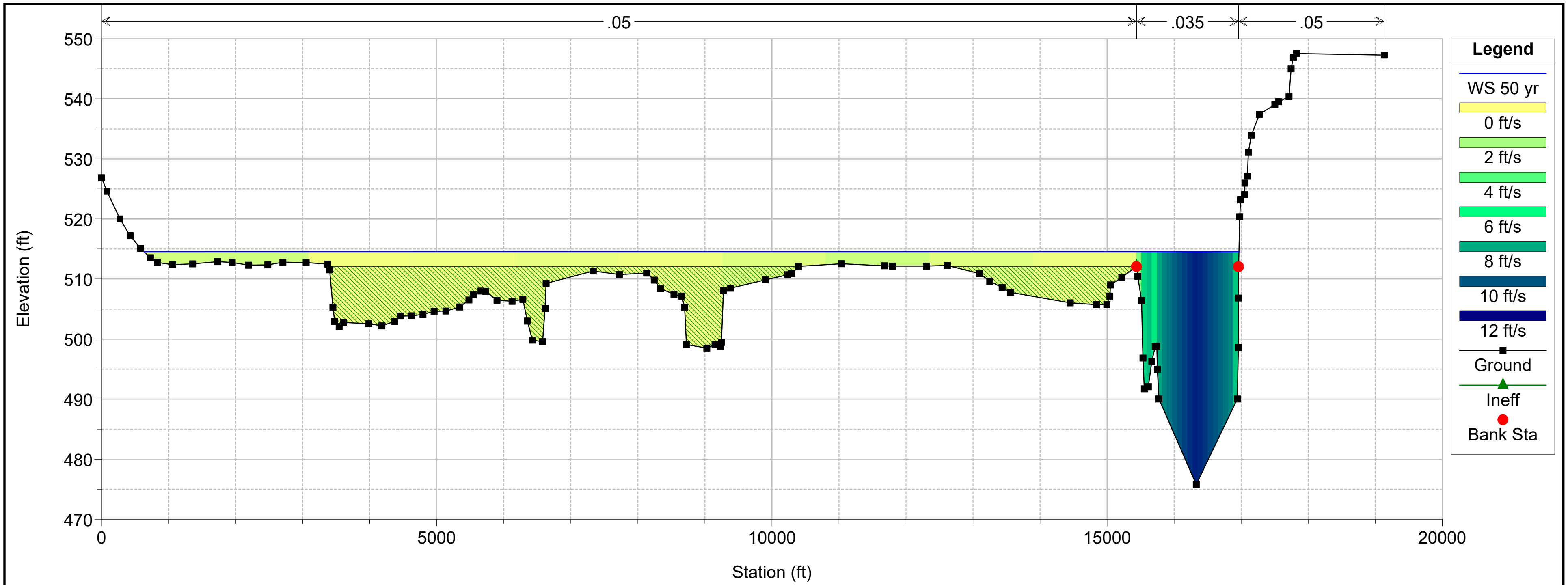
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Elevation (ft)
0
5000
10000
15000
20000
Station (ft)
Legend
WS 50 yr
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Ineff
Bank Sta

Appendix G - Survey Drawings

SURVEY DATA SHEETS

ROGERS COUNTY
PORT OF CATOOSA

SWO 5532(1)
STATE JOB NO. 35257(04)

McCLELLAN-KERR ARKASAS RIVER NAVIGATION SYSTEM (MKARNS(- MOORINGS MODERNIZATION

SURVEY CONTROL DATA

1. POSITIONAL CONTROL:

   A. POSITIONAL CONTROL FOR THIS SURVEY IS THE NGS OKLAHOMA STATE PLANE COORDINATE SYSTEM, NAD83 (2011), LAMBERT PROJECTION (NORTH ZONE).

   B. ACCURACY - THE POSITIONAL CONTROLS FOR THIS SURVEY MEETS OR EXCEEDS THE FOLLOWING ACCURACY CRITERIA:
      1. NETWORK ACCURACY: 0.10 FOOT
      2. LOCAL ACCURACY: 0.05 FOOT

2. BEARINGS:

   THE BEARINGS SHOWN HEREIN OR HEREON ARE GRID BEARINGS DERIVED FROM THE NGS OKLAHOMA STATE PLANE COORDINATE SYSTEM AND ARE NOT ASTRONOMICAL. THE ANGLE OF VARIANCE BETWEEN GRID NORTH (GN) AND THE ASTRONOMICAL TRUE NORTH (TN) IS DEPICTED DIAGRAMMATICALLY.

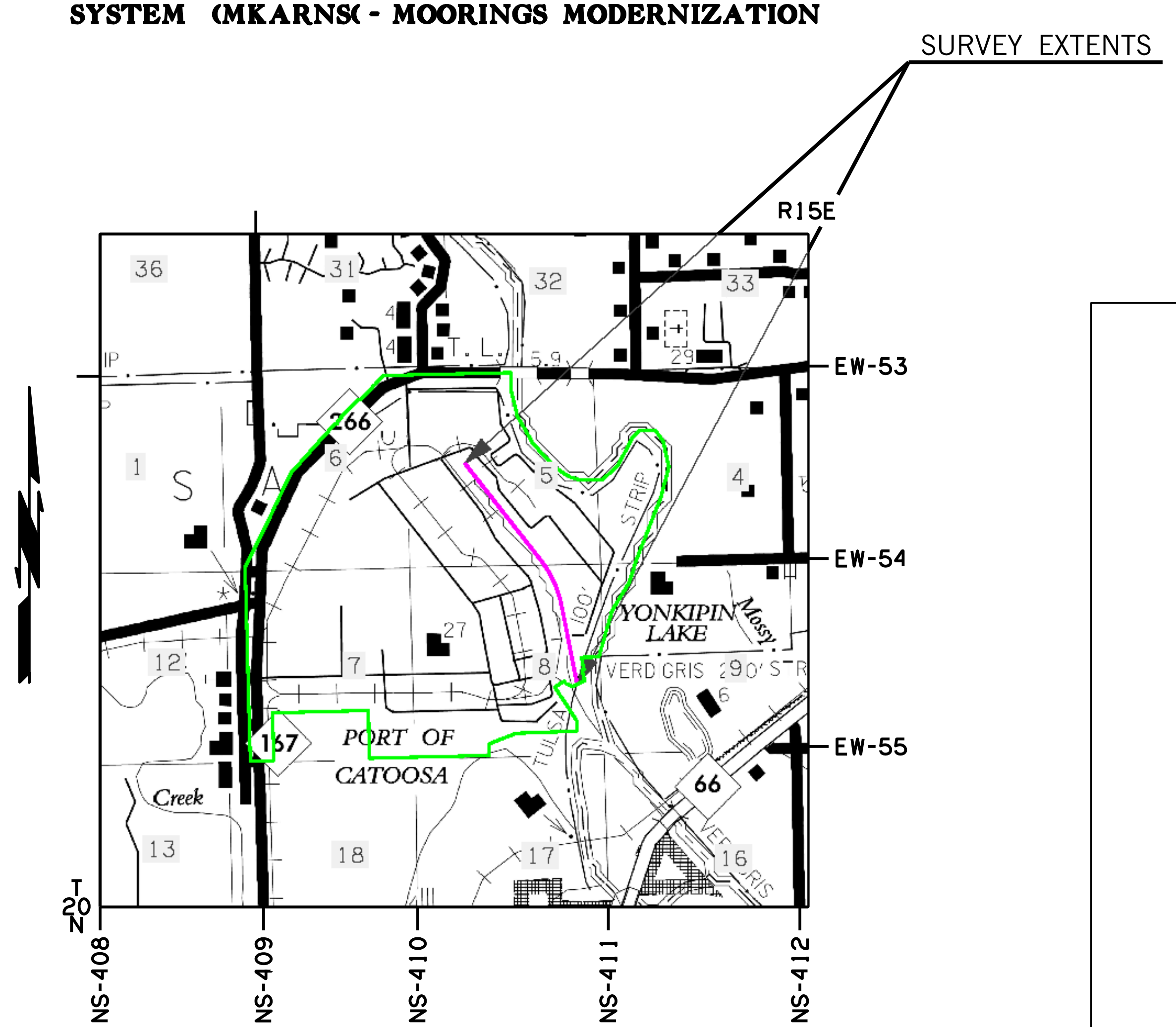
3. VERTICAL CONTROLS:

   A. LEVEL DATUM IS NAVD 88 FROM STATIC GPS.

   B. ACCURACY - VERTICAL CONTROL FOR THIS SURVEY MEETS OR EXCEEDS THE FOLLOWING ACCURACY CRITERIA:
      1. NETWORK ACCURACY (FROM GPS OR LEVELING): 0.10 FOOT
      2. LOCAL ACCURACY (CONFIRMED BY LEVELING): 0.02 FOOT

UTILITIES CONTACTED

THERE ARE NO UTILITIES WITHIN THIS SITE



PROJECT LENGTH 7000.00 Ft. 1.33 MI.

BEGINNING STATION : 100+00.00
ENDING STATION : 170+00.00

INDEX OF SHEETS

SURVEY BEGAN:	6/21/2021
SURVEY COMPLETED:	10/29/2021

PERSONNEL:	**TITLE:**
C.E. Harris	Professional Land Surveyor
K.A. Felder	Professional Land Surveyor
D.A. McPeek	Professional Land Surveyor
K.L. Belveal	Tech III
C.J. Guffey	Tech II
K.F. Slater	Tech II
T.N. Rolland	Tech I
R.L. Smith	Tech I
W.D. Wilson	Tech I
T.D. Lee	CAD Tech III
D.R. Tapp	CAD Tech II

EQUIPMENT:
- Topcon Hiper II
- GR-3 GPS Receivers
- Topcon PS Total Station
- Topcon DL-503 Digital Level
- Coda Octopus

STATE OF OKLAHOMA
DEPARTMENT OF TRANSPORTATION

SWO 5532 (1) Job/Piece 35257(04) Engr. Contract No. 2320

LAND SURVEYOR'S CERTIFICATION

I hereby certify that all land and property sub-division distances, angles, corners, and monumentation made or used in conjunction with this survey and depicted or recorded herein or hereon were recovered, established or re-established in substantial conformity with:

- Applicable instructions contained in the U.S. Government Bureau of Land Management publication **"Manual of Survey Instruction"**,
- Its supplement, **"Restoration of Lost or Obliterated Corners and Sub-division of Sections"**;
- **"Oklahoma Minimum Standards for the Practice of Land Surveying"** as adopted by the State Board of Licensure for Professional Engineers and Land Surveyors; **and**
- Sound land surveying practices;

including a thorough search, study, analysis and consideration of all existing records and field evidence.

I further certify that all survey monuments depicted exist and that all land survey work was done by me or under my direct supervision.

Dated this 29th day of October, 20 21.

LICENSED PROFESSIONAL LAND SURVEYOR
CAREY E. HARRIS
1719
OKLAHOMA

Land Surveyor ____
Signature

Carey E. Harris
Printed Name

Oklahoma Licensed Land Surveyor No. 1719

Certificate of Authorization No. 5877 Exp. 6/30/2023

SCALES

SURVEY DATA SHEETS	1" =50' TOWN
SURVEY DATA SHEETS	1" =100'
GEOMETRIC DATA SHEETS	1" =500'

THIS SURVEY MEETS THE OKLAHOMA MINIMUM STANDARDS FOR THE PRACTICE OF LAND SURVEYING AS ADOPTED BY THE OKLAHOMA STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS, SEPTEMBER 14, 2018.

SPECIFICATIONS FOR SURVEYS FOR PRIMARY AND SECONDARY HIGHWAYS DATED JANUARY, 2018 GOVERN.

BEFORE YOU DIG CALL OKIE CALL 811

Keystone

PLS	CEH	10-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	10-21	SURVEY DATA SHEET
CHECKED	TDL	10-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S001

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION (405)-521-2621 FAX 405-522-0364

Date: October 29, 2021

To	Mr. Kyle King, Chief of Surveys
From	Carey E. Harris, Professional Land Surveyor
Subject	SWO 5532(1) – J/P No. 35257(04) – Port of Catoosa – Rogers County McClellan-Kerr Arkansas River Navigation System (MKARNS) - Moorings Modernization

1. SURVEY ASSIGNMENT:
   This survey was assigned to me by Mr. King under E.C. 2320. All measurements are in U.S. Survey Feet.
2. PURPOSE OF SURVEY:
   The purpose of this survey was to furnish sufficient data to develop construction plans for the moorings at the Port of Catoosa.
3. SURVEY LIMITS:
   The Survey begins at the south end of the port and extends northerly to the north end of the port. Limits are from the east / west top of banks, including riverbed.
4. ALIGNMENT:
   The Centerline of Survey for this project is the approximate split between the waters edge on the east / west waterline.
5. STATIONING:
   The Stationing for the survey was derived from assigning P.O.T. Sta. 100+00.00 at the beginning of survey and carried northerly without equations.
6. HORIZONTAL CONTROL:
   This project is on Oklahoma State Plane NAD 1983 (2011) North Zone. Using the provided ODOT stations: R-66-389 and R-66-972 from SWO4099(1) and R-66-1174 from SWO5148(1) and verified with RTN Network.
7. VERTICAL CONTROL:
   Level datum is Mean Sea Level (NGS), NAVD 1988 datum. Elevations were established from provided ODOT stations: R-66-389 and R-66-972 from SWO4099(1) and R-66-1174 from SWO5148(1) and verified with RTN Network.
8. TOPOGRAPHY:
   A. Aerial LiDar was performed on this project. Field work consisted of obtaining topographic and level data to supplement the LiDar data via break line method. Riverbed was collected by the engineer of record, Consor.
   B. All data obtained in the Field was recorded in a digital format and archived.

9. CROSS SECTION /DTM
   A DTM has been made for this project by the field crew in coordination with Consor, who collected and provided riverbed elevations.
10. LAND TIES:
    Land tied we not established under this contract. The Port of Catoosa is completely contained and owned by the City of Tulsa. We collected enough land ties to accurately tie down the City of Tulsa property line around the port. The U.S. Army Corps of Engineers boundary line does not affect this project.
11. RIGHT-OF-WAY:
    There is no existing right of way on this project.
12. UTILITIES:
    A. There are no utilities within the survey limits.
13. ENVIRONMENTAL CONCERNS:
    No environmental concerns seen at time of survey.
14. EQUIPMENT USED:
    All data was obtained with Topcon Hiper II and GR-3 GPS receivers, Topcon PS Total Station, Topcon DL-503 digital level, and IG3S Static Receivers.
    Consor used a Coda Octopus hydrographic scanner to collect the riverbed.
15. TIME CHARGES:
    This survey began June 21, 2021 and was completed October 29, 2021. A total of 880 hours was spent.
16. DATA SUBMITTED:
    A. REPORTS:
       1. Historical Letter and Written Report
       2. ODOT form SD-1, Transmittal Letter
       3. ODOT form SD-7, Public and Private Owned Utilities
       4. ODOT form SD-20, Survey Control Data Statement
       5. ODOT form SD-41, Surveyor's Certification
       6. Alignment Report
       7. Cogo Data
       8. Benchmarks and Check Levels list
       9. Ownership list
       10. OSSDA Field Verification Form
       11. GPS on Benchmark

    B. COMPUTER FILES:
       1. SWO5532_1_v1_Catoosa.dgn
       2. SWO5532_1_v1_topo_Catoosa.dgn
       3. SWO5532_1_v1_sff_Catoosa.dgn
       4. SWO5532_1_v1_tri_Catoosa.dgn
       5. SWO5532_1_v1_peri_Catoosa.dgn
       6. SWO5532_1_v1_cogo_Catoosa.txt
       7. SWO5532_1_v1_Catoosa.alg
       8. SWO5532_1_v1_Catoosa.dtm

17. PERSONNEL:
    Other than myself, the following listed personnel worked on this survey:

K.A. Felder	Professional Land Surveyor
D.A. McPeek	Professional Land Surveyor
K.L. Belveal	Tech III
C.J. Guffey	Tech II
K.F. Slater	Tech II
T.N. Rolland	Tech I
R.L. Smith	Tech I
W.D. Wilson	Tech I
T.D. Lee	CAD Tech III
D.R. Tapp	CAD Tech II

18. SURVEY INFORMATION USED:
    SWO's
    SWO4099(1)
    SWO5148(1)

Carey E. Harris
Professional Land Surveyor

PLS	CEH	10-21
DRAWN	TDL	10-21
CHECKED	TDL	10-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

SWO 5532(1)

COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S002

COORDINATE POINT LIST

SWO 5532(1)

Job Piece 35257(04)

Pt No.	EASTING	NORTHING	ELEVATION
1	2637722.3111940	454766.5686520	560.5310
2	2637623.8965190	455063.8463630	575.4420
3	2637495.1768620	455807.6266030	574.6560
4	2637163.9751470	456468.2758000	576.0210
5	2636885.3355050	457066.1978460	575.1340
6	2636459.0513750	457608.2579950	573.5820
7	2636022.4240720	458163.4024310	573.1730
8	2635709.9847950	458659.3836100	574.6440
9	2635353.9914530	459110.3447990	574.0590
10	2634991.2934530	459571.5561790	573.7510
11	2634738.7908260	459892.0133170	574.1510
12	2635932.8349180	459885.0822680	576.9390
13	2636202.7584580	459291.7008010	576.6560
14	2636683.3176060	458665.0592080	581.4690
15	2637084.8351920	458152.1160560	580.9760
16	2637515.4171140	457606.0461220	581.8720
17	2637756.7939660	457136.1685180	572.8740
18	2638080.2810200	456356.5100720	588.5340
19	2638121.2501560	455655.8586410	585.5510
20	2638173.2181120	455406.4480190	586.6000
21	2638444.1934980	454979.0572140	584.8890
R-66-1252	2637769.8015480	454056.8732970	578.3960
R-66-1253	2635482.8116900	460459.7521450	576.1850
7400	2637769.8015480	454056.8732970	578.3960
7401	2635482.8116900	460459.7521450	576.1850
300	2638188.7862266	454018.9190856	
301	2637756.4187592	456189.9306930	
302	2637616.6414334	456891.7832139	
303	2634814.1995022	455603.9734902	
304	2637175.0963756	457454.9640232	
305	2635088.8210030	460115.9614277	

Pt No.	EASTING	NORTHING
8001	2636362.2601510	462617.1639550
8002	2634683.8705940	462577.4223560
8003	2633517.6009670	462550.5141100
8004	2632845.9961390	462535.6182180
8005	2632224.7041710	461882.7278150
8006	2632151.9560150	461880.9449090
8007	2631566.9056140	461263.2673060
8008	2631568.4454390	461203.2870680
8009	2631507.5737170	461201.7952280
8010	2630294.3508360	459844.6924480
8011	2629657.5367540	458508.3485080
8012	2629033.7868020	457241.4328130
8013	2629035.6507340	457172.2779280
8014	2629177.7541210	451900.0126370
8015	2629822.7603650	451915.8235300
8016	2629790.1063370	453234.1191740
8017	2632429.2999940	453299.3636600
8018	2632461.9676410	451980.5181850
8019	2633781.5712420	452012.8653310
8020	2634524.7779870	452031.0833910
8021	2635762.9816320	452061.4351990
8022	2635756.4969440	452328.5154000
8023	2635755.2828210	452378.5006570
8024	2636499.9290200	452670.9079720
8025	2638178.7983000	452732.5354170
8026	2638167.7933990	453032.3335020
8027	2637569.3933740	453943.3864150
8028	2637820.1418830	454108.0836700
8029	2637843.5968380	454099.4312110
8030	2637867.5572380	454044.7067480
8031	2638064.3803050	453958.1869220
8032	2638392.3826210	454118.3102510
8033	2638328.6239880	454411.4566940
8034	2638377.4817290	454422.0831320

Pt No.	EASTING	NORTHING
8035	2638303.0966570	454764.0873150
8036	2638783.3161130	454776.1127530
8037	2638980.2935070	455461.6758770
8038	2639151.1554490	456056.3463820
8039	2639629.1510740	456842.3317440
8040	2639813.0292610	457441.9617200
8041	2640492.5052120	459174.1510020
8042	2640715.2880470	460021.1418210
8043	2640560.5919480	460711.7478710
8044	2640338.2807270	461032.6560710
8045	2639913.0058400	461021.1688750
8046	2639689.0592200	460793.8946440
8047	2639529.6815250	460472.3682070
8048	2639288.5146290	460030.8616780
8049	2638872.7292080	459662.9658830
8050	2638279.0428720	459646.3075100
8051	2637970.1598420	459745.9266660
8052	2637592.4939520	459988.3189380
8053	2636969.2939650	460654.0254400
8054	2636533.1705290	461430.9577990
8055	2636365.2526650	462129.6531390

PLS	CEH	10-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	10-21	SURVEY DATA SHEET SWO 5532(1)
CHECKED	TDL	10-21	
APPROVED			
CREW			

COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S003

CHECK LEVELS SWO 5532(1) - J/P 35257(04) BENCHMARKS LIST NAVD 88 DATUM

BM NO.	RUN 1	RUN 2	MEAN DIFF.	ADJ. DIFF.	ADJ. ELEV.	PUBLISHED ELEVATION	BM DESCRIPTION, STA/OFFSET Page 1 of 3
CONTROL POINT R-66-1252						578.3960	Mag Nail w/washer (Keystone Benchmark) Sta. 101+19.06 403.50' Lt
to	-17.862	-17.868	-17.865	-17.865			
BM 1					560.5309		Mag Nail w/washer (Keystone Benchmark) Sta. 108+24.36 311.46' Lt
to	14.912	14.911	14.912	14.911			
BM 2					575.4422		Mag Nail w/washer (Keystone Benchmark) Sta. 111+35.14 349.92' Lt
to	-0.784	-0.789	-0.787	-0.787			
BM 3					574.6556		Mag Nail w/washer (Keystone Benchmark) Sta. 118+89.73 330.88' Lt
to	1.365	1.366	1.366	1.365			
BM 4					576.0210		Mag Nail w/washer (Keystone Benchmark) Sta. 126+81.29 496.31' Lt
to	-0.886	-0.888	-0.887	-0.887			
BM 5					575.1338		Mag Nail w/washer (Keystone Benchmark) Sta. 134+68.13 464.71' Lt
to	-1.554	-1.550	-1.552	-1.552			
BM 6					573.5817		Mag Nail w/washer (Keystone Benchmark) Sta. 141+81.10 468.92' Lt
to	-0.408	-0.409	-0.409	-0.409			
BM 7					573.1730		Mag Nail w/washer (Keystone Benchmark) Sta. 148+87.37 470.01' Lt
to	1.471	1.471	1.471	1.471			
BM 8					574.6439		Mag Nail w/washer (Keystone Benchmark) Sta. 154+70.47 409.87' Lt
to	-0.587	-0.583	-0.585	-0.585			
BM 9					574.0588		Mag Nail w/washer (Keystone Benchmark) Sta. 160+45.00 411.78' Lt
to	-0.310	-0.305	-0.308	-0.308			

CHECK LEVELS SWO 5532(1) - J/P 35257(04) BENCHMARKS LIST NAVD 88 DATUM

BM NO.	RUN 1	RUN 2	MEAN DIFF.	ADJ. DIFF.	ADJ. ELEV.	PUBLISHED ELEVATION	BM DESCRIPTION, STA/OFFSET Page 2 of 3
BM 10					573.7511		Mag Nail w/washer (Keystone Benchmark) Sta. 166+31.75 412.65' Lt
to	0.400	0.400	0.400	0.400			
BM 11					574.1510		Mag Nail w/washer (Keystone Benchmark) Sta. 170+39.73 413.64' Lt
to	2.037	2.032	2.035	2.034			
CONTROL POINT R-66-1253					576.1854	576.1850	Mag Nail w/washer (Keystone Benchmark) Sta. 170+27.46 522.90' Rt
to	0.754	0.753	0.754	0.753			
BM 12					576.9387		Mag Nail w/washer (Keystone Benchmark) Sta. 162+97.55 521.76' Rt
to	-0.280	-0.285	-0.283	-0.283			
BM 13					576.6561		Mag Nail w/washer (Keystone Benchmark) Sta. 156+64.04 368.06' Rt
to	4.813	4.814	4.814	4.813			
BM 14					581.4695		Mag Nail w/washer (Keystone Benchmark) Sta. 148+74.39 359.61' Rt
to	-0.493	-0.493	-0.493	-0.493			
BM 15					580.9763		3/4" Rebar w/cap (Keystone Benchmark) Sta. 142+22.99 359.11' Rt
to	0.896	0.896	0.896	0.896			
BM 16					581.8722		3/4" Rebar w/cap (Keystone Benchmark) Sta. 135+37.38 362.27' Rt
to	-8.997	-9.000	-8.999	-8.999			
BM 17					572.8735		Mag Nail w/washer (Keystone Benchmark) Sta. 130+64.10 317.60' Rt
to	15.658	15.664	15.661	15.661			
BM 18					588.5344		3/4" Rebar w/cap (Keystone Benchmark) Sta. 123+03.27 351.66' Rt
to	-2.983	-2.983	-2.983	-2.983			
BM 19					585.5513		3/4" Rebar w/cap (Keystone Benchmark) Sta. 116+18.60 253.49' Rt
to	1.046	1.051	1.049	1.048			

CHECK LEVELS SWO 5532(1) - J/P 35257(04) BENCHMARKS LIST NAVD 88 DATUM

BM NO.	RUN 1	RUN 2	MEAN DIFF.	ADJ. DIFF.	ADJ. ELEV.	PUBLISHED ELEVATION	BM DESCRIPTION, STA/OFFSET Page 3 of 3
BM 20					586.5996		Mag Nail w/washer (Keystone Benchmark) Sta. 113+63.85 255.74' Rt
to	-1.711	-1.711	-1.711	-1.711			
BM 21					584.8885		Mag Nail w/washer (Keystone Benchmark) Sta. 108+91.76 438.02' Rt
to	-6.493	-6.493	-6.493	-6.493			
CONTROL POINT R-66-1252					578.3959	578.3960	Mag Nail w/washer (Keystone Benchmark) Sta. 101+19.06 403.50' Lt

PLS	CEH	10-21
DRAWN	TDL	10-21
CHECKED	TDL	10-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

SWO 5532(1)

COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S004

STATE OF OKLAHOMA
DEPARTMENT OF HIGHWAYS
SURVEY DIVISION
POSITION AND DESCRIPTION OF SURVEY MONUMENTS

S.D. FORM NO. 11
REVISED 02/05/2018

COUNTY ROGERS | Monument Number R-66-1252 | SWO 5532(1) | DATE 10/13/2021

TYPE OF MONUMENT MAG NAIL W/ "CA5877" WASHER MONUMENT SET FOR HORIZONTAL & VERTICAL CONTROL

WRITTEN DESCRIPTION OF LOCATION: LOCATED NEAR THE PORT OF CATOOSA, APPROXIMATELY 1650' EAST AND 560' NORTH OF THE INTERSECTION OF FT. GIBSON RD. AND BIRD CREEK AVE, JUST SOUTH OF AN ENTRANCE TO A BOAT RAMP Sta. 101+19.08 403.5' LT

ESTABLISHED BY: KEYSTONE ENGINEERING

COORDINATE SYSTEM: NAD83 (2011) ZONE: OK NORTH

COORDINATES (FEET) X 2637769.8015 Y 454056.8733

GEODETIC POSITION

LATITUDE 36°13'33.0875" NORTH

LONGITUDE 95°43'50.5195" WEST

ELLIPSOIDAL HEIGHT 482.7021

METHOD USED TO ESTABLISHED: RTN NETWORK, CHECKED TO ODOT STATION NUMBERS R-66-389 & R-66-972 FROM SWO 4099(1) AND R-66-1174 FROM SWO 5148(1).

SOURCE: GPS USING RTN NETWORK

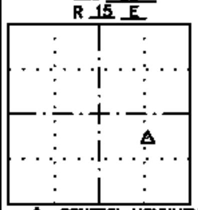
ORTHOMETRIC HEIGHT

578.3960 FEET GEOID MODEL: GEOID18 GEOID SEPARATION: 95.6939 FEET

METHOD USED TO ESTABLISHED: RTN NETWORK, CHECKED TO ODOT STATION NUMBERS R-66-389 & R-66-972 FROM SWO 4099(1) AND R-66-1174 FROM SWO 5148(1).

SOURCE: DIFFERENTIAL LEVELING USING DIGITAL LEVELS

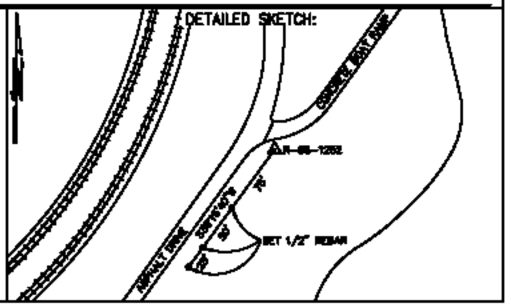
GENERAL VICINITY:
SEC 08
R 15 E



T 20 N

△= CONTROL MONUMENT
⊙= LAND CORNER
⊡= OTHER

DETAILED SKETCH:



STATE OF OKLAHOMA
DEPARTMENT OF HIGHWAYS
SURVEY DIVISION
POSITION AND DESCRIPTION OF SURVEY MONUMENTS

S.D. FORM NO. 11
REVISED 02/05/2018

COUNTY ROGERS | Monument Number R-66-1253 | SWO 5532(1) | DATE 10/13/2021

TYPE OF MONUMENT MAG NAIL W/ "CA5877" WASHER MONUMENT SET FOR HORIZONTAL & VERTICAL CONTROL

WRITTEN DESCRIPTION OF LOCATION: LOCATED NEAR THE PORT OF CATOOSA, APPROXIMATELY 1070' EAST AND 160' NORTH OF THE INTERSECTION NORTH CHANNEL ROAD AND WEST CHANNEL ROAD, IN THE SOUTHWESTERLY CURB OF NORTH CHANNEL ROAD. Sta. 170+27.46 522.9' RT

ESTABLISHED BY: KEYSTONE ENGINEERING

COORDINATE SYSTEM: NAD83 (2011) ZONE: OK NORTH

COORDINATES (FEET) X 2635482.6117 Y 460459.7521

GEODETIC POSITION

LATITUDE 36°14'39.8175" NORTH

LONGITUDE 95°44'16.6060" WEST

ELLIPSOIDAL HEIGHT 480.4743

METHOD USED TO ESTABLISHED: RTN NETWORK, CHECKED TO ODOT STATION NUMBERS R-66-389 & R-66-972 FROM SWO 4099(1) AND R-66-1174 FROM SWO 5148(1).

SOURCE: GPS USING RTN NETWORK

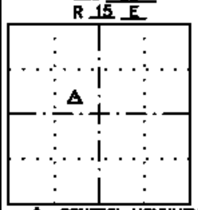
ORTHOMETRIC HEIGHT

576.1850 FEET GEOID MODEL: GEOID18 GEOID SEPARATION: 95.7107 FEET

METHOD USED TO ESTABLISHED: RTN NETWORK, CHECKED TO ODOT STATION NUMBERS R-66-389 & R-66-972 FROM SWO 4099(1) AND R-66-1174 FROM SWO 5148(1).

SOURCE: DIFFERENTIAL LEVELING USING DIGITAL LEVELS

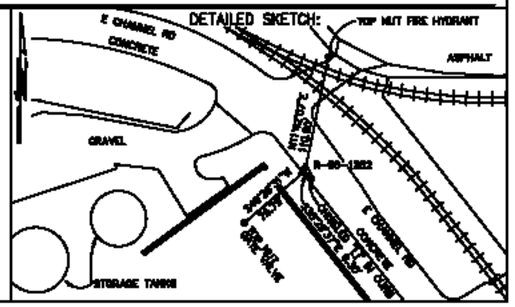
GENERAL VICINITY:
SEC 05
R 15 E



T 20 N

△= CONTROL MONUMENT
⊙= LAND CORNER
⊡= OTHER

DETAILED SKETCH:




```
           Project Name: swo5532_1_v1_Catoosa
            Description: Port of Catoosa - MKARNS
Horizontal Alignment Name: A001
            Description: Centerline Port of Catoosa
                  Style: Centerline
                                  STATION        EASTING      NORTHING

Element: Linear
          POB  (      300)       100+00.00  2638188.7862   454018.9191
           PC  (      301)       122+13.65  2637756.4188   456189.9307
       Tangent Direction:   N 11^15'48.11" W
          Tangent Length:         2213.647

Element: Circular
           PC  (      301)       122+13.65  2637756.4188   456189.9307
           PI  (      302)       129+29.28  2637616.6414   456891.7832
           CC  (      303)                  2634814.1995   455603.9735
           PT  (      304)       136+18.66  2637175.0964   457454.9640
                  Radius:         3000.000
                   Delta:     26^50'01.66" Left
  Degree of Curvature(Arc):      1^54'35.49"
                  Length:         1405.014
                 Tangent:          715.636
                   Chord:         1392.209
         Middle Ordinate:           81.878
                External:           84.175
       Tangent Direction:   N 11^15'48.11" W
        Radial Direction:   N 78^44'11.89" E
         Chord Direction:   N 24^40'48.94" W
        Radial Direction:   N 51^54'10.23" E
       Tangent Direction:   N 38^05'49.77" W

Element: Linear
           PT  (      304)       136+18.66  2637175.0964   457454.9640
          POE  (      305)       170+00.00  2635088.8210   460115.9614
       Tangent Direction:   N 38^05'49.77" W
          Tangent Length:         3381.339

   Total Length of Alignment A001:   7000.000
```

Page 1

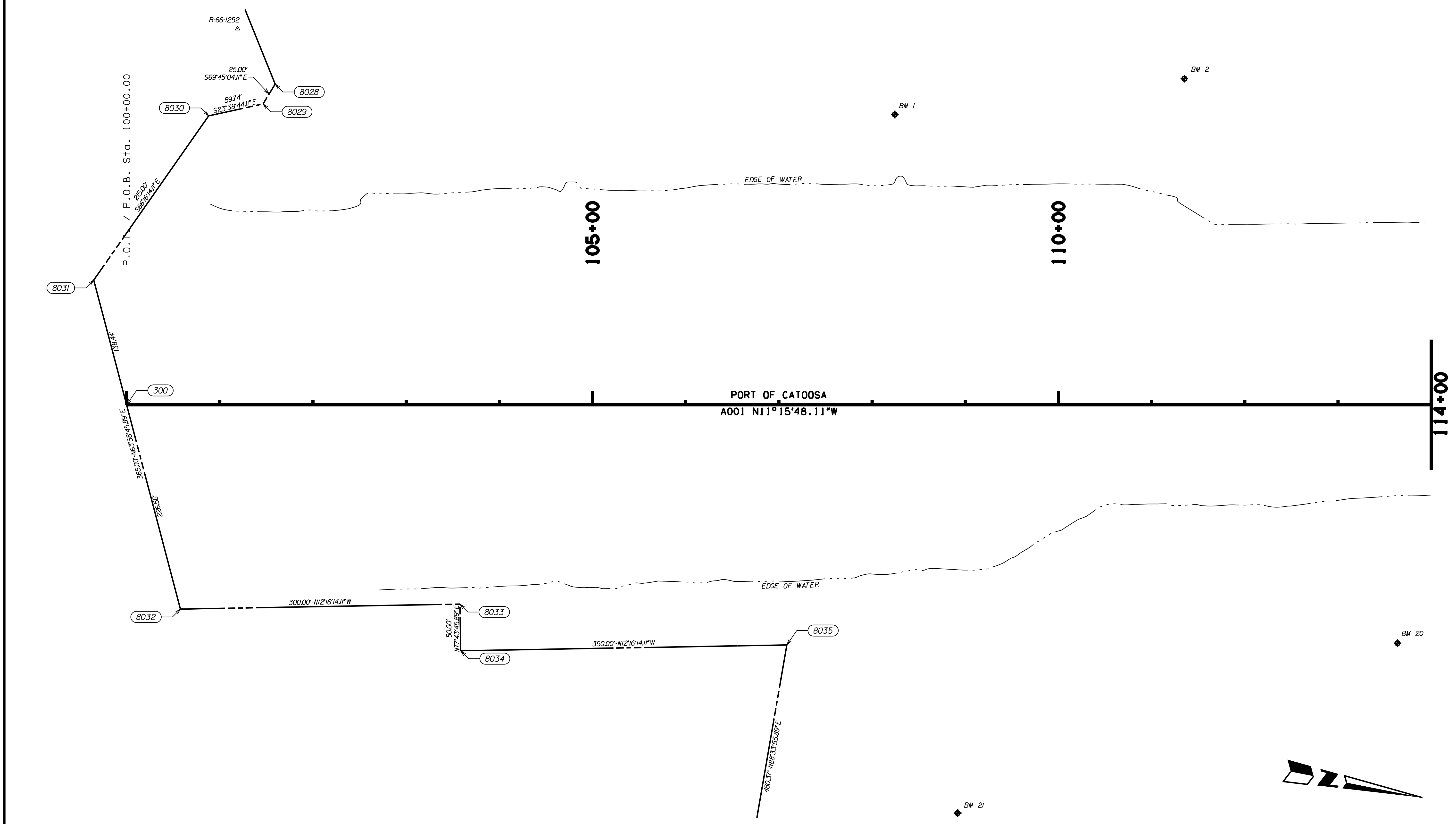
PLS	CEH	10-21
DRAWN	TDL	10-21
CHECKED	TDL	10-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

SWO 5532(1)

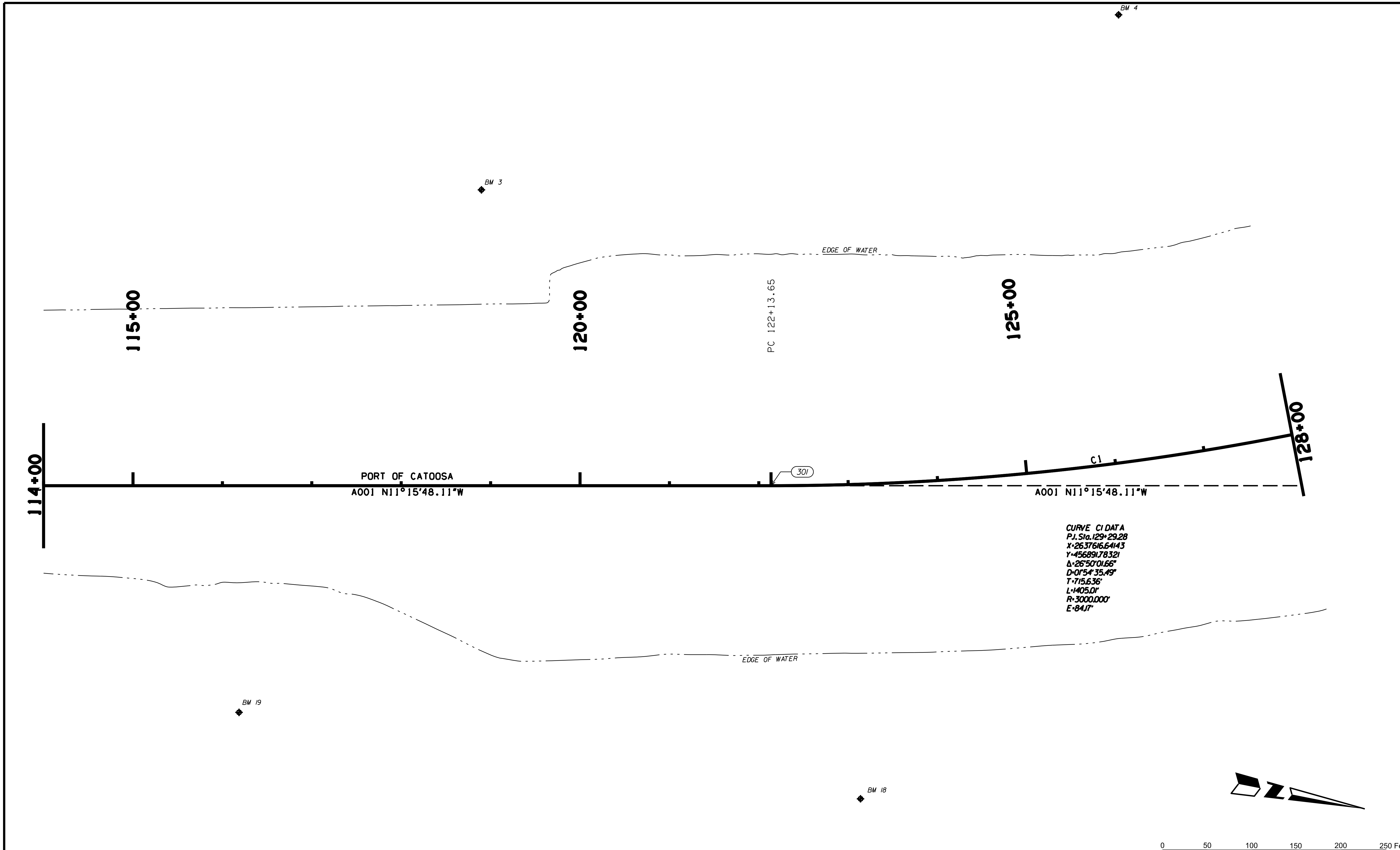
COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S005



SCALE 0 50 100 150 200 250 Feet

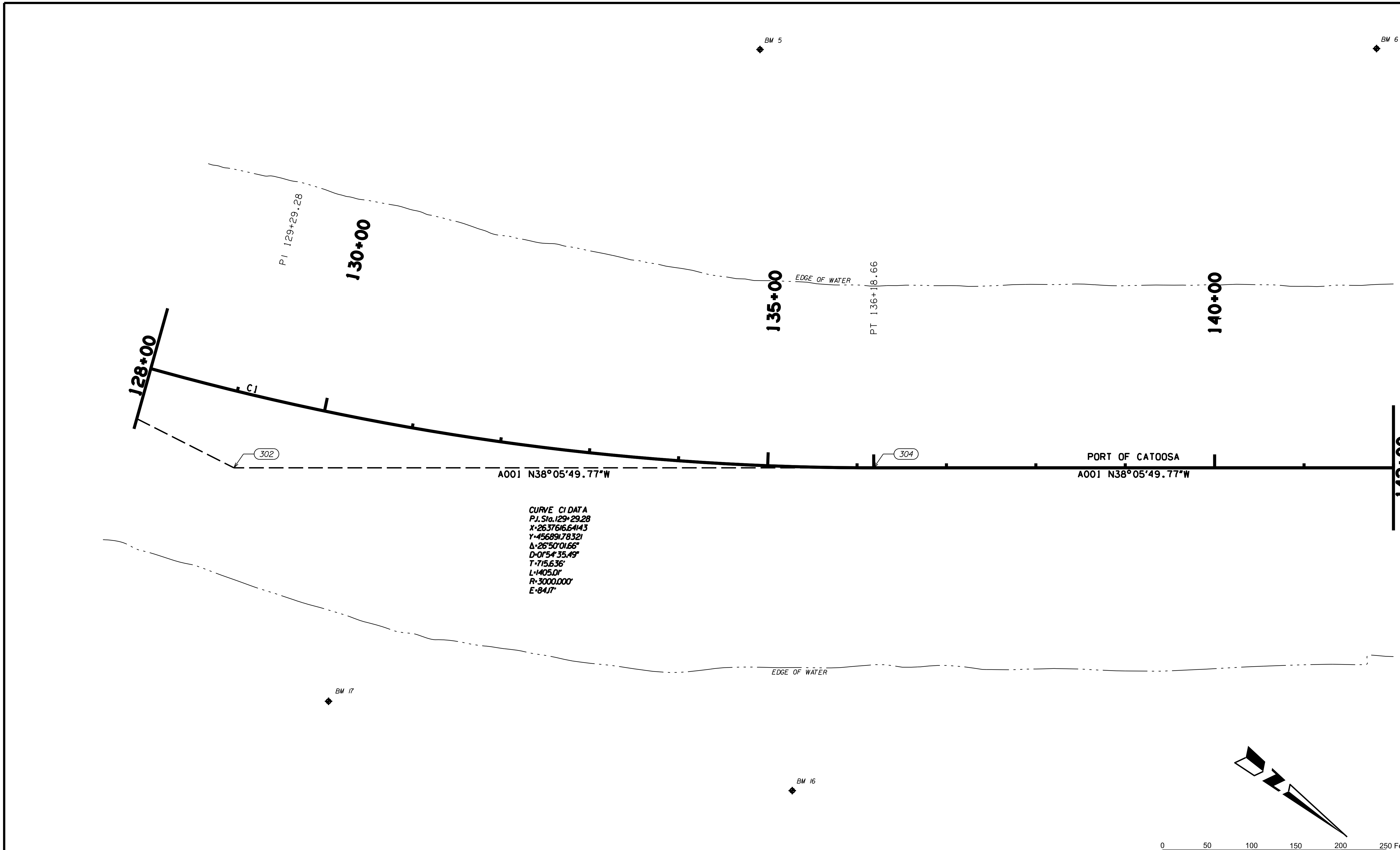
PLS	CEH	10-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	10-21	SURVEY DATA SHEET
CHECKED	TDL	10-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S006



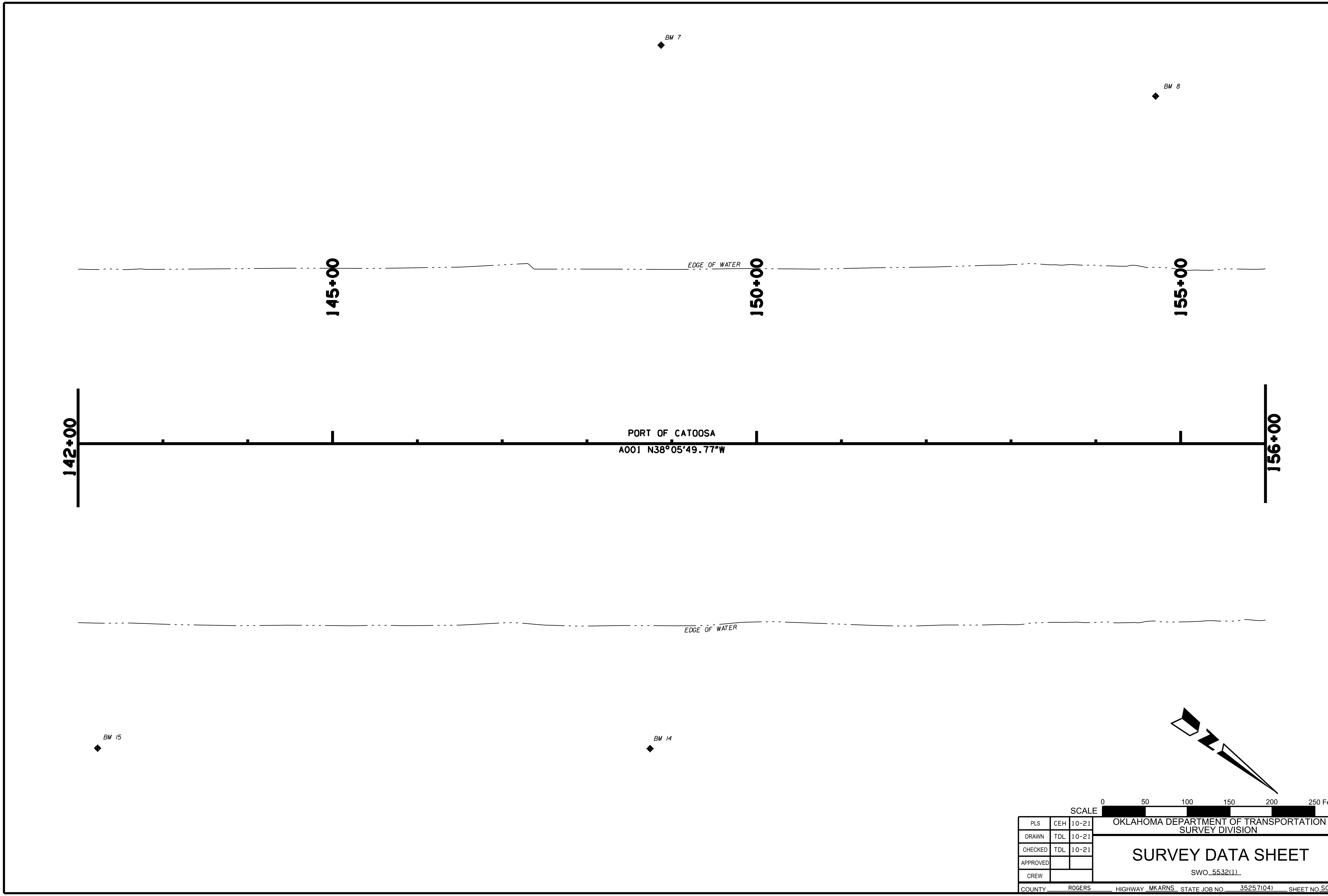
PLS	CEH	10-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	10-21	SURVEY DATA SHEET SWO 5532(1)
CHECKED	TDL	10-21	
APPROVED			
CREW			

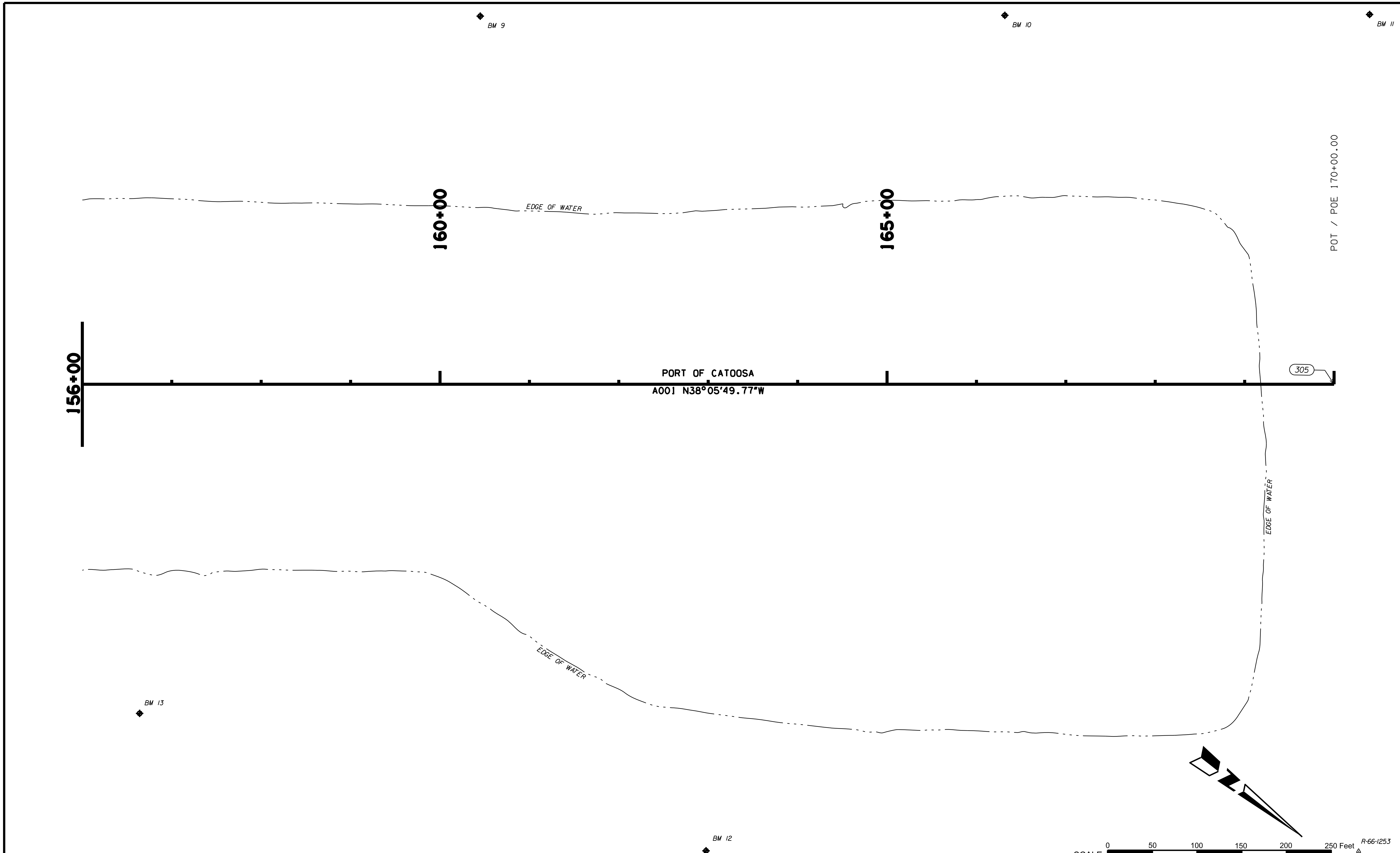
COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S007



PLS	CEH	10-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	10-21	SURVEY DATA SHEET
CHECKED	TDL	10-21	
APPROVED			
CREW			SWO 5532(1)

COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S008


BM 7
BM 8
EDGE OF WATER
145+00
150+00
155+00
142+00
156+00
PORT OF CATOOSA
A001 N38°05'49.77"W
EDGE OF WATER
BM 15
BM 14
N
SCALE
0
50
100
150
200
250 Feet
PLS CEH 10-21
DRAWN TDL 10-21
CHECKED TDL 10-21
APPROVED
CREW
OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION
SURVEY DATA SHEET
SWO 5532(1)
COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S009



PLS	CEH	10-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	10-21	SURVEY DATA SHEET
CHECKED	TDL	10-21	
APPROVED			SWO 5532(1)
CREW			

COUNTY ROGERS HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S010

SURVEY DATA SHEETS

MUSKOGEE COUNTY
PORT OF MUSKOGEE

SWO 5532(1)
STATE JOB NO. 35257(04)

McClellan-Kerr Arkansas River Navigation System (MKARNS) - Moorings Modernization at Multiple Locations

SURVEY CONTROL DATA

1. POSITIONAL CONTROL:
   - A. POSITIONAL CONTROL FOR THIS SURVEY IS THE NGS OKLAHOMA STATE PLANE COORDINATE SYSTEM, NAD83 (2011), LAMBERT PROJECTION (NORTH ZONE).
   - B. ACCURACY - THE POSITIONAL CONTROLS FOR THIS SURVEY MEETS OR EXCEEDS THE FOLLOWING ACCURACY CRITERIA:
     1. NETWORK ACCURACY: 0.10 FOOT
     2. LOCAL ACCURACY: 0.05 FOOT
2. BEARINGS:

   THE BEARINGS SHOWN HEREIN OR HEREON ARE GRID BEARINGS DERIVED FROM THE NGS OKLAHOMA STATE PLANE COORDINATE SYSTEM AND ARE NOT ASTRONOMICAL. THE ANGLE OF VARIANCE BETWEEN GRID NORTH (GN) AND THE ASTRONOMICAL TRUE NORTH (TN) IS DEPICTED DIAGRAMMATICALLY.
3. VERTICAL CONTROLS:
   - A. LEVEL DATUM IS NAVD 88 FROM STATIC GPS.
   - B. ACCURACY - VERTICAL CONTROL FOR THIS SURVEY MEETS OR EXCEEDS THE FOLLOWING ACCURACY CRITERIA:
     1. NETWORK ACCURACY (FROM GPS OR LEVELING): 0.10 FOOT
     2. LOCAL ACCURACY (CONFIRMED BY LEVELING): 0.02 FOOT

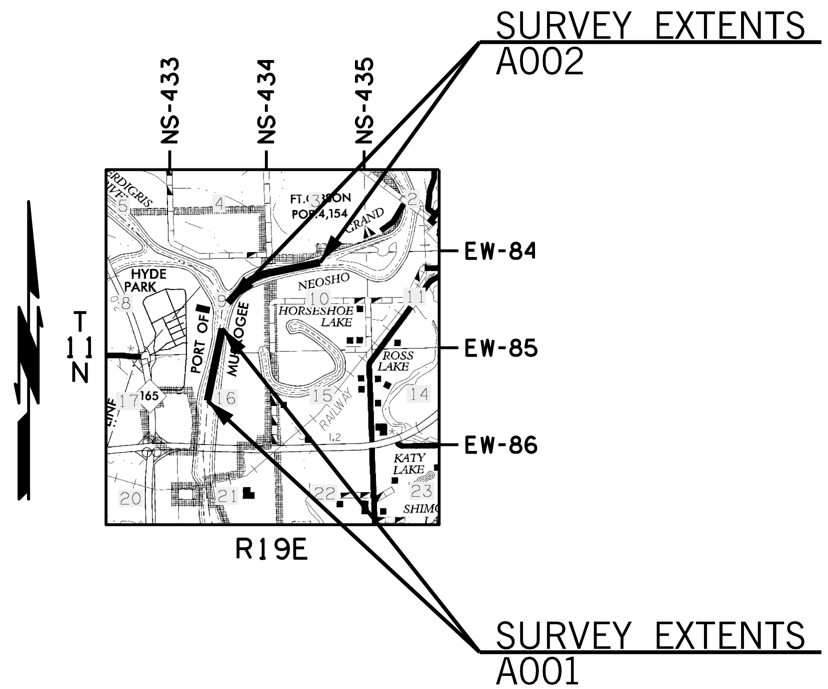
INDEX OF SHEETS

S001	TITLE SHEET
S002 – S003	HISTORICAL LETTER
S004 – S005	COGO LIST
S006	ALIGNMENT REPORT
S007	CHECK LEVELS
S008	SD-11's
S009 – S015	SURVEY DATA SHEET

SURVEY BEGAN: 6/21/2021
SURVEY COMPLETED: 11/15/2021

PERSONNEL:	TITLE:
C.E. Harris	Professional Land Surveyor
K.A. Felder	Professional Land Surveyor
D.A. McPeek	Professional Land Surveyor
K.L. Belveal	Tech III
C.J. Guffey	Tech II
K.F. Slater	Tech II
T.N. Rolland	Tech I
R.L. Smith	Tech I
W.D. Wilson	Tech I
T.D. Lee	CAD Tech III
D.R. Tapp	CAD Tech II

EQUIPMENT:
- Topcon Hiper II
- GR-3 GPS Receivers
- Topcon PS Total Station
- Topcon DL-503 Digital Level
- Coda Octopus



UTILITIES CONTACTED

UTILITY	CONTACT	PHONE
Elecric Tran's Lines:		
Oklahoma Natural Gas	Keith Applegarth	(918) 261-4568
Pipelines		
City of Muskogee	Tish Callhan	(918) 684-6232
Tel & Tel Lines		
AT&T Distribution	Jimmy Price	(918) 859-6993

STATE OF OKLAHOMA
DEPARTMENT OF TRANSPORTATION

SWO 5532 (1) Job/Piece 35257(04) Engr. Contract No. 2320

LAND SURVEYOR'S CERTIFICATION

I hereby certify that all land and property sub-division distances, angles, corners, and monumentation made or used in conjunction with this survey and depicted or recorded herein or hereon were recovered, established or re-established in substantial conformity with:

- Applicable instructions contained in the U.S. Government Bureau of Land Management publication **"Manual of Survey Instruction"**,
- Its supplement, **"Restoration of Lost or Obliterated Corners and Sub-division of Sections"**;
- **"Oklahoma Minimum Standards for the Practice of Land Surveying"** as adopted by the State Board of Licensure for Professional Engineers and Land Surveyors; **and**
- Sound land surveying practices;

including a thorough search, study, analysis and consideration of all existing records and field evidence.

I further certify that all survey monuments depicted exist and that all land survey work was done by me or under my direct supervision.

Dated this 4th day of November, 20 21.

LICENSED PROFESSIONAL LAND SURVEYOR
CAREY E. HARRIS
1719
OKLAHOMA

Land Surveyor CEH
Signature

Carey E. Harris
Printed Name

Oklahoma Licensed Land Surveyor No. 1719

Certificate of Authorization No. 5877 Exp. 6/30/2023

PROJECT LENGTH 9616.81 Ft. 1.82 MI.

BEGINNING STATION A001:	100+00.00
ENDING STATION :	140+00.00
BEGINNING STATION A002:	200+00.00
ENDING STATION :	256+16.81

SCALES 1"

SURVEY DATA SHEETS	1" =50' TOWN
SURVEY DATA SHEETS	1" =100'
GEOMETRIC DATA SHEETS	1" =500'

THIS SURVEY MEETS THE OKLAHOMA MINIMUM STANDARDS FOR THE PRACTICE OF LAND SURVEYING AS ADOPTED BY THE OKLAHOMA STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS, SEPTEMBER 14, 2018.

SPECIFICATIONS FOR SURVEYS FOR PRIMARY AND SECONDARY HIGHWAYS DATED JANUARY, 2018 GOVERN.

Keystone

			OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
PLS	CEH	11-21	
DRAWN	TDL	11-21	
CHECKED	TDL	11-21	SURVEY DATA SHEET
APPROVED			SWO 5532(1)
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S001

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION (405)-521-2621 FAX 405-522-0364

Date: October 29, 2021

To Mr. Kyle King, Chief of Surveys
From Carey E. Harris, Professional Land Surveyor
Subject SWO 5532(1) – J/P No. 35257(04) – Port of Muskogee – Muskogee County McClellan-Kerr Arkansas River Navigation System (MKARNS) - Moorings Modernization

1. SURVEY ASSIGNMENT:
   This survey was assigned to me by Mr. King under E.C. 2320. All measurements are in U.S. Survey Feet.

2. PURPOSE OF SURVEY:
   The purpose of this survey was to furnish sufficient data to develop construction plans for the moorings at the Port of Muskogee and Neosho River.

3. SURVEY LIMITS:
   The Survey covers the existing moorings. Limits are from the top of bank to top of bank, including riverbed.

4. ALIGNMENT:
   The Centerline of Survey for this project is the approximate split between the water's edge on the east / west waterline for the Arkansas River (A001) and the north / south for the Neosho River (A002).

5. STATIONING:
   The Stationing for the survey was derived from assigning P.O.T. Sta. 100+00.00 for the Arkansas River (A001) and P.O.T. Sta. 200+00.00 Neosho River (A002) at the beginning of survey and carried northerly and easterly without equations.

6. HORIZONTAL CONTROL:
   This project is on Oklahoma State Plane NAD 1983 (2011) North Zone. Using the provided ODOT stations: M-51-463 and M-51-464 from SWO5220(1).

7. VERTICAL CONTROL:
   Level datum is Mean Sea Level (NGS), NAVD 1988 datum. Elevations were established from provided ODOT stations: M-51-463 and M-51-464 from SWO5220(1).

8. TOPOGRAPHY:
   A. Aerial LiDar was performed on this project. Field work consisted of obtaining topographic and level data to supplement the LiDar data via break line method. Riverbed was collected by the engineer of record, Consor.
   B. All data obtained in the Field was recorded in a digital format and archived.

9. CROSS SECTION /DTM
   A DTM has been made for this project by the field crew in coordination with Consor, who collected and provided riverbed elevations.

10. LAND TIES:
   Land ties for this survey were established for the following Sections:

   T-15-N, R-11-W, I.M. – Sections 2, 3, 10 and 11

   A search was made for any trace of the original monuments and/or accessories. All filed certified corners received from the Oklahoma Department of Libraries were researched and noted.

   The Original Government Survey and resurvey notes were used from the following surveys:

Surveyor:	Description:	Date:
Charles Walcott	Original	7/11/1898
Fred Dennett	Survey of Island	4/17/1908
Robert Casias	Dependent Resurvey	12/19/2012

NW Corner Section 09, T-15-N, R-19-E, I.M. – Calculated Corner

N Quarter Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1064
Found BLM aluminum cap. Set new references.

NE Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1065
Found and accepted army corps of engineers 3.5" brass cap. Found and did not accept 1/2" iron pin from previous CCR filed by Lynn Coffman, PLS#1121, dated Mar. 26, 2007. Set new references.

N Quarter Corner Section 10, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1066
Found 3.5" Army Corp of Engineers brass cap and 2 remaining references from CCR filed by LS 1353, Edward R. Seaton, dated 08/16/2012. Set new references.

NE Corner Section 10, T-15-N, R-19-E, I.M. – Calculated Corner

E Quarter Corner Section 10, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1067
Found 5/8" rebar and references from previous CCR filed by PLS 1121, Lynn Coffman, dated 06/2005. Set new references.

10. LAND TIES: (Cont.)

Center Corner Section 10, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1068
Set 1/2" rebar with CA5877 cap at intersection of lines between found quarter section corners. Set references

W Quarter Corner Section 10, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1069
Found and accepted army corps of engineers 3.5" brass cap. Set 1/2" rebar with CA5877 cap, using found evidence and Army Corp of Engineers plat
Set new references

Center Corner Section 9, T-15-N, R-19-E, I.M. – Calculated Corner

W Quarter Corner Section 09, T-15-N, R-19-E, I.M.- ODOT Mon. No. M-51-1070
Acquired Army Corp of Engineers boundary plat and located nearby corners. Set 1/2" rebar with CA5877 cap, using found evidence and Army Corp of Engineers plat
Set new references

SW Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-822
Found 1/2" rebar with cap "HUB 1352," fits found reference from CCR filed by LS 319, Roy W. Entz, dated 12/18/2002. As per conversation with surveyor who set the monument, it was set in place of the axle using an old survey from the area. Set new references.

S Quarter Corner Section 9, T-15-N, R-19-E, I.M. – Calculated Corner

SE Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-338
Found ODOT brass cap and references from CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by LS 1508, Geoffrey A. King, dated 08/27/2005. Monument appears to be same as the monument from ODOT SD-11 form for station M-51-338 by Jerry Wayne Haynes filed on 06/07/1973. Found references appear be the same as those used by LS 319, Roy W. Entz, dated 01/07/1982. Set new references.

S Quarter Corner Section 10, T-15-N, R-19-E, I.M.- ODOT Mon. No. M-51-339
Found busted ODOT brass disc in concrete and references from previous CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012. Monument appears to be same as monument from ODOT SD-11 corner record form by Jerry Wayne Haynes, dated 06/07/1973. Set new references.

SE Corner Section 10, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-340
Found 3.5" ODOT aluminum cap and references from previous CCR filed by Robert Levine Johnston Jr., PLS#1792, dated Aug. 2, 2012. Set new reference.

E Quarter Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-823
Found BLM brass disk and references from previous CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by LS 1508, Geoffrey A. King, dated 03/27/2005. Set new reference.

PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	
APPROVED			
CREW			SWO 5532(1)

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S002

SWO 5532(1) – Port of Muskogee - MKARNS – Rogers County
Historical Letter & Written Report
Page 4 of 5

10. LAND TIES: (Cont.)

Center Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1071
Found nearby corners and used ODOT plans from SWO 2641(1). Set 1/2" rebar with CA5877 cap using calculated position from SWO 2641(1), which fits with local evidence. Set new references

W Quarter Corner Section 16, T-15-N, R-19-E, I.M.- ODOT Mon. No. M-51-1072
Found 5/8" rebar with PLS 1199 cap and references from CCR by PLS 1199, Richard Phillip Wright, dated 12/26/2019. Set new reference.

SW Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-826
Found mag nail with PLS 1199 washer and references from CCR by PLS 1199, Richard Phillip Wright, dated 12/26/2019. Set new reference.

S Quarter Corner Section 16, T-15-N, R-19-E, I.M.- ODOT Mon. No. M-51-825
Found BLM aluminum cap and references from previous CCR filed by PLS 1508, Geoffrey A. King, dated 04/27/2005. Set new references.

SE Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-824
Found BLM brass cap and references from CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by PLS 1432, Randy L. Marquardt, dated 10/26/2006 and CCR by LS 1508, Geoffrey A. King, dated 04/27/2005.

11. RIGHT-OF-WAY:

There is no existing right of way on this project.

12. UTILITIES:

A. There are no utilities within the survey limits.

13. ENVIRONMENTAL CONCERNS:

No environmental concerns seen at time of survey.

14. EQUIPMENT USED:

All data was obtained with Topcon Hiper II and GR-3 GPS receivers, Topcon PS Total Station, Topcon DL-503 digital level, and IG3S Static Receivers.
Consor used a Coda Octopus hydrographic scanner to collect the riverbed.

15. TIME CHARGES:

This survey began June 21, 2021 and was completed November 15, 2021. A total of 1270 hours was spent.

SWO 5532(1) – Port of Muskogee - MKARNS – Rogers County
Historical Letter & Written Report
Page 5 of 5

16. DATA SUBMITTED:

A. REPORTS:
1. Historical Letter and Written Report
2. ODOT form SD-1, Transmittal Letter
3. ODOT form SD-7, Public and Private Owned Utilities
4. ODOT form SD-11, Control Sheets
5. ODOT form SD-20, Survey Control Data Statement
6. ODOT form SD-41, Surveyor's Certification
7. Alignment Report
8. Cogo Data
9. Benchmarks and Check Levels list
10. Ownership list
11. Certified Corner Records
12. OSSDA Field Verification Form

B. COMPUTER FILES:
1. SWO5532_1_v1_Muskogee.dgn
2. SWO5532_1_v1_topo_Muskogee.dgn
3. SWO5532_1_v1_sff_Muskogee.dgn
4. SWO5532_1_v1_tri_Muskogee.dgn
5. SWO5532_1_v1_peri_Muskogee.dgn
6. SWO5532_1_v1_cogo_Muskogee.txt
7. SWO5532_1_v1_Muskogee.alg
8. SWO5532_1_v1_Muskogee.dtm
9. SWO5532_1_v1_Oakley.dtm

17. PERSONNEL:

Other than myself, the following listed personnel worked on this survey:

K.A. Felder	Professional Land Surveyor
D.A. McPeek	Professional Land Surveyor
K.L. Belveal	Tech III
C.J. Guffey	Tech II
K.F. Slater	Tech II
T.N. Rolland	Tech I
R.L. Smith	Tech I
W.D. Wilson	Tech I
T.D. Lee	CAD Tech III
D.R. Tapp	CAD Tech II

18. SURVEY INFORMATION USED:

SWO's
SWO5220(1)

Carey E. Harris
Professional Land Surveyor

PLS	CEH	11-21
DRAWN	TDL	11-21
CHECKED	TDL	11-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

SWO 5532(1)

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S003

COORDINATE POINT LIST
SWO 5532(1)_Muskogee

Job Piece 35257(04)
Page 1 of 2

Pt No.	EASTING	NORTHING	ELEVATION	Pt No.	EASTING	NORTHING	Pt No.	EASTING	NORTHING
1	2768873.6563000	294665.0883970	495.5170	315	2775529.2616960	301415.8258610	8042	2774283.2197550	298859.0398450
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3	2769271.7095360	295891.7786170	510.8226				8044	2774238.3086260	300335.6669060
4	2769491.3036530	296456.9330010	510.8904	8001	2767894.7336050	291857.7880610	8045	2775548.7312630	300703.8863230
5	2769701.2226750	297361.9550110	512.0292	8002	2768430.0546610	291802.8766450	8046	2776204.3626880	300888.3637690
6	2770420.8129360	294236.7814440	504.8578	8003	2768769.6222230	291785.7339810	8047	2777524.4728790	300927.4937950
7	2770554.1918850	294873.6676120	494.8236	8004	2768770.8151490	292676.6031820	8048	2778198.6823000	300779.8526480
8	2770727.4620270	295785.8283570	498.0344	8005	2768779.0109230	293217.1410530	8049	2769379.9307120	301851.4151360
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12	2771128.5933000	299370.3709070	496.8217	8010	2767814.3688720	294564.2052340	8053	2771899.5175420	301264.9860280
13	2771688.2287700	299900.9627670	494.4710	8011	2771848.2432640	291366.6822240	8054	2771888.9978950	301594.8183140
14	2772242.5774830	300147.7420490	495.6983	8012	2771842.6256600	291581.4605800	8055	2772879.2374160	301611.8282690
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311	2771206.4836890	299967.2812660		8038	2775620.7809130	298069.2620670	9102	2768090.4457840	301264.6995480
312	2773334.3067280	298049.1074320		8039	2774954.3073330	298381.9697680	9103	2768369.5533340	301170.9595790
313	2772766.4076820	300857.0448280		8040	2774946.1336540	298711.2283300	9104	2768945.7407390	300694.6073960
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PLS	CEH	11-21
DRAWN	TDL	11-21
CHECKED	TDL	11-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

SWO 5532(1)

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S004

COORDINATE POINT LIST

SWO 5532(1)_Muskogee

Job Piece 35257(04)

Pt No.	EASTING	NORTHING	Pt No.	EASTING	NORTHING	Pt No.	EASTING	NORTHING
9106	2769284.9056950	300196.2321770	9149	2770926.5304470	296384.5145450	9192	2773689.0489280	300328.6711250
9107	2769522.5515830	299688.5679960	9150	2770886.4496120	296234.7102120	9193	2774233.1043700	300493.9161850
9108	2769564.1119250	299403.7423250	9151	2770886.4496120	296234.7102120	9194	2774383.4124210	300539.5690010
9109	2769638.6274580	299300.7466260	9152	2770760.0970550	296154.2526850	9195	2775119.2465610	300831.5754120
9110	2769668.2636900	299098.0532160	9153	2770374.8353380	295405.5436890	9196	2775310.0591650	300884.1161270
9111	2769795.4149060	298873.3300110	9154	2770360.5058920	295194.2050290	9197	2776317.3270130	301199.6786480
9112	2769782.9474110	298733.5868700	9155	2770292.9910950	295085.4373570	9198	2776861.4127520	301153.4647010
9113	2769731.5465150	298618.7590620	9156	2770169.9194260	294288.5018610	9199	2776908.9389220	301149.4278890
9114	2769782.9317190	298483.9714590	9157	2770055.6650230	293031.9807530	9200	2776873.4726720	300749.4226750
9115	2769754.6286570	298181.6433050	9158	2770037.9205180	292837.4617180	9201	2775548.6191670	300707.9853250
9116	2769780.7906290	297605.8950400	9159	2770071.2077180	292157.9324920	9202	2778198.3261760	300790.8600250
9117	2769580.2526250	296582.0044620	9160	2770037.8264160	291777.3186460	9203	2777700.1803170	301123.8021320
9118	2769406.5898080	295907.1683530	9161	2770017.0359090	291674.4769950	9204	2778186.0008300	301171.8227070
9119	2769409.4229120	295755.2807140	9162	2769975.6658090	291614.8323940	9205	2778173.1514190	301568.9836440
9120	2769256.5999760	295400.3969800	9163	2769963.1483740	291313.5236930	9206	2777985.7602480	301600.5501640
9121	2769162.7730110	294979.4225240	9164	2767873.3759560	292574.5748630	9207	2777784.2565650	301584.2615200
9122	2769006.6432830	294471.8541840	9165	2768771.8788330	292599.7502700	9208	2777649.4906990	301585.7399220
9123	2768884.1271180	294234.8023750	9166	2768861.4370810	293921.9411800	9209	2777380.2811920	301572.2366900
9124	2768859.3311060	293892.9029760	9167	2769223.5225090	295251.9879490	9210	2777053.5383220	301654.4817390
9125	2768792.2082060	293368.7869420	9168	2767795.3362380	295211.9275620	9211	2776834.4468060	301811.5008590
9126	2768828.4233730	293261.8056830	9169	2769767.1588520	297905.8904760	9212	2777304.2462600	302075.9112570
9127	2768811.9388340	292990.8428360	9170	2767714.2539340	297849.1593860	9213	2776167.8065980	302041.1843510
9128	2768778.0287140	292724.8341760	9171	2767694.2146660	298473.3097240	9214	2775715.6975300	301936.3444340
9129	2768726.3925270	291674.5932970	9172	2768349.2919420	299201.8451690	9215	2775260.9990000	301843.3752780
9130	2768716.1472270	291278.4282070	9173	2767667.7834880	299296.5448020	9216	2775012.6807960	301750.2580940
9131	2768751.2804110	301835.1650540	9174	2769032.1663860	300523.5265130	9217	2774956.3356510	301715.3149840
9132	2769200.0338130	301578.4154950	9175	2767629.5802450	300486.4369110	9218	2774830.8126280	301672.5697420
9133	2769447.3195110	301406.5516450	9176	2771813.7626720	292684.9816770	9219	2774308.4197800	301580.7183740
9134	2769803.1519370	301110.9658450	9177	2770047.8136990	292635.5010510	9220	2774202.9339330	301566.2580850
9135	2770158.6520650	300617.4597220	9178	2771779.2820800	294003.2811310	9221	2773717.2413320	301499.6780100
9136	2770651.5556400	299770.5888260	9179	2770139.8251490	293957.5378560	9222	2773260.6228960	301416.6501750
9137	2771028.9996010	299333.8398280	9180	2771744.7145870	295322.7069660	9223	2772887.5360580	301336.1748750
9138	2771104.8562790	299147.0114830	9181	2770366.5977410	295284.0510180	9224	2772504.8746230	301213.1760270
9139	2771082.7872210	299070.3926810	9182	2771710.1470930	296642.1328010	9225	2771585.1965210	300719.5425090
9140	2771162.8625920	298548.0106230	9183	2771669.8084920	297958.4693310	9226	2771548.7927060	301907.4783990
9141	2771242.8855740	298523.5170950	9184	2771178.4675220	297944.8913470	9227	2770456.5088800	300105.7039130
9142	2771270.3199850	298416.2654670	9185	2771629.4698920	299274.8058600			
9143	2771194.9142460	298334.3150740	9186	2771097.9167640	299396.6636430			
9144	2771164.6899050	297618.6664440	9187	2771363.5650960	299599.2910970			
9145	2771204.2691120	297396.8057960	9188	2771615.5404060	299729.3553610			
9146	2771094.5632610	296978.6824210	9189	2771720.0687160	299783.3106380			
9147	2770940.2492720	296620.3985590	9190	2772157.1477020	299951.3972500			
9148	2770862.4275200	296440.5249360	9191	2772923.9935810	300125.1767980			

PLS	CEH	11-21
DRAWN	TDL	11-21
CHECKED	TDL	11-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

SWO 5532(1)

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S005

```
           Project Name: swo5532_1_v1_Muskogee
            Description: Port of Muskogee
Horizontal Alignment Name: A001
            Description: CL Arkansas River
                  Style: Centerline
                                 STATION       EASTING      NORTHING

Element: Linear
          POB  (     300)        100+00.00  2769436.1024   293937.9427
          POE  (     301)        140+00.00  2770231.9122   297857.9793
       Tangent Direction:   N 11^28'32.55" E
          Tangent Length:         4000.000

   Total Length of Alignment A001:   4000.000
```

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           Project Name: swo5532_1_v1_Muskogee
            Description: Port of Muskogee
Horizontal Alignment Name: A002
            Description: CL Neosho river
                  Style: Centerline
                                 STATION       EASTING      NORTHING

Element: Linear
          POB  (     310)        200+00.00  2770556.0724   299245.7824
           PC  (     311)        209+71.39  2771206.4837   299967.2813
       Tangent Direction:   N 42^02'01.64" E
          Tangent Length:          971.388

Element: Circular
           PC  (     311)        209+71.39  2771206.4837   299967.2813
           PI  (     314)        219+16.96  2771839.6058   300669.6012
           CC  (     312)                   2773334.3067   298049.1074
           PT  (     313)        227+98.01  2772766.4077   300857.0448
                  Radius:         2864.790
                   Delta:      36^31'57.00" Right
  Degree of Curvature(Arc):       2^00'00.00"
                  Length:         1826.626
                 Tangent:          945.567
                   Chord:         1795.840
         Middle Ordinate:          144.356
                External:          152.016
       Tangent Direction:   N 42^02'01.64" E
        Radial Direction:   S 47^57'58.36" E
         Chord Direction:   N 60^18'00.14" E
        Radial Direction:   S 11^26'01.37" E
       Tangent Direction:   N 78^33'58.63" E

Element: Linear
           PT  (     313)        227+98.01  2772766.4077   300857.0448
          POE  (     315)        256+16.81  2775529.2617   301415.8259
       Tangent Direction:   N 78^33'58.63" E
          Tangent Length:         2818.794

   Total Length of Alignment A002:   5616.808
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PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	
APPROVED			
CREW			SWO 5532(1)

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S006

CHECK LEVELS SWO 5532(1) - J/P 35257(04) BENCHMARKS LIST NAVD 88 DATUM

Page 1 of 4

BM NO.	RUN 1	RUN 2	MEAN DIFF.	ADJ. DIFF.	ADJ. ELEV.	PUBLISHED ELEVATION	BM DESCRIPTION, STA/OFFSET
CONTROL POINT M-51-1063						496.4694	3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 233+00.73 567.0' Lt.
to	5.162	5.162	5.162	5.162			
BM 19					501.632		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 208+57.62 630.3' Lt.
to	-4.327	-4.323	-4.325	-4.324			
BM 20					497.307		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 214+57.75 527.5' Lt.
to	1.392	1.393	1.393	1.393			
BM 21					498.701		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 220+57.49 581.7' Lt.
to	-0.768	-0.768	-0.768	-0.767			
BM 22					497.934		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 226+18.86 644.3' Lt.
to	-1.465	-1.465	-1.465	-1.464			
CONTROL POINT M-51-1063					496.469	496.4694	3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 233+00.73 567.0' Lt.
to	3.644	3.644	3.644	3.645			
BM 23					500.114		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 240+22.53 510.2' Lt.
to	1.108	1.108	1.108	1.109			
BM 24					501.223		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 248+29.74 434.7' Lt.

CHECK LEVELS SWO 5532(1) - J/P 35257(04) BENCHMARKS LIST NAVD 88 DATUM

Page 3 of 4

BM NO.	RUN 1	RUN 2	MEAN DIFF.	ADJ. DIFF.	ADJ. ELEV.	PUBLISHED ELEVATION	BM DESCRIPTION, STA/OFFSET
BM15					497.240		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 230+44.00 467.8' Rt.
to	2.215	2.214	2.215	2.214			
BM16					499.454		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 235+99.82 446.4' Rt.
to	0.225	0.225	0.225	0.224			
BM17					499.678		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 243+02.10 499.9' Rt.
to	1.705	1.707	1.706	1.705			
BM18					501.384		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 250+85.43 420.1' Rt.
to	63.867	63.867	63.867	63.867			
CONTROL POINT M-51-464					565.250	565.250	2" ODOT Bronze Disk (M-51-464) from SWO 5220(1)

CHECK LEVELS SWO 5532(1) - J/P 35257(04) BENCHMARKS LIST NAVD 88 DATUM

Page 2 of 4

BM NO.	RUN 1	RUN 2	MEAN DIFF.	ADJ. DIFF.	ADJ. ELEV.	PUBLISHED ELEVATION	BM DESCRIPTION, STA/OFFSET
CONTROL POINT M-51-464						565.250	2" ODOT Bronze Disk (M-51-464) from SWO 5220(1)
to	-60.394	-60.389	-60.392	-60.392			
BM6					504.858		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 104+88.78 905.6' Rt.
to	-10.033	-10.034	-10.034	-10.034			
BM7					494.824		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 111+39.47 909.6' Rt.
to	3.212	3.211	3.212	3.211			
BM8					498.034		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 120+67.86 897.9' Rt.
to	2.533	2.530	2.532	2.531			
BM9					500.565		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 127+59.46 964.8' Rt.
to	-0.606	-0.604	-0.605	-0.606			
BM10					499.960		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 135+27.25 1032.7' Rt.
to	-2.454	-2.454	-2.454	-2.455			
BM11					497.505		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 141+46.46 1095.9' Rt.
to	-0.685	-0.680	-0.683	-0.683			
BM12					496.822		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 204+75.88 341.8' Rt.
to	-2.351	-2.349	-2.350	-2.351			
BM13					494.471		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 212+88.04 387.1' Rt.
to	1.227	1.229	1.228	1.227			
BM14					495.698		3/4" Rebar w/cap (Keystone Benchmark) A002 Sta. 219+95.51 499.2' Rt.
to	1.544	1.541	1.543	1.542			

CHECK LEVELS SWO 5532(1) - J/P 35257(04) BENCHMARKS LIST NAVD 88 DATUM

Page 4 of 4

BM NO.	RUN 1	RUN 2	MEAN DIFF.	ADJ. DIFF.	ADJ. ELEV.	PUBLISHED ELEVATION	BM DESCRIPTION, STA/OFFSET
CONTROL POINT M-51-1062						511.2610	Mag Nail w/washer (Keystone Benchmark) A001 Sta. 138+38.10 495.2' Lt.
to	-15.744	-15.744	-15.744	-15.744			
BM 1					495.517		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 106+00.71 695.9' Lt.
to	11.365	11.367	11.366	11.367			
BM 2					506.884		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 111+37.10 504.4' Lt.
to	3.938	3.938	3.938	3.939			
BM 3					510.823		3/4" Rebar w/cap (Keystone Benchmark) A001 Sta. 118+82.07 549.8' Lt.
to	0.066	0.068	0.067	0.068			
BM 4					510.890		Mag Nail w/washer (Keystone Benchmark) A001 Sta. 124+79.62 447.1' Lt.
to	1.138	1.138	1.138	1.139			
BM 5					512.029		Mag Nail w/washer (Keystone Benchmark) A001 Sta. 134+08.31 421.4' Lt.
to	-0.769	-0.769	-0.769	-0.768			
CONTROL POINT M-51-1062					511.261	511.2610	Mag Nail w/washer (Keystone Benchmark) A001 Sta. 138+38.10 495.2' Lt.

PLS	CEH	11-21
DRAWN	TDL	11-21
CHECKED	TDL	11-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

SWO 5532(1)

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S007

STATE OF OKLAHOMA
DEPARTMENT OF HIGHWAYS
SURVEY DIVISION
POSITION AND DESCRIPTION OF SURVEY MONUMENTS

S.D. FORM NO. 11
REVISED 02/05/2018

COUNTY MUSKOGEE | Monument Number M-51-1062 | SWO 5532(1) DATE 10/13/2021

TYPE OF MONUMENT MAG NAIL W/ "CA5677" WASHER MONUMENT SET FOR HORIZONTAL & VERTICAL CONTROL

WRITTEN DESCRIPTION OF LOCATION: LOCATED APPROXIMATELY 1280' EAST AND 120' NORTH OF THE NE 51ST STREET AND HAROLD SCROGGINS DRIVE, AT THE NORTHEAST CORNER OF A CONCRETE PARKING AREA, JUST NORTH OF A CONCRETE BLOCK BUILDING. Sta. 138+38.10 496.2' Lt.

ESTABLISHED BY: KEYSTONE ENGINEERING

COORDINATE SYSTEM: NAD83 (2011) ZONE: OK NORTH

COORDINATES (FEET) X 2769714.3549 Y 297787.8447

GEODETIC POSITION

LATITUDE 35°47'14.8573" NORTH
LONGITUDE 95°17'53.7624" WEST
ELLIPSOIDAL HEIGHT 414.8116

METHOD USED TO ESTABLISHED: DOUBLE OPUS FROM GPS STATIC RECEIVERS

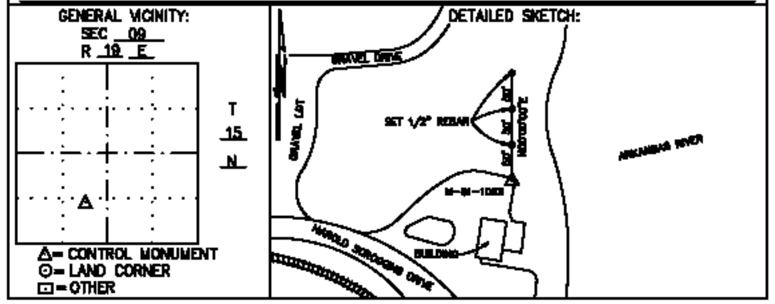
SOURCE: DOUBLE OPUS FROM GPS STATIC RECEIVERS AND CHECKED TO ODOT STATION NUMBERS M-51-463 & M-51-464 FROM SWO 5220(1)

ORTHOMETRIC HEIGHT

511.2610 FEET GEOID MODEL: GEOID18 GEOID SEPARATION: 96.4494 FEET

METHOD USED TO ESTABLISHED: DOUBLE OPUS FROM GPS STATIC RECEIVERS AND DIFFERENTIAL LEVELING. CHECKED TO ODOT STATION NUMBERS M-51-463 & M-51-464 FROM SWO 5220(1)

SOURCE: OPUS AND DIFFERENTIAL LEVELING USING DIGITAL LEVELS



STATE OF OKLAHOMA
DEPARTMENT OF HIGHWAYS
SURVEY DIVISION
POSITION AND DESCRIPTION OF SURVEY MONUMENTS

S.D. FORM NO. 11
REVISED 02/05/2018

COUNTY MUSKOGEE | Monument Number M-51-1063 | SWO 5532(1) DATE 10/13/2021

TYPE OF MONUMENT 3/4" REBAR WITH "KEYSTONE BENCHMARK CAP" MONUMENT SET FOR HORIZONTAL & VERTICAL CONTROL

WRITTEN DESCRIPTION OF LOCATION: LOCATED APPROXIMATELY 430' SOUTH AND 290' EAST OF THE INTERSECTION OF EAST 840 ROAD AND NORTH 55TH STREET EAST, JUST SOUTH OF A GRAVEL DRIVE, AND NORTH OF THE NORTH SHORE OF THE NEOSHO RIVER. Sta. 233+00.73 587.0' Lt.

ESTABLISHED BY: KEYSTONE ENGINEERING

COORDINATE SYSTEM: NAD83 (2011) ZONE: OK NORTH

COORDINATES (FEET) X 2773148.7422 Y 301512.4601

GEODETIC POSITION

LATITUDE 35°47'50.8330" NORTH
LONGITUDE 95°17'10.8571" WEST
ELLIPSOIDAL HEIGHT 400.0489

METHOD USED TO ESTABLISHED: DOUBLE OPUS FROM GPS STATIC RECEIVERS

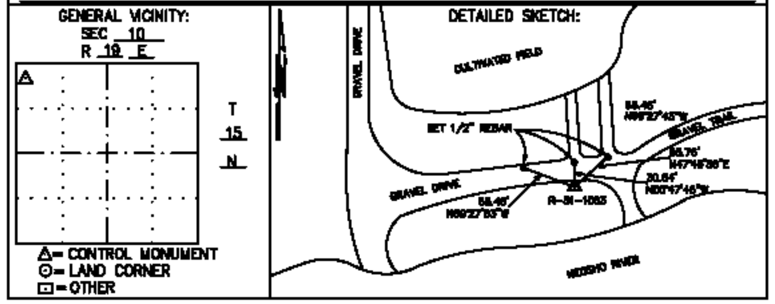
SOURCE: DOUBLE OPUS FROM GPS STATIC RECEIVERS AND CHECKED TO ODOT STATION NUMBERS M-51-463 & M-51-464 FROM SWO 5220(1)

ORTHOMETRIC HEIGHT

496.4694 FEET GEOID MODEL: GEOID18 GEOID SEPARATION: 96.4205 FEET

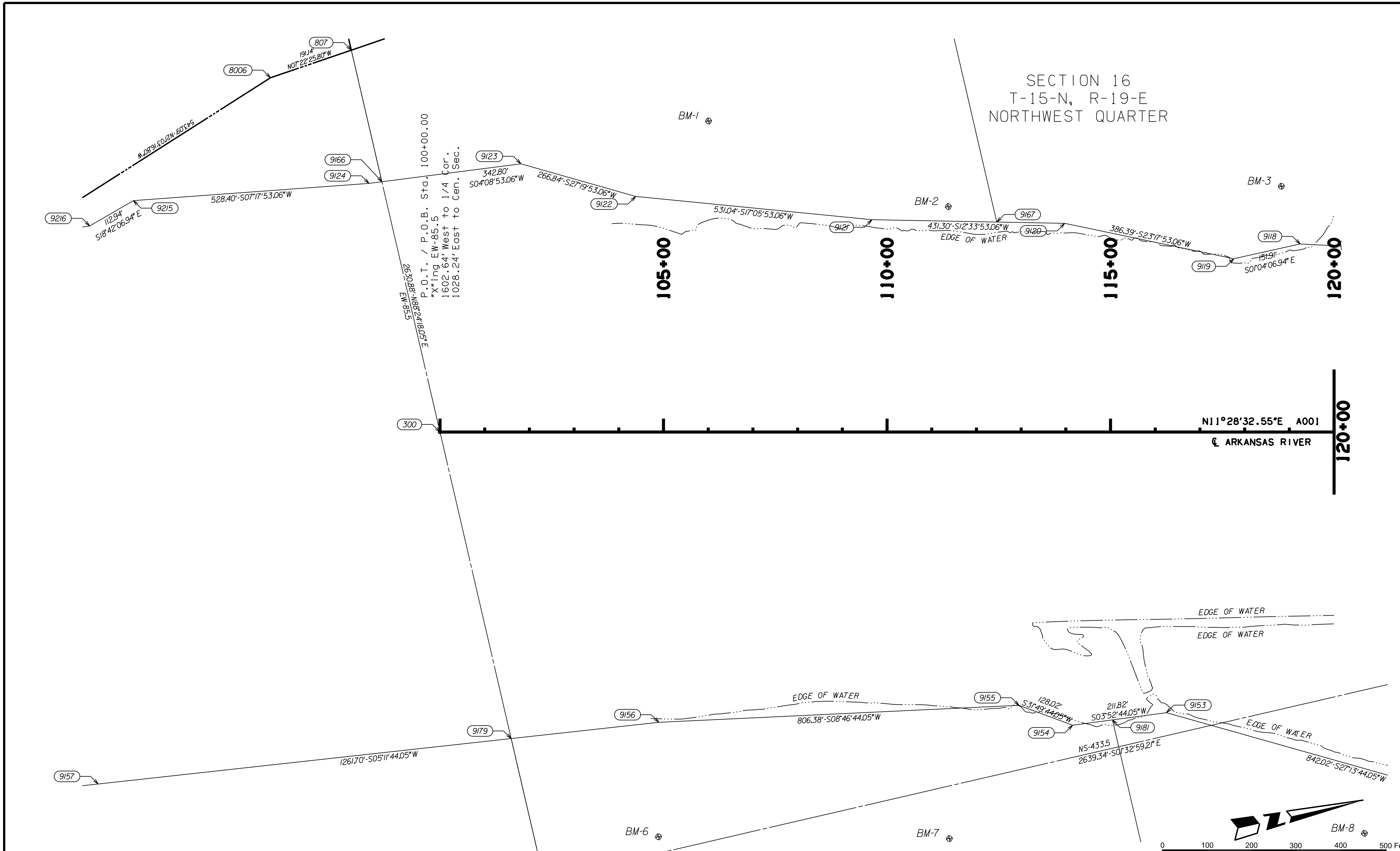
METHOD USED TO ESTABLISHED: DOUBLE OPUS FROM GPS STATIC RECEIVERS AND DIFFERENTIAL LEVELING. CHECKED TO ODOT STATION NUMBERS M-51-463 & M-51-464 FROM SWO 5220(1)

SOURCE: OPUS AND DIFFERENTIAL LEVELING USING DIGITAL LEVELS



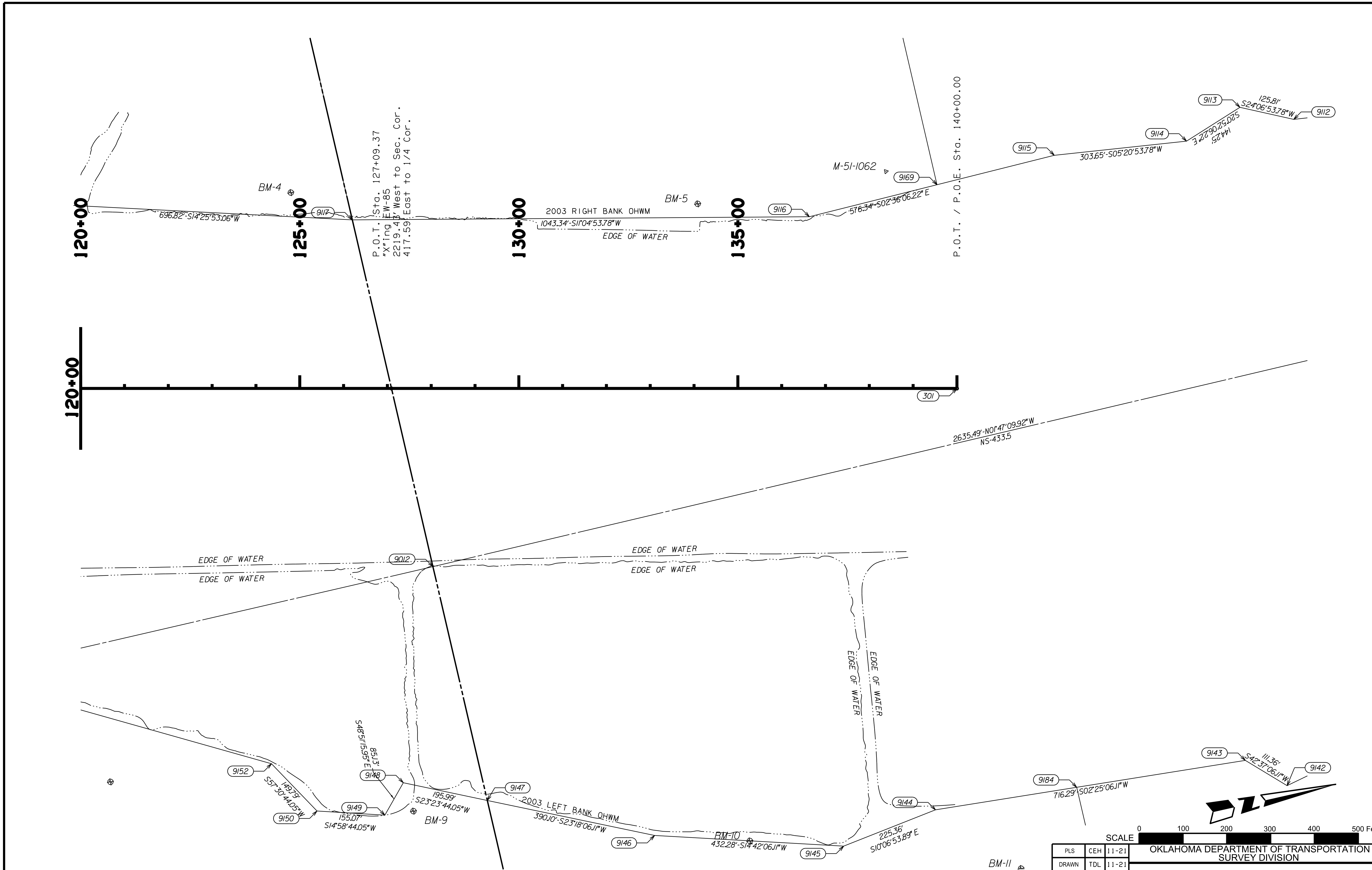
PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S008



PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S009



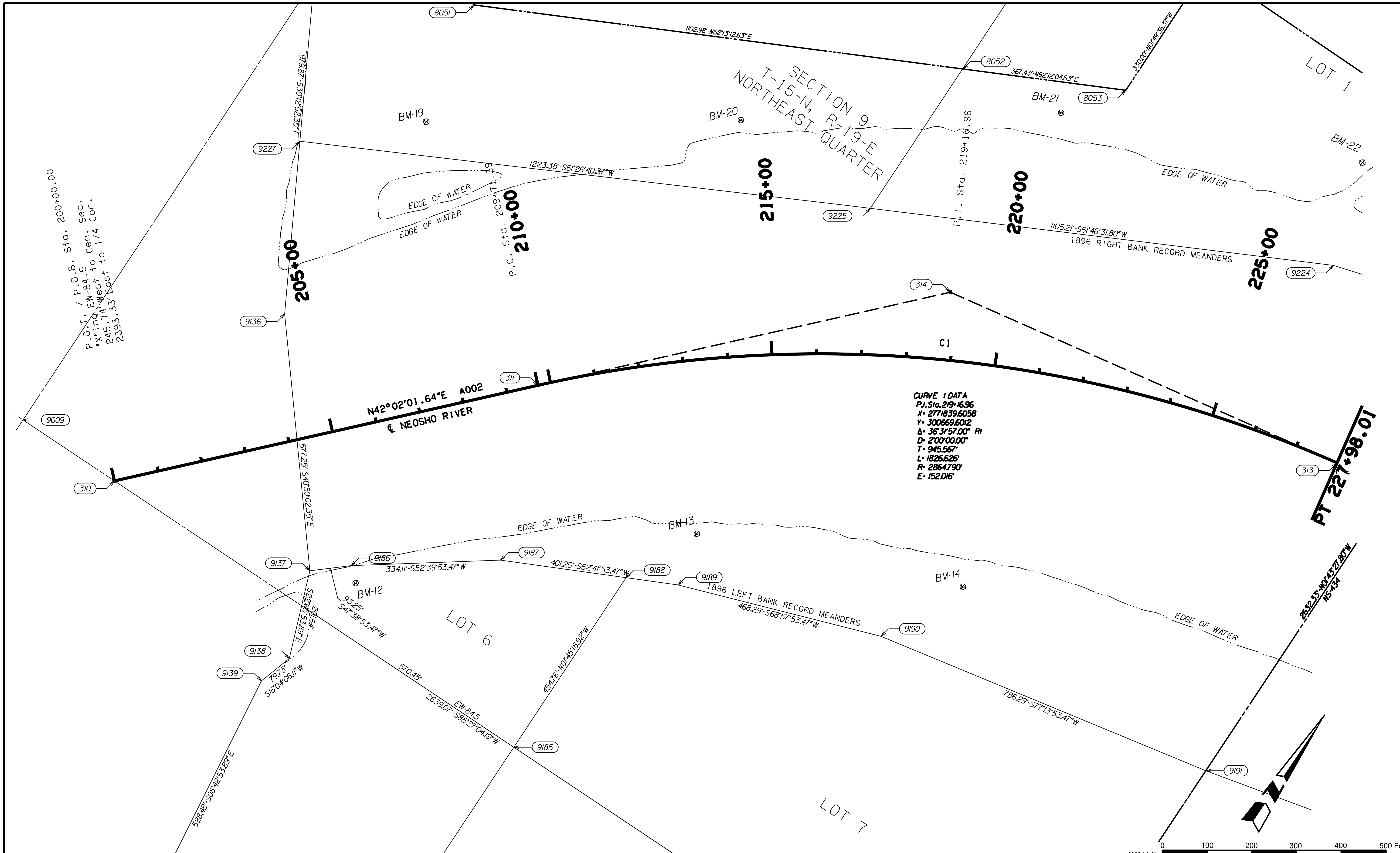
PLS	CEH	11-21
DRAWN	TDL	11-21
CHECKED	TDL	11-21
APPROVED		
CREW		

OKLAHOMA DEPARTMENT OF TRANSPORTATION
SURVEY DIVISION

SURVEY DATA SHEET

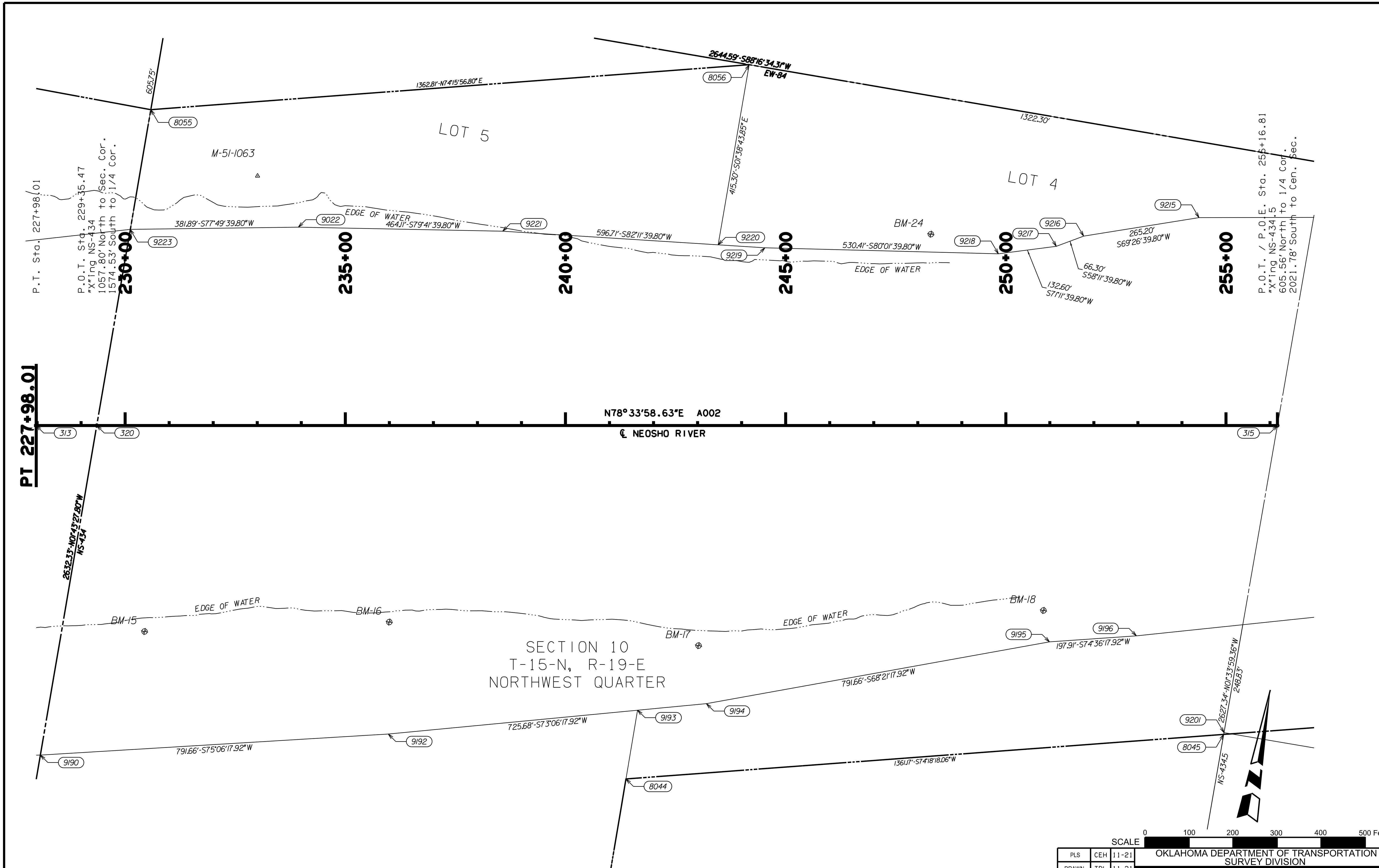
SWO 5532(1)

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S010



PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S011



PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S012

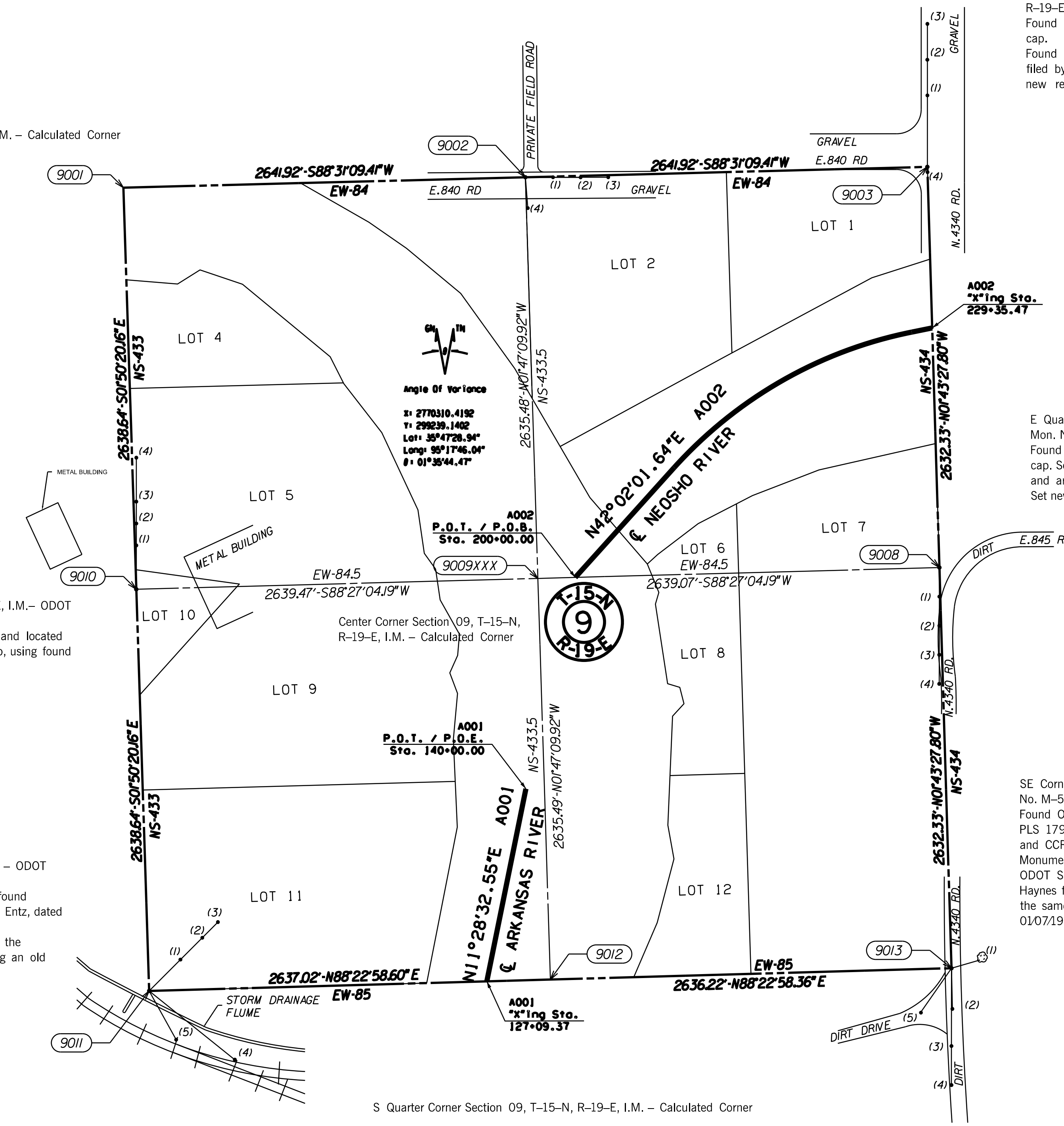
REFERENCE MEASUREMENTS:

	Distance (Feet [X] Meters [ ])	Bearing (True [X] Magnetic [ ])
NW/COR.SEC.9		
Description		
Calculated Corner		
N/4 COR.SEC.9		
Description		
(1) Set 1/2" rebar	25.00'	N90°00'00"E
(2) Set 1/2" rebar	50.00'	N90°00'00"E
(3) Set 1/2" rebar	75.00'	N90°00'00"E
(4) Set 2" metal post	27.97'	S04°28'36"E
NE/COR.SEC.9		
Description		
(1) Set 1/2" rebar	50.00'	N00°00'00"W
(2) Set 1/2" rebar	75.00'	N00°00'00"W
(3) Set 1/2" rebar	100.00'	N00°00'00"W
(4) Found 1/2" rebar from previous CCR	0.25'	S00°49'42"E
E/4 COR.SEC.9		
Description		
(1) Set 1/2" rebar	50.00'	S00°06'14"W
(2) Set 1/2" rebar	100.00'	S00°06'14"W
(3) Set 1/2" rebar	150.00'	S00°06'14"W
(4) Set 1/2" rebar	200.00'	S00°06'14"W
CENT./COR.SEC.9		
Description		
Calculated Corner		
W/4 COR.SEC.9		
Description		
(1) Set 1/2" rebar	50.00'	N00°00'00"E
(2) Set 1/2" rebar	75.00'	N00°00'00"E
(3) Set 1/2" rebar	100.00'	N00°00'00"E
(4) Set 1/2" rebar	150.00'	N00°00'00"E
SW/COR.SEC.9		
Description		
(1) Set 1/2" rebar	50.00'	N45°00'00"E
(2) Set 1/2" rebar	85.00'	N45°00'00"E
(3) Set 1/2" rebar	110.00'	N45°00'00"E
(4) Set existing mag nail in railroad tie	124.26'	S51°56'26"E
(5) Found mag nail in railroad tie	63.05'	S28°56'26"E
S/4 COR.SEC.9		
Description		
Calculated Corner		
SE/COR.SEC.9		
Description		
(1) Found 60d nail in north face of 4" tree	18.97'	N73°46'36"E
(2) Found 5/8" rebar	26.50'	S01°26'01"E
(3) Set 1/2" rebar	50.00'	S00°00'00"E
(4) Set 1/2" rebar	75.00'	S00°00'00"E
(5) Found 5/8" rebar	35.26'	S34°53'47"W

N Quarter Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1064
Found BLM aluminum cap. Set new references.

NE Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1065
Found and accepted army corps of engineers 3.5" brass cap.
Found and did not accept 1/2" iron pin from previous CCR filed by Lynn Coffman, PLS#1121, dated Mar. 26, 2007. Set new references.

NW Corner Section 09, T-15-N, R-19-E, I.M. - Calculated Corner



E Quarter Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-1069
Found and accepted army corps of engineers 3.5" brass cap. Set 1/2" rebar with CA5877 cap, using found evidence and army corp of engineers plat
Set new references

W Quarter Corner Section 09, T-15-N, R-19-E, I.M.- ODOT Mon. No. M-51-1070
Acquired army corp of engineers boundary plat and located nearby corners. Set 1/2" rebar with CA5877 cap, using found evidence and army corp of engineers plat
Set new references

Center Corner Section 09, T-15-N, R-19-E, I.M. - Calculated Corner

SW Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-822
Found 1/2" rebar with cap "HUB 1352," fits found reference from CCR filed by LS 319, Roy W. Entz, dated 12/18/2002.
As per conversation with surveyor who set the the monument, it was set in place of the axle using an old survey from the area.
Set new references.

SE Corner Section 09, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-338
Found ODOT brass cap and references from CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by LS 1508, Geoffrey A. King, dated 08/27/2005. Monument appears to be same as the monument from ODOT SD-11 form for station M-51-338 by Jerry Wayne Haynes filed on 06/07/1973. Found references appear be the same as those used by LS 319, Roy W. Entz, dated 01/07/1982. Set new references.

S Quarter Corner Section 09, T-15-N, R-19-E, I.M. - Calculated Corner

SCALE 0 500 1000 1500 2000 2500 Feet

PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S013

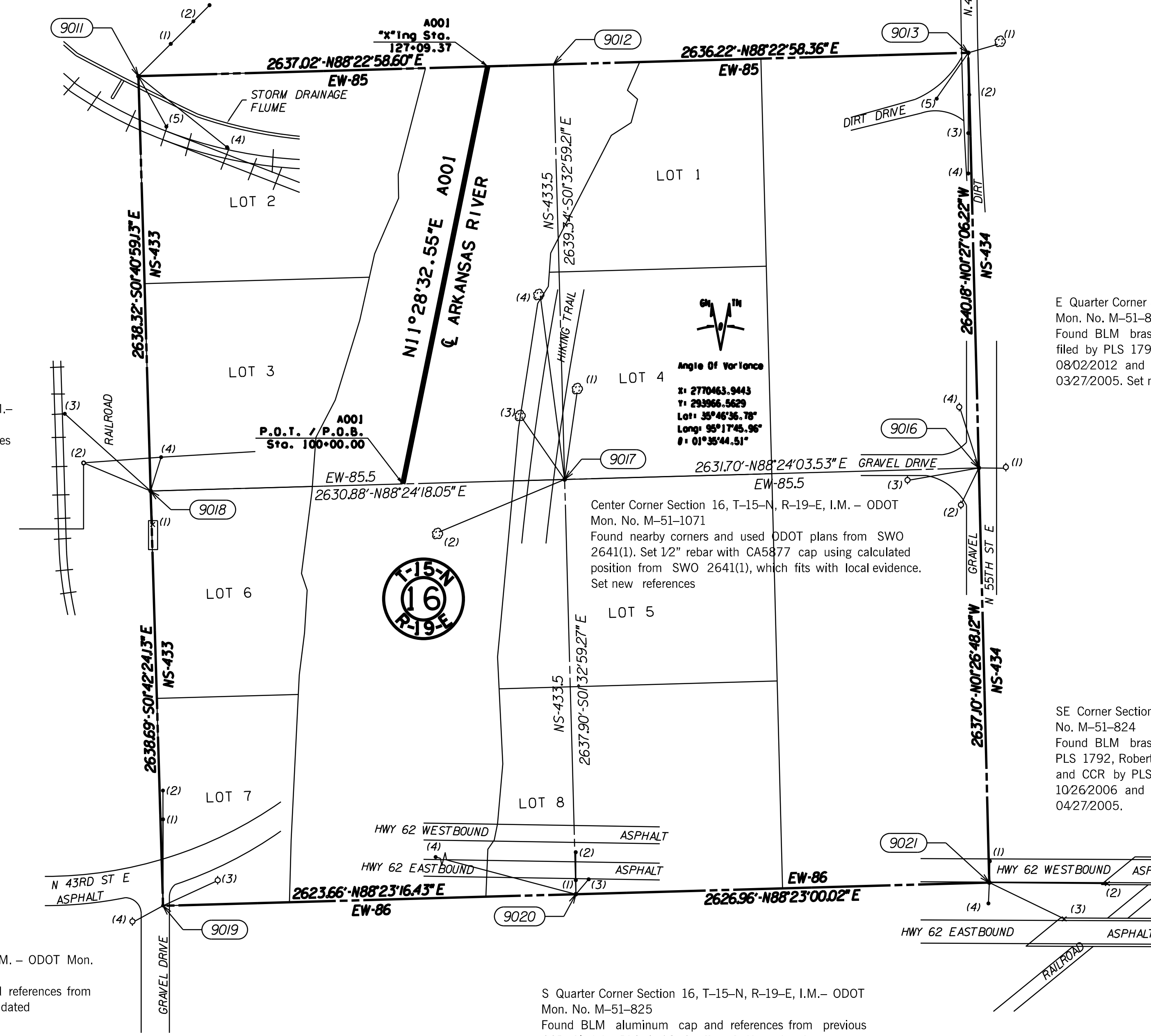
REFERENCE MEASUREMENTS:

Description	Distance (Feet [X] Meters [ ])	Bearing (True [X] Magnetic [ ])
NW/COR.SEC.16		
(1) Set 1/2" rebar	50.00'	N45°00'00"E
(2) Set 1/2" rebar	85.00'	N45°00'00"E
(3) Set 1/2" rebar	110.00'	N45°00'00"E
(4) Set existing mag nail in railroad tie	124.26'	S51°56'26"E
(5) Found mag nail in railroad tie	63.05'	S28°56'26"E
N/4 COR.SEC.16		
Calculated Corner		
NE/COR.SEC.16		
(1) Found 60d nail in north face of 4" tree	18.97'	N73°46'36"E
(2) Found 5/8" rebar	26.50'	S01°26'01"E
(3) Set 1/2" rebar	50.00'	S00°00'00"E
(4) Set 1/2" rebar	75.00'	S00°00'00"E
(5) Found 5/8" rebar	35.26'	S34°53'47"W
E/4 COR.SEC.16		
(1) Set 40d nail in South face of power pole	18.33'	S89°32'31"E
(2) Found mag nail wit BLM washer in northeast face of power pole	28.28'	S25°33'57"W
(3) Set existing 40d nail in south face of power pole	51.09'	S79°57'14"W
(4) Found 60d nail in southeast face of power pole	46.24'	N17°17'36"W
CENT./COR.SEC.16		
(1) Set 60d nail in 24" oak tree	27.55'	N08°05'36"E
(2) Set 60d nail in 20" elm tree	42.52'	S67°17'10"W
(3) Set 60d nail in 10" elm tree	23.57'	N34°45'34"W
(4) Set 60d nail in 8" elm tree	58.00'	N07°34'00"W
W/4 COR.SEC.16		
(1) Found chiseled 'X' on headwall	12.85'	S03°22'03"E
(2) Found face of fence corner post	28.05'	N67°15'09"W
(3) Set existing mag nail with washer BLM1991 on railroad tie	44.21'	N48°00'29"W
(4) Set existing 5/8" rebar	13.55'	N17°11'44"E
SW/COR.SEC.16		
(1) Set 1/2" rebar	75.00'	N00°00'00"E
(2) Set 1/2" rebar	100.00'	N00°00'00"E
(3) Found mag nail with shiner BLM 1991 on west face of power pole	50.53'	N65°13'28"E
(4) Found mag nail with shiner BLM 1991 on east face of power pole	27.85'	S61°18'01"W
S/4 COR.SEC.16		
(1) Set 1/2" rebar	25.00'	N00°00'00"E
(2) Set 1/2" rebar	75.00'	N00°00'00"E
(3) Found mag nail in asphalt curb	34.87'	N40°58'06"E
(4) Found ODOT aluminum cap "M-51-464"	366.38'	N75°08'28"W
SE/COR.SEC.16		
(1) Found mag nail	32.20'	N01°53'49"E
(2) Found chiseled "X" on bridge wall	177.59'	S89°30'47"E
(3) Found chiseled "X" on bridge wall	125.36'	S64°07'56"E
(4) Set 1/2" rebar	31.44'	S01°56'38"W

NW Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-822
Found 1/2" rebar with cap "HUB 1352," fits found reference from CCR filed by LS 319, Roy W. Entz, dated 12/18/2002.
As per conversation with surveyor who set the the monument, it was set in place of the axle using an old survey from the area.
Set new references.

N Quarter Corner Section 16, T-15-N, R-19-E, I.M. - Calculated Corner

NE Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-338
Found ODOT brass cap and references from CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by LS 1508, Geoffrey A. King, dated 08/27/2005. Monument appears to be same as the monument from ODOT SD-11 form for station M-51-338 by Jerry Wayne Haynes filed on 06/07/1973. Found references appear be the same as those used by LS 319, Roy W. Entz, dated 01/07/1982. Set new references.



W Quarter Corner Section 16, T-15-N, R-19-E, I.M.- ODOT Mon. No. M-51-1072
Found 5/8" rebar with PLS 1199 cap and references from CCR by PLS 1199, Richard Phillip Wright, dated 12/26/2019. Set new reference.

E Quarter Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-823
Found BLM brass disk and references from previous CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by LS 1508, Geoffrey A. King, dated 03/27/2005. Set new reference.

SE Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-824
Found BLM brass cap and references from CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by PLS 1432, Randy L. Marquardt, dated 10/26/2006 and CCR by LS 1508, Geoffrey A. King, dated 04/27/2005.

SW Corner Section 16, T-15-N, R-19-E, I.M. - ODOT Mon. No. M-51-826
Found mag nail with PLS 1199 washer and references from CCR by PLS 1199, Richard Phillip Wright, dated 12/26/2019. Set new reference.

S Quarter Corner Section 16, T-15-N, R-19-E, I.M.- ODOT Mon. No. M-51-825
Found BLM aluminum cap and references from previous CCR filed by PLS 1508, Geoffrey A. King, dated 04/27/2005. Set new references.

SCALE 0 500 1000 1500 2000 2500 Feet

			OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
PLS	CEH	11-21	SURVEY DATA SHEET
DRAWN	TDL	11-21	SWO 5532(1)
CHECKED	TDL	11-21	
APPROVED			
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S014

REFERENCE MEASUREMENTS:

	Distance (Feet [X] / Meters [ ])	Bearing (True [X] / Magnetic [ ])
NW/COR.SEC.10		
Description		
(1) Set 1/2" rebar	50.00'	N00°00'00"W
(2) Set 1/2" rebar	75.00'	N00°00'00"W
(3) Set 1/2" rebar	100.00'	N00°00'00"W
(4) Found 1/2" rebar from previous CCR	0.25'	S00°49'42"E
N/4 COR.SEC.10		
Description		
(1) Set 60d nail in South side of 12" tree	5.28'	N70°51'41"E
(2) Set 60d nail in West side of 12" tree	13.30'	S24°31'36"E
(3) Set 60d nail in South side of 30" tree	13.35'	S62°42'35"W
(4) Found 60d nail in Northeast side of 24" tree	12.50'	S77°07'02"W
(5) Found 60d nail in railroad tie post	8.5'	N88°03'46"W
(6) Set 60d nail in Southwest side of 8" tree	22.50'	N40°02'07"W
NE/COR.SEC.10		
Description		
Calculated Corner		
E/4 COR.SEC.10		
Description		
(1) Found 60d nail in west face of power pole	150.85'	S83°46'20"E
(2) Set 1/2" rebar	50.00'	S45°00'00"E
(3) Set 1/2" rebar	75.00'	S45°00'00"E
(4) Set 1/2" rebar	110.00'	S45°00'00"E
(5) Found 60d nail in northwest face of power pole	25.97'	S40°16'24"W
CENT./COR.SEC.10		
Description		
(1) Set 60d nail in 10" elm tree	16.00'	S25°33'02"E
(2) Set 60d nail in 12" twin hackberry tree	8.45'	S21°46'13"W
(3) Set 60d nail in 12" hackberry tree	9.25'	N78°09'27"W
(4) Set 60d nail in 12" hackberry tree	9.70'	N43°02'56"W
W/4 COR.SEC.10		
Description		
(1) Set 1/2" rebar	50.00'	S00°06'14"W
(2) Set 1/2" rebar	100.00'	S00°06'14"W
(3) Set 1/2" rebar	150.00'	S00°06'14"W
(4) Set 1/2" rebar	200.00'	S00°06'14"W
SW/COR.SEC.10		
Description		
(1) Found 60d nail in north face of 4" tree	18.97'	N73°46'36"E
(2) Found 5/8" rebar	26.50'	S01°26'01"E
(3) Set 1/2" rebar	50.00'	S00°00'00"E
(4) Set 1/2" rebar	75.00'	S00°00'00"E
(5) Found 5/8" rebar	35.26'	S34°53'47"W
S/4 COR.SEC.10		
Description		
(1) Found 60d nail in north face of tree	4.50'	N89°55'13"E
(2) Set 1/2" rebar	10.75'	S37°03'20"W
(3) Found 60d nail in south face of tree	44.20'	S88°51'49"W
(4) Found 60d nail in east face of tree	8.05'	N41°47'50"W
SE/COR.SEC.10		
Description		
(1) Found 40d nail in southwest face of power pole	35.51'	N42°22'22"E
(2) Set 60d nail in northwest face of tree	22.81'	S54°28'45"W
(3) Set 1/2" rebar	39.62'	S81°51'32"W
(4) Found 60d nail in east face of power pole	47.76'	N60°48'04"W

NW Corner Section 10, T–15–N, R–19–E, I.M. – ODOT Mon. No. M–51–1065
Found and accepted army corps of engineers 3.5" brass cap.
Found and did not accept 1/2" iron pin from previous CCR filed by Lynn Coffman, PLS#1121, dated Mar. 26, 2007. Set new references.

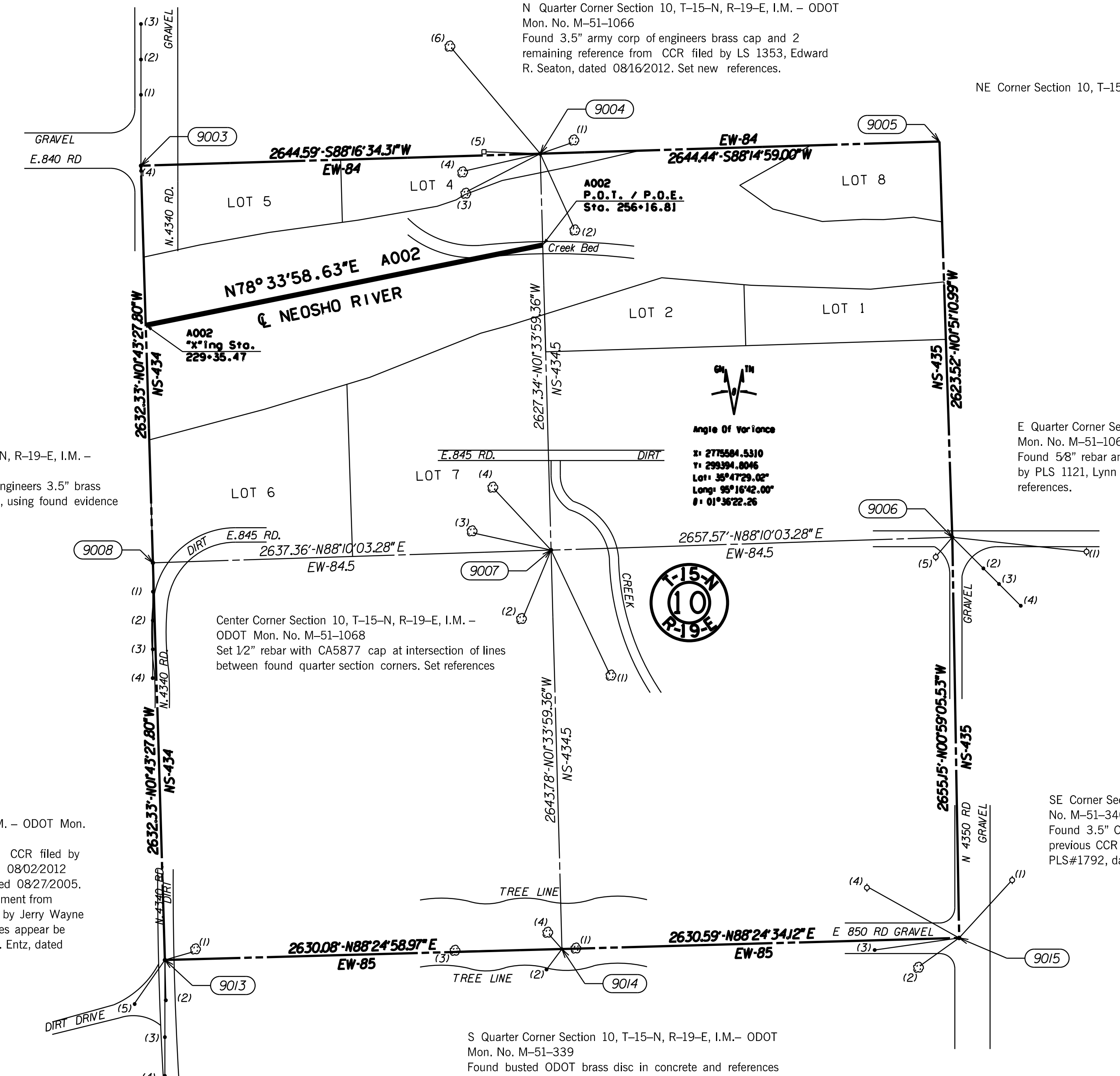
N Quarter Corner Section 10, T–15–N, R–19–E, I.M. – ODOT Mon. No. M–51–1066
Found 3.5" army corp of engineers brass cap and 2 remaining reference from CCR filed by LS 1353, Edward R. Seaton, dated 08/16/2012. Set new references.

NE Corner Section 10, T–15–N, R–19–E, I.M. – Calculated Corner

W Quarter Corner Section 10, T–15–N, R–19–E, I.M. – ODOT Mon. No. M–51–1069
Found and accepted army corps of engineers 3.5" brass cap. Set 1/2" rebar with CA5877 cap, using found evidence and army corp of engineers plat
Set new references

E Quarter Corner Section 10, T–15–N, R–19–E, I.M. – ODOT Mon. No. M–51–1067
Found 5/8" rebar and references from previous CCR filed by PLS 1121, Lynn Coffman, dated 06/2005. Set new references.

Center Corner Section 10, T–15–N, R–19–E, I.M. – ODOT Mon. No. M–51–1068
Set 1/2" rebar with CA5877 cap at intersection of lines between found quarter section corners. Set references



SW Corner Section 10, T–15–N, R–19–E, I.M. – ODOT Mon. No. M–51–338
Found ODOT brass cap and references from CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012 and CCR by LS 1508, Geoffrey A. King, dated 08/27/2005. Monument appears to be same as the monument from ODOT SD–11 form for station M–51–338 by Jerry Wayne Haynes filed on 06/07/1973. Found references appear be the same as those used by LS 319, Roy W. Entz, dated 01/07/1982. Set new references.

SE Corner Section 10, T–15–N, R–19–E, I.M. – ODOT Mon. No. M–51–340
Found 3.5" ODOT aluminum cap and references from previous CCR filed by Robert Levine Johnston Jr., PLS#1792, dated Aug. 2, 2012. Set new reference.

S Quarter Corner Section 10, T–15–N, R–19–E, I.M.– ODOT Mon. No. M–51–339
Found busted ODOT brass disc in concrete and references from previous CCR filed by PLS 1792, Robert Levine Johnston Jr., dated 08/02/2012. Monument appears to be same as monument from ODOT SD–11 corner record form by Jerry Wayne Haynes, dated 06/07/1973. Set new references.

SCALE 0 500 1000 1500 2000 2500 Feet

PLS	CEH	11-21	OKLAHOMA DEPARTMENT OF TRANSPORTATION SURVEY DIVISION
DRAWN	TDL	11-21	SURVEY DATA SHEET
CHECKED	TDL	11-21	SWO 5532(1)
APPROVED			
CREW			

COUNTY MUSKOGEE HIGHWAY MKARNS STATE JOB NO. 35257(04) SHEET NO. S015

Appendix H - Optimoor Results

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Batch File: 21-12-20-ODOT- Barge Fleet.env
Pull-In initialised at the water levels, drafts, trims, and offsets specified for each particular batch case

Batch Run 1:

Static Mooring Response for 6x1 Barges at Single Berth

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet (6x1 Flood Current).opt)
Remarks:

Water Level:	0.00 above Datum (initialised at this water level)
Draft:	12.00 (initialised at this draft))
Trim:	0.00 (initialised at this trim)
Bottom Clearance:	1.00
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Stbd Target:	-1.0 above Pier
Current:	2.0 knots
Current Direction from:	270° True 180° Screen Right
Wind Speed:	75 knots
Wind Direction from:	All°

Total End-on Windage Area:	4592
Total Side Windage Area:	0

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	19.5	0.5	0.1

Movement of Vessel	3.10 (fwd)	-3.26 (out)	2.8° (port)	0.00 (up)
at its Stbd Target	-4.02 (aft)	-0.10 (out)	-2.3° (stbd)	0.00 (up)

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Worst Direction True	Line Tension	Percent Strength
1-J	0.00	147.6			-180°	270°	21.1	15%
2-J	0.00	111.0			-180°	270°	20.9	26%
3-J	0.00	73.5			-180°	270°	41.5	51%
4-J	0.00	147.6			-180°	270°	21.1	15%
5-J	0.00	111.0			-180°	270°	20.9	26%
6-J	0.00	73.5			-180°	270°	41.5	51%
7-H	0.00	143.0			-180°	270°	17.1	21%
8-H	0.00	111.0			-180°	270°	23.6	29%
9-H	0.00	76.0			-180°	270°	35.1	43%
10-H	0.00	143.0			-180°	270°	17.1	21%
11-H	0.00	111.0			-180°	270°	23.6	29%
12-H	0.00	76.0			-180°	270°	35.1	43%
13-J	0.00	76.0			-180°	270°	55.3	**68%**
14-J	0.00	76.0			-180°	270°	55.3	**68%**
15-H	0.00	76.0			20°	110°	37.1	46%
16-H	0.00	76.0			20°	110°	37.1	46%

Fender	Thrust	Compression	Pressure	Flatside Area
dd	94	0.17	1.9	50%
ee		0.00		
ff	63	0.13	1.3	50%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
H	130.7	52.5			151.4	29%	87°	-76.2
J	-96.2	82.2			131.7	25%	-10°	-102.0

Batch Run 2:

Static Mooring Response for 6x1 Barges at Single Berth

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet (6x1 Flood Current).opt)
Remarks:

Water Level:	0.00 above Datum (initialised at this water level)
Draft:	12.00 (initialised at this draft))
Trim:	0.00 (initialised at this trim)
Bottom Clearance:	1.00
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Stbd Target:	-1.0 above Pier
Current:	6.6 knots

```
        Current Direction from:   270° True  180° Screen Right
                    Wind Speed:    40 knots
           Wind Direction from:   All°

      Total End-on Windage Area:  4592
        Total Side Windage Area:     0

                            Longitudinal  Transverse  Yaw Moment/LBP
      Current Drag Force:      235.0         21.5          2.1

       Movement of Vessel   -5.87 (aft)   -4.58 (out)   4.2° (port)   0.00 (up)
       at its Stbd Target   -6.67 (aft)   -4.24 (out)   3.8° (port)   0.00 (up)
```

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Worst Direction True	Line Tension	Percent Strength
1-J	0.00	147.6			-180°	270°	41.1	30%
2-J	0.00	111.0			-180°	270°	40.6	50%
3-J	0.00	73.5			-180°	270°	80.0	99%
4-J	0.00	147.6			-180°	270°	41.1	30%
5-J	0.00	111.0			-180°	270°	40.6	50%
6-J	0.00	73.5			-180°	270°	80.0	99%
7-H	0.00	143.0			175°	265°	35.5	44%
8-H	0.00	111.0			175°	265°	48.7	60%
9-H	0.00	76.0			175°	265°	72.5	90%
10-H	0.00	143.0			175°	265°	35.5	44%
11-H	0.00	111.0			175°	265°	48.7	60%
12-H	0.00	76.0			175°	265°	72.5	90%
13-J	0.00	76.0			175°	265°	108.7	134%
14-J	0.00	76.0			175°	265°	108.7	134%
15-H	0.00	76.0			-90°	0°	0.0	0%
16-H	0.00	76.0			-90°	0°	0.0	0%

Fender	Thrust	Compression	Pressure	Flatside Area
dd	207	0.35	4.1	50%
ee		0.00		
ff		0.00		

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
H	274.2	5.7			313	60%	89°	-151.0
J	-6.4	206.7			281.6	54%	1°	-191.1

Batch Run 3:

Static Mooring Response for 6x1 Barges at Single Berth

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet (6x1 Flood Current).opt)
Remarks:

```
                   Water Level:   0.00 above Datum (initialised at this water level)
                         Draft:   1.00 (initialised at this draft))
                          Trim:   0.00 (initialised at this trim)
              Bottom Clearance:   12.0
     Fwd Offset of Vessel Target:  0.0 from Berth Target
           Vessel Stbd Target:   -1.0 above Pier
                       Current:   2.0 knots
        Current Direction from:   270° True  180° Screen Right
                    Wind Speed:    75 knots
           Wind Direction from:   All°

      Total End-on Windage Area:  6902
        Total Side Windage Area:  2200

                            Longitudinal  Transverse  Yaw Moment/LBP
      Current Drag Force:        0.0          0.0          0.0

       Movement of Vessel    4.05 (fwd)   -3.32 (out)   2.8° (port)   0.00 (up)
       at its Stbd Target   -3.98 (aft)    0.06 (inw)  -2.9° (stbd)   0.00 (up)
```

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Worst Direction True	Line Tension	Percent Strength
1-J	0.00	144.7			-20°	70°	33.7	24%
2-J	0.00	107.7			-20°	70°	26.9	33%
3-J	0.00	69.7			-175°	275°	48.4	60%
4-J	0.00	144.7			-20°	70°	33.7	24%

5-J	0.00	107.7			-20°	70°	26.9	33%
6-J	0.00	69.7			-175°	275°	48.4	60%
7-H	0.00	139.2			-25°	65°	28.6	35%
8-H	0.00	107.7			-180°	270°	28.8	36%
9-H	0.00	72.7			-180°	270°	43.5	54%
10-H	0.00	139.2			-25°	65°	28.6	35%
11-H	0.00	107.7			-180°	270°	28.8	36%
12-H	0.00	72.7			-180°	270°	43.5	54%
13-J	0.00	75.0			-180°	270°	57.1	70%
14-J	0.00	75.0			-180°	270°	57.1	70%
15-H	0.00	75.0			-20°	70°	55.2	68%
16-H	0.00	75.0			-20°	70°	55.2	68%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	119	0.21	2.2	53%
bb	17	0.06	0.3	53%
cc	120	0.22	2.3	53%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
H	187.7	112.6			188.2	36%	87°	-11.2
J	-204.7	102.2			205.2	39%	-87°	-10.7

Batch Run 4:

Static Mooring Response for 6x1 Barges at Single Berth

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet (6x1 Flood Current).opt)
Remarks:

Water Level: 0.00 above Datum (initialised at this water level)
Draft: 1.00 (initialised at this draft))
Trim: 0.00 (initialised at this trim)
Bottom Clearance: 12.0
Fwd Offset of Vessel Target: 0.0 from Berth Target
Vessel Stbd Target: -1.0 above Pier
Current: 6.6 knots
Current Direction from: 270° True 180° Screen Right
Wind Speed: 40 knots
Wind Direction from: All°

Total End-on Windage Area: 6902
Total Side Windage Area: 2200

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	0.0	0.0	0.0

Movement of Vessel	2.00 (fwd)	-1.92 (out)	1.5° (port)	0.00 (up)
at its Stbd Target	-1.93 (aft)	0.04 (inw)	-1.6° (stbd)	0.00 (up)

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	True	Line Tension	Percent Strength
1-J	0.00	144.7			-20°	70°	12.2	9%
2-J	0.00	107.7			-20°	70°	9.7	12%
3-J	0.00	69.7			-170°	280°	19.7	24%
4-J	0.00	144.7			-20°	70°	12.2	9%
5-J	0.00	107.7			-20°	70°	9.7	12%
6-J	0.00	69.7			-170°	280°	19.7	24%
7-H	0.00	139.2			-30°	60°	11.6	14%
8-H	0.00	107.7			-30°	60°	11.6	14%
9-H	0.00	72.7			-30°	60°	17.6	22%
10-H	0.00	139.2			-30°	60°	11.6	14%
11-H	0.00	107.7			-30°	60°	11.6	14%
12-H	0.00	72.7			-30°	60°	17.6	22%
13-J	0.00	75.0			-180°	270°	21.6	27%
14-J	0.00	75.0			-180°	270°	21.6	27%
15-H	0.00	75.0			-20°	70°	21.2	26%
16-H	0.00	75.0			-20°	70°	21.2	26%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	36	0.09	0.7	53%
bb	5	0.04	0.1	53%
cc	36	0.09	0.7	53%

Hook/	X-	Y-	Other	Other	Total	%Bollard	Direction	Bollard

Bollard	Force	Force	X-Load	Y-Load	Force	Strength	in Plan	Uplift
H	67.0	31.5			67.4	13%	85°	-4.7
J	-73.8	28.7			74.2	14%	-85°	-4.4

Batch File: 21-12-20-ODOT- Barge Fleet.env

Greatest Excursions at Target:

	Highest Excursion	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
Long	4.05	75	70°	2.0	270°				0.0	1.0	0.0	0.0	3
Long	-6.67	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
Trans	-4.58	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
Trans	0.06	75	190°	2.0	270°				0.0	1.0	0.0	0.0	3

Greatest Line Tensions as % of Strength:

Line	Highest Loading	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
1	30%	40	270°	6.6	270°				0.0	12.0	0.0	0.0	2
2	50%	40	270°	6.6	270°				0.0	12.0	0.0	0.0	2
3	99%	40	270°	6.6	270°				0.0	12.0	0.0	0.0	2
4	30%	40	270°	6.6	270°				0.0	12.0	0.0	0.0	2
5	50%	40	270°	6.6	270°				0.0	12.0	0.0	0.0	2
6	99%	40	270°	6.6	270°				0.0	12.0	0.0	0.0	2
7	44%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
8	60%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
9	90%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
10	44%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
11	60%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
12	90%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
13	134%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
14	134%	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
15	68%	75	70°	2.0	270°				0.0	1.0	0.0	0.0	3
16	68%	75	70°	2.0	270°				0.0	1.0	0.0	0.0	3

Greatest Berth Fender Thrusts:

Fender	Highest Thrust	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
aa	119	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
bb	17	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
cc	120	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3

Greatest Horizontal Bollard Forces:

Bollard	Highest Force	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
H	313	40	265°	6.6	270°				0.0	12.0	0.0	0.0	2
J	282	40	270°	6.6	270°				0.0	12.0	0.0	0.0	2

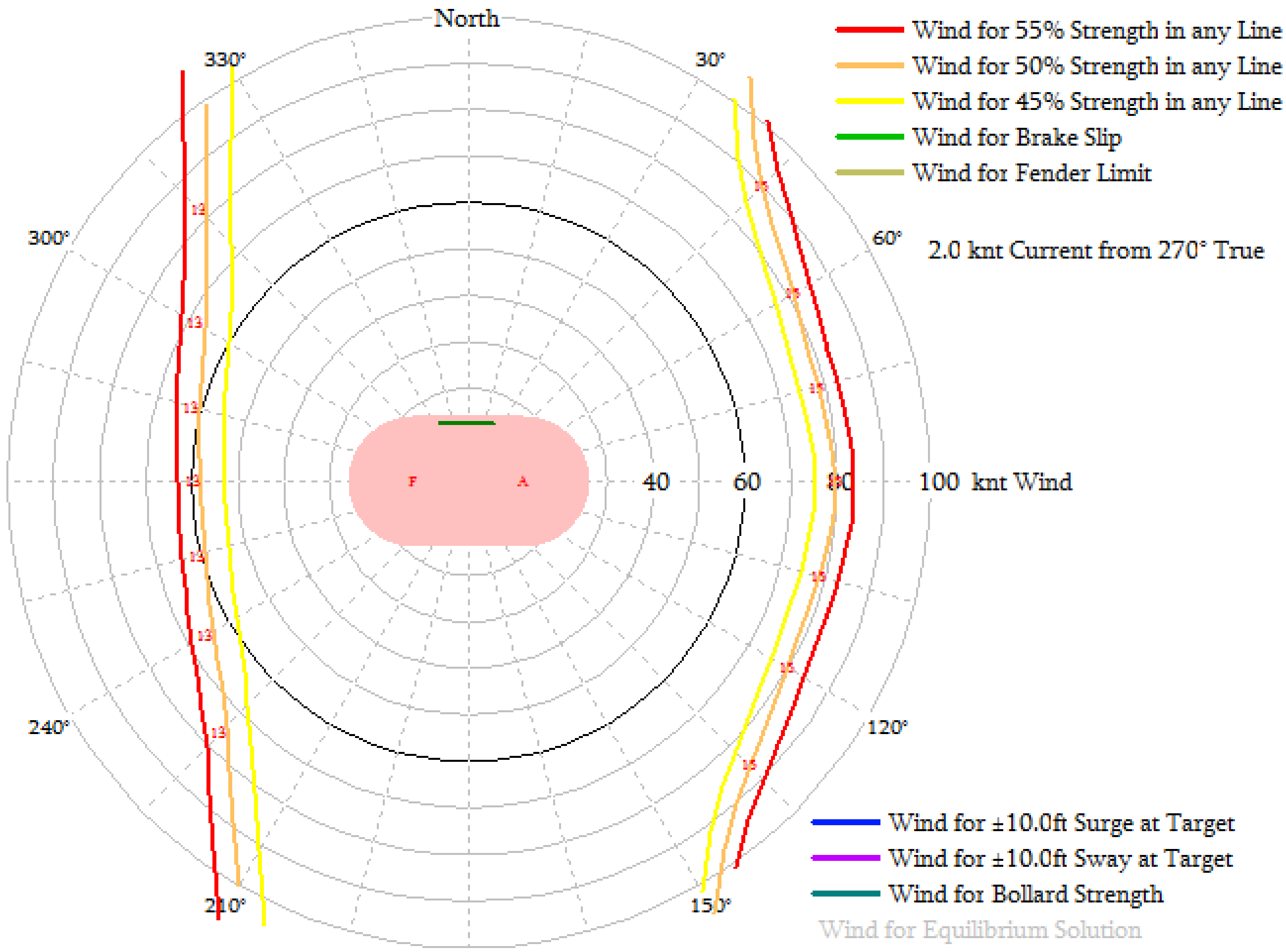
==

Batch File: 21-12-20-ODOT- Barge Fleet.env

Pull-In initialised at the water levels, drafts, trims, and offsets specified for each particular batch case

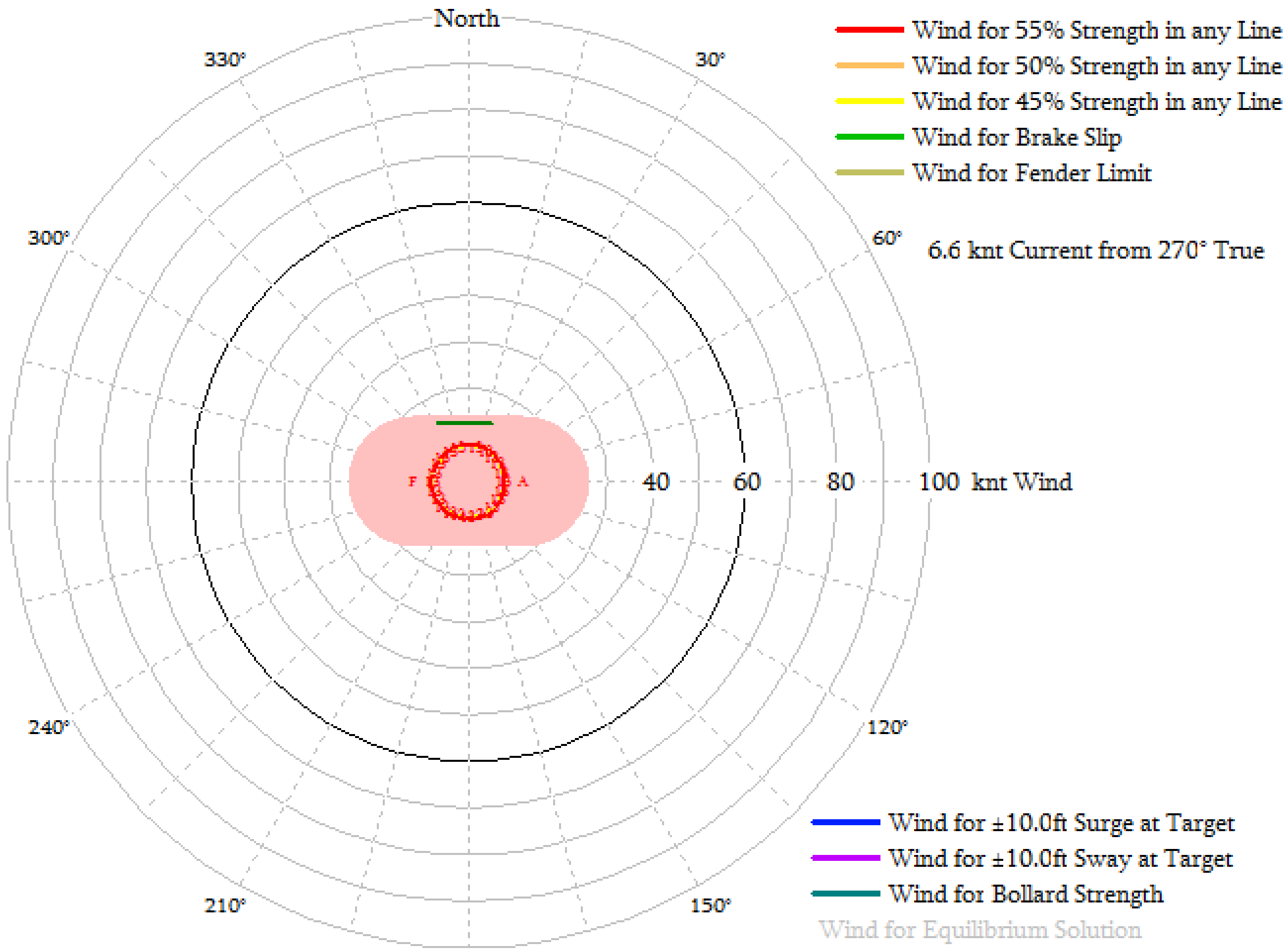
Wind Capability Rose for 6x1 Barges at Single Berth

Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
Ref:
Remarks: Remarks:
Water Level: 0.00 above datum
Draft: 12.0
Trim: 0.0



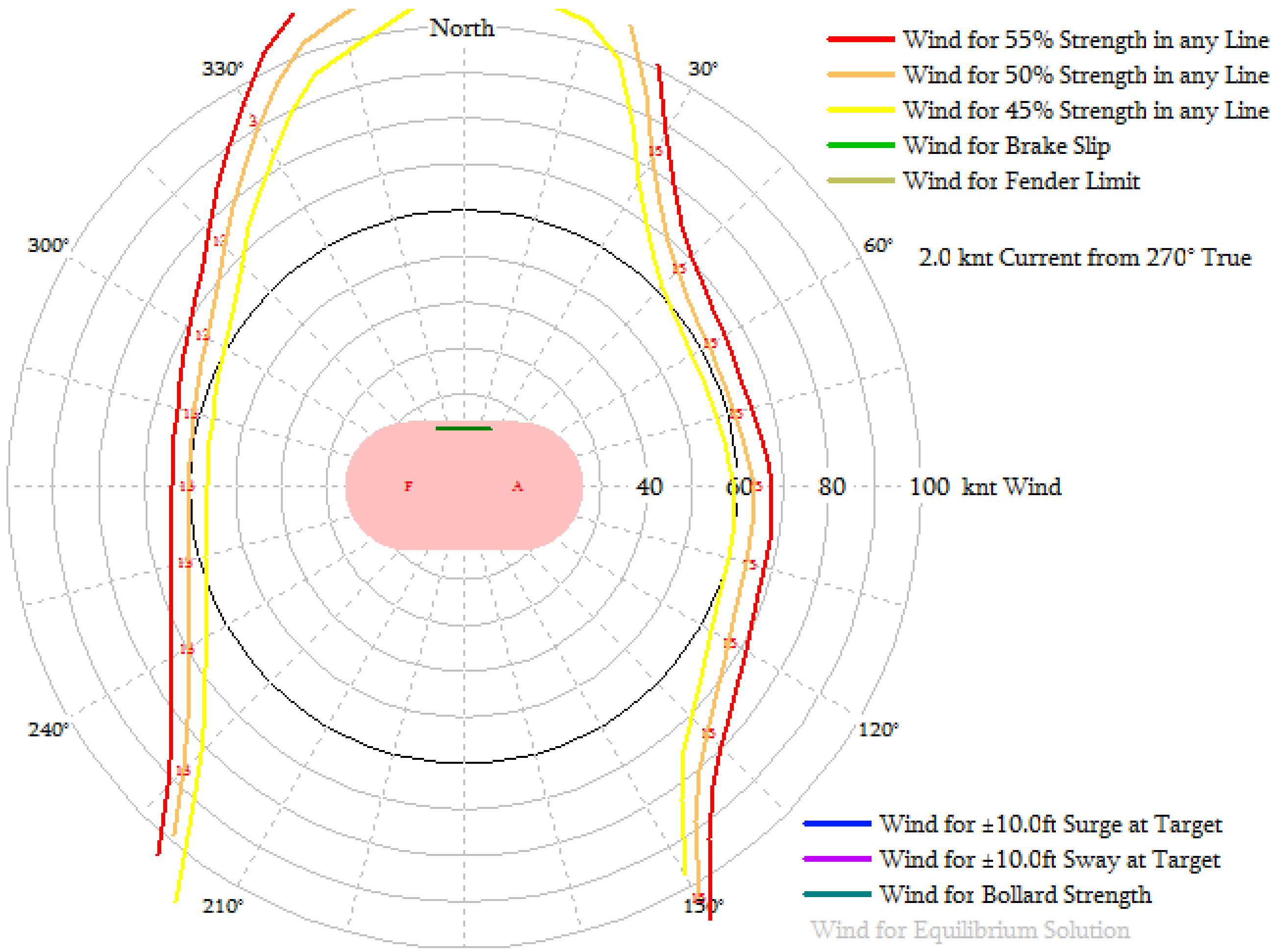
Wind Capability Rose for 6x1 Barges at Single Berth

```
Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
              Ref:
          Remarks: Remarks:
      Water Level:   0.00 above datum
            Draft:  12.0
             Trim:   0.0
```



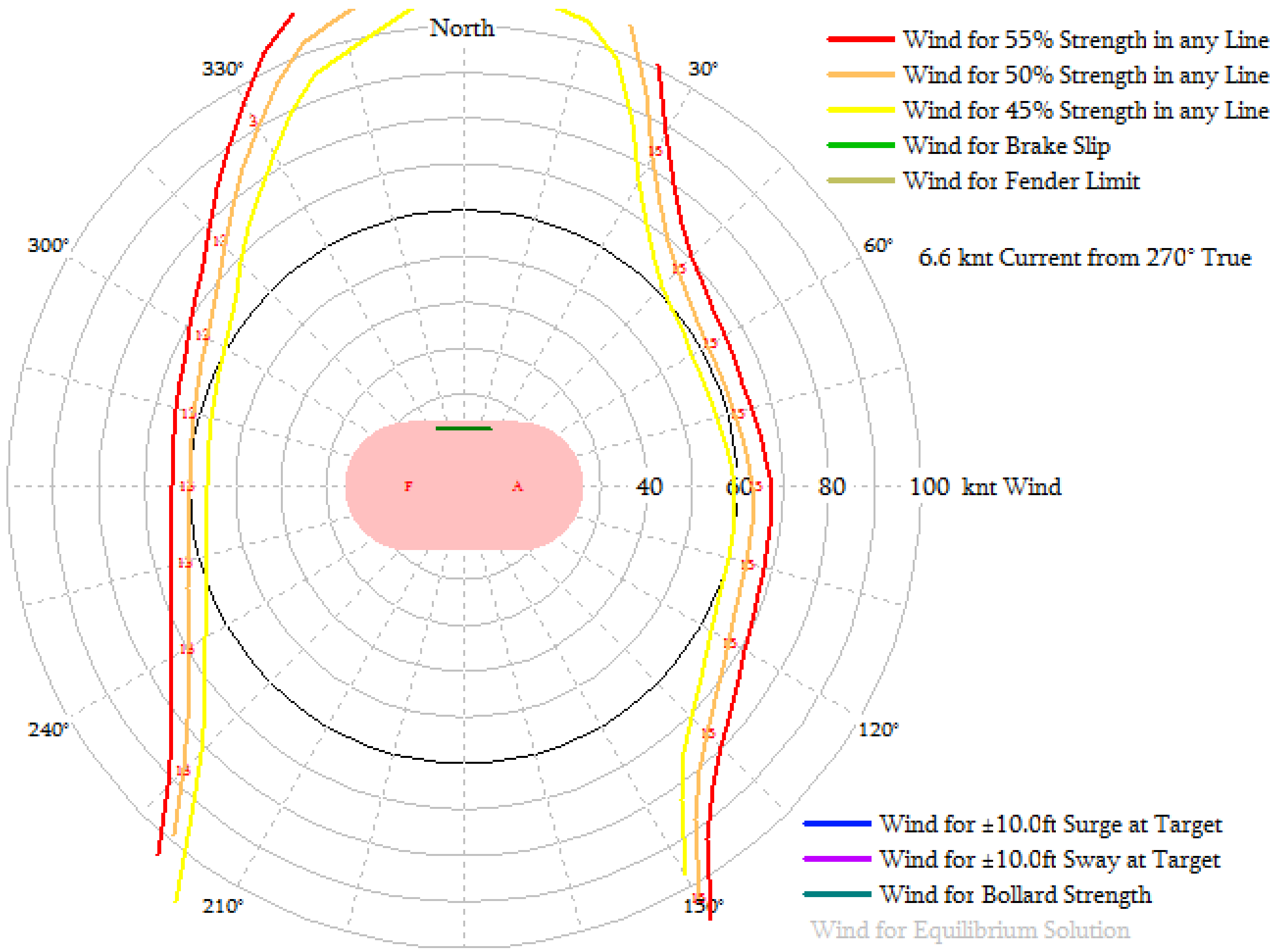
Wind Capability Rose for 6x1 Barges at Single Berth

```
Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
              Ref:
          Remarks: Remarks:
      Water Level:   0.00 above datum
            Draft:   1.0
             Trim:   0.0
```



Wind Capability Rose for 6x1 Barges at Single Berth

```
Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
              Ref:
          Remarks: Remarks:
      Water Level:   0.00 above datum
            Draft:   1.0
             Trim:   0.0
```


North
330°
30°
300°
60°
240°
120°
210°
150°
40
60
80
100 knt Wind
F
A
Wind for 55% Strength in any Line
Wind for 50% Strength in any Line
Wind for 45% Strength in any Line
Wind for Brake Slip
Wind for Fender Limit
6.6 knt Current from 270° True
Wind for ±10.0ft Surge at Target
Wind for ±10.0ft Sway at Target
Wind for Bollard Strength
Wind for Equilibrium Solution

==

Batch File: 21-12-20-ODOT- Barge Fleet.env
Pull-In initialised at the water levels, drafts, trims, and offsets specified for each particular batch case

Batch Run 1:

Static Mooring Response for 6x4 Barges at Multiplle berths

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet 4x6.opt)
Remarks:

```
                Water Level:   0.00 above Datum (initialised at this water level)
                      Draft:  12.00 (initialised at this draft))
                       Trim:   0.00 (initialised at this trim)
           Bottom Clearance:   1.00
  Fwd Offset of Vessel Target:   0.0 from Berth Target
         Vessel Stbd Target:   0.7 above Pier
                    Current:   2.0 knots
     Current Direction from:   270° True  180° Screen Right
                 Wind Speed:    75 knots
        Wind Direction from:   All°

   Total End-on Windage Area:  1010
     Total Side Windage Area:  1010

                         Longitudinal  Transverse  Yaw Moment/LBP
  Current Drag Force:        19.5          0.1          0.0

   Movement of Vessel   0.03 (fwd)   -0.86 (out)   0.1° (port)   0.00 (up)
   at its Stbd Target  -0.08 (aft)    0.04 (inw)  -0.1° (stbd)   0.00 (up)
```

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Worst Direction True	Line Tension	Percent Strength
1-L	0.00	142.1			-120°	330°	6.7	8%
2-L	0.00	107.6			-120°	330°	8.8	11%
3-L	0.00	72.6			-120°	330°	13.0	16%
4-K	0.00	90.0			-50°	40°	1.4	2%
5-K	0.00	90.0			-130°	320°	5.8	7%
6-J	0.00	137.1			-125°	325°	10.8	13%
7-I	0.00	142.1			-90°	0°	4.8	6%
8-H	0.00	90.0			-50°	40°	1.6	2%
9-H	0.00	90.0			-130°	320°	4.9	6%
10-G	0.00	142.1			-120°	330°	6.0	8%
11-F	0.00	142.1			-60°	30°	4.3	5%
12-E	0.00	90.0			-40°	50°	2.0	2%
13-E	0.00	90.0			-130°	320°	4.1	5%
14-D	0.00	142.1			-80°	10°	4.9	6%
15-C	0.00	137.1			-50°	40°	6.5	8%
16-B	0.00	90.3			-40°	50°	1.9	2%
17-B	0.00	89.7			-130°	320°	3.5	4%
18-A	0.00	72.6			-60°	30°	9.7	12%
19-A	0.00	107.6			-60°	30°	6.5	8%
20-A	0.00	142.1			-60°	30°	4.9	6%
21-L	0.00	142.1			-120°	330°	6.7	8%
22-L	0.00	107.6			-120°	330°	8.8	11%
23-L	0.00	72.6			-120°	330°	13.0	16%
24-K	0.00	90.0			-50°	40°	1.4	2%
25-K	0.00	90.0			-130°	320°	5.8	7%
26-J	0.00	137.1			-125°	325°	10.8	13%
27-I	0.00	142.1			-90°	0°	4.8	6%
28-H	0.00	90.0			-50°	40°	1.6	2%
29-H	0.00	90.0			-130°	320°	4.9	6%
30-G	0.00	142.1			-120°	330°	6.0	8%
31-F	0.00	142.1			-60°	30°	4.3	5%
32-E	0.00	90.0			-40°	50°	2.0	2%
33-E	0.00	90.0			-130°	320°	4.1	5%
34-D	0.00	142.1			-80°	10°	4.9	6%
35-C	0.00	137.1			-50°	40°	6.5	8%
36-B	0.00	90.3			-40°	50°	1.9	2%
37-B	0.00	89.7			-130°	320°	3.5	4%
38-A	0.00	72.6			-60°	30°	9.7	12%
39-A	0.00	107.6			-60°	30°	6.5	8%
40-A	0.00	142.1			-60°	30°	4.9	6%

Fender   Thrust   Compression   Pressure   Flatside Area

aa	9	0.05	0.1	67%
bb	3	0.04	0.0	67%
cc	3	0.04	0.0	67%
dd	3	0.04	0.0	67%
ee	2	0.04	0.0	67%
ff	2	0.04	0.0	67%
gg	2	0.04	0.0	67%
hh	2	0.04	0.0	67%
ii	1	0.04	0.0	67%
jj	1	0.03	0.0	67%
kk	1	0.03	0.0	67%
ll	1	0.03	0.0	67%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
A	41.9	6.1			42.3	8%	82°	1.5
B	7.0	0.1			7.0	1%	89°	0.2
C	-12.8	2.4			13.0	2%	-79°	0.6
D	9.7	1.3			9.8	2%	82°	0.3
E	8.2	0.2			8.2	2%	89°	0.3
F	-8.5	1.2			8.6	2%	-82°	0.3
G	11.9	1.7			12.0	2%	82°	0.4
H	9.8	0.3			9.8	2%	88°	0.3
I	-9.4	1.4			9.5	2%	-81°	0.3
J	21.1	4.3			21.6	4%	78°	1.0
K	11.5	0.4			11.5	2%	88°	0.3
L	-56.1	9.6			56.9	11%	-80°	2.0

Batch Run 2:

Static Mooring Response for 6x4 Barges at Multiplle berths

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet 4x6.opt)
Remarks:

Water Level: 0.00 above Datum (initialised at this water level)
Draft: 12.00 (initialised at this draft))
Trim: 0.00 (initialised at this trim)
Bottom Clearance: 1.00
Fwd Offset of Vessel Target: 0.0 from Berth Target
Vessel Stbd Target: 0.7 above Pier
Current: 6.6 knots
Current Direction from: 270° True 180° Screen Right
Wind Speed: 40 knots
Wind Direction from: All°

Total End-on Windage Area: 1010
Total Side Windage Area: 1010

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	232.0	3.7	0.4

Movement of Vessel	-0.25 (aft)	-1.22 (out)	0.2° (port)	0.00 (up)
at its Stbd Target	-0.26 (aft)	-1.10 (out)	0.2° (port)	0.00 (up)

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	True	Line Tension	Percent Strength
1-L	0.00	142.1			-110°	340°	10.2	13%
2-L	0.00	107.6			-110°	340°	13.4	17%
3-L	0.00	72.6			-110°	340°	19.9	25%
4-K	0.00	90.0			-90°	0°	0.0	0%
5-K	0.00	90.0			-130°	320°	20.1	25%
6-J	0.00	137.1			-120°	330°	28.0	35%
7-I	0.00	142.1			-110°	340°	3.4	4%
8-H	0.00	90.0			-90°	0°	0.0	0%
9-H	0.00	90.0			-130°	320°	18.0	22%
10-G	0.00	142.1			-130°	320°	17.0	21%
11-F	0.00	142.1			-90°	0°	0.0	0%
12-E	0.00	90.0			-90°	0°	0.0	0%
13-E	0.00	90.0			-130°	320°	16.2	20%
14-D	0.00	142.1			-130°	320°	12.3	15%
15-C	0.00	137.1			-90°	0°	0.0	0%
16-B	0.00	90.3			-90°	0°	0.0	0%
17-B	0.00	89.7			-140°	310°	15.0	19%
18-A	0.00	72.6			-140°	310°	17.2	21%

19-A	0.00	107.6	-140°	310°	11.6	14%
20-A	0.00	142.1	-140°	310°	8.8	11%
21-L	0.00	142.1	-110°	340°	10.2	13%
22-L	0.00	107.6	-110°	340°	13.4	17%
23-L	0.00	72.6	-110°	340°	19.9	25%
24-K	0.00	90.0	-90°	0°	0.0	0%
25-K	0.00	90.0	-130°	320°	20.1	25%
26-J	0.00	137.1	-120°	330°	28.0	35%
27-I	0.00	142.1	-110°	340°	3.4	4%
28-H	0.00	90.0	-90°	0°	0.0	0%
29-H	0.00	90.0	-130°	320°	18.0	22%
30-G	0.00	142.1	-130°	320°	17.0	21%
31-F	0.00	142.1	-90°	0°	0.0	0%
32-E	0.00	90.0	-90°	0°	0.0	0%
33-E	0.00	90.0	-130°	320°	16.2	20%
34-D	0.00	142.1	-130°	320°	12.3	15%
35-C	0.00	137.1	-90°	0°	0.0	0%
36-B	0.00	90.3	-90°	0°	0.0	0%
37-B	0.00	89.7	-140°	310°	15.0	19%
38-A	0.00	72.6	-140°	310°	17.2	21%
39-A	0.00	107.6	-140°	310°	11.6	14%
40-A	0.00	142.1	-140°	310°	8.8	11%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	50	0.11	0.4	67%
bb		0.00		
cc		0.00		
dd		0.00		
ee		0.00		
ff		0.00		
gg		0.00		
hh		0.00		
ii		0.00		
jj		0.00		
kk		0.00		
ll		0.00		

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
A	74.7	6.7			75.0	14%	85°	2.6
B	30.1	0.4			30.1	6%	89°	0.2
C								0.6
D	24.4	3.1			24.6	5%	83°	0.8
E	32.4	0.9			32.4	6%	88°	0.3
F								0.3
G	33.5	5.4			33.9	6%	81°	1.2
H	35.9	1.3			35.9	7%	88°	0.3
I	-6.6	1.3			6.7	1%	-79°	0.2
J	54.2	14.1			56.0	11%	75°	2.5
K	40.2	1.8			40.2	8%	87°	0.3
L	-84.6	19.7			86.9	17%	-77°	3.0

Batch Run 3:

Static Mooring Response for 6x4 Barges at Multiplle berths

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet 4x6.opt)
Remarks:

Water Level: 0.00 above Datum (initialised at this water level)
Draft: 1.00 (initialised at this draft))
Trim: 0.00 (initialised at this trim)
Bottom Clearance: 12.0
Fwd Offset of Vessel Target: 0.0 from Berth Target
Vessel Stbd Target: 0.7 above Pier
Current: 2.0 knots
Current Direction from: 270° True 180° Screen Right
Wind Speed: 75 knots
Wind Direction from: All°

Total End-on Windage Area: 3320
Total Side Windage Area: 9810

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	0.0	0.0	0.0

Movement of Vessel	0.25 (fwd)	-3.82 (out)	0.2° (port)	0.00 (up)
at its Stbd Target	-0.19 (aft)	0.06 (inw)	-0.3° (stbd)	0.00 (up)

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	True	Line Tension	Percent Strength
1-L	0.00	145.3			-120°	330°	31.1	39%
2-L	0.00	110.8			-120°	330°	40.7	51%
3-L	0.00	75.8			-120°	330°	59.6	74%
4-K	0.00	90.8			-60°	30°	12.7	16%
5-K	0.00	90.8			-130°	320°	17.3	22%
6-J	0.00	141.1			-120°	330°	39.3	49%
7-I	0.00	145.3			-100°	350°	28.7	36%
8-H	0.00	90.8			-50°	40°	15.2	19%
9-H	0.00	90.8			-130°	320°	15.4	19%
10-G	0.00	145.3			-110°	340°	29.0	36%
11-F	0.00	145.3			-80°	10°	29.3	37%
12-E	0.00	90.8			-40°	50°	18.2	23%
13-E	0.00	90.8			-120°	330°	13.8	17%
14-D	0.00	145.3			-90°	0°	29.0	36%
15-C	0.00	141.1			-60°	30°	41.4	52%
16-B	0.00	91.1			-35°	55°	19.8	25%
17-B	0.00	90.5			-120°	330°	10.7	13%
18-A	0.00	75.8			-60°	30°	63.1	79%
19-A	0.00	110.8			-60°	30°	43.2	54%
20-A	0.00	145.3			-60°	30°	32.9	41%
21-L	0.00	145.3			-120°	330°	31.1	39%
22-L	0.00	110.8			-120°	330°	40.7	51%
23-L	0.00	75.8			-120°	330°	59.6	74%
24-K	0.00	90.8			-60°	30°	12.7	16%
25-K	0.00	90.8			-130°	320°	17.3	22%
26-J	0.00	141.1			-120°	330°	39.3	49%
27-I	0.00	145.3			-100°	350°	28.7	36%
28-H	0.00	90.8			-50°	40°	15.2	19%
29-H	0.00	90.8			-130°	320°	15.4	19%
30-G	0.00	145.3			-110°	340°	29.0	36%
31-F	0.00	145.3			-80°	10°	29.3	37%
32-E	0.00	90.8			-40°	50°	18.2	23%
33-E	0.00	90.8			-120°	330°	13.8	17%
34-D	0.00	145.3			-90°	0°	29.0	36%
35-C	0.00	141.1			-60°	30°	41.4	52%
36-B	0.00	91.1			-35°	55°	19.8	25%
37-B	0.00	90.5			-120°	330°	10.7	13%
38-A	0.00	75.8			-60°	30°	63.1	79%
39-A	0.00	110.8			-60°	30°	43.2	54%
40-A	0.00	145.3			-60°	30°	32.9	41%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	26	0.07	0.3	50%
bb	24	0.07	0.2	50%
cc	22	0.07	0.2	50%
dd	21	0.07	0.2	50%
ee	20	0.06	0.2	50%
ff	19	0.06	0.2	50%
gg	19	0.06	0.2	50%
hh	19	0.06	0.2	50%
ii	20	0.06	0.2	50%
jj	21	0.06	0.2	50%
kk	22	0.07	0.2	50%
ll	23	0.07	0.2	50%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
A	230.8	75.7			278.3	53%	72°	135.8
B	-39.3	2.6			39.6	8%	-87°	5.8
C	-62.5	24.8			82.9	16%	-68°	48.4
D	48.4	14.4			57.9	11%	74°	28.4
E	-36.0	3.1			36.3	7%	-87°	6.2
F	-49.1	14.2			58.6	11%	-74°	28.7
G	48.7	14.0			58.1	11%	74°	28.4
H	-30.1	3.1			30.4	6%	-87°	6.1
I	-48.0	14.1			57.4	11%	-74°	28.1
J	59.2	23.4			78.5	15%	68°	46.0
K	29.4	3.5			29.6	6%	87°	6.7
L	-218.9	68.3			262.8	50%	-73°	128.4

Batch Run 4:

Static Mooring Response for 6x4 Barges at Multiplle berths

Units in ft & kips (file J:\11000s\11682 ODOT Arkansas River Mooring Modernization\Design\Mooring\Optimoor\21-12-20-ODOT- Barge Fleet 4x6.opt)
Remarks:

Water Level:	0.00 above Datum (initialised at this water level)
Draft:	1.00 (initialised at this draft))
Trim:	0.00 (initialised at this trim)
Bottom Clearance:	12.0
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Stbd Target:	0.7 above Pier
Current:	6.6 knots
Current Direction from:	270° True 180° Screen Right
Wind Speed:	40 knots
Wind Direction from:	All°
Total End-on Windage Area:	3320
Total Side Windage Area:	9810

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	0.0	0.0	0.0

Movement of Vessel	0.11 (fwd)	-2.01 (out)	0.1° (port)	0.00 (up)
at its Stbd Target	-0.08 (aft)	0.04 (inw)	-0.2° (stbd)	0.00 (up)

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	True	Line Tension	Percent Strength
1-L	0.00	145.3			-120°	330°	12.7	16%
2-L	0.00	110.8			-120°	330°	16.7	21%
3-L	0.00	75.8			-120°	330°	24.4	31%
4-K	0.00	90.8			-60°	30°	5.1	6%
5-K	0.00	90.8			-130°	320°	7.0	9%
6-J	0.00	141.1			-120°	330°	16.1	20%
7-I	0.00	145.3			-100°	350°	11.7	15%
8-H	0.00	90.8			-50°	40°	6.0	8%
9-H	0.00	90.8			-130°	320°	6.2	8%
10-G	0.00	145.3			-110°	340°	11.8	15%
11-F	0.00	145.3			-80°	10°	12.0	15%
12-E	0.00	90.8			-40°	50°	7.3	9%
13-E	0.00	90.8			-120°	330°	5.5	7%
14-D	0.00	145.3			-90°	0°	11.8	15%
15-C	0.00	141.1			-60°	30°	17.0	21%
16-B	0.00	91.1			-40°	50°	7.8	10%
17-B	0.00	90.5			-120°	330°	4.1	5%
18-A	0.00	75.8			-60°	30°	25.9	32%
19-A	0.00	110.8			-60°	30°	17.7	22%
20-A	0.00	145.3			-60°	30°	13.5	17%
21-L	0.00	145.3			-120°	330°	12.7	16%
22-L	0.00	110.8			-120°	330°	16.7	21%
23-L	0.00	75.8			-120°	330°	24.4	31%
24-K	0.00	90.8			-60°	30°	5.1	6%
25-K	0.00	90.8			-130°	320°	7.0	9%
26-J	0.00	141.1			-120°	330°	16.1	20%
27-I	0.00	145.3			-100°	350°	11.7	15%
28-H	0.00	90.8			-50°	40°	6.0	8%
29-H	0.00	90.8			-130°	320°	6.2	8%
30-G	0.00	145.3			-110°	340°	11.8	15%
31-F	0.00	145.3			-80°	10°	12.0	15%
32-E	0.00	90.8			-40°	50°	7.3	9%
33-E	0.00	90.8			-120°	330°	5.5	7%
34-D	0.00	145.3			-90°	0°	11.8	15%
35-C	0.00	141.1			-60°	30°	17.0	21%
36-B	0.00	91.1			-40°	50°	7.8	10%
37-B	0.00	90.5			-120°	330°	4.1	5%
38-A	0.00	75.8			-60°	30°	25.9	32%
39-A	0.00	110.8			-60°	30°	17.7	22%
40-A	0.00	145.3			-60°	30°	13.5	17%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	7	0.04	0.1	50%
bb	7	0.04	0.1	50%
cc	6	0.04	0.1	50%
dd	6	0.04	0.1	50%

ee	6	0.04	0.1	50%
ff	5	0.04	0.1	50%
gg	5	0.04	0.1	50%
hh	5	0.04	0.1	50%
ii	6	0.04	0.1	50%
jj	6	0.04	0.1	50%
kk	6	0.04	0.1	50%
ll	6	0.04	0.1	50%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
A	96.8	21.5			114.3	22%	77°	56.8
B	-15.4	0.6			15.5	3%	-88°	2.2
C	-26.3	7.2			34.1	6%	-75°	20.5
D	20.1	4.1			23.6	4%	79°	11.8
E	-14.5	0.9			14.7	3%	-88°	2.5
F	-20.3	4.1			23.9	5%	-79°	11.9
G	20.1	4.0			23.6	4%	79°	11.7
H	-11.9	0.9			12.1	2%	-88°	2.5
I	-19.8	4.0			23.3	4%	-79°	11.6
J	24.9	6.8			32.2	6%	75°	19.4
K	11.4	1.0			11.5	2%	88°	2.7
L	-91.4	19.5			107.7	21%	-78°	53.5

Batch File: 21-12-20-ODOT- Barge Fleet.env
Greatest Excursions at Target:

	Highest Excursion	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
Long	0.25	75	60°	2.0	270°				0.0	1.0	0.0	0.0	3
Long	-0.26	40	320°	6.6	270°				0.0	12.0	0.0	0.0	2
Trans	-3.82	75	355°	2.0	270°				0.0	1.0	0.0	0.0	3
Trans	0.06	75	190°	2.0	270°				0.0	1.0	0.0	0.0	3

Greatest Line Tensions as % of Strength:

Line	Highest Loading	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
1	39%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
2	51%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
3	74%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
4	16%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
5	25%	40	320°	6.6	270°				0.0	12.0	0.0	0.0	2
6	49%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
7	36%	75	350°	2.0	270°				0.0	1.0	0.0	0.0	3
8	19%	75	40°	2.0	270°				0.0	1.0	0.0	0.0	3
9	22%	40	320°	6.6	270°				0.0	12.0	0.0	0.0	2
10	36%	75	340°	2.0	270°				0.0	1.0	0.0	0.0	3
11	37%	75	10°	2.0	270°				0.0	1.0	0.0	0.0	3
12	23%	75	50°	2.0	270°				0.0	1.0	0.0	0.0	3
13	20%	40	320°	6.6	270°				0.0	12.0	0.0	0.0	2
14	36%	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
15	52%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
16	25%	75	55°	2.0	270°				0.0	1.0	0.0	0.0	3
17	19%	40	310°	6.6	270°				0.0	12.0	0.0	0.0	2
18	79%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
19	54%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
20	41%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
21	39%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
22	51%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
23	74%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
24	16%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
25	25%	40	320°	6.6	270°				0.0	12.0	0.0	0.0	2
26	49%	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
27	36%	75	350°	2.0	270°				0.0	1.0	0.0	0.0	3
28	19%	75	40°	2.0	270°				0.0	1.0	0.0	0.0	3
29	22%	40	320°	6.6	270°				0.0	12.0	0.0	0.0	2
30	36%	75	340°	2.0	270°				0.0	1.0	0.0	0.0	3
31	37%	75	10°	2.0	270°				0.0	1.0	0.0	0.0	3
32	23%	75	50°	2.0	270°				0.0	1.0	0.0	0.0	3
33	20%	40	320°	6.6	270°				0.0	12.0	0.0	0.0	2
34	36%	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
35	52%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
36	25%	75	55°	2.0	270°				0.0	1.0	0.0	0.0	3
37	19%	40	310°	6.6	270°				0.0	12.0	0.0	0.0	2
38	79%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
39	54%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3

40	41%	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3	

Greatest Berth Fender Thrusts:

Fender	Highest Thrust	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
aa	50	40	0°	6.6	270°				0.0	12.0	0.0	0.0	2
bb	24	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
cc	22	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
dd	21	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
ee	20	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
ff	19	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
gg	19	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
hh	19	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
ii	20	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
jj	21	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
kk	22	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
ll	23	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3

Greatest Horizontal Bollard Forces:

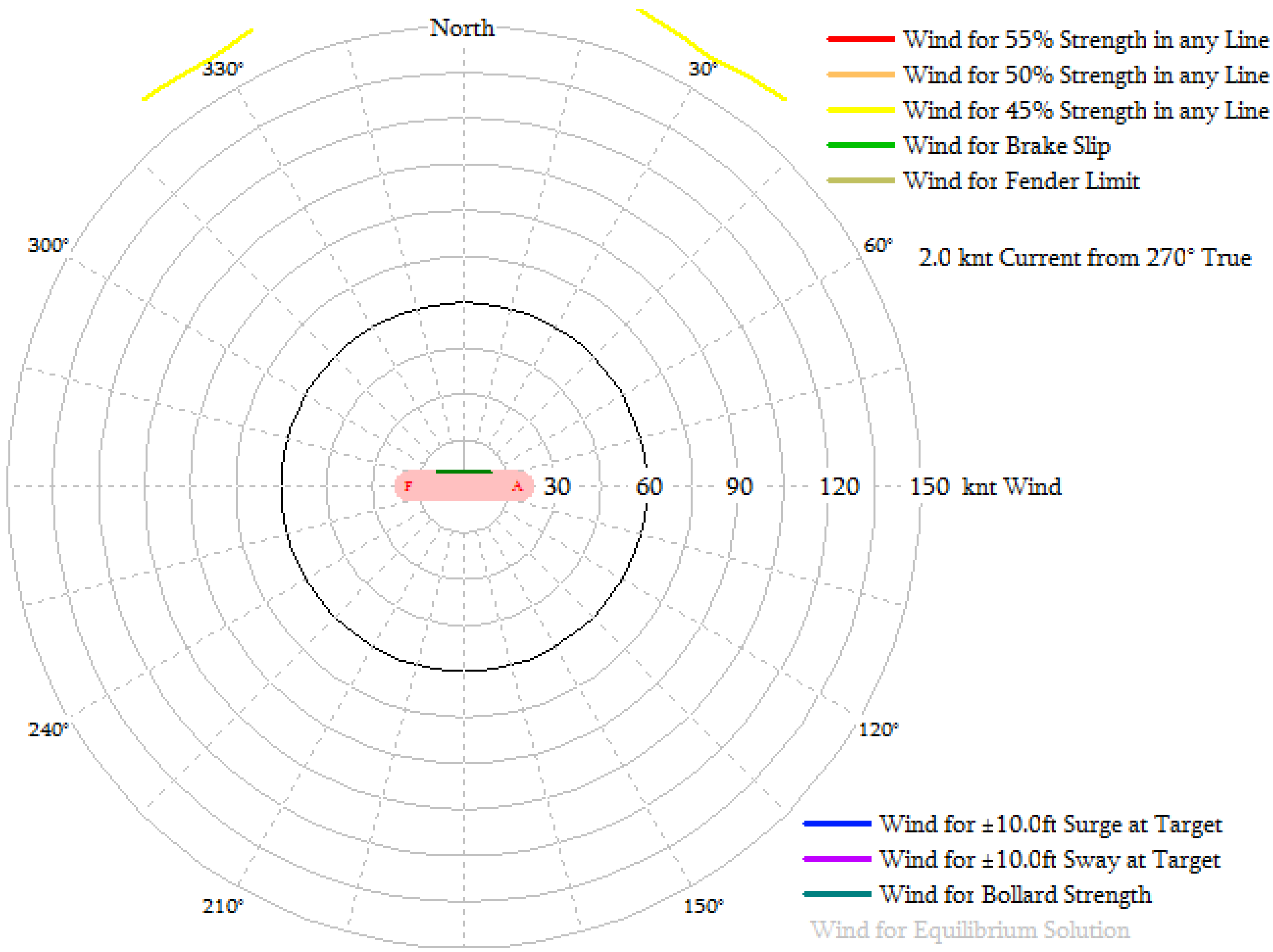
Bollard	Highest Force	Wind Speed	True Direction	Current Speed	True Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
A	278	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
B	40	75	55°	2.0	270°				0.0	1.0	0.0	0.0	3
C	83	75	30°	2.0	270°				0.0	1.0	0.0	0.0	3
D	58	75	0°	2.0	270°				0.0	1.0	0.0	0.0	3
E	36	75	50°	2.0	270°				0.0	1.0	0.0	0.0	3
F	59	75	10°	2.0	270°				0.0	1.0	0.0	0.0	3
G	58	75	340°	2.0	270°				0.0	1.0	0.0	0.0	3
H	36	40	325°	6.6	270°				0.0	12.0	0.0	0.0	2
I	57	75	350°	2.0	270°				0.0	1.0	0.0	0.0	3
J	79	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3
K	40	40	325°	6.6	270°				0.0	12.0	0.0	0.0	2
L	263	75	330°	2.0	270°				0.0	1.0	0.0	0.0	3

==

Batch File: 21-12-20-ODOT- Barge Fleet.env
Pull-In initialised at the water levels, drafts, trims, and offsets specified for each particular batch case

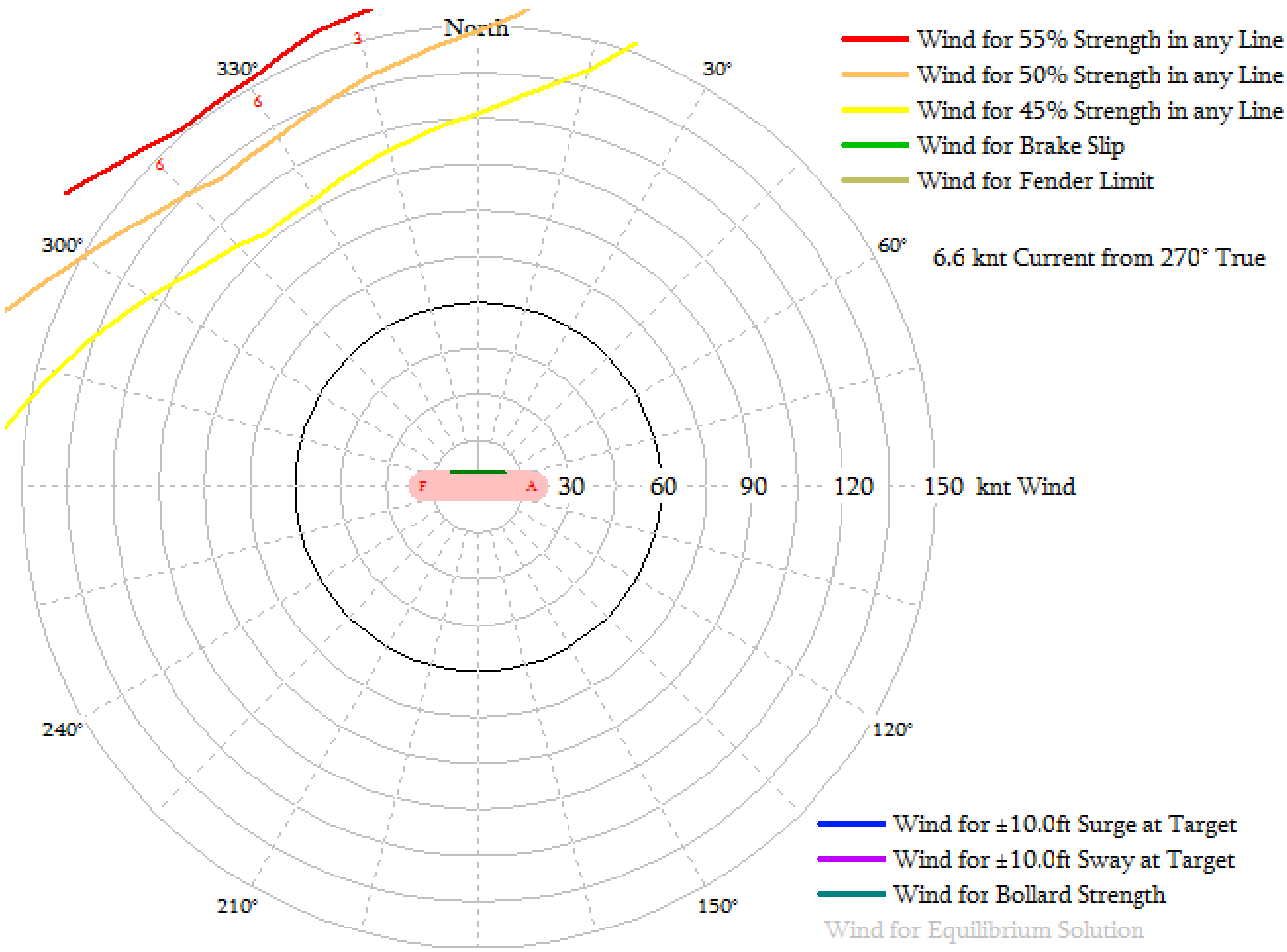
Wind Capability Rose for 6x4 Barges at Multiplle berths

Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
Ref:
Remarks: Remarks:
Water Level: 0.00 above datum
Draft: 12.0
Trim: 0.0



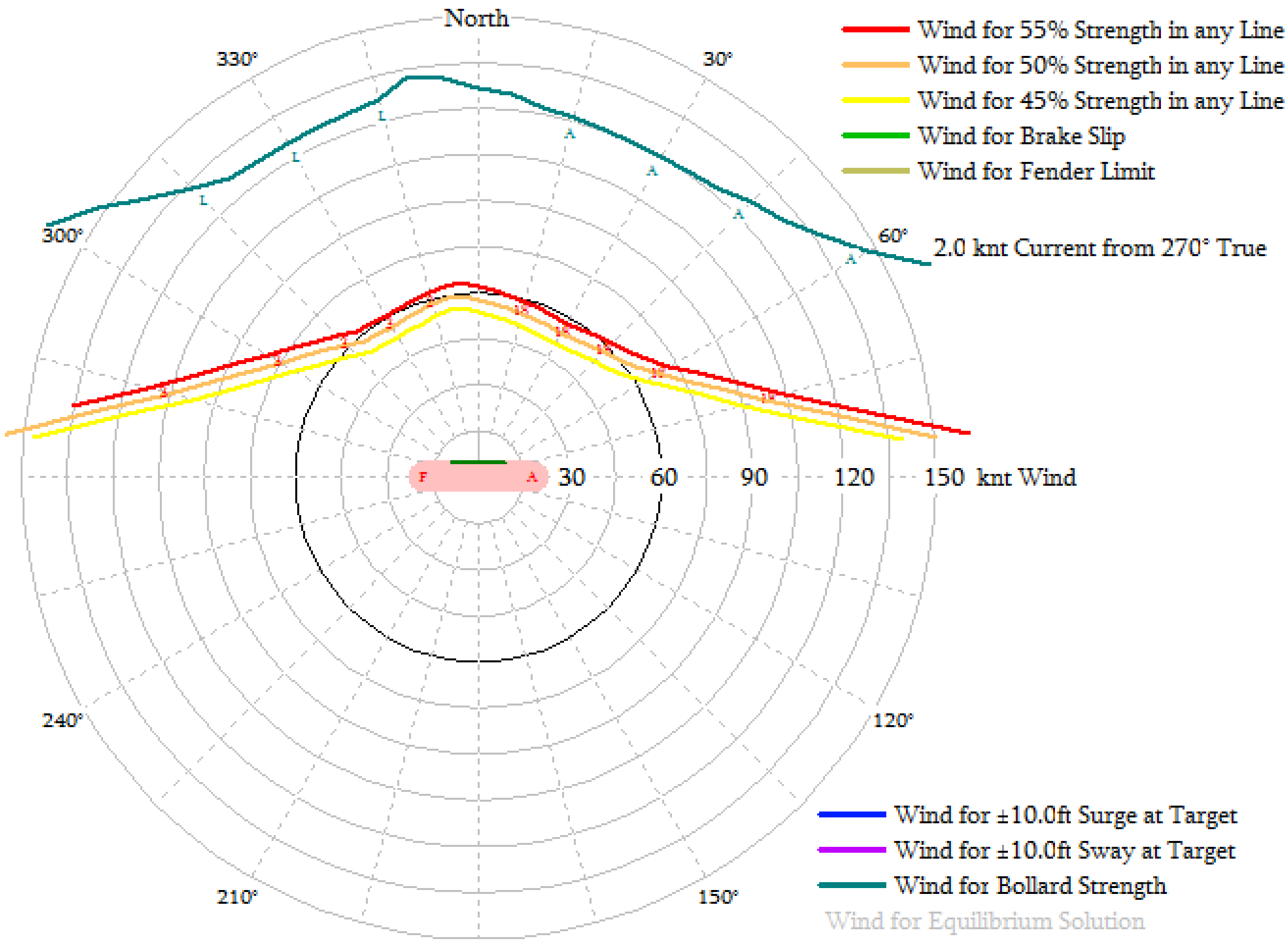
Wind Capability Rose for 6x4 Barges at Multiplle berths

```
Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
              Ref:
          Remarks: Remarks:
      Water Level:   0.00 above datum
            Draft:  12.0
             Trim:   0.0
```



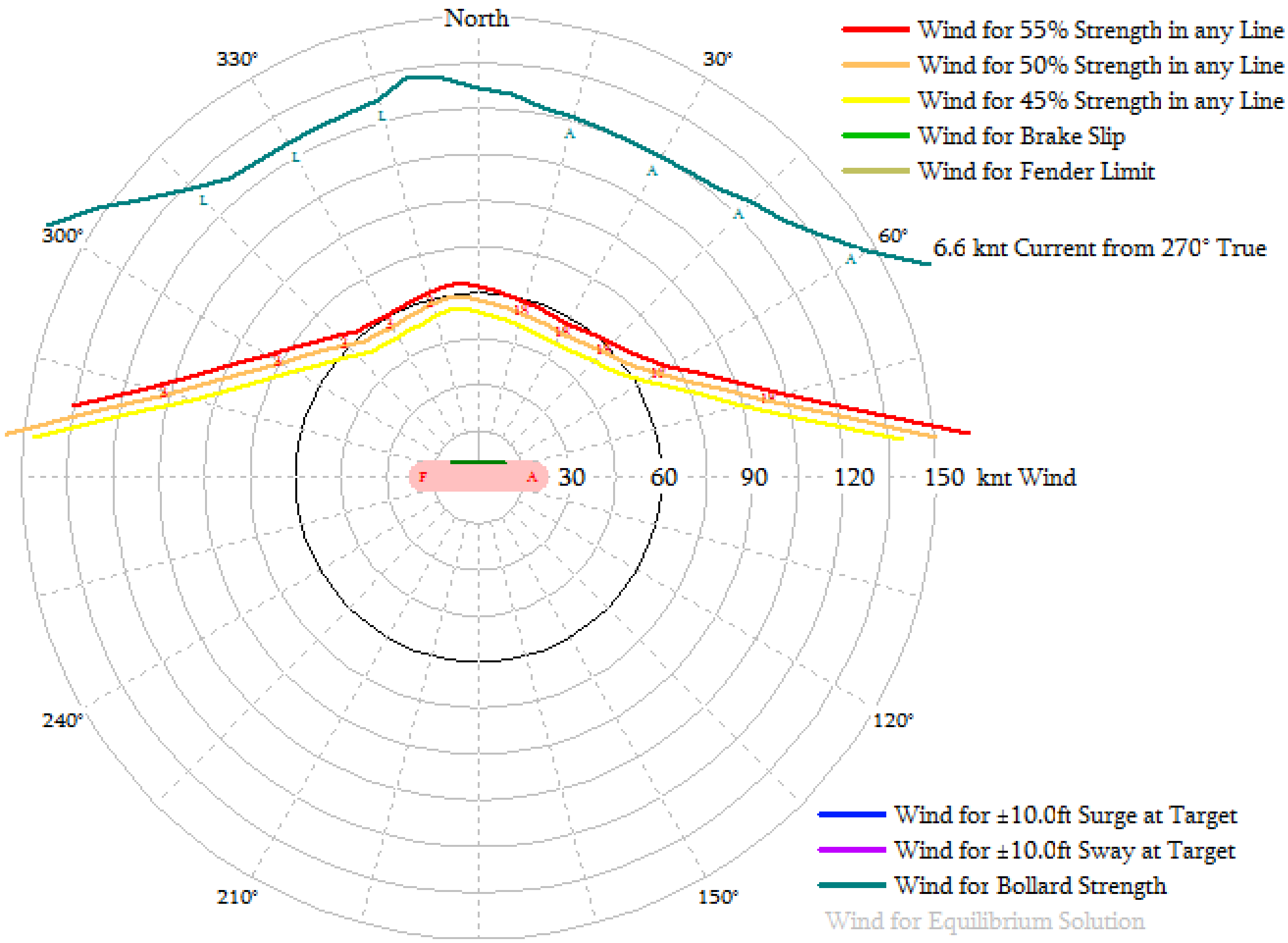
Wind Capability Rose for 6x4 Barges at Multiplle berths

```
Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
              Ref:
          Remarks: Remarks:
      Water Level:   0.00 above datum
            Draft:   1.0
             Trim:   0.0
```



Wind Capability Rose for 6x4 Barges at Multiplle berths

```
Analysis for Time: 0730 Jul 02 2019 (initialised at 0730 Jul 02 2019)
              Ref:
          Remarks: Remarks:
      Water Level:   0.00 above datum
            Draft:   1.0
             Trim:   0.0
```


North
330°
30°
300°
60°
240°
120°
210°
150°
30
60
90
120
150 knt Wind
Wind for 55% Strength in any Line
Wind for 50% Strength in any Line
Wind for 45% Strength in any Line
Wind for Brake Slip
Wind for Fender Limit
6.6 knt Current from 270° True
Wind for ±10.0ft Surge at Target
Wind for ±10.0ft Sway at Target
Wind for Bollard Strength
Wind for Equilibrium Solution

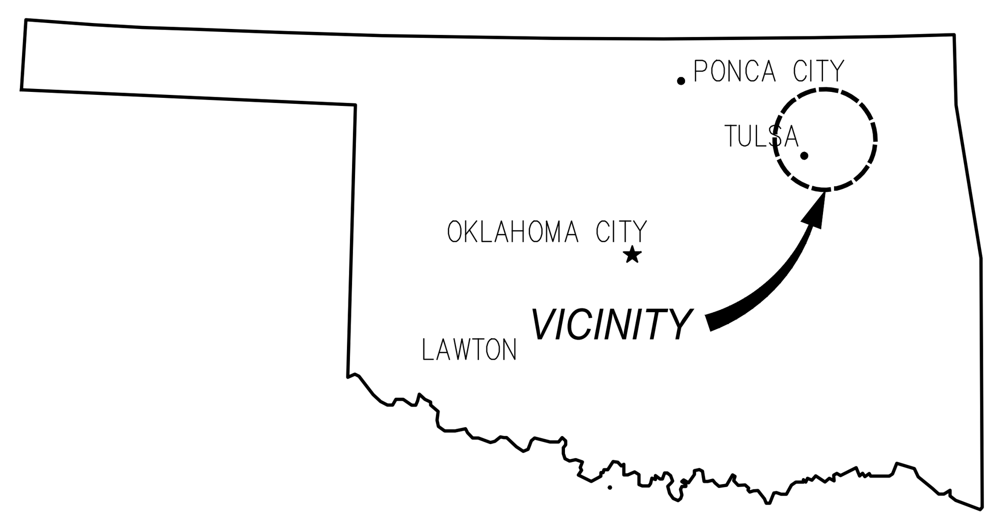
Appendix I - Preliminary Drawings

OKLAHOMA DEPARTMENT OF TRANSPORTATION

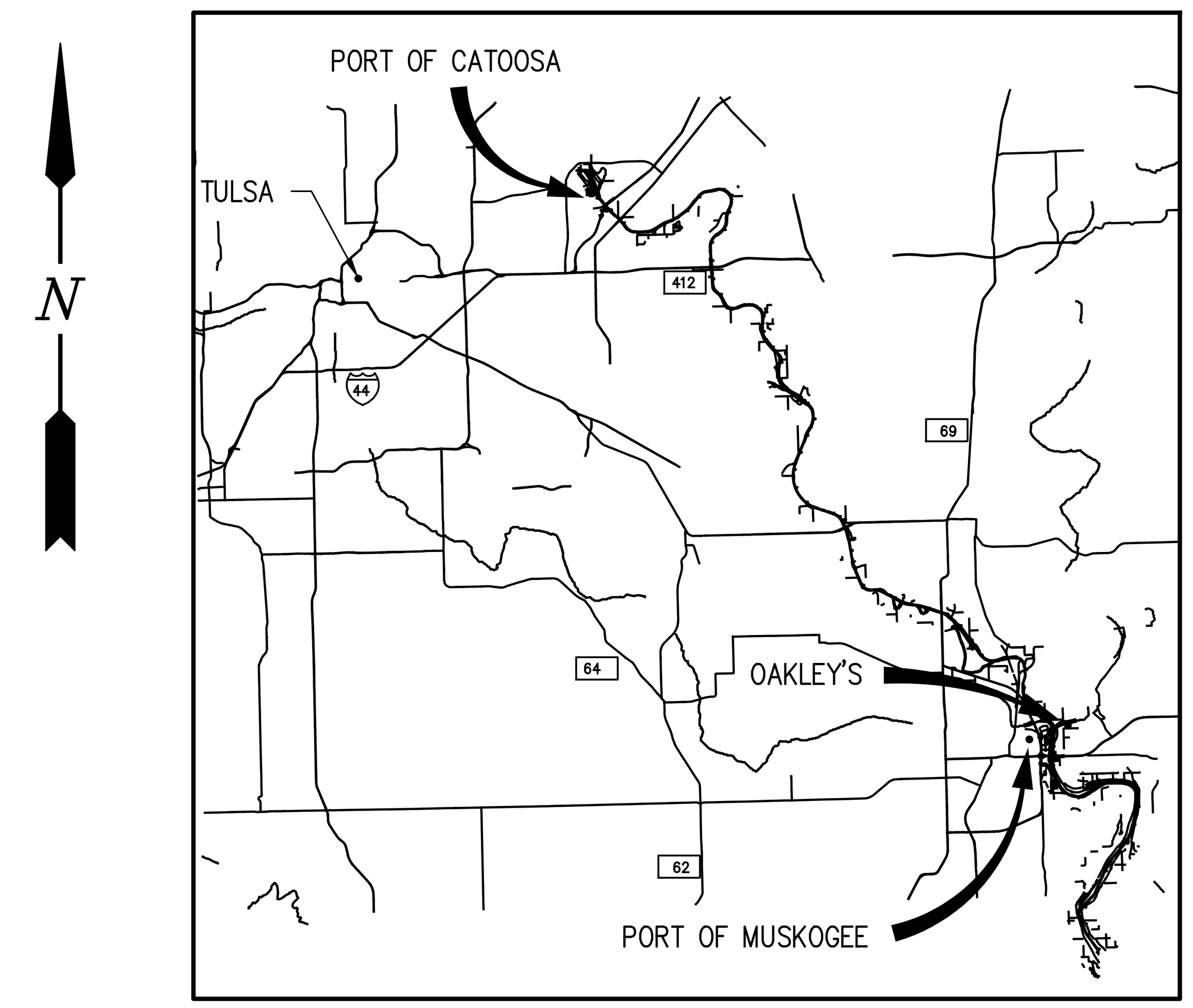
OKLAHOMA
PORT OF CATOOSA, MUSKOGEE, AND OAKLEY'S
MOORING MODERNIZATION

DRAWING INDEX

DWG. NUMBER	TITLE
CS1	TITLE SHEET, DRAWING INDEX, AND GENERAL NOTES
SP1	PORT OF MUSKOGEE SITE PLAN
SP2	PORT OF CATOOSA SITE PLAN
SP3	OAKLEY'S 33 GRAND RIVER SITE PLAN
S1	MONOPILE ELEVATIONS AND DETAILS

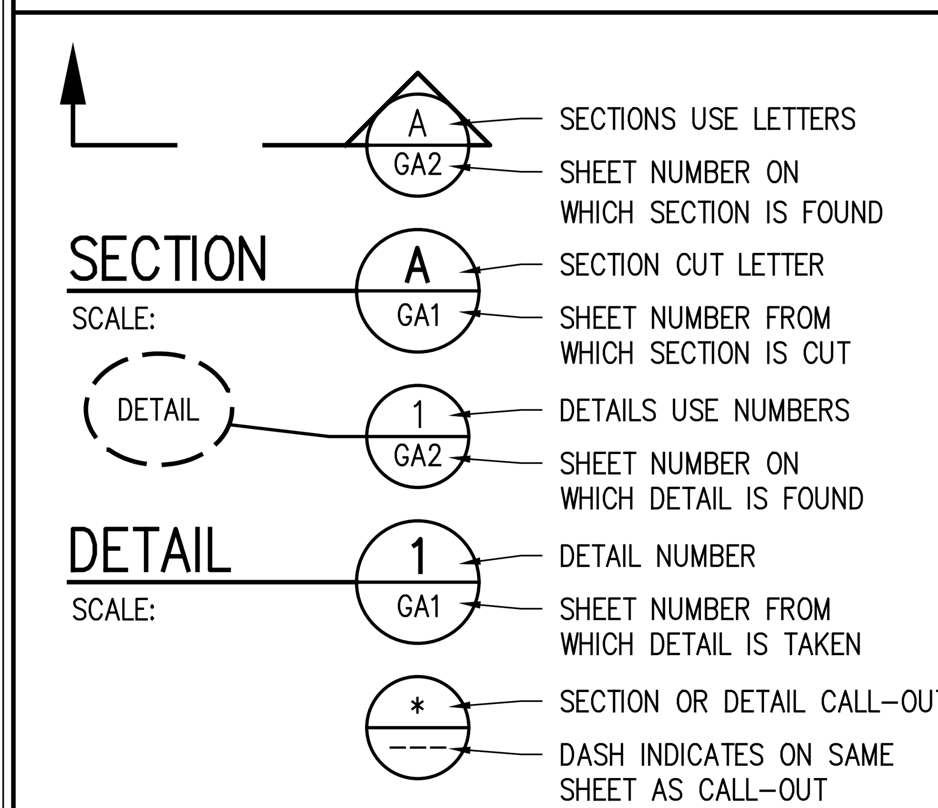


AREA MAP
N.T.S.



VICINITY MAP

LEGEND



GENERAL NOTES:

1. HORIZONTAL DATUM REFERENCED TO OKLAHOMA STATE PLANE (NORTH) NAD 83.
2. EXISTING CONSTRUCTION AND CONDITIONS SHOWN ARE SCHEMATIC. ACTUAL CONDITIONS MAY DIFFER. THE CONTRACTOR IS FULLY RESPONSIBLE FOR MAKING HIS OWN SITE EXAMINATION AND DETERMINING THE ACTUAL NATURE AND EXTENT OF EXISTING CONDITIONS AS NEEDED PRIOR TO UNDERTAKING THE WORK.
3. ALL STRUCTURAL STEEL AND ASSOCIATED FABRICATION SHALL CONFORM WITH AISC STEEL CONSTRUCTION MANUAL FOURTEENTH EDITION AND THE LATEST REQUIREMENTS OF AISC FOR FABRICATION AND ERECTION OF STRUCTURAL STEEL.
4. ALL STEEL WIDE FLANGES/WT SECTIONS ARE TO MEET ASTM A992; STEEL HP AND CHANNELS ARE TO MEET ASTM A572 GRADE 50; STEEL ANGLES AND PLATE ARE TO MEET ASTM A572 GR 50; STEEL PIPE (12" DIAMETER OR LESS) ARE TO MEET ASTM A53 GRADE B. PIPE SECTIONS LARGER THAN 12" SHALL BE ASTM A572 GR 50 OR API 5L GR 52.
5. ALL CONNECTIONS TO BE FULL PENETRATION WELDS AND TO DEVELOP FULL CAPACITY OF MEMBERS UNLESS OTHERWISE NOTED.
6. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH AWS D1.1 OR D1.4, LATEST EDITIONS, AND SHALL BE PERFORMED BY AWS CERTIFIED WELDERS. WELDING ELECTRODES TO BE E70XX.

PRELIMINARY FOR REVIEW ONLY
MARCH 7, 2022

J:\11000S\11682 ODOT ARKANSAS RIVER MOORING MODERNIZATION\DRAWINGS\11682-CS1.DWG

LANIER & ASSOCIATES
CONSULTING ENGINEERS
INCORPORATED
LA: C–1120 OK: 7205 TX: F–2981
NEW ORLEANS, LA • BEAUMONT, TX

REV	DATE	BY	DESCRIPTION	REV	DATE	BY	DESCRIPTION
*				*			

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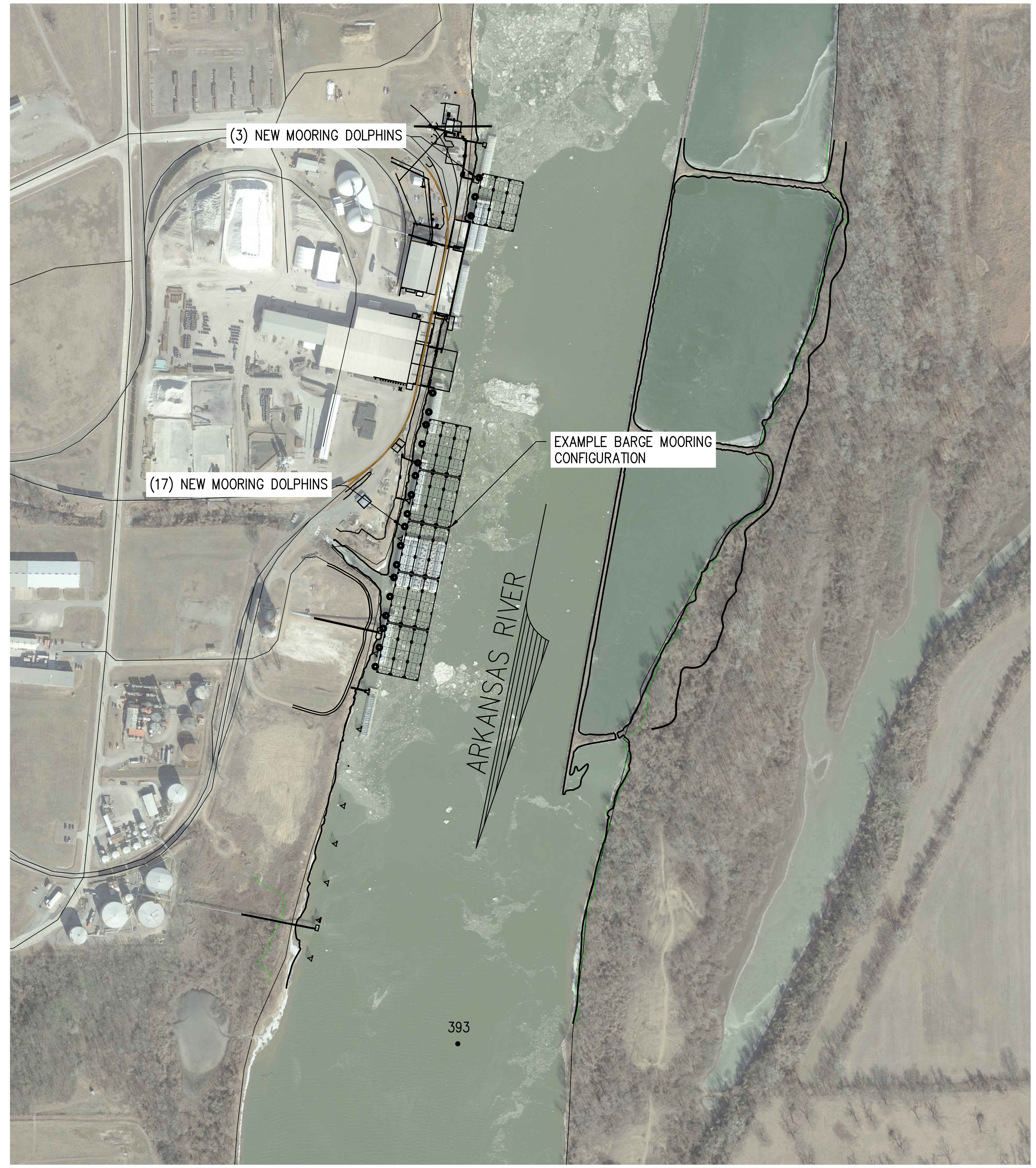
DATE APRIL '21
SHT SIZE 22"x34"
DESIGN EMG
DRAWN TAC
CHECK CLO
APPR'D RRM
JOB NO 11682

OKLAHOMA DEPARTMENT OF TRANSPORTATION
OKLAHOMA

MOORING MODERNIZATION
TITLE SHEET
DRAWING INDEX AND GENERAL NOTES

SHEET NO.
CS1

N



PORT OF MUSKOGEE – SITE PLAN

SCALE: 1" = 300'

300 0 150 300 600
(IN FEET)

PRELIMINARY FOR REVIEW ONLY
MARCH 7, 2022

J:\11000S\11682 ODOT ARKANSAS RIVER MOORING MODERNIZATION\DRAWINGS\11682-SP1.DWG

LANIER & ASSOCIATES
CONSULTING ENGINEERS
INCORPORATED
LA: EF-1120 OK: 7205 TX: F-2981
NEW ORLEANS • BEAUMONT • CORPUS CHRISTI • HOUSTON

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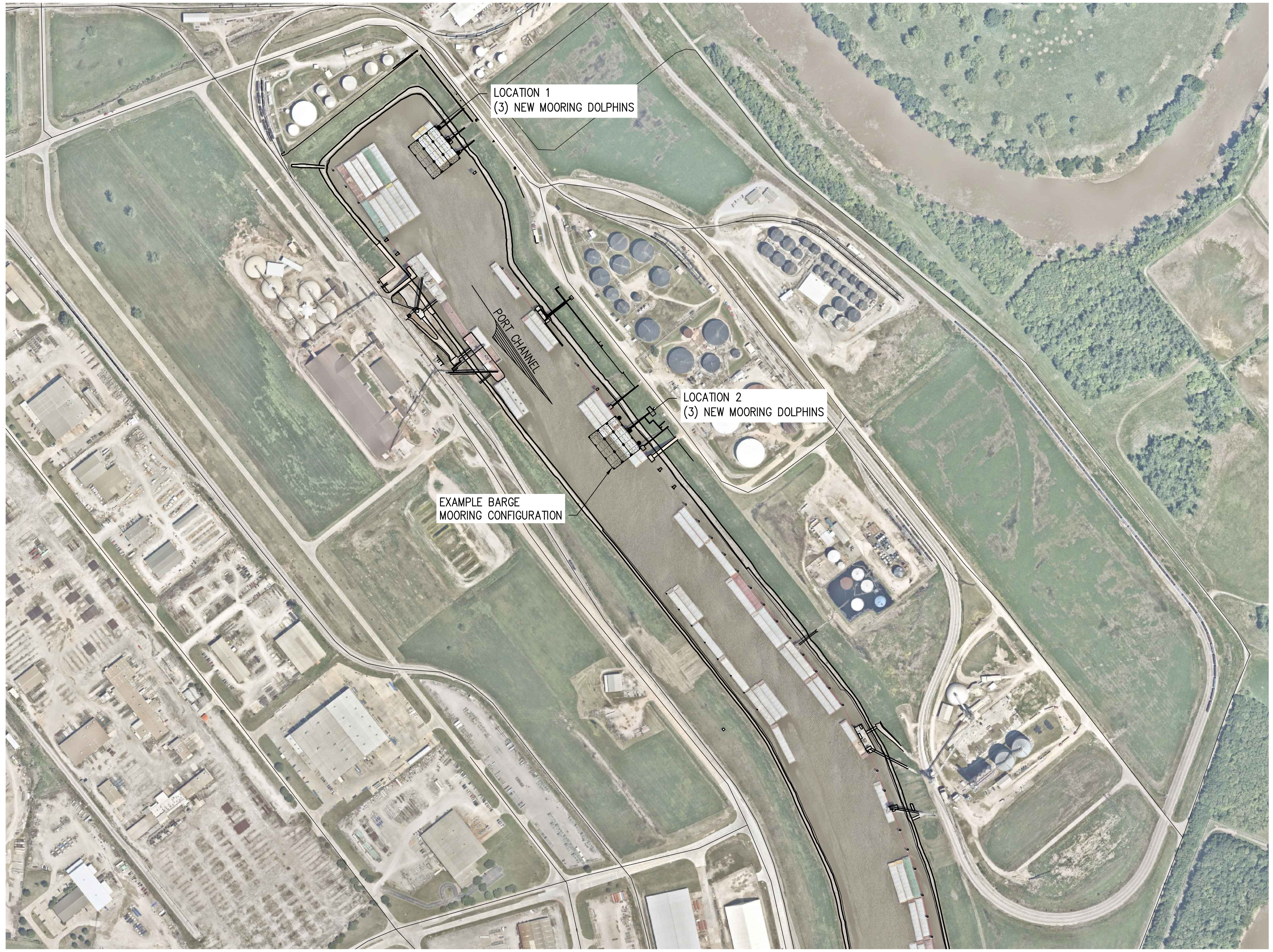
JOB NO 11682

OKLAHOMA DEPARTMENT OF TRANSPORTATION
MUSKOGEE OKLAHOMA

MOORING MODERNIZATION
PORT OF MUSKOGEE
SITE PLAN

SHEET NO.
SP1



PORT OF CATOOSA – SITE PLAN

SCALE: 1" = 300'

300 0 150 300 600
(IN FEET)

PRELIMINARY FOR REVIEW ONLY
MARCH 7, 2022

J:\11000S\11682 ODOT ARKANSAS RIVER MOORING MODERNIZATION\DRAWINGS\11682-SP2.DWG

LANIER & ASSOCIATES
CONSULTING ENGINEERS
INCORPORATED
LA: EF-1120 OK: 7205 TX: F-2981
NEW ORLEANS • BEAUMONT • CORPUS CHRISTI • HOUSTON

REV	DATE	BY	DESCRIPTION	REV	DATE	BY	DESCRIPTION

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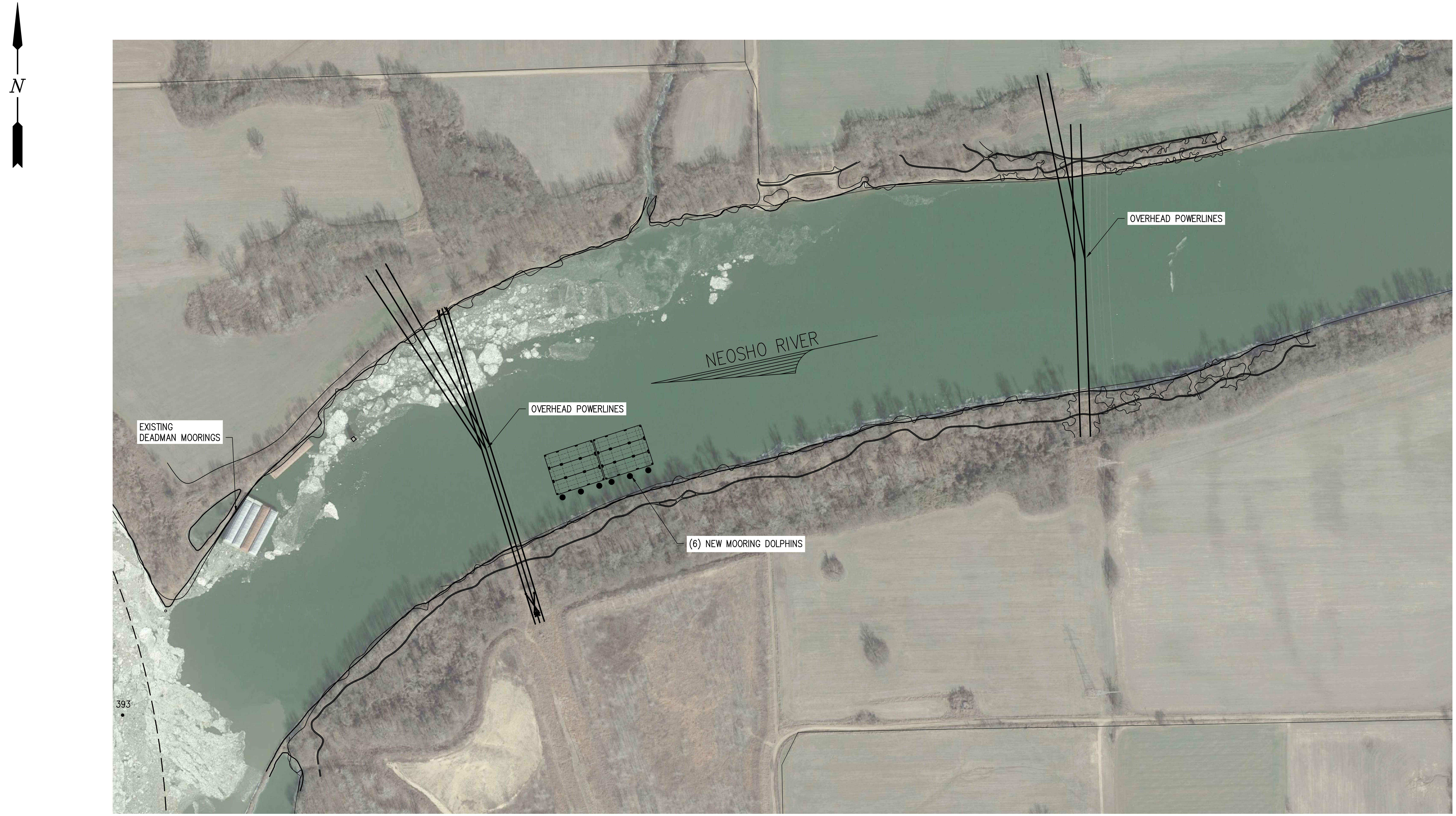
DATE APRIL '21
SHT SIZE 22"x34"
DESIGN EMG
DRAWN TAC
CHECK CLO
APPR'D RRM
JOB NO 11682

OKLAHOMA DEPARTMENT OF TRANSPORTATION
TULSA OKLAHOMA

MOORING MODERNIZATION
PORT OF CATOOSA
SITE PLAN

SHEET NO.
SP2



OAKLEY'S 33 – SITE PLAN

SCALE: 1" = 200'

200 0 100 200 400
(IN FEET)

PRELIMINARY
FOR REVIEW ONLY
MARCH 7, 2022

J:\11000S\11682 ODOT ARKANSAS RIVER MOORING MODERNIZATION\DRAWINGS\11682-SP3.DWG

LANIER & ASSOCIATES
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INCORPORATED
LA: EF-1120 OK: 7205 TX: F-2981
NEW ORLEANS • BEAUMONT • CORPUS CHRISTI • HOUSTON

REV	DATE	BY	DESCRIPTION	REV	DATE	BY	DESCRIPTION

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DATE APRIL '21
SHT SIZE 22"x34"
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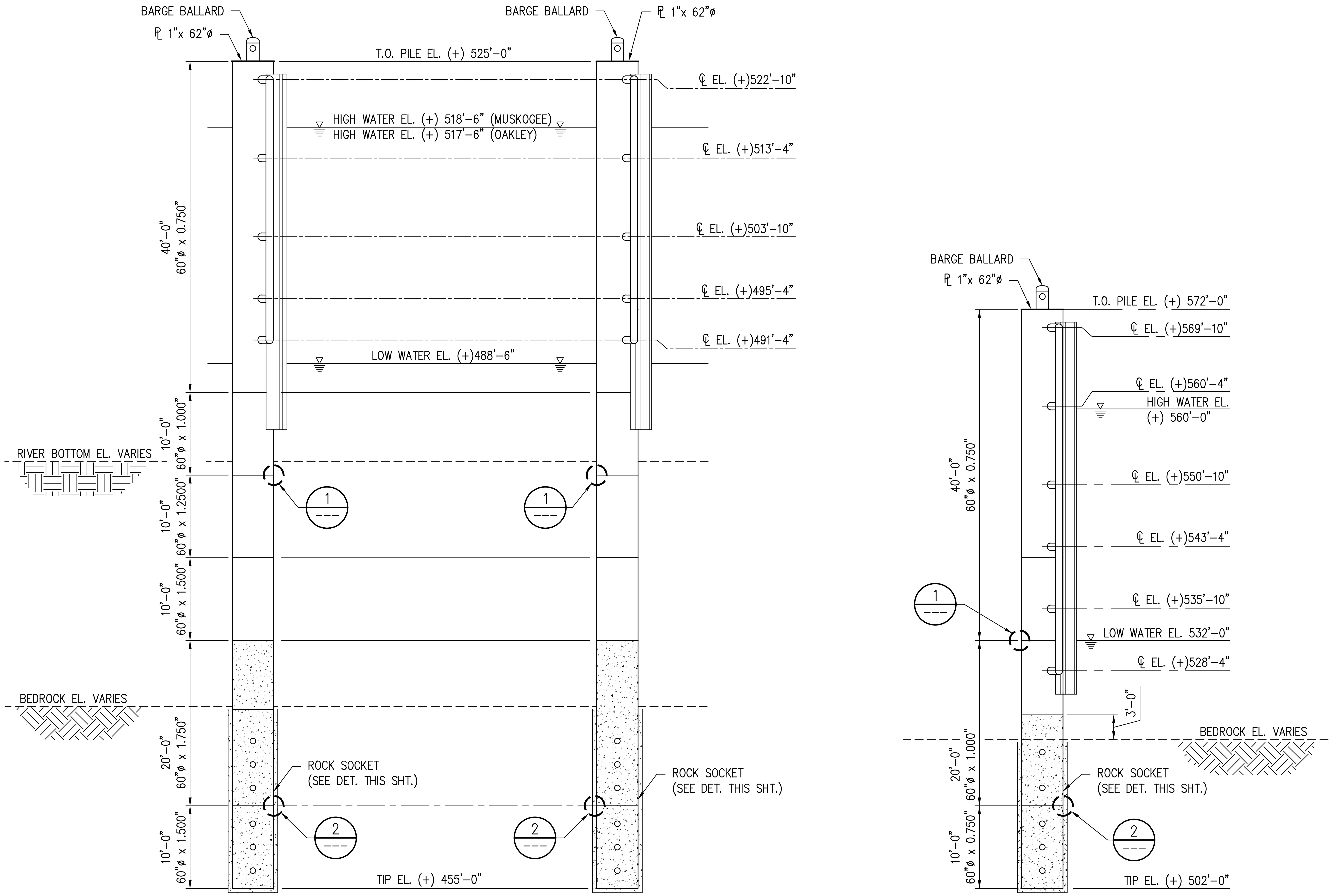
DRAWN TAC
CHECK CLO
APPR'D RRM
JOB NO 11682

OKLAHOMA DEPARTMENT OF TRANSPORTATION
TULSA OKLAHOMA

MOORING MODERNIZATION
OAKLEY'S 33 GRAND RIVER
SITE PLAN

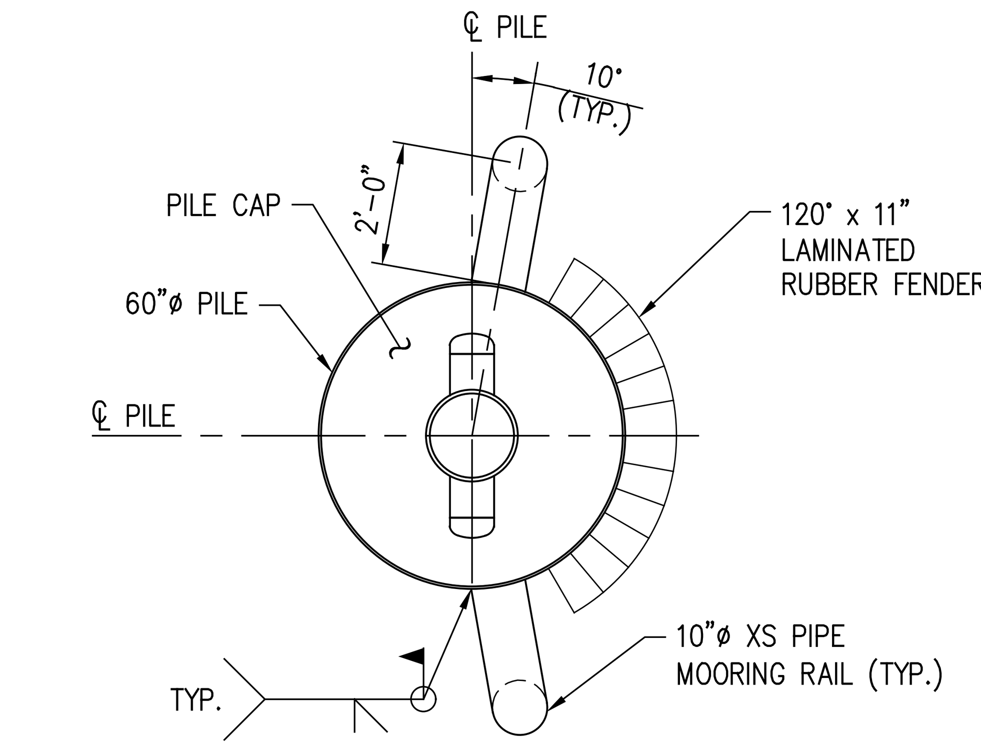
SHEET NO.
SP3



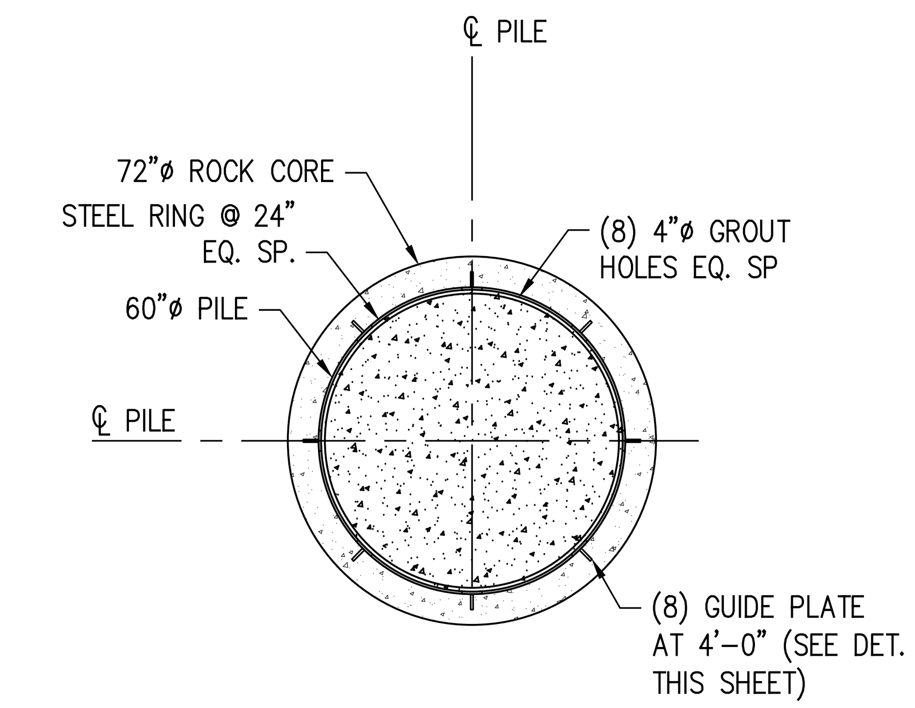
PORT OF MUSKOGEE PILE ELEVATION
SCALE: 1/4" = 1'–0"
(20 REQUIRED)

OAKLEY'S 33 PILE ELEVATION
SCALE: 3/16" = 1'–0"
(6 REQUIRED)

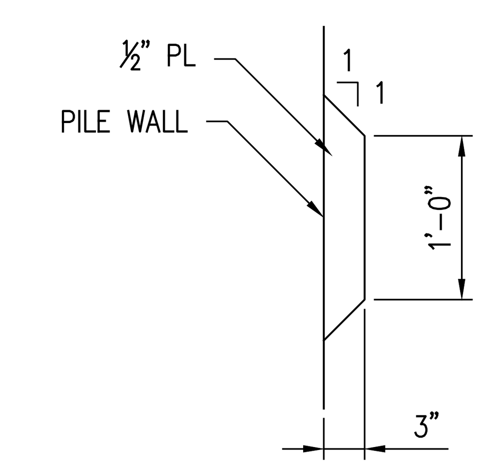
PORT OF CATOOSA PILE ELEVATION
SCALE: 3/16" = 1'–0"
(6 REQUIRED)



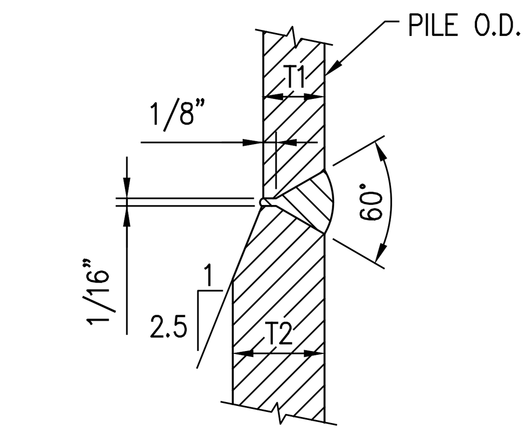
DOLPHIN PLAN
SCALE: 3/8" = 1'–0"



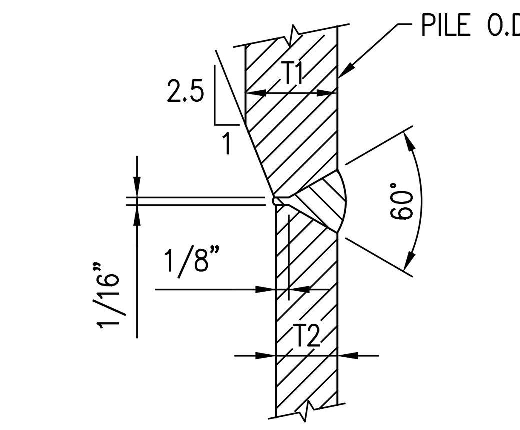
ROCK SOCKET PLAN
SCALE: 3/8" = 1'–0"



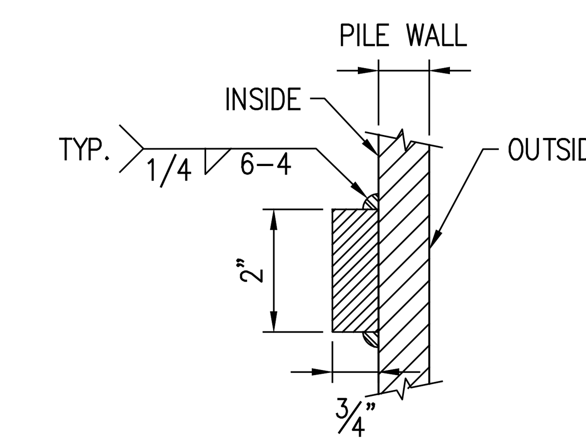
PILE GUIDE PLATE
SCALE: 1" = 1'–0"



DETAIL 1
N.T.S.



DETAIL 2
N.T.S.



STEEL RING DETAIL
N.T.S.

PRELIMINARY
FOR REVIEW ONLY
MARCH 7, 2022

NOTES:

1. DRIVING TIP TO BE INSTALLED AS NEEDED TO PREVENT DAMAGE TO PILE TIP DURING DRIVING.

LANIER & ASSOCIATES
CONSULTING ENGINEERS
INCORPORATED
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REV	DATE	BY	DESCRIPTION	REV	DATE	BY	DESCRIPTION

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JOB NO 11682

OKLAHOMA DEPARTMENT OF TRANSPORTATION
MUSKOGEE OKLAHOMA

MKARNS MOORING MONOPILES
MONOPILE ELVATIONS

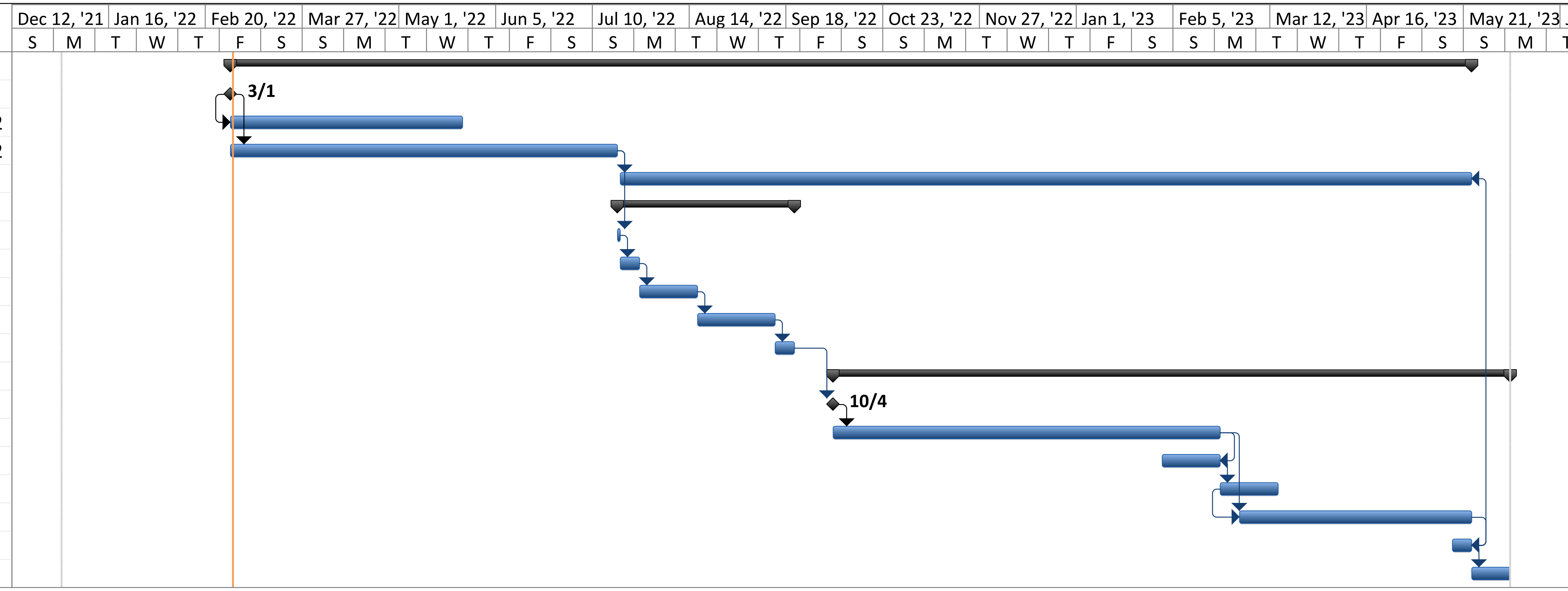
SHEET NO.
S1

J:\11000S\11682 ODOT ARKANSAS RIVER MOORING MODERNIZATION\DRAWINGS\11682-S1.DWG

Appendix J - Proposed Project Schedule

Preliminary Construction Schedule
Port of Catoosa

ID	Task Name	Duration	Start	Finish
1	**Detailed Engineering**	**321 days?**	**Tue 3/1/22**	**Tue 5/23/23**
2	Notice to Proceed	0 days	Tue 3/1/22	Tue 3/1/22
3	Permitting	3 mons	Tue 3/1/22	Mon 5/23/22
4	Detailed Engineering	5 mons	Tue 3/1/22	Mon 7/18/22
5	Construction Support	220 days	Wed 7/20/22	Tue 5/23/23
6	**Bidding**	**46 days?**	**Tue 7/19/22**	**Tue 9/20/22**
7	Advertisement	1 day	Tue 7/19/22	Tue 7/19/22
8	Prebid Meeting	5 days?	Wed 7/20/22	Tue 7/26/22
9	Bids Due	15 days	Wed 7/27/22	Tue 8/16/22
10	Bid Review	20 days	Wed 8/17/22	Tue 9/13/22
11	Award Contract	5 days	Wed 9/14/22	Tue 9/20/22
12	**Construction**	**175 days**	**Tue 10/4/22**	**Tue 6/6/23**
13	Notice to Proceed	0 days	Tue 10/4/22	Tue 10/4/22
14	Procurement	20 wks	Wed 10/5/22	Tue 2/21/23
15	Mobilization	15 days	Wed 2/1/23	Tue 2/21/23
16	Demolition	15 days	Wed 2/22/23	Tue 3/14/23
17	Pile Installation	12 wks	Wed 3/1/23	Tue 5/23/23
18	Fender Installation	1 wk	Wed 5/17/23	Tue 5/23/23
19	Demobilization	10 days	Wed 5/24/23	Tue 6/6/23

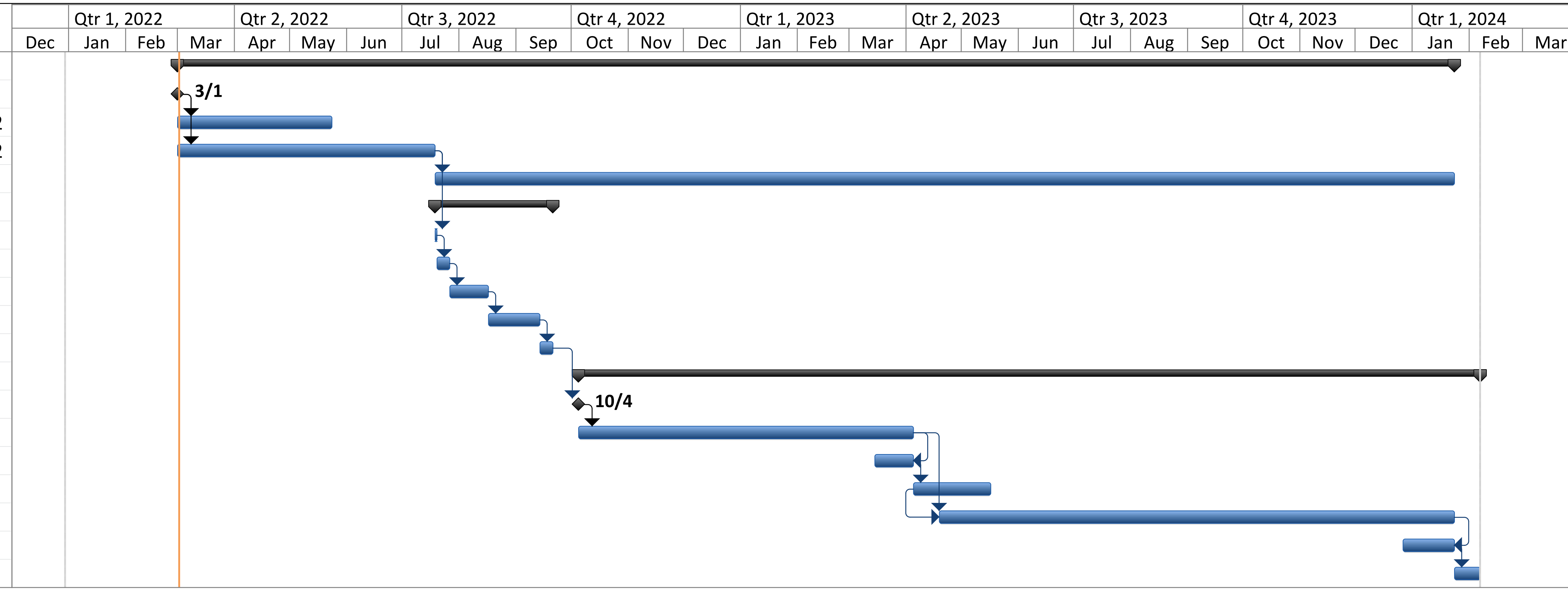


Project: 21-12-30-11682-Port of C
Date: Wed 3/2/22

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

LANIER & ASSOCIATES
CONSULTING ENGINEERS, INC.

ID	Task Name	Duration	Start	Finish
1	**Detailed Engineering**	**496 days?**	**Tue 3/1/22**	**Tue 1/23/24**
2	Notice to Proceed	0 days	Tue 3/1/22	Tue 3/1/22
3	Permitting	3 mons	Tue 3/1/22	Mon 5/23/22
4	Detailed Engineering	5 mons	Tue 3/1/22	Mon 7/18/22
5	Construction Support	396 days	Tue 7/19/22	Tue 1/23/24
6	**Bidding**	**46 days?**	**Tue 7/19/22**	**Tue 9/20/22**
7	Advertisement	1 day	Tue 7/19/22	Tue 7/19/22
8	Prebid Meeting	5 days?	Wed 7/20/22	Tue 7/26/22
9	Bids Due	15 days	Wed 7/27/22	Tue 8/16/22
10	Bid Review	20 days	Wed 8/17/22	Tue 9/13/22
11	Award Contract	5 days	Wed 9/14/22	Tue 9/20/22
12	**Construction**	**350 days**	**Tue 10/4/22**	**Tue 2/6/24**
13	Notice to Proceed	0 days	Tue 10/4/22	Tue 10/4/22
14	Procurement	26 wks	Wed 10/5/22	Tue 4/4/23
15	Mobilization	15 days	Wed 3/15/23	Tue 4/4/23
16	Demolition	30 days	Wed 4/5/23	Tue 5/16/23
17	Pile Installation	40 wks	Wed 4/19/23	Tue 1/23/24
18	Fender Installation	4 wks	Wed 12/27/23	Tue 1/23/24
19	Demobilization	10 days	Wed 1/24/24	Tue 2/6/24

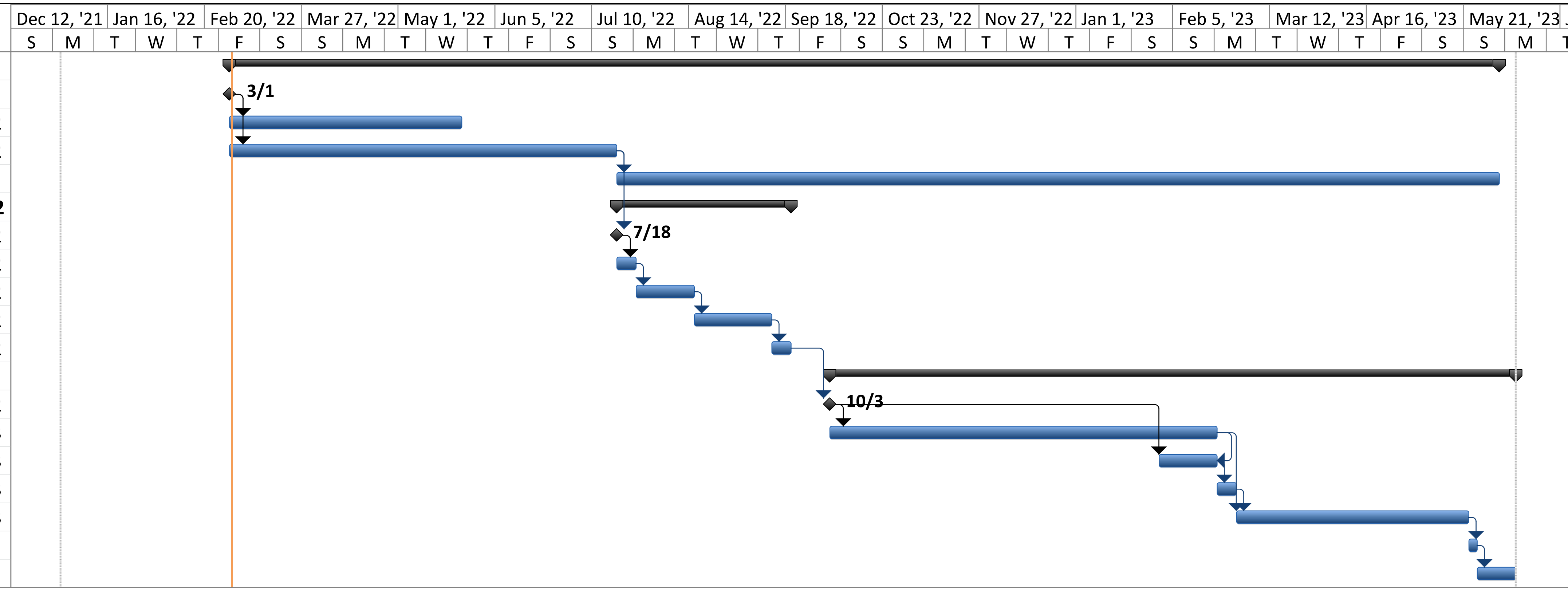


Project: 21-12-30-11682-Port of M
Date: Wed 3/2/22

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

Preliminary Construction Schedule
Oakley's 33 Grand River Port

ID	Task Name	Duration	Start	Finish
1	**Detailed Engineering**	**329 days?**	**Tue 3/1/22**	**Fri 6/2/23**
2	Notice to Proceed	0 days	Tue 3/1/22	Tue 3/1/22
3	Permitting	3 mons	Tue 3/1/22	Mon 5/23/22
4	Detailed Engineering	5 mons	Tue 3/1/22	Mon 7/18/22
5	Construction Support	229 days	Tue 7/19/22	Fri 6/2/23
6	**Bidding**	**45 days?**	**Mon 7/18/22**	**Mon 9/19/22**
7	Advertisement	0 days	Mon 7/18/22	Mon 7/18/22
8	Prebid Meeting	5 days?	Tue 7/19/22	Mon 7/25/22
9	Bids Due	15 days	Tue 7/26/22	Mon 8/15/22
10	Bid Review	20 days	Tue 8/16/22	Mon 9/12/22
11	Award Contract	5 days	Tue 9/13/22	Mon 9/19/22
12	**Construction**	**178 days**	**Mon 10/3/22**	**Thu 6/8/23**
13	Notice to Proceed	0 days	Mon 10/3/22	Mon 10/3/22
14	Procurement	20 wks	Tue 10/4/22	Mon 2/20/23
15	Mobilization	15 days	Tue 1/31/23	Mon 2/20/23
16	Demolition	5 days	Tue 2/21/23	Mon 2/27/23
17	Pile Installation	12 wks	Tue 2/28/23	Mon 5/22/23
18	Fender Installation	3 days	Tue 5/23/23	Thu 5/25/23
19	Demobilization	10 days	Fri 5/26/23	Thu 6/8/23



Project: 21-12-30-11682-Oakleys
Date: Wed 3/2/22

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

LANIER & ASSOCIATES
CONSULTING ENGINEERS, INC.

Appendix K - Proposed Construction Estimate

Oklahoma Department of Transportation February-2022
MKARNS Mooring Modernization Project - Port of Catoosa L&A Job 11682

Opinion of Probable Cost

Costs are Based on Recent Area Projects

Item	Quantity	Unit	Unit Cost	Total Item Cost
Mobilization and Demobilizatipon				
Mobilization and Demobilizatipon	1	allow	$ 500,000.00	$ 500,000.00
Demolition	6	Ea	$ 10,000.00	$ 60,000.00
			Item Total	**$ 560,000.00**
Excavation and Monopile Mooring				
Overburden Excavation (5'x30'x6)		C.Y.	$ 200.00	$ -
Rock Excavation(6'x20'x6)	120	FT	$ 3,000.00	$ 360,000.00
			Item Total	**$ 360,000.00**
Monopile Casing Fabrication and Installation - 6 Total				
60-inch Diameter Varying Wall Thickness x 70'	273,741	lb	$ 3.00	$ 821,223.00
Coating	79,128	ft²	$ 2.00	$ 158,256.00
(1) 72-inch x 0.625-inch x 30 foot Diameter Sleeve	45,600	lb	$ 1.00	$ 45,600.00
Delivery	1	L.S.	$ 100,000.00	$ 100,000.00
			Item Total	**$ 1,125,079.00**
Cast-in-place Concrete For 6 Monopiles				
Tremie Concrete at Rock Embedment	164	C.Y.	$ 300.00	$ 49,200.00
Rebar	32725	lb	$ 1.00	$ 32,725.00
			Item Total	**$ 81,925.00**
Mooring Fixtures, Anchorage, and Fenders for 6 Monopiles				
Mooring Rails	10,560	lb	$ 3.00	$ 31,680.00
Fenders	6	ea	$ 20,000.00	$ 120,000.00
			Item Total	**$ 151,680.00**
CONSTRUCTION SUBTOTAL BASIC MARINE FACILITIES			Sub Total	**$ 2,278,684.00**
With 20% Contengency				$ 2,734,000.00
TOTAL RECOMMENDED PROJECT BUDGET				**$ 2,734,000.00**

Oklahoma Department of Transportation February-2022
MKARNS Mooring Modernization Project - Port of Muskogee L&A Job 11682

Opinion of Probable Cost

Costs are Based on Recent Area Projects

Item	Quantity	Unit	Unit Cost	Total Item Cost
Mobilization and Demobilizatipon				
Mobilization and Demobilizatipon	1	allow	$ 600,000.00	$ 600,000.00
Demolition	20	Ea	$ 10,000.00	$ 200,000.00
			Item Total	**$ 800,000.00**
Excavation and Monopile Mooring				
Overburden Excavation (5'x20'x20)	290	C.Y.	$ 200.00	$ 58,000.00
Rock Excavation(6'x20'x20)	400	FT	$ 3,000.00	$ 1,200,000.00
			Item Total	**$ 1,258,000.00**
Monopile Casing Fabrication and Installation - 20 Total				
60-inch Diameter Varying Wall Thickness x 100'	1,472,906	lb	$ 3.00	$ 4,418,716.50
Coating	376,800	ft²	$ 2.00	$ 753,600.00
(3) 72-inch x 1.00-inch x 60 foot Diameter Sleeve	136,800	lb	$ 1.00	$ 136,800.00
Delivery	1	L.S.	$ 200,000.00	$ 200,000.00
			Item Total	**$ 5,509,116.50**
Cast-in-place Concrete For 20 Monopiles				
Tremie Concrete at Rock Embedment	545.42	C.Y.	$ 300.00	$ 163,626.00
Rebar	109084	lb	$ 1.00	$ 109,084.00
			Item Total	**$ 272,710.00**
Mooring Fixtures, Anchorage, and Fenders for 20 Monopiles				
Mooring Rails	35,840.00	lb	$ 3.00	$ 107,520.00
Fenders	20	ea	$ 20,000.00	$ 400,000.00
			Item Total	**$ 507,520.00**
CONSTRUCTION SUBTOTAL BASIC MARINE FACILITIES			Sub Total	**$ 8,347,346.50**
With 20% Contengency				$ 10,017,000.00
TOTAL RECOMMENDED PROJECT BUDGET				**$ 10,017,000.00**

Oklahoma Department of Transportation February-2022
MKARNS Mooring Modernization Project - Port of Oakley 33 L&A Job 11682

Opinion of Probable Cost

Costs are Based on Recent Area Projects

Item	Quantity	Unit	Unit Cost	Total Item Cost
Mobilization and Demobilizatipon				
Mobilization and Demobilizatipon	1	allow	$ 600,000.00	$ 600,000.00
Demolition	0	Ea	$ -	$ -
			Item Total	**$ 600,000.00**
Excavation and Monopile Mooring				
Overburden Excavation (5'x20'x6)	90	C.Y.	$ 200.00	$ 18,000.00
Rock Excavation(6'x20'x6)	120	C.Y.	$ 3,000.00	$ 360,000.00
			Item Total	**$ 378,000.00**
Monopile Casing Fabrication and Installation - 6 Total				
60-inch Diameter Varying Wall Thickness x 100'	441,872	lb	$ 3.00	$ 1,325,614.95
Coating	113,040	ft²	$ 2.00	$ 226,080.00
(1) 72-inch x 0.625-inch x 50 foot Diameter Sleeve	45,497	lb	$ 1.00	$ 45,496.80
Delivery	1	L.S.	$ 100,000.00	$ 100,000.00
			Item Total	**$ 1,697,191.75**
Cast-in-place Concrete For 6 Monopiles				
Tremie Concrete at Rock Embedment	163	C.Y.	$ 300.00	$ 48,900.00
Rebar	32600	C.Y.	$ 1.00	$ 32,600.00
			Item Total	**$ 81,500.00**
Mooring Fixtures, Anchorage, and Fenders for 6 Monopiles				
Mooring Rails	14,000	lb	$ 3.00	$ 42,000.00
Fenders	6	ea	$ 20,000.00	$ 120,000.00
			Item Total	**$ 162,000.00**
CONSTRUCTION SUBTOTAL BASIC MARINE FACILITIES			Sub Total	**$ 2,918,691.75**
With 20% Contengency				$ 3,502,000.00
TOTAL RECOMMENDED PROJECT BUDGET				**$ 3,502,000.00**

LANIER & ASSOCIATES
CONSULTING ENGINEERS, INC.

Appendix L - Hazardous Materials Report

SOIL BORING REPORT

PORT OF CATOOSA
ROGERS COUNTY, OKLAHOMA

ENERCON PROJECT NO. CONSOR-00001

Prepared for:
CONSOR Engineers, LLC
3741 S. Peoria Avenue
Tulsa, Oklahoma 74015
Attention: Mr. Gregg Hostetler, PE

Date:
March 2, 2022

Prepared by:

ENERCON
Excellence—Every project. Every day.

1601 Northwest Expressway, Suite 1000
Oklahoma City, Ok 73118
(405) 722-7693 (Phone)
(405) 722-7694 (Fax)

Prepared By:

Zoe Silver

Zoe Silver
Geoscience and Remediation Specialist

Reviewed By:

Rusty Lynch

Rusty Lynch
Senior Project Manager
OCC Licensed Environmental Consultant #1800

TABLE OF CONTENTS

1.0 INTRODUCTION

Enercon Services, Inc. (ENERCON) was retained by Mr. Gregg Hostetler, PE of CONSOR Engineers, LLC., hereafter referred to as Client, to conduct environmental field screening and sampling of river sediment during geotechnical investigations at the Port of Catoosa located in Rogers County, Oklahoma (subject property).

1.1 Purpose

The purpose of this screening and sampling event was to determine if river sediment has been impacted by chemicals of concern (COCs) at the subject property. All observations are current as of the date the field activities were conducted at the subject property (November 9, 2021). Property modification, events, or information made available subsequent to this date are not addressed herein.

1.2 Involved Parties

This project was authorized by CONSOR and the Oklahoma Department of Transportation (ODOT) by issuance of Purchase Order No. 170550 and ODOT Contract 2245B on October 18, 2021.

2.0 GENERAL SITE CHARACTERISTICS

ENERCON reviewed available sources of information in regard to the subject property and adjoining property uses. This section discusses the general characteristics of the subject property and vicinity that may influence the scope of work and potential findings.

2.1 Location

The subject property is located at the Port of Catoosa in Rogers County, Oklahoma. The subject property location is shown on the Site Map included in Appendix A.

2.2 Site Description and Current Land Uses

The subject property is a multi-modal shipping complex consisting of approximately 2,000-acres of industrial park and is currently improved with steel dolphin mooring structures, six of which are to be removed and replaced with six new monopile mooring structures.

3.0 BACKGROUND

ENERCON reviewed available sources of information in regard to historical land use, site features, and site conditions. The purpose of this section is to identify and summarize available historical information pertinent to the current assessment.

3.1 Project Background

On November 9, 2021, ENERCON provided assistance with the geotechnical investigation in the Port of Catoosa and performed environmental screening and sampling to determine if river sediment has been impacted by Chemical of Concerns (COCs) at the construction locations. The field activities included continuous screening of sediment samples from the mudline to the bedrock interface with a photo-ionization detector (PID) and a Ludlum Model 19 MicroR. ENERCON also collected samples for laboratory analysis. These samples included one (1) sediment sample from each boring based on visual observations or field screening results and investigation derived waste (sediment and drill cuttings) for waste characterization. Sediment samples were analyzed for total petroleum hydrocarbon (TPH) by Texas Method 1005, volatile organic compounds (VOCs) by United States Environmental Protection Agency (US EPA) Method 8260B, semi-volatile organic compounds (SVOCs) by US EPA Method 8270C, polychlorinated biphenyls (PCBs) by US EPA Method 8082, Resource Conservation Recovery Act (RCRA) metals by US EPA Method 6010D/7471A, and Gamma-Ray Isotopic by EPA Method 901.1. The composite waste sample was analyzed for heavy metals, VOCs, SVOCs, pesticides, herbicides, reactivity, corrosivity, and ignitability.

The soil sample collected from soil boring SB-5 contained detectable concentrations of Arsenic (34.5 mg/kg) respectively, which exceeded the EPA regulatory screening level (RSL) for Arsenic in industrial soils (3.0 mg/kg) as well as the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg).

Concentrations of all other analyzed COCs in samples collected from soil borings SB-1 through SB-6 were below their respective regulatory action level and/or laboratory detection limit.

3.2 Additional Background Information

No additional background information was provided by the client.

4.0 REGULATORY REQUIREMENTS AND SCOPE OF WORK

ENERCON considers current site conditions, site background, previously completed environmental assessments, and the subject property's environmental setting when developing the project scope of work. This section discusses the applicable regulatory programs and scope of work developed for the project.

4.1 Regulatory Requirements

The USEPA List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA), CERCLA and Section 112(r) of the Clean Air Act (June 2019) (List of Lists) provides reportable quantities for numerous hazardous chemicals which must be reported to the National Response Center, if exceeded. The reportable quantity for TPH, however, is not listed in the USEPA List of Lists publication as TPH is a combination of numerous petroleum-related compounds.

Selected soil samples were collected and submitted to an ODEQ certified laboratory for analysis. Following analysis, the laboratory results of the soil samples were compared to the EPA RSL for industrial soil, and ODEQ Tier 1 Generic TPH Cleanup Levels (February 2020) for industrial soils for each COC, as applicable.

4.2 Scope of Work Completed

The following provides a summary of the scope of work performed:

- ENERCON prepared a site-specific health and safety plan (HASP) for field screening and sampling from barges.

- ENERCON worked with CONSOR's geotechnical drillers and consultants in coordinating and documenting the location and depth of each screening and sampling interval. ENERCON continuously screened sediment samples with a (PID) and a Ludlum Model 19 MicroR survey meter from the mud line to the bedrock interface. Field screening using these devices and visual observation were used to evaluate areas for potential impact, and for the selection of samples for laboratory analysis.
- The sediment samples collected from the subject property were submitted to Pace Analytical National Center for Testing and Innovation (PACE), an ODEQ-certified laboratory, in Mt. Juliet, Tennessee under chain-of-custody documentation. The sediment samples collected from soil borings SB-1 through SB-6 were placed in laboratory provided containers and immediately

packed on ice. The laboratory analytical report and associated chain-of-custody for all sediment samples collected as part of this project are included in Appendix C.

- Upon completion of the above-referenced activities, ENERCON prepared this Soil Boring Report documenting the completed work and findings.

Note: The scope of this investigation was not intended to fully delineate the extent of any contamination identified in river sediment and/or groundwater.

5.0 RESULTS OF ASSESSMENT

This section provides a summary of the field observations and laboratory analytical results obtained through completion of the Scope of Work described in Section 4.2.

5.1 Field Observations

The following subsections summarize field observations and field screening results for the environmental media assessed during performance of this project.

Sediment observed from each soil boring SB-1 through SB-6 showed no signs of staining or hydrocarbon odor. Field screening of sediment from each soil boring SB-1 through SB-6 showed PID levels of 0.0 and Ludlum readings within the acceptable range.

5.2 Sample Analytical Results

The following subsections summarize the laboratory analytical results for environmental media samples collected from soil borings SB-1 through SB-6. The laboratory analytical results of the sediment samples collected from the soil borings are summarized in Tables 1-11 included in Appendix E.

Sample Analytical Result Summary

The following provides a summary of the laboratory analytical results of the sediment samples collected from soil borings SB-1 through SB-6 and waste composites.

Soil Boring SB-1

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-2

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-3

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-4

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-5

The detected concentration of Arsenic (34.5 mg/kg) exceeded the EPA RSL in industrial soil of 3.0 mg/kg as well as the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg). All other analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-6

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Waste Composites COMP-01 and COMP-02

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

6.0 DISCUSSION OF FINDINGS

ENERCON has completed the geotechnical investigation activities at the subject property in accordance with the approved scope of work identified in the letter proposal dated October 18, 2021.

6.1 Conclusions

The sediment samples collected from soil boring SB-5 contained Arsenic in concentrations exceeding applicable regulatory screening levels. The sediment samples collected from soil borings SB-1 through SB-4 and SB-6 as well as waste composite samples did not contain any analyzed COCs in concentrations above the laboratory detection limits or applicable regulatory screening levels.

7.0 LIMITATIONS AND USER RELIANCE

The conclusions presented above are based on the agreed upon scope of work outlined in the above report. ENERCON makes no guarantees as to the accuracy or completeness of information obtained from others. It is possible that information exists beyond the scope of this assessment. Additional information which was not available to ENERCON at the time of writing the report may result in modification of the conclusions and recommendations presented. The services performed by ENERCON have been conducted in a manner consistent with the level of care ordinarily exercised by members of our profession currently practicing under similar conditions. This report is not a legal opinion but may under certain circumstances be prepared at the direction of counsel, may be in anticipation of litigation, and may be classified as an attorney-client communication or as an attorney-work product.

This report was prepared by ENERCON specifically for use by CONSOR Engineers (the Client), who may rely on its contents and conclusions. Use of or reliance upon this information by any other party without express written permission granted by ENERCON and the Client is not authorized and is completely at the risk of the user.

8.0 PUBLISHED REFERENCES

Oklahoma Administrative Code. September 15, 2019, Title 252 Department of Environmental Quality, Chapter 205 Hazardous Waste Management.

Oklahoma Department of Environmental Quality. February 2020, Tier 2 Generic TPH Cleanup Levels.

United States Environmental Protection Agency, Office of Land and Emergency Management. June 2019, List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 112(r) of the Clean Air Act.

Appendix A

Site Map

Enercon Services, Inc.
6301 NW Expressway, Ste. 1000
Oklahoma City, OK 73118
www.enercon.com
405.722.7693 405.722.7694 (fax)

Figure 1: Boring Location Map

ENERCON Project Number: CONSOR-00001
Source: Google Earth

Moorings Update
Tulsa Port of Catoosa
Rogers County, Oklahoma
(36.239995, -95.736849)

Appendix B

ENERCON Field Records

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SB-1

SITE: **Port of Catoosa** PROJECT NO.: **CONSOR-00001**
ADDRESS: **Tulsa Port of Catoosa, Rogers County, OK** LOCATION: **36.238372, -95.734698**
START DATE: **11/9/2021** COMPLETION DATE: **11/9/2021**
DRILL CO: **Drilling Services of Oklahoma** DRILLER: **Todd Simpson** BOREHOLE DIAMETER: **4"**
LOGGED BY: **LD & ZS** DRILLING METHOD: **hollow stem auger** WATER DEPTH: **14'**
SAMPLING PROCEDURE: **grab & comp** SAMPLING INTERVAL: **5'** TOTAL DEPTH: **36'**

NOTES: Field screened with MiniRae 3000 PID

ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	1		CL	0'-24.5' Greyish Brown 10YR (5/2), Silty Clay.	1	10 - 15	0.0
	2				2		0.0
	3				3		0.0
	4				4		0.0
	5				5		0.0
	6				6	10 - 15	0.0
	7				7		0.0
	8				8		0.0
	9				9		0.0
	10				10		0.0
	11				11	20	1.5
	12				12	10 - 15	1.5
	13				13		1.5
	14				14		1.5
	15				15		1.5

Note: NR = No Recovery LABORATORY SAMPLE INTERVAL

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SB-1

SITE: **Port of Catoosa** PROJECT NO.: **CONSOR-00001**
ADDRESS: **Tulsa Port of Catoosa, Rogers County, OK** LOCATION: **36.238372, -95.734698**
START DATE: **11/9/2021** COMPLETION DATE: **11/9/2021**
DRILL CO: **Drilling Services of Oklahoma** DRILLER: **Todd Simpson** BOREHOLE DIAMETER: **4"**
LOGGED BY: **LD & ZS** DRILLING METHOD: **hollow stem auger** WATER DETPH: **14'**
SAMPLING PROCEDURE: **grab & comp** SAMPLING INTERVAL: **5'** TOTAL DEPTH: **36'**

NOTES: Field screened with MiniRae 3000 PID
ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	16		CL	0'-24.5' Greyish Brown 10YR (5/2), Silty Clay.	16	15	0.0
	17				17		0.0
	18				18		0.0
	19				19		0.0
	20				20		0.0
	21				21	15	0.0
	22				22		0.0
	23				23		0.0
	24				24		0.0
	25		SHALE	24.5'-36' Bluish Black GLEY2 (2.5/5B), Shale.	25		0.0
	26				26	15	0.0
	27				27		0.0
	28				28		0.0
	29				29		0.0
	30				30		0.0
	31				31	15	0.0
	32				32		0.0
	33				33		0.0
	34				34		0.0
	35				35		0.0
	36				36	15	0.0
	37			Refusal at 36'	37		
	38				38		
	39				39		
	40				40		

Total Depth Drilled: 36'

NR = No Recovery LABORATORY SAMPLE INTERVAL

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SB-2

SITE: **Port of Catoosa** PROJECT NO.: **CONSOR-00001**

ADDRESS: **Tulsa Port of Catoosa, Rogers County, OK** LOCATION: **36.238606, -95.734909**

START DATE: **11/9/2021** COMPLETION DATE: **11/9/2021**

DRILL CO: **Drilling Services of Oklahoma** DRILLER: **Todd Simpson** BOREHOLE DIAMETER: **4"**

LOGGED BY: **LD & ZS** DRILLING METHOD: **hollow stem auger** WATER DEPTH: **14.5'**

SAMPLING PROCEDURE: **grab & comp** SAMPLING INTERVAL: **5'** TOTAL DEPTH: **5'**

NOTES: Field screened with MiniRae 3000 PID

ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	1		SM	0'-5' Brownish Grey 2.5Y (6/2), Silty Sand.	1	10 - 15	0.0
	2				2		0.0
	3				3		0.0
	4				4		0.0
	5				5		0.0
	6			Total Depth Drilled: 5'	6		
	7				7		
	8				8		
	9				9		
	10				10		
	11				11		
	12				12		
	13				13		
	14				14		
	15				15		

Note: NR = No Recovery LABORATORY SAMPLE INTERVAL

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SB-3

SITE: **Port of Catoosa** PROJECT NO.: **CONSOR-00001**

ADDRESS: **Tulsa Port of Catoosa, Rogers County, OK** LOCATION: **36.238902, -95.735181**

START DATE: **11/9/2021** COMPLETION DATE: **11/9/2021**

DRILL CO: **Drilling Services of Oklahoma** DRILLER: **Todd Simpson** BOREHOLE DIAMETER: **4"**

LOGGED BY: **LD & ZS** DRILLING METHOD: **hollow stem auger** WATER DEPTH: **10'**

SAMPLING PROCEDURE: **grab & comp** SAMPLING INTERVAL: **5'** TOTAL DEPTH: **32'**

NOTES: Field screened with MiniRae 3000 PID

ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	1		CL	0'-24.5' Brownish Grey 2.5Y (6/2), Silty Clay.	1	0 - 10	0.0
	2				2		0.0
	3				3		0.0
	4				4		0.0
	5				5		0.0
	6				6	5 - 10	0.0
	7				7		0.0
	8				8		0.0
	9				9		0.0
	10				10		0.0
	11				11	5 - 10	1.5
	12				12		1.5
	13				13		1.5
	14				14		1.5
	15				15		1.5

Note: NR = No Recovery LABORATORY SAMPLE INTERVAL

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SB-3

SITE:	**Port of Catoosa**	PROJECT NO.:	**CONSOR-00001**
ADDRESS:	**Tulsa Port of Catoosa, Rogers County, OK**	LOCATION:	**36.238902, -95.735181**
START DATE:	**11/9/2021**	COMPLETION DATE:	**11/9/2021**
DRILL CO:	**Drilling Services of Oklahoma**	DRILLER:	**Todd Simpson**
BOREHOLE DIAMETER:	**4"**		
LOGGED BY:	**LD & ZS**	DRILLING METHOD:	**hollow stem auger**
WATER DETPH:	**10'**		
SAMPLING PROCEDURE	**grab & comp**	SAMPLING INTERVAL:	**5'**
TOTAL DEPTH:	**32'**		

NOTES: Field screened with MiniRae 3000 PID

ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	16		CL	0'-24.5' Greyish Brown 10YR (5/2), Silty Clay.	16	5 - 10	1.1
	17				17		1.1
	18				18		1.1
	19				19		1.1
	20				20		1.1
	21				21	5 - 10	0.7
	22				22		0.0
	23				23		0.0
	24				24		0.0
	25		SHALE	24.5'-32' Bluish Black GLEY (2.5/10B), Shale.	25		0.0
	26				26	< 5	0.0
	27				27		0.0
	28				28		0.0
	29				29		0.0
	30				30		0.0
	31				31	2.5 - 5	0.0
	32				32		0.0
	33			Refusal at 32'	33		
	34				34		
	35				35		
	36				36		
	37				37		
	38				38		
	39				39		
	40				40		

Total Depth Drilled: 32'

NR = No Recovery LABORATORY SAMPLE INTERVAL

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SB-4	PAGE 1 OF 1

SITE: **Port of Catoosa** PROJECT NO.: **CONSOR-00001**
ADDRESS: **Tulsa Port of Catoosa, Rogers County, OK** LOCATION: **36.242236, -95.737526**
START DATE: **11/9/2021** COMPLETION DATE: **11/9/2021**
DRILL CO: **Drilling Services of Oklahoma** DRILLER: **Todd Simpson** BOREHOLE DIAMETER: **4"**
LOGGED BY: **LD & ZS** DRILLING METHOD: **hollow stem auger** WATER DEPTH: **13.9'**
SAMPLING PROCEDURE **grab & comp** SAMPLING INTERVAL: **5'** TOTAL DEPTH: **5'**
NOTES: Field screened with MiniRae 3000 PID
ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	1		CL	0'-5' Brownish-Grey 2.5Y (6/2), Silty Clay.	1	4	0.0
	2				2	4	0.0
	3				3	4	0.0
	4				4	4	0.0
	5				5	4	0.0
	6			Total Depth Drilled: 5'	6		
	7				7		
	8				8		
	9				9		
	10				10		
	11				11		
	12				12		
	13				13		
	14				14		
	15				15		

Note: NR = No Recovery LABORATORY SAMPLE INTERVAL

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SB-5

SITE: **Port of Catoosa**
PROJECT NO.: **CONSOR-00001**
ADDRESS: **Tulsa Port of Catoosa, Rogers County, OK**
LOCATION: **36.242405, -95.737672**
START DATE: **11/9/2021**
COMPLETION DATE: **11/9/2021**
DRILL CO: **Drilling Services of Oklahoma**
DRILLER: **Todd Simpson**
BOREHOLE DIAMETER: **4"**
LOGGED BY: **LD & ZS**
DRILLING METHOD: **hollow stem auger**
WATER DEPTH: **10'**
SAMPLING PROCEDURE: **grab & comp**
SAMPLING INTERVAL: **5'**
TOTAL DEPTH: **34.5'**
NOTES: Field screened with MiniRae 3000 PID
ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	1		CL	0'-19.5' Brown 10YR (5/3), Silty Clay.	1	10 - 15	0.0
	2				2		0.0
	3				3		0.0
	4				4		0.0
	5				5		0.0
	6				6	5	0.0
	7				7		0.0
	8				8		0.0
	9				9		0.0
	10				10		0.0
	11				11	4	0.0
	12				12		0.0
	13				13		0.0
	14				14		0.0
	15				15		0.0

Note: NR = No Recovery
LABORATORY SAMPLE INTERVAL

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SB-5

SITE:	**Port of Catoosa**	PROJECT NO.:	**CONSOR-00001**
ADDRESS:	**Tulsa Port of Catoosa, Rogers County, OK**	LOCATION:	**36.242405, -95.737672**
START DATE:	**11/9/2021**	COMPLETION DATE:	**11/9/2021**
DRILL CO:	**Drilling Services of Oklahoma**	DRILLER:	**Todd Simpson**
BOREHOLE DIAMETER:	**4"**		
LOGGED BY:	**LD & ZS**	DRILLING METHOD:	**hollow stem auger**
WATER DETPH:	**10'**		
SAMPLING PROCEDURE	**grab & comp**	SAMPLING INTERVAL:	**5'**
TOTAL DEPTH:	**34.5'**		

NOTES: Field screened with MiniRae 3000 PID

ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	16		CL	0'-19.5' Brown 10YR (5/3), Silty Clay.	16	4	0.0
	17				17		0.0
	18				18		0.0
	19				19		0.0
	20		SHALE	19.5'-34.5' Very Dark Blueish Grey GLEY2 (3/10B), Shale.	20		0.0
	21				21	4	0.0
	22				22		0.0
	23				23		0.0
	24				24		0.0
	25				25		0.0
	26				26	4	0.0
	27				27		0.0
	28				28		0.0
	29				29		0.0
	30				30		0.0
	31				31	4	0.0
	32				32		0.0
	33				33		0.0
	34				34		0.0
	35			Refusal at 34.5'	35		
	36				36		
	37				37		
	38				38		
	39				39		
	40				40		

Total Depth Drilled: 34.5'

NR = No Recovery

LABORATORY SAMPLE INTERVAL

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SB-6

PAGE 1 OF 1

SITE: **Port of Catoosa** PROJECT NO.: **CONSOR-00001**
ADDRESS: **Tulsa Port of Catoosa, Rogers County, OK** LOCATION: **36.242560, -95.737821**
START DATE: **11/9/2021** COMPLETION DATE: **11/9/2021**
DRILL CO: **Drilling Services of Oklahoma** DRILLER: **Todd Simpson** BOREHOLE DIAMETER: **4"**
LOGGED BY: **LD & ZS** DRILLING METHOD: **hollow stem auger** WATER DEPTH: **10'**
SAMPLING PROCEDURE: **grab & comp** SAMPLING INTERVAL: **5'** TOTAL DEPTH: **5'**
NOTES: Field screened with MiniRae 3000 PID
ELEVATION (FEET): **Not Applicable**

PLUGGING INFO	DEPTH (FT.)	LITHOLOGY	USCS CLASS	MATERIAL DESCRIPTION	ANALYTICAL SAMPLE DEPTH (FT)	LUDLUM READING	ORGANIC VAPOR READINGS (ppm)
N/A	1		CL	0'-5' Greyish Brown 10YR (5/2), Silty Clay.	1	5	0.0
	2				2	5	0.0
	3				3	5	0.0
	4				4	5	0.0
	5				5	5	0.0
	6			Total Depth Drilled: 5'	6		
	7				7		
	8				8		
	9				9		
	10				10		
	11				11		
	12				12		
	13				13		
	14				14		
	15				15		

Note: NR = No Recovery LABORATORY SAMPLE INTERVAL

Appendix C

Laboratory Analytical Report and Chain-of-Custody

ANALYTICAL REPORT

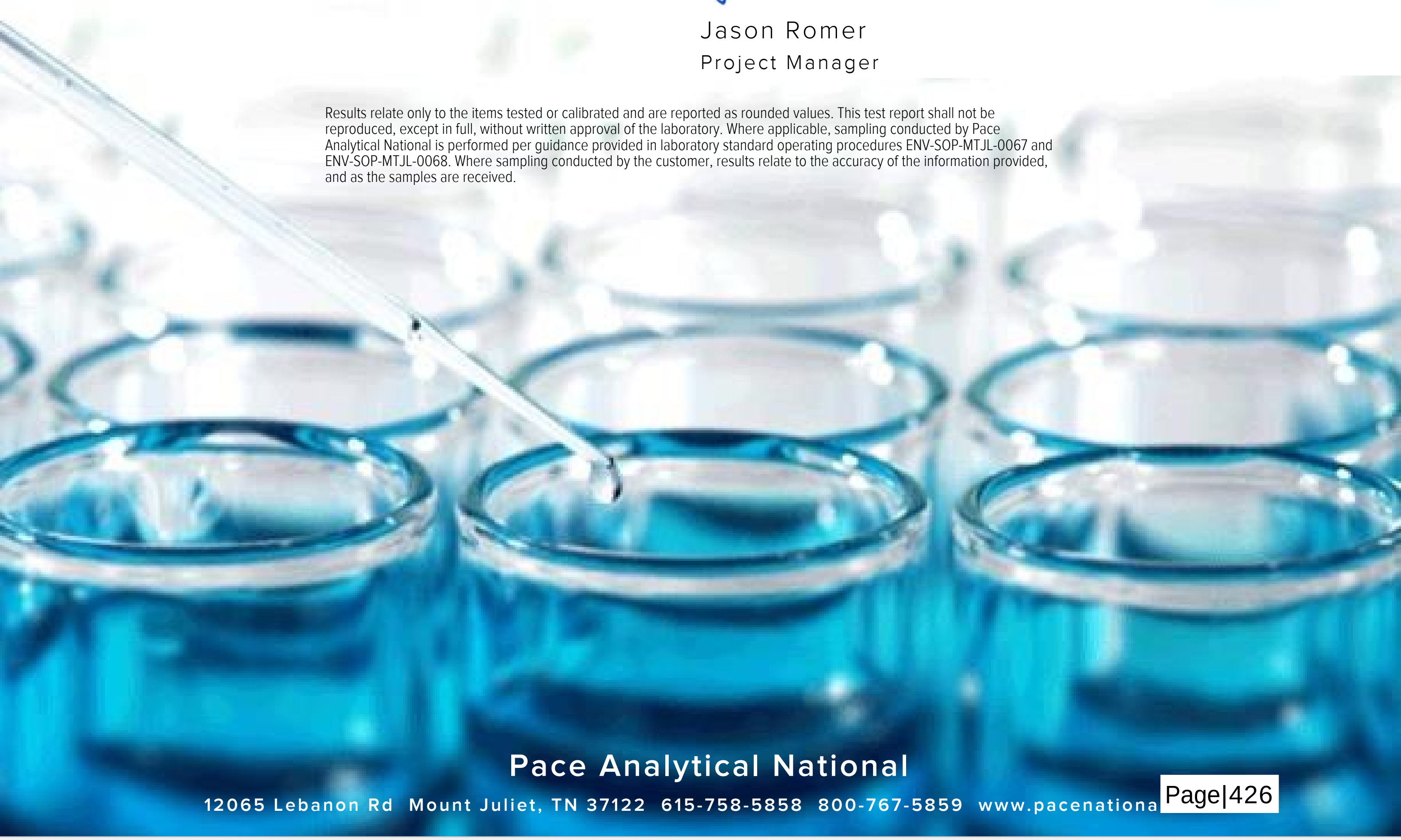
December 08, 2021

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1430030
Samples Received:	11/11/2021
Project Number:	CONSOR-00001
Description:	Red Rock Morrings Update
Report To:	Rusty Lynch 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenationa

TABLE OF CONTENTS

SB-1 L1430030-01 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 07:44	11/11/21 16:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1778974	1	11/15/21 14:00	12/06/21 12:33	DME	Mt. Juliet, TN

SB-2 L1430030-02 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 10:20	11/11/21 16:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1778974	1	11/15/21 14:00	12/06/21 12:02	DME	Mt. Juliet, TN

SB-3 L1430030-03 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 11:05	11/11/21 16:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1778974	1	11/15/21 14:00	12/06/21 15:23	DME	Mt. Juliet, TN

SB-4 L1430030-04 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 13:58	11/11/21 16:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1778974	1	11/15/21 14:00	12/06/21 10:48	DME	Mt. Juliet, TN

SB-5 L1430030-05 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 14:35	11/11/21 16:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1778974	1	11/15/21 14:00	12/06/21 16:27	DME	Mt. Juliet, TN

SB-6 L1430030-06 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 16:50	11/11/21 16:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1778974	1	11/15/21 14:00	12/06/21 16:18	RRE	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.33		0.365	0.548	12/06/2021 12:33	WG1778974
Bismuth-212	0.591	U	1.07	2.11	12/06/2021 12:33	WG1778974
Bismuth-214 (Ra-226)	1.15		0.242	0.281	12/06/2021 12:33	WG1778974
Lead-212	1.34		0.220	0.247	12/06/2021 12:33	WG1778974
Lead-214	1.46		0.228	0.262	12/06/2021 12:33	WG1778974
Potassium-40	17.4		2.86	2.12	12/06/2021 12:33	WG1778974
Thallium-208	0.475		0.117	0.144	12/06/2021 12:33	WG1778974
Uranium-235	0.210	U	0.0879	0.868	12/06/2021 12:33	WG1778974
Thorium-234 (U-238)	1.46	J	1.04	2.14	12/06/2021 12:33	WG1778974
Radium-226 (186 KeV)	2.16		0.884	1.42	12/06/2021 12:33	WG1778974

Cp Tc Ss Cn Sr Qc Gl Al Sc

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.84		0.400	0.554	12/06/2021 12:02	WG1778974
Bismuth-212	3.28		1.24	1.78	12/06/2021 12:02	WG1778974
Bismuth-214 (Ra-226)	1.72		0.277	0.288	12/06/2021 12:02	WG1778974
Lead-212	2.29		0.279	0.232	12/06/2021 12:02	WG1778974
Lead-214	1.84		0.251	0.261	12/06/2021 12:02	WG1778974
Potassium-40	34.9		4.00	1.87	12/06/2021 12:02	WG1778974
Thallium-208	0.599		0.120	0.129	12/06/2021 12:02	WG1778974
Uranium-235	0.262	U	0.0950	0.811	12/06/2021 12:02	WG1778974
Thorium-234 (U-238)	1.41	J	1.01	2.18	12/06/2021 12:02	WG1778974
Radium-226 (186 KeV)	2.80		0.965	1.52	12/06/2021 12:02	WG1778974

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.48		0.289	0.365	12/06/2021 15:23	WG1778974
Bismuth-212	1.41	J	0.866	1.49	12/06/2021 15:23	WG1778974
Bismuth-214 (Ra-226)	1.02		0.189	0.212	12/06/2021 15:23	WG1778974
Lead-212	1.38		0.183	0.164	12/06/2021 15:23	WG1778974
Lead-214	1.25		0.177	0.187	12/06/2021 15:23	WG1778974
Potassium-40	17.2		2.33	1.25	12/06/2021 15:23	WG1778974
Thallium-208	0.284		0.0786	0.103	12/06/2021 15:23	WG1778974
Uranium-235	0.139	U	0.0667	0.607	12/06/2021 15:23	WG1778974
Thorium-234 (U-238)	0.922	J	0.725	1.53	12/06/2021 15:23	WG1778974
Radium-226 (186 KeV)	1.35		0.667	1.12	12/06/2021 15:23	WG1778974

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	0.876		0.374	0.772	12/06/2021 10:48	WG1778974
Bismuth-212	1.17	J	1.24	2.28	12/06/2021 10:48	WG1778974
Bismuth-214 (Ra-226)	1.04		0.272	0.362	12/06/2021 10:48	WG1778974
Lead-212	1.43		0.252	0.299	12/06/2021 10:48	WG1778974
Lead-214	1.06		0.226	0.334	12/06/2021 10:48	WG1778974
Potassium-40	13.5		2.63	2.5	12/06/2021 10:48	WG1778974
Thallium-208	0.281		0.122	0.198	12/06/2021 10:48	WG1778974
Uranium-235	0.133	J	0.107	0.196	12/06/2021 10:48	WG1778974
Thorium-234 (U-238)	0.725	U	1.38	3.07	12/06/2021 10:48	WG1778974
Radium-226 (186 KeV)	1.35	J	1.10	1.95	12/06/2021 10:48	WG1778974

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.96		0.382	0.442	12/06/2021 16:27	WG1778974
Bismuth-212	1.88	J	1.16	1.95	12/06/2021 16:27	WG1778974
Bismuth-214 (Ra-226)	1.66		0.270	0.256	12/06/2021 16:27	WG1778974
Lead-212	1.81		0.242	0.222	12/06/2021 16:27	WG1778974
Lead-214	1.59		0.231	0.255	12/06/2021 16:27	WG1778974
Potassium-40	28.7		3.54	1.85	12/06/2021 16:27	WG1778974
Thallium-208	0.553		0.120	0.142	12/06/2021 16:27	WG1778974
Uranium-235	0.145	U	0.0835	0.791	12/06/2021 16:27	WG1778974
Thorium-234 (U-238)	1.29	J	0.990	2.11	12/06/2021 16:27	WG1778974
Radium-226 (186 KeV)	1.58		0.844	1.43	12/06/2021 16:27	WG1778974

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.24		0.314	0.444	12/06/2021 16:18	WG1778974
Bismuth-212	1.82		1.02	1.72	12/06/2021 16:18	WG1778974
Bismuth-214 (Ra-226)	1.03		0.211	0.241	12/06/2021 16:18	WG1778974
Lead-212	1.40		0.191	0.184	12/06/2021 16:18	WG1778974
Lead-214	1.10		0.182	0.212	12/06/2021 16:18	WG1778974
Potassium-40	12.4		2.17	1.7	12/06/2021 16:18	WG1778974
Thallium-208	0.367		0.0924	0.11	12/06/2021 16:18	WG1778974
Uranium-235	0.123	J	0.0733	0.127	12/06/2021 16:18	WG1778974
Thorium-234 (U-238)	0.810	J	0.741	1.54	12/06/2021 16:18	WG1778974
Radium-226 (186 KeV)	1.14	J	0.739	1.29	12/06/2021 16:18	WG1778974

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3738275-3 12/06/21 17:30

Analyte	MB Result pCi/g	MB Qualifier	MB Uncertainty + / -	MB MDA pCi/g
Actinium-228 (Ra-228)	-0.0271	U	0.0966	0.250
Americium-241	0.0680	U	0.122	0.216
Bismuth-212	0.106	U	0.307	0.656
Bismuth-214 (Ra-226)	-0.0333	U	0.0630	0.156
Cesium-137	0.0108	U	0.0415	0.0867
Cobalt-60	0.00715	U	0.0256	0.0900
Lead-212	0.0118	U	0.0566	0.114
Lead-214	0.0442	U	0.0630	0.138
Potassium-40	-0.192	U	0.389	1.01
Radium-226 (186 KeV)	0.368	U	0.458	0.841
Thallium-208	-0.0116	U	0.0323	0.0740
Thorium-234 (U-238)	1.05	J	0.607	1.14
Uranium-235	0.0125	U	0.0444	0.539

L1430490-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1430490-01 12/07/21 15:00 • (DUP) R3738275-4 12/07/21 16:56

Analyte	Original Result pCi/g	Original Uncertainty + / -	Original MDA pCi/g	DUP Result pCi/g	DUP Uncertainty + / -	DUP MDA pCi/g	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Actinium-228 (Ra-228)	2.75	0.390	0.466	2.59	0.529	0.466	1	5.95	0.242		20	3
Bismuth-212	2.29	1.09	1.86	2.97	1.69	1.86	1	25.7	0.336		20	3
Bismuth-214 (Ra-226)	3.64	0.384	0.235	3.31	0.489	0.235	1	9.51	0.531		20	3
Lead-212	2.13	0.271	0.26	2.82	0.378	0.26	1	27.7	1.47		20	3
Lead-214	3.90	0.396	0.237	4.17	0.525	0.237	1	6.67	0.409		20	3
Potassium-40	26.2	2.79	1.31	24.6	3.41	1.31	1	6.07	0.350		20	3
Radium-226 (186 KeV)	8.83	1.29	1.46	7.07	1.45	1.46	1	22.2	0.909		20	3
Thallium-208	0.923	0.132	0.119	0.975	0.185	0.119	1	5.44	0.227		20	3
Thorium-234 (U-238)	12.1	3.81	2.38	9.73	3.15	2.38	1	21.3	0.470		20	3
Uranium-235	0.108	0.434	0.785	0.726	0.143	0.785	1	148	1.35		20	3

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3738275-1 12/06/21 10:32 • (LCSD) R3738275-2 12/06/21 16:22

Analyte	Spike Amount pCi/g	LCS Result pCi/g	LCSD Result pCi/g	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Americium-241	47.3	47.9	51.2	101	108	60.0-140			6.68	20
Cesium-137	72.4	75.9	77.1	105	107	80.0-120			1.61	20
Cobalt-60	86.9	88.1	91.8	101	106	80.0-120			4.09	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Enercon - Oklahoma City, OK
1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Analysis / Container / Preservative: gamma ray isotopic method 901.1

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: **Rusty Lynch**

Email To: **rlynch@enercon.com**

Project Description: Red Rock Moorings Update

City/State Collected: Catoosa, OK

Please Circle: PT MT CT ET

Phone: **405-722-7693**
Fax:

Client Project # **CONSOR-00001**

Lab Project # ENERCOOK-CONSOR00001

SDG # L1430030

B081

Collected by (print): Lauran Drummond

Site/Facility ID #

P.O. #

Acctnum: ENERCOOK

Template:
Prelogin:
PM:
PB:
Shipped Via:

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	gamma ray isotopic method 901.1	Remarks	Sample # (lab only)
SB-1	Grab	SS		11/9/21	744	1	X		-01
SB-2	↓	SS		11/9/21	1020	1	X		-02
SB-3		SS		11/9/21	1105	1	X		-03
SB-4		SS		11/9/21	1358	1	X		-04
SB-5		SS		11/9/21	1435	1	X		-05
SB-6		SS		11/9/21	1650	1	X		-06

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ______

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier __ ______

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
[signature]	11/10/21	1208	E. Davis
E. Davis	11/10/21	17:00	

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: AMB °C 1.1+0=1.1
Bottles Received: 6

If preservation required by Login: Date/Time

Received for lab by: (Signature) [signature]
Date: 11/11/21
Time: 1615

Hold:

Condition: NCF / OK

ANALYTICAL REPORT

December 16, 2021

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1430150
Samples Received:	11/11/2021
Project Number:	CONSOR-00001
Description:	Red Rock Moorings Update
Report To:	Rusty Lynch 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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TABLE OF CONTENTS

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 07:44	11/11/21 16:15

SB-1 L1430150-01 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1773298	1	11/16/21 09:37	11/16/21 09:43	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1774938	1	11/16/21 09:52	11/17/21 07:52	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1775229	1	11/22/21 12:09	12/15/21 17:40	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1774680	1	11/12/21 00:45	11/16/21 02:18	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1775730	1	11/12/21 00:45	11/17/21 13:16	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1777360	1	11/20/21 14:16	11/21/21 01:19	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1777085	1	11/19/21 09:11	11/21/21 19:27	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1777093	1	11/20/21 18:30	11/21/21 20:09	JNJ	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 10:20	11/11/21 16:15

SB-2 L1430150-02 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1773298	1	11/16/21 09:37	11/16/21 09:43	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1774938	1	11/16/21 09:52	11/17/21 07:54	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1775229	1	11/22/21 12:09	12/15/21 17:42	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1774680	1	11/12/21 00:45	11/16/21 02:36	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1775730	1	11/12/21 00:45	11/17/21 13:35	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1776718	8	11/12/21 00:45	11/18/21 17:52	ADM	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1777364	1	11/22/21 08:54	11/22/21 16:21	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1777085	1	11/19/21 09:11	11/21/21 19:37	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1778004	1	11/22/21 04:01	11/22/21 16:28	AMG	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 11:05	11/11/21 16:15

SB-3 L1430150-03 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1773298	1	11/16/21 09:37	11/16/21 09:43	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1774938	1	11/16/21 09:52	11/17/21 07:56	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1775229	1	11/22/21 12:09	12/15/21 17:45	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1774680	1	11/12/21 00:45	11/16/21 02:55	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1775730	1	11/12/21 00:45	11/17/21 13:54	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1776718	1	11/12/21 00:45	11/18/21 17:33	ADM	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1777364	1	11/22/21 08:54	11/22/21 16:34	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1777085	1	11/19/21 09:11	11/21/21 19:46	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1778004	1	11/22/21 04:01	11/22/21 17:30	AMG	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 13:58	11/11/21 16:15

SB-4 L1430150-04 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1773298	1	11/16/21 09:37	11/16/21 09:43	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1774938	1	11/16/21 09:52	11/17/21 07:58	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1775229	1	11/22/21 12:09	12/15/21 17:53	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1774680	1	11/12/21 00:45	11/16/21 03:14	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1775730	1	11/12/21 00:45	11/17/21 14:12	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1777364	1	11/22/21 08:54	11/22/21 16:48	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1777085	1	11/19/21 09:11	11/21/21 19:56	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1778004	1	11/22/21 04:01	11/22/21 16:49	AMG	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 14:35	11/11/21 16:15

SB-5 L1430150-05 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1773299	1	11/16/21 09:21	11/16/21 09:31	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1774938	1	11/16/21 09:52	11/17/21 08:00	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1775229	1	11/22/21 12:09	12/15/21 17:56	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1774680	1.15	11/12/21 00:45	11/16/21 03:33	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1775730	1.15	11/12/21 00:45	11/17/21 14:31	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1777364	1	11/22/21 08:54	11/22/21 17:01	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1777085	1	11/19/21 09:11	11/21/21 20:05	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1778004	1	11/22/21 04:01	11/22/21 16:08	AMG	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 16:50	11/11/21 16:15

SB-6 L1430150-06 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1773299	1	11/16/21 09:21	11/16/21 09:31	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1774938	1	11/16/21 09:52	11/17/21 08:06	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1775229	1	11/22/21 12:09	12/15/21 17:59	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1774680	1	11/12/21 00:45	11/16/21 03:51	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1775730	1	11/12/21 00:45	11/17/21 14:50	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1777364	1	11/22/21 08:54	11/22/21 17:14	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1777085	1	11/19/21 09:11	11/21/21 20:15	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1778004	1	11/22/21 04:01	11/22/21 17:09	AMG	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	66.4		1	11/16/2021 09:43	WG1773298

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0391	J	0.0271	0.0603	1	11/17/2021 07:52	WG1774938

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	U		0.781	3.01	1	12/15/2021 17:40	WG1775229
Barium	142		0.128	0.753	1	12/15/2021 17:40	WG1775229
Cadmium	1.13		0.0710	0.753	1	12/15/2021 17:40	WG1775229
Chromium	29.8		0.200	1.51	1	12/15/2021 17:40	WG1775229
Lead	18.9		0.313	0.753	1	12/15/2021 17:40	WG1775229
Selenium	U		1.15	3.01	1	12/15/2021 17:40	WG1775229
Silver	U		0.191	1.51	1	12/15/2021 17:40	WG1775229

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.106	0.145	1	11/17/2021 13:16	WG1775730
Acrylonitrile	U		0.0105	0.0363	1	11/17/2021 13:16	WG1775730
Benzene	U		0.00136	0.00291	1	11/17/2021 13:16	WG1775730
Bromobenzene	U		0.00262	0.0363	1	11/16/2021 02:18	WG1774680
Bromodichloromethane	U		0.00211	0.00727	1	11/17/2021 13:16	WG1775730
Bromoform	U		0.00340	0.0727	1	11/16/2021 02:18	WG1774680
Bromomethane	U		0.00573	0.0363	1	11/17/2021 13:16	WG1775730
n-Butylbenzene	U		0.0153	0.0363	1	11/16/2021 02:18	WG1774680
sec-Butylbenzene	U		0.00837	0.0363	1	11/16/2021 02:18	WG1774680
tert-Butylbenzene	U		0.00567	0.0145	1	11/16/2021 02:18	WG1774680
Carbon tetrachloride	U		0.00261	0.0145	1	11/16/2021 02:18	WG1774680
Chlorobenzene	U		0.000611	0.00727	1	11/16/2021 02:18	WG1774680
Chlorodibromomethane	U		0.00178	0.00727	1	11/16/2021 02:18	WG1774680
Chloroethane	U		0.00494	0.0145	1	11/16/2021 02:18	WG1774680
Chloroform	U		0.00299	0.00727	1	11/17/2021 13:16	WG1775730
Chloromethane	U		0.0126	0.0363	1	11/16/2021 02:18	WG1774680
2-Chlorotoluene	U		0.00252	0.00727	1	11/16/2021 02:18	WG1774680
4-Chlorotoluene	U		0.00131	0.0145	1	11/16/2021 02:18	WG1774680
1,2-Dibromo-3-Chloropropane	U		0.0113	0.0727	1	11/16/2021 02:18	WG1774680
1,2-Dibromoethane	U		0.00188	0.00727	1	11/16/2021 02:18	WG1774680
Dibromomethane	U		0.00218	0.0145	1	11/17/2021 13:16	WG1775730
1,2-Dichlorobenzene	U		0.00124	0.0145	1	11/16/2021 02:18	WG1774680
1,3-Dichlorobenzene	U		0.00174	0.0145	1	11/16/2021 02:18	WG1774680
1,4-Dichlorobenzene	U		0.00204	0.0145	1	11/16/2021 02:18	WG1774680
Dichlorodifluoromethane	U		0.00468	0.00727	1	11/17/2021 13:16	WG1775730
1,1-Dichloroethane	U		0.00143	0.00727	1	11/16/2021 02:18	WG1774680
1,2-Dichloroethane	U		0.00189	0.00727	1	11/17/2021 13:16	WG1775730
1,1-Dichloroethene	U		0.00176	0.00727	1	11/16/2021 02:18	WG1774680
cis-1,2-Dichloroethene	U		0.00213	0.00727	1	11/16/2021 02:18	WG1774680
trans-1,2-Dichloroethene	U		0.00302	0.0145	1	11/17/2021 13:16	WG1775730
1,2-Dichloropropane	U		0.00413	0.0145	1	11/16/2021 02:18	WG1774680
1,1-Dichloropropene	U		0.00235	0.00727	1	11/17/2021 13:16	WG1775730
1,3-Dichloropropane	U		0.00146	0.0145	1	11/16/2021 02:18	WG1774680

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00220	0.00727	1	11/17/2021 13:16	WG1775730
trans-1,3-Dichloropropene	U		0.00331	0.0145	1	11/16/2021 02:18	WG1774680
2,2-Dichloropropane	U		0.00401	0.00727	1	11/17/2021 13:16	WG1775730
Di-isopropyl ether	U		0.00119	0.00291	1	11/16/2021 02:18	WG1774680
Ethylbenzene	U		0.00214	0.00727	1	11/16/2021 02:18	WG1774680
Hexachloro-1,3-Butadiene	U		0.0174	0.0727	1	11/16/2021 02:18	WG1774680
Isopropylbenzene	0.00256	J	0.00124	0.00727	1	11/16/2021 02:18	WG1774680
p-Isopropyltoluene	U		0.00741	0.0145	1	11/16/2021 02:18	WG1774680
2-Butanone (MEK)	U		0.185	0.291	1	11/16/2021 02:18	WG1774680
Methylene Chloride	U		0.0193	0.0727	1	11/16/2021 02:18	WG1774680
4-Methyl-2-pentanone (MIBK)	U		0.00663	0.0727	1	11/16/2021 02:18	WG1774680
Methyl tert-butyl ether	U		0.00102	0.00291	1	11/17/2021 13:16	WG1775730
Naphthalene	U		0.0142	0.0363	1	11/16/2021 02:18	WG1774680
n-Propylbenzene	0.00477	J	0.00276	0.0145	1	11/16/2021 02:18	WG1774680
Styrene	U		0.000666	0.0363	1	11/16/2021 02:18	WG1774680
1,1,1,2-Tetrachloroethane	U		0.00276	0.00727	1	11/16/2021 02:18	WG1774680
1,1,2,2-Tetrachloroethane	U		0.00202	0.00727	1	11/16/2021 02:18	WG1774680
1,1,2-Trichlorotrifluoroethane	U		0.00219	0.00727	1	11/17/2021 13:16	WG1775730
Tetrachloroethene	U		0.00261	0.00727	1	11/16/2021 02:18	WG1774680
Toluene	U		0.00378	0.0145	1	11/16/2021 02:18	WG1774680
1,2,3-Trichlorobenzene	U		0.0213	0.0363	1	11/16/2021 02:18	WG1774680
1,2,4-Trichlorobenzene	U		0.0128	0.0363	1	11/16/2021 02:18	WG1774680
1,1,1-Trichloroethane	U		0.00268	0.00727	1	11/17/2021 13:16	WG1775730
1,1,2-Trichloroethane	U		0.00174	0.00727	1	11/16/2021 02:18	WG1774680
Trichloroethene	U		0.00170	0.00291	1	11/16/2021 02:18	WG1774680
Trichlorofluoromethane	U		0.00240	0.00727	1	11/17/2021 13:16	WG1775730
1,2,3-Trichloropropane	U		0.00471	0.0363	1	11/16/2021 02:18	WG1774680
1,2,4-Trimethylbenzene	0.00898	J	0.00459	0.0145	1	11/16/2021 02:18	WG1774680
1,2,3-Trimethylbenzene	U		0.00459	0.0145	1	11/16/2021 02:18	WG1774680
1,3,5-Trimethylbenzene	U		0.00582	0.0145	1	11/16/2021 02:18	WG1774680
Vinyl chloride	U		0.00337	0.00727	1	11/17/2021 13:16	WG1775730
Xylenes, Total	0.0124	J	0.00256	0.0189	1	11/16/2021 02:18	WG1774680
(S) Toluene-d8	*125*			*75.0-131*		*11/16/2021 02:18*	WG1774680
(S) Toluene-d8	*131*			*75.0-131*		*11/17/2021 13:16*	WG1775730
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*11/16/2021 02:18*	WG1774680
(S) 4-Bromofluorobenzene	*100*			*67.0-138*		*11/17/2021 13:16*	WG1775730
(S) 1,2-Dichloroethane-d4	*85.3*			*70.0-130*		*11/16/2021 02:18*	WG1774680
(S) 1,2-Dichloroethane-d4	*77.2*			*70.0-130*		*11/17/2021 13:16*	WG1775730

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		22.6	75.3	1	11/21/2021 01:19	WG1777360
TPH C12 - C28	U		22.6	75.3	1	11/21/2021 01:19	WG1777360
TPH C28 - C35	U		22.6	75.3	1	11/21/2021 01:19	WG1777360
TPH C6 - C35	U		22.6	75.3	1	11/21/2021 01:19	WG1777360
(S) o-Terphenyl	*116*			*70.0-130*		*11/21/2021 01:19*	WG1777360
(S) 1-chlorooctane	*112*			*70.0-130*		*11/21/2021 01:19*	WG1777360

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0178	0.0512	1	11/21/2021 19:27	WG1777085
PCB 1221	U		0.0178	0.0512	1	11/21/2021 19:27	WG1777085
PCB 1232	U		0.0178	0.0512	1	11/21/2021 19:27	WG1777085
PCB 1242	U		0.0178	0.0512	1	11/21/2021 19:27	WG1777085
PCB 1248	U		0.0111	0.0256	1	11/21/2021 19:27	WG1777085
PCB 1254	U		0.0111	0.0256	1	11/21/2021 19:27	WG1777085
PCB 1260	U		0.0111	0.0256	1	11/21/2021 19:27	WG1777085
(S) Decachlorobiphenyl	*89.3*			*10.0-135*		*11/21/2021 19:27*	WG1777085
(S) Tetrachloro-m-xylene	*107*			*10.0-139*		*11/21/2021 19:27*	WG1777085

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00812	0.0502	1	11/21/2021 20:09	WG1777093
Acenaphthylene	U		0.00707	0.0502	1	11/21/2021 20:09	WG1777093
Anthracene	U		0.00894	0.0502	1	11/21/2021 20:09	WG1777093
Benzidine	U		0.0943	2.52	1	11/21/2021 20:09	WG1777093
Benzo(a)anthracene	0.0157	J	0.00885	0.0502	1	11/21/2021 20:09	WG1777093
Benzo(b)fluoranthene	0.0118	J	0.00936	0.0502	1	11/21/2021 20:09	WG1777093
Benzo(k)fluoranthene	U		0.00892	0.0502	1	11/21/2021 20:09	WG1777093
Benzo(g,h,i)perylene	U		0.00918	0.0502	1	11/21/2021 20:09	WG1777093
Benzo(a)pyrene	U		0.00933	0.0502	1	11/21/2021 20:09	WG1777093
Bis(2-chlorethoxy)methane	U		0.0151	0.502	1	11/21/2021 20:09	WG1777093
Bis(2-chloroethyl)ether	U		0.0166	0.502	1	11/21/2021 20:09	WG1777093
2,2-Oxybis(1-Chloropropane)	U		0.0217	0.502	1	11/21/2021 20:09	WG1777093
4-Bromophenyl-phenylether	U		0.0176	0.502	1	11/21/2021 20:09	WG1777093
2-Chloronaphthalene	U		0.00882	0.0502	1	11/21/2021 20:09	WG1777093
4-Chlorophenyl-phenylether	U		0.0175	0.502	1	11/21/2021 20:09	WG1777093
Chrysene	0.0134	J	0.00998	0.0502	1	11/21/2021 20:09	WG1777093
Dibenz(a,h)anthracene	U		0.0139	0.0502	1	11/21/2021 20:09	WG1777093
3,3-Dichlorobenzidine	U		0.0185	0.502	1	11/21/2021 20:09	WG1777093
2,4-Dinitrotoluene	U		0.0144	0.502	1	11/21/2021 20:09	WG1777093
2,6-Dinitrotoluene	U		0.0164	0.502	1	11/21/2021 20:09	WG1777093
Fluoranthene	0.0282	J	0.00906	0.0502	1	11/21/2021 20:09	WG1777093
Fluorene	U		0.00817	0.0502	1	11/21/2021 20:09	WG1777093
Hexachlorobenzene	U		0.0178	0.502	1	11/21/2021 20:09	WG1777093
Hexachloro-1,3-butadiene	U		0.0169	0.502	1	11/21/2021 20:09	WG1777093
Hexachlorocyclopentadiene	U		0.0264	0.502	1	11/21/2021 20:09	WG1777093
Hexachloroethane	U		0.0197	0.502	1	11/21/2021 20:09	WG1777093
Indeno(1,2,3-cd)pyrene	U		0.0142	0.0502	1	11/21/2021 20:09	WG1777093
Isophorone	U		0.0154	0.502	1	11/21/2021 20:09	WG1777093
Naphthalene	0.0167	J	0.0126	0.0502	1	11/21/2021 20:09	WG1777093
Nitrobenzene	U		0.0175	0.502	1	11/21/2021 20:09	WG1777093
n-Nitrosodimethylamine	U		0.0744	0.502	1	11/21/2021 20:09	WG1777093
n-Nitrosodiphenylamine	U		0.0380	0.502	1	11/21/2021 20:09	WG1777093
n-Nitrosodi-n-propylamine	U		0.0167	0.502	1	11/21/2021 20:09	WG1777093
Phenanthrene	0.0215	J	0.00996	0.0502	1	11/21/2021 20:09	WG1777093
Benzylbutyl phthalate	U		0.0157	0.502	1	11/21/2021 20:09	WG1777093
Bis(2-ethylhexyl)phthalate	U		0.0636	0.502	1	11/21/2021 20:09	WG1777093
Di-n-butyl phthalate	U		0.0172	0.502	1	11/21/2021 20:09	WG1777093
Diethyl phthalate	U		0.0166	0.502	1	11/21/2021 20:09	WG1777093
Dimethyl phthalate	U		0.106	0.502	1	11/21/2021 20:09	WG1777093
Di-n-octyl phthalate	U		0.0339	0.502	1	11/21/2021 20:09	WG1777093
Pyrene	0.0374	J	0.00977	0.0502	1	11/21/2021 20:09	WG1777093
1,2,4-Trichlorobenzene	U		0.0157	0.502	1	11/21/2021 20:09	WG1777093
4-Chloro-3-methylphenol	U		0.0163	0.502	1	11/21/2021 20:09	WG1777093

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0166	0.502	1	11/21/2021 20:09	WG1777093
2,4-Dichlorophenol	U		0.0146	0.502	1	11/21/2021 20:09	WG1777093
2,4-Dimethylphenol	U		0.0131	0.502	1	11/21/2021 20:09	WG1777093
4,6-Dinitro-2-methylphenol	U		0.114	0.502	1	11/21/2021 20:09	WG1777093
2,4-Dinitrophenol	U		0.117	0.502	1	11/21/2021 20:09	WG1777093
2-Nitrophenol	U		0.0179	0.502	1	11/21/2021 20:09	WG1777093
4-Nitrophenol	U		0.0157	0.502	1	11/21/2021 20:09	WG1777093
Pentachlorophenol	U		0.0135	0.502	1	11/21/2021 20:09	WG1777093
Phenol	U		0.0202	0.502	1	11/21/2021 20:09	WG1777093
2,4,6-Trichlorophenol	U		0.0161	0.502	1	11/21/2021 20:09	WG1777093
(S) 2-Fluorophenol	*41.1*			*12.0-120*		*11/21/2021 20:09*	WG1777093
(S) Phenol-d5	*39.3*			*10.0-120*		*11/21/2021 20:09*	WG1777093
(S) Nitrobenzene-d5	*37.2*			*10.0-122*		*11/21/2021 20:09*	WG1777093
(S) 2-Fluorobiphenyl	*41.1*			*15.0-120*		*11/21/2021 20:09*	WG1777093
(S) 2,4,6-Tribromophenol	*41.0*			*10.0-127*		*11/21/2021 20:09*	WG1777093
(S) p-Terphenyl-d14	*37.2*			*10.0-120*		*11/21/2021 20:09*	WG1777093

Cp Tc Ss Cn Sr Qc Gl Al Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	81.0		1	11/16/2021 09:43	WG1773298

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0300	J	0.0222	0.0494	1	11/17/2021 07:54	WG1774938

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	U		0.639	2.47	1	12/15/2021 17:42	WG1775229
Barium	81.5		0.105	0.617	1	12/15/2021 17:42	WG1775229
Cadmium	0.667		0.0581	0.617	1	12/15/2021 17:42	WG1775229
Chromium	24.7		0.164	1.23	1	12/15/2021 17:42	WG1775229
Lead	10.5		0.257	0.617	1	12/15/2021 17:42	WG1775229
Selenium	U		0.943	2.47	1	12/15/2021 17:42	WG1775229
Silver	U		0.157	1.23	1	12/15/2021 17:42	WG1775229

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.520	0.713	8	11/18/2021 17:52	WG1776718
Acrylonitrile	U		0.00643	0.0223	1	11/17/2021 13:35	WG1775730
Benzene	0.00127	J	0.000832	0.00178	1	11/17/2021 13:35	WG1775730
Bromobenzene	U		0.00160	0.0223	1	11/16/2021 02:36	WG1774680
Bromodichloromethane	U		0.00129	0.00445	1	11/17/2021 13:35	WG1775730
Bromoform	U		0.00208	0.0445	1	11/16/2021 02:36	WG1774680
Bromomethane	U		0.00351	0.0223	1	11/17/2021 13:35	WG1775730
n-Butylbenzene	0.0292		0.00935	0.0223	1	11/16/2021 02:36	WG1774680
sec-Butylbenzene	0.0106	J	0.00513	0.0223	1	11/16/2021 02:36	WG1774680
tert-Butylbenzene	U		0.00347	0.00891	1	11/16/2021 02:36	WG1774680
Carbon tetrachloride	U		0.00160	0.00891	1	11/16/2021 02:36	WG1774680
Chlorobenzene	U		0.000374	0.00445	1	11/16/2021 02:36	WG1774680
Chlorodibromomethane	U		0.00109	0.00445	1	11/16/2021 02:36	WG1774680
Chloroethane	U		0.00303	0.00891	1	11/16/2021 02:36	WG1774680
Chloroform	U		0.00184	0.00445	1	11/17/2021 13:35	WG1775730
Chloromethane	U		0.00775	0.0223	1	11/16/2021 02:36	WG1774680
2-Chlorotoluene	U		0.00154	0.00445	1	11/16/2021 02:36	WG1774680
4-Chlorotoluene	U		0.000802	0.00891	1	11/16/2021 02:36	WG1774680
1,2-Dibromo-3-Chloropropane	U		0.00695	0.0445	1	11/16/2021 02:36	WG1774680
1,2-Dibromoethane	U		0.00115	0.00445	1	11/16/2021 02:36	WG1774680
Dibromomethane	U		0.00134	0.00891	1	11/17/2021 13:35	WG1775730
1,2-Dichlorobenzene	U		0.000757	0.00891	1	11/16/2021 02:36	WG1774680
1,3-Dichlorobenzene	U		0.00107	0.00891	1	11/16/2021 02:36	WG1774680
1,4-Dichlorobenzene	U		0.00125	0.00891	1	11/16/2021 02:36	WG1774680
Dichlorodifluoromethane	U		0.00287	0.00445	1	11/17/2021 13:35	WG1775730
1,1-Dichloroethane	U		0.000875	0.00445	1	11/16/2021 02:36	WG1774680
1,2-Dichloroethane	U		0.00116	0.00445	1	11/17/2021 13:35	WG1775730
1,1-Dichloroethene	U		0.00108	0.00445	1	11/16/2021 02:36	WG1774680
cis-1,2-Dichloroethene	U		0.00131	0.00445	1	11/16/2021 02:36	WG1774680
trans-1,2-Dichloroethene	U		0.00185	0.00891	1	11/17/2021 13:35	WG1775730
1,2-Dichloropropane	U		0.00253	0.00891	1	11/16/2021 02:36	WG1774680
1,1-Dichloropropene	U		0.00144	0.00445	1	11/17/2021 13:35	WG1775730
1,3-Dichloropropane	U		0.000893	0.00891	1	11/16/2021 02:36	WG1774680

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00135	0.00445	1	11/17/2021 13:35	WG1775730
trans-1,3-Dichloropropene	U		0.00203	0.00891	1	11/16/2021 02:36	WG1774680
2,2-Dichloropropane	U		0.00246	0.00445	1	11/17/2021 13:35	WG1775730
Di-isopropyl ether	U		0.000731	0.00178	1	11/16/2021 02:36	WG1774680
Ethylbenzene	0.233		0.00131	0.00445	1	11/16/2021 02:36	WG1774680
Hexachloro-1,3-Butadiene	U		0.0107	0.0445	1	11/16/2021 02:36	WG1774680
Isopropylbenzene	0.0506		0.000757	0.00445	1	11/16/2021 02:36	WG1774680
p-Isopropyltoluene	0.0360		0.00454	0.00891	1	11/16/2021 02:36	WG1774680
2-Butanone (MEK)	1.09	B	0.113	0.178	1	11/16/2021 02:36	WG1774680
Methylene Chloride	U		0.0118	0.0445	1	11/16/2021 02:36	WG1774680
4-Methyl-2-pentanone (MIBK)	U		0.00406	0.0445	1	11/16/2021 02:36	WG1774680
Methyl tert-butyl ether	U		0.000624	0.00178	1	11/17/2021 13:35	WG1775730
Naphthalene	0.251		0.00870	0.0223	1	11/16/2021 02:36	WG1774680
n-Propylbenzene	0.0962		0.00169	0.00891	1	11/16/2021 02:36	WG1774680
Styrene	U		0.000408	0.0223	1	11/16/2021 02:36	WG1774680
1,1,1,2-Tetrachloroethane	U		0.00169	0.00445	1	11/16/2021 02:36	WG1774680
1,1,2,2-Tetrachloroethane	U		0.00124	0.00445	1	11/16/2021 02:36	WG1774680
1,1,2-Trichlorotrifluoroethane	U		0.00134	0.00445	1	11/17/2021 13:35	WG1775730
Tetrachloroethene	U		0.00160	0.00445	1	11/16/2021 02:36	WG1774680
Toluene	0.440		0.00232	0.00891	1	11/16/2021 02:36	WG1774680
1,2,3-Trichlorobenzene	U		0.0131	0.0223	1	11/16/2021 02:36	WG1774680
1,2,4-Trichlorobenzene	U		0.00784	0.0223	1	11/16/2021 02:36	WG1774680
1,1,1-Trichloroethane	U		0.00164	0.00445	1	11/17/2021 13:35	WG1775730
1,1,2-Trichloroethane	U		0.00106	0.00445	1	11/16/2021 02:36	WG1774680
Trichloroethene	U		0.00104	0.00178	1	11/16/2021 02:36	WG1774680
Trichlorofluoromethane	U		0.00147	0.00445	1	11/17/2021 13:35	WG1775730
1,2,3-Trichloropropane	U		0.00289	0.0223	1	11/16/2021 02:36	WG1774680
1,2,4-Trimethylbenzene	0.588		0.00282	0.00891	1	11/16/2021 02:36	WG1774680
1,2,3-Trimethylbenzene	0.308		0.00282	0.00891	1	11/16/2021 02:36	WG1774680
1,3,5-Trimethylbenzene	0.129		0.00356	0.00891	1	11/16/2021 02:36	WG1774680
Vinyl chloride	U		0.00207	0.00445	1	11/17/2021 13:35	WG1775730
Xylenes, Total	1.41		0.00157	0.0116	1	11/16/2021 02:36	WG1774680
(S) Toluene-d8	*124*			*75.0-131*		*11/16/2021 02:36*	WG1774680
(S) Toluene-d8	*128*			*75.0-131*		*11/17/2021 13:35*	WG1775730
(S) Toluene-d8	*113*			*75.0-131*		*11/18/2021 17:52*	WG1776718
(S) 4-Bromofluorobenzene	*100*			*67.0-138*		*11/16/2021 02:36*	WG1774680
(S) 4-Bromofluorobenzene	*98.5*			*67.0-138*		*11/17/2021 13:35*	WG1775730
(S) 4-Bromofluorobenzene	*108*			*67.0-138*		*11/18/2021 17:52*	WG1776718
(S) 1,2-Dichloroethane-d4	*79.3*			*70.0-130*		*11/16/2021 02:36*	WG1774680
(S) 1,2-Dichloroethane-d4	*80.7*			*70.0-130*		*11/17/2021 13:35*	WG1775730
(S) 1,2-Dichloroethane-d4	*97.9*			*70.0-130*		*11/18/2021 17:52*	WG1776718

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		18.5	61.7	1	11/22/2021 16:21	WG1777364
TPH C12 - C28	U		18.5	61.7	1	11/22/2021 16:21	WG1777364
TPH C28 - C35	U		18.5	61.7	1	11/22/2021 16:21	WG1777364
TPH C6 - C35	U		18.5	61.7	1	11/22/2021 16:21	WG1777364
(S) o-Terphenyl	*86.3*			*70.0-130*		*11/22/2021 16:21*	WG1777364
(S) 1-chlorooctane	*100*			*70.0-130*		*11/22/2021 16:21*	WG1777364

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0146	0.0420	1	11/21/2021 19:37	WG1777085
PCB 1221	U		0.0146	0.0420	1	11/21/2021 19:37	WG1777085
PCB 1232	U		0.0146	0.0420	1	11/21/2021 19:37	WG1777085
PCB 1242	U		0.0146	0.0420	1	11/21/2021 19:37	WG1777085
PCB 1248	U		0.00911	0.0210	1	11/21/2021 19:37	WG1777085
PCB 1254	U		0.00911	0.0210	1	11/21/2021 19:37	WG1777085
PCB 1260	U		0.00911	0.0210	1	11/21/2021 19:37	WG1777085
(S) Decachlorobiphenyl	*60.3*			*10.0-135*		*11/21/2021 19:37*	WG1777085
(S) Tetrachloro-m-xylene	*77.1*			*10.0-139*		*11/21/2021 19:37*	WG1777085

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00665	0.0411	1	11/22/2021 16:28	WG1778004
Acenaphthylene	U		0.00579	0.0411	1	11/22/2021 16:28	WG1778004
Anthracene	U		0.00732	0.0411	1	11/22/2021 16:28	WG1778004
Benzidine	U		0.0772	2.06	1	11/22/2021 16:28	WG1778004
Benzo(a)anthracene	0.0114	J	0.00724	0.0411	1	11/22/2021 16:28	WG1778004
Benzo(b)fluoranthene	U		0.00766	0.0411	1	11/22/2021 16:28	WG1778004
Benzo(k)fluoranthene	U		0.00730	0.0411	1	11/22/2021 16:28	WG1778004
Benzo(g,h,i)perylene	0.00796	J	0.00751	0.0411	1	11/22/2021 16:28	WG1778004
Benzo(a)pyrene	U		0.00764	0.0411	1	11/22/2021 16:28	WG1778004
Bis(2-chlorethoxy)methane	U		0.0123	0.411	1	11/22/2021 16:28	WG1778004
Bis(2-chloroethyl)ether	U		0.0136	0.411	1	11/22/2021 16:28	WG1778004
2,2-Oxybis(1-Chloropropane)	U		0.0178	0.411	1	11/22/2021 16:28	WG1778004
4-Bromophenyl-phenylether	U		0.0144	0.411	1	11/22/2021 16:28	WG1778004
2-Chloronaphthalene	U		0.00722	0.0411	1	11/22/2021 16:28	WG1778004
4-Chlorophenyl-phenylether	U		0.0143	0.411	1	11/22/2021 16:28	WG1778004
Chrysene	0.0105	J	0.00817	0.0411	1	11/22/2021 16:28	WG1778004
Dibenz(a,h)anthracene	U		0.0114	0.0411	1	11/22/2021 16:28	WG1778004
3,3-Dichlorobenzidine	U		0.0152	0.411	1	11/22/2021 16:28	WG1778004
2,4-Dinitrotoluene	U		0.0118	0.411	1	11/22/2021 16:28	WG1778004
2,6-Dinitrotoluene	U		0.0134	0.411	1	11/22/2021 16:28	WG1778004
Fluoranthene	0.0118	J	0.00742	0.0411	1	11/22/2021 16:28	WG1778004
Fluorene	0.0142	J	0.00669	0.0411	1	11/22/2021 16:28	WG1778004
Hexachlorobenzene	U		0.0146	0.411	1	11/22/2021 16:28	WG1778004
Hexachloro-1,3-butadiene	U		0.0138	0.411	1	11/22/2021 16:28	WG1778004
Hexachlorocyclopentadiene	U		0.0216	0.411	1	11/22/2021 16:28	WG1778004
Hexachloroethane	U		0.0162	0.411	1	11/22/2021 16:28	WG1778004
Indeno(1,2,3-cd)pyrene	U		0.0116	0.0411	1	11/22/2021 16:28	WG1778004
Isophorone	U		0.0126	0.411	1	11/22/2021 16:28	WG1778004
Naphthalene	0.0880		0.0103	0.0411	1	11/22/2021 16:28	WG1778004
Nitrobenzene	U		0.0143	0.411	1	11/22/2021 16:28	WG1778004
n-Nitrosodimethylamine	U		0.0610	0.411	1	11/22/2021 16:28	WG1778004
n-Nitrosodiphenylamine	U		0.0311	0.411	1	11/22/2021 16:28	WG1778004
n-Nitrosodi-n-propylamine	U		0.0137	0.411	1	11/22/2021 16:28	WG1778004
Phenanthrene	0.0482		0.00816	0.0411	1	11/22/2021 16:28	WG1778004
Benzylbutyl phthalate	U		0.0128	0.411	1	11/22/2021 16:28	WG1778004
Bis(2-ethylhexyl)phthalate	U		0.0521	0.411	1	11/22/2021 16:28	WG1778004
Di-n-butyl phthalate	U		0.0141	0.411	1	11/22/2021 16:28	WG1778004
Diethyl phthalate	U		0.0136	0.411	1	11/22/2021 16:28	WG1778004
Dimethyl phthalate	U		0.0871	0.411	1	11/22/2021 16:28	WG1778004
Di-n-octyl phthalate	U		0.0278	0.411	1	11/22/2021 16:28	WG1778004
Pyrene	0.0312	J	0.00800	0.0411	1	11/22/2021 16:28	WG1778004
1,2,4-Trichlorobenzene	U		0.0128	0.411	1	11/22/2021 16:28	WG1778004
4-Chloro-3-methylphenol	U		0.0133	0.411	1	11/22/2021 16:28	WG1778004

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0136	0.411	1	11/22/2021 16:28	WG1778004
2,4-Dichlorophenol	U		0.0120	0.411	1	11/22/2021 16:28	WG1778004
2,4-Dimethylphenol	U		0.0107	0.411	1	11/22/2021 16:28	WG1778004
4,6-Dinitro-2-methylphenol	U		0.0932	0.411	1	11/22/2021 16:28	WG1778004
2,4-Dinitrophenol	U		0.0961	0.411	1	11/22/2021 16:28	WG1778004
2-Nitrophenol	U		0.0147	0.411	1	11/22/2021 16:28	WG1778004
4-Nitrophenol	U		0.0128	0.411	1	11/22/2021 16:28	WG1778004
Pentachlorophenol	U		0.0111	0.411	1	11/22/2021 16:28	WG1778004
Phenol	U		0.0165	0.411	1	11/22/2021 16:28	WG1778004
2,4,6-Trichlorophenol	U		0.0132	0.411	1	11/22/2021 16:28	WG1778004
(S) 2-Fluorophenol	*73.8*			*12.0-120*		*11/22/2021 16:28*	WG1778004
(S) Phenol-d5	*64.2*			*10.0-120*		*11/22/2021 16:28*	WG1778004
(S) Nitrobenzene-d5	*68.3*			*10.0-122*		*11/22/2021 16:28*	WG1778004
(S) 2-Fluorobiphenyl	*70.5*			*15.0-120*		*11/22/2021 16:28*	WG1778004
(S) 2,4,6-Tribromophenol	*64.8*			*10.0-127*		*11/22/2021 16:28*	WG1778004
(S) p-Terphenyl-d14	*77.2*			*10.0-120*		*11/22/2021 16:28*	WG1778004

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	65.8		1	11/16/2021 09:43	WG1773298

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0400	J	0.0274	0.0608	1	11/17/2021 07:56	WG1774938

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	U		0.788	3.04	1	12/15/2021 17:45	WG1775229
Barium	179		0.130	0.760	1	12/15/2021 17:45	WG1775229
Cadmium	1.23		0.0716	0.760	1	12/15/2021 17:45	WG1775229
Chromium	26.0		0.202	1.52	1	12/15/2021 17:45	WG1775229
Lead	20.5		0.316	0.760	1	12/15/2021 17:45	WG1775229
Selenium	U		1.16	3.04	1	12/15/2021 17:45	WG1775229
Silver	U		0.193	1.52	1	12/15/2021 17:45	WG1775229

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0745	0.102	1	11/18/2021 17:33	WG1776718
Acrylonitrile	U		0.00737	0.0255	1	11/17/2021 13:54	WG1775730
Benzene	U		0.000953	0.00204	1	11/17/2021 13:54	WG1775730
Bromobenzene	0.00873	J	0.00184	0.0255	1	11/16/2021 02:55	WG1774680
Bromodichloromethane	U		0.00148	0.00510	1	11/17/2021 13:54	WG1775730
Bromoform	U		0.00239	0.0510	1	11/16/2021 02:55	WG1774680
Bromomethane	U		0.00402	0.0255	1	11/18/2021 17:33	WG1776718
n-Butylbenzene	U		0.0107	0.0255	1	11/16/2021 02:55	WG1774680
sec-Butylbenzene	U		0.00588	0.0255	1	11/16/2021 02:55	WG1774680
tert-Butylbenzene	U		0.00398	0.0102	1	11/16/2021 02:55	WG1774680
Carbon tetrachloride	U		0.00183	0.0102	1	11/16/2021 02:55	WG1774680
Chlorobenzene	U		0.000429	0.00510	1	11/16/2021 02:55	WG1774680
Chlorodibromomethane	U		0.00125	0.00510	1	11/16/2021 02:55	WG1774680
Chloroethane	U		0.00347	0.0102	1	11/16/2021 02:55	WG1774680
Chloroform	U		0.00210	0.00510	1	11/17/2021 13:54	WG1775730
Chloromethane	U		0.00888	0.0255	1	11/16/2021 02:55	WG1774680
2-Chlorotoluene	U		0.00177	0.00510	1	11/16/2021 02:55	WG1774680
4-Chlorotoluene	U		0.000918	0.0102	1	11/16/2021 02:55	WG1774680
1,2-Dibromo-3-Chloropropane	U		0.00796	0.0510	1	11/16/2021 02:55	WG1774680
1,2-Dibromoethane	U		0.00132	0.00510	1	11/16/2021 02:55	WG1774680
Dibromomethane	U		0.00153	0.0102	1	11/17/2021 13:54	WG1775730
1,2-Dichlorobenzene	U		0.000867	0.0102	1	11/16/2021 02:55	WG1774680
1,3-Dichlorobenzene	U		0.00122	0.0102	1	11/16/2021 02:55	WG1774680
1,4-Dichlorobenzene	U		0.00143	0.0102	1	11/16/2021 02:55	WG1774680
Dichlorodifluoromethane	U		0.00329	0.00510	1	11/17/2021 13:54	WG1775730
1,1-Dichloroethane	U		0.00100	0.00510	1	11/16/2021 02:55	WG1774680
1,2-Dichloroethane	U		0.00132	0.00510	1	11/17/2021 13:54	WG1775730
1,1-Dichloroethene	U		0.00124	0.00510	1	11/16/2021 02:55	WG1774680
cis-1,2-Dichloroethene	U		0.00150	0.00510	1	11/16/2021 02:55	WG1774680
trans-1,2-Dichloroethene	U		0.00212	0.0102	1	11/17/2021 13:54	WG1775730
1,2-Dichloropropane	U		0.00290	0.0102	1	11/16/2021 02:55	WG1774680
1,1-Dichloropropene	U		0.00165	0.00510	1	11/17/2021 13:54	WG1775730
1,3-Dichloropropane	U		0.00102	0.0102	1	11/16/2021 02:55	WG1774680

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00154	0.00510	1	11/17/2021 13:54	WG1775730
trans-1,3-Dichloropropene	U		0.00233	0.0102	1	11/16/2021 02:55	WG1774680
2,2-Dichloropropane	U		0.00282	0.00510	1	11/17/2021 13:54	WG1775730
Di-isopropyl ether	U		0.000837	0.00204	1	11/16/2021 02:55	WG1774680
Ethylbenzene	0.00863		0.00150	0.00510	1	11/17/2021 13:54	WG1775730
Hexachloro-1,3-Butadiene	U		0.0122	0.0510	1	11/16/2021 02:55	WG1774680
Isopropylbenzene	U		0.000867	0.00510	1	11/16/2021 02:55	WG1774680
p-Isopropyltoluene	U		0.00520	0.0102	1	11/16/2021 02:55	WG1774680
2-Butanone (MEK)	U		0.130	0.204	1	11/16/2021 02:55	WG1774680
Methylene Chloride	U		0.0135	0.0510	1	11/16/2021 02:55	WG1774680
4-Methyl-2-pentanone (MIBK)	U		0.00465	0.0510	1	11/16/2021 02:55	WG1774680
Methyl tert-butyl ether	U		0.000714	0.00204	1	11/17/2021 13:54	WG1775730
Naphthalene	0.0416		0.00996	0.0255	1	11/17/2021 13:54	WG1775730
n-Propylbenzene	0.00551	J	0.00194	0.0102	1	11/17/2021 13:54	WG1775730
Styrene	U		0.000467	0.0255	1	11/16/2021 02:55	WG1774680
1,1,1,2-Tetrachloroethane	U		0.00193	0.00510	1	11/16/2021 02:55	WG1774680
1,1,2,2-Tetrachloroethane	U		0.00142	0.00510	1	11/16/2021 02:55	WG1774680
1,1,2-Trichlorotrifluoroethane	U		0.00154	0.00510	1	11/17/2021 13:54	WG1775730
Tetrachloroethene	U		0.00183	0.00510	1	11/16/2021 02:55	WG1774680
Toluene	0.0132		0.00265	0.0102	1	11/17/2021 13:54	WG1775730
1,2,3-Trichlorobenzene	U		0.0150	0.0255	1	11/16/2021 02:55	WG1774680
1,2,4-Trichlorobenzene	U		0.00898	0.0255	1	11/16/2021 02:55	WG1774680
1,1,1-Trichloroethane	U		0.00188	0.00510	1	11/17/2021 13:54	WG1775730
1,1,2-Trichloroethane	U		0.00122	0.00510	1	11/16/2021 02:55	WG1774680
Trichloroethene	U		0.00119	0.00204	1	11/16/2021 02:55	WG1774680
Trichlorofluoromethane	U		0.00169	0.00510	1	11/17/2021 13:54	WG1775730
1,2,3-Trichloropropane	U		0.00331	0.0255	1	11/16/2021 02:55	WG1774680
1,2,4-Trimethylbenzene	0.0269		0.00322	0.0102	1	11/17/2021 13:54	WG1775730
1,2,3-Trimethylbenzene	0.0135		0.00322	0.0102	1	11/17/2021 13:54	WG1775730
1,3,5-Trimethylbenzene	0.00541	J	0.00408	0.0102	1	11/17/2021 13:54	WG1775730
Vinyl chloride	U		0.00237	0.00510	1	11/17/2021 13:54	WG1775730
Xylenes, Total	0.0329		0.00180	0.0133	1	11/17/2021 13:54	WG1775730
(S) Toluene-d8	*124*			*75.0-131*		*11/16/2021 02:55*	WG1774680
(S) Toluene-d8	*128*			*75.0-131*		*11/17/2021 13:54*	WG1775730
(S) Toluene-d8	*114*			*75.0-131*		*11/18/2021 17:33*	WG1776718
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*11/16/2021 02:55*	WG1774680
(S) 4-Bromofluorobenzene	*95.8*			*67.0-138*		*11/17/2021 13:54*	WG1775730
(S) 4-Bromofluorobenzene	*107*			*67.0-138*		*11/18/2021 17:33*	WG1776718
(S) 1,2-Dichloroethane-d4	*85.1*			*70.0-130*		*11/16/2021 02:55*	WG1774680
(S) 1,2-Dichloroethane-d4	*75.4*			*70.0-130*		*11/17/2021 13:54*	WG1775730
(S) 1,2-Dichloroethane-d4	*94.4*			*70.0-130*		*11/18/2021 17:33*	WG1776718

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		22.8	76.0	1	11/22/2021 16:34	WG1777364
TPH C12 - C28	U		22.8	76.0	1	11/22/2021 16:34	WG1777364
TPH C28 - C35	U		22.8	76.0	1	11/22/2021 16:34	WG1777364
TPH C6 - C35	U		22.8	76.0	1	11/22/2021 16:34	WG1777364
(S) o-Terphenyl	*90.2*			*70.0-130*		*11/22/2021 16:34*	WG1777364
(S) 1-chlorooctane	*103*			*70.0-130*		*11/22/2021 16:34*	WG1777364

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0179	0.0517	1	11/21/2021 19:46	WG1777085
PCB 1221	U		0.0179	0.0517	1	11/21/2021 19:46	WG1777085
PCB 1232	U		0.0179	0.0517	1	11/21/2021 19:46	WG1777085
PCB 1242	U		0.0179	0.0517	1	11/21/2021 19:46	WG1777085
PCB 1248	U		0.0112	0.0259	1	11/21/2021 19:46	WG1777085
PCB 1254	U		0.0112	0.0259	1	11/21/2021 19:46	WG1777085
PCB 1260	U		0.0112	0.0259	1	11/21/2021 19:46	WG1777085
(S) Decachlorobiphenyl	*80.6*			*10.0-135*		*11/21/2021 19:46*	WG1777085
(S) Tetrachloro-m-xylene	*93.4*			*10.0-139*		*11/21/2021 19:46*	WG1777085

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00820	0.0506	1	11/22/2021 17:30	WG1778004
Acenaphthylene	U		0.00713	0.0506	1	11/22/2021 17:30	WG1778004
Anthracene	U		0.00902	0.0506	1	11/22/2021 17:30	WG1778004
Benzidine	U		0.0952	2.54	1	11/22/2021 17:30	WG1778004
Benzo(a)anthracene	0.0170	J	0.00893	0.0506	1	11/22/2021 17:30	WG1778004
Benzo(b)fluoranthene	0.0199	J	0.00944	0.0506	1	11/22/2021 17:30	WG1778004
Benzo(k)fluoranthene	U		0.00900	0.0506	1	11/22/2021 17:30	WG1778004
Benzo(g,h,i)perylene	U		0.00926	0.0506	1	11/22/2021 17:30	WG1778004
Benzo(a)pyrene	0.0104	J	0.00941	0.0506	1	11/22/2021 17:30	WG1778004
Bis(2-chlorethoxy)methane	U		0.0152	0.506	1	11/22/2021 17:30	WG1778004
Bis(2-chloroethyl)ether	U		0.0167	0.506	1	11/22/2021 17:30	WG1778004
2,2-Oxybis(1-Chloropropane)	U		0.0219	0.506	1	11/22/2021 17:30	WG1778004
4-Bromophenyl-phenylether	U		0.0178	0.506	1	11/22/2021 17:30	WG1778004
2-Chloronaphthalene	U		0.00890	0.0506	1	11/22/2021 17:30	WG1778004
4-Chlorophenyl-phenylether	U		0.0176	0.506	1	11/22/2021 17:30	WG1778004
Chrysene	0.0217	J	0.0101	0.0506	1	11/22/2021 17:30	WG1778004
Dibenz(a,h)anthracene	U		0.0140	0.0506	1	11/22/2021 17:30	WG1778004
3,3-Dichlorobenzidine	U		0.0187	0.506	1	11/22/2021 17:30	WG1778004
2,4-Dinitrotoluene	U		0.0145	0.506	1	11/22/2021 17:30	WG1778004
2,6-Dinitrotoluene	U		0.0166	0.506	1	11/22/2021 17:30	WG1778004
Fluoranthene	0.0395	J	0.00914	0.0506	1	11/22/2021 17:30	WG1778004
Fluorene	0.00976	J	0.00824	0.0506	1	11/22/2021 17:30	WG1778004
Hexachlorobenzene	U		0.0179	0.506	1	11/22/2021 17:30	WG1778004
Hexachloro-1,3-butadiene	U		0.0170	0.506	1	11/22/2021 17:30	WG1778004
Hexachlorocyclopentadiene	U		0.0266	0.506	1	11/22/2021 17:30	WG1778004
Hexachloroethane	U		0.0199	0.506	1	11/22/2021 17:30	WG1778004
Indeno(1,2,3-cd)pyrene	U		0.0143	0.0506	1	11/22/2021 17:30	WG1778004
Isophorone	U		0.0155	0.506	1	11/22/2021 17:30	WG1778004
Naphthalene	U		0.0127	0.0506	1	11/22/2021 17:30	WG1778004
Nitrobenzene	U		0.0176	0.506	1	11/22/2021 17:30	WG1778004
n-Nitrosodimethylamine	U		0.0751	0.506	1	11/22/2021 17:30	WG1778004
n-Nitrosodiphenylamine	U		0.0383	0.506	1	11/22/2021 17:30	WG1778004
n-Nitrosodi-n-propylamine	U		0.0169	0.506	1	11/22/2021 17:30	WG1778004
Phenanthrene	0.0382	J	0.0101	0.0506	1	11/22/2021 17:30	WG1778004
Benzylbutyl phthalate	U		0.0158	0.506	1	11/22/2021 17:30	WG1778004
Bis(2-ethylhexyl)phthalate	U		0.0642	0.506	1	11/22/2021 17:30	WG1778004
Di-n-butyl phthalate	U		0.0173	0.506	1	11/22/2021 17:30	WG1778004
Diethyl phthalate	U		0.0167	0.506	1	11/22/2021 17:30	WG1778004
Dimethyl phthalate	U		0.107	0.506	1	11/22/2021 17:30	WG1778004
Di-n-octyl phthalate	U		0.0342	0.506	1	11/22/2021 17:30	WG1778004
Pyrene	0.0566		0.00986	0.0506	1	11/22/2021 17:30	WG1778004
1,2,4-Trichlorobenzene	U		0.0158	0.506	1	11/22/2021 17:30	WG1778004
4-Chloro-3-methylphenol	U		0.0164	0.506	1	11/22/2021 17:30	WG1778004

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0167	0.506	1	11/22/2021 17:30	WG1778004
2,4-Dichlorophenol	U		0.0148	0.506	1	11/22/2021 17:30	WG1778004
2,4-Dimethylphenol	U		0.0132	0.506	1	11/22/2021 17:30	WG1778004
4,6-Dinitro-2-methylphenol	U		0.115	0.506	1	11/22/2021 17:30	WG1778004
2,4-Dinitrophenol	U		0.118	0.506	1	11/22/2021 17:30	WG1778004
2-Nitrophenol	U		0.0181	0.506	1	11/22/2021 17:30	WG1778004
4-Nitrophenol	U		0.0158	0.506	1	11/22/2021 17:30	WG1778004
Pentachlorophenol	U		0.0136	0.506	1	11/22/2021 17:30	WG1778004
Phenol	U		0.0204	0.506	1	11/22/2021 17:30	WG1778004
2,4,6-Trichlorophenol	U		0.0163	0.506	1	11/22/2021 17:30	WG1778004
(S) 2-Fluorophenol	*48.8*			*12.0-120*		*11/22/2021 17:30*	WG1778004
(S) Phenol-d5	*44.9*			*10.0-120*		*11/22/2021 17:30*	WG1778004
(S) Nitrobenzene-d5	*45.0*			*10.0-122*		*11/22/2021 17:30*	WG1778004
(S) 2-Fluorobiphenyl	*48.0*			*15.0-120*		*11/22/2021 17:30*	WG1778004
(S) 2,4,6-Tribromophenol	*42.6*			*10.0-127*		*11/22/2021 17:30*	WG1778004
(S) p-Terphenyl-d14	*52.3*			*10.0-120*		*11/22/2021 17:30*	WG1778004

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	72.9		1	11/16/2021 09:43	WG1773298

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0391	J	0.0247	0.0549	1	11/17/2021 07:58	WG1774938

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	U		0.710	2.74	1	12/15/2021 17:53	WG1775229
Barium	162		0.117	0.686	1	12/15/2021 17:53	WG1775229
Cadmium	0.894		0.0646	0.686	1	12/15/2021 17:53	WG1775229
Chromium	21.4		0.182	1.37	1	12/15/2021 17:53	WG1775229
Lead	18.0		0.285	0.686	1	12/15/2021 17:53	WG1775229
Selenium	U		1.05	2.74	1	12/15/2021 17:53	WG1775229
Silver	U		0.174	1.37	1	12/15/2021 17:53	WG1775229

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0770	0.106	1	11/17/2021 14:12	WG1775730
Acrylonitrile	U		0.00762	0.0264	1	11/17/2021 14:12	WG1775730
Benzene	U		0.000986	0.00211	1	11/17/2021 14:12	WG1775730
Bromobenzene	U		0.00190	0.0264	1	11/16/2021 03:14	WG1774680
Bromodichloromethane	U		0.00153	0.00528	1	11/17/2021 14:12	WG1775730
Bromoform	U		0.00247	0.0528	1	11/16/2021 03:14	WG1774680
Bromomethane	U		0.00416	0.0264	1	11/17/2021 14:12	WG1775730
n-Butylbenzene	U		0.0111	0.0264	1	11/16/2021 03:14	WG1774680
sec-Butylbenzene	U		0.00608	0.0264	1	11/16/2021 03:14	WG1774680
tert-Butylbenzene	U		0.00412	0.0106	1	11/16/2021 03:14	WG1774680
Carbon tetrachloride	U		0.00190	0.0106	1	11/16/2021 03:14	WG1774680
Chlorobenzene	U		0.000443	0.00528	1	11/16/2021 03:14	WG1774680
Chlorodibromomethane	U		0.00129	0.00528	1	11/16/2021 03:14	WG1774680
Chloroethane	U		0.00359	0.0106	1	11/16/2021 03:14	WG1774680
Chloroform	U		0.00217	0.00528	1	11/17/2021 14:12	WG1775730
Chloromethane	U		0.00918	0.0264	1	11/16/2021 03:14	WG1774680
2-Chlorotoluene	U		0.00183	0.00528	1	11/16/2021 03:14	WG1774680
4-Chlorotoluene	U		0.000950	0.0106	1	11/16/2021 03:14	WG1774680
1,2-Dibromo-3-Chloropropane	U		0.00823	0.0528	1	11/16/2021 03:14	WG1774680
1,2-Dibromoethane	U		0.00137	0.00528	1	11/16/2021 03:14	WG1774680
Dibromomethane	U		0.00158	0.0106	1	11/17/2021 14:12	WG1775730
1,2-Dichlorobenzene	U		0.000897	0.0106	1	11/16/2021 03:14	WG1774680
1,3-Dichlorobenzene	U		0.00127	0.0106	1	11/16/2021 03:14	WG1774680
1,4-Dichlorobenzene	U		0.00148	0.0106	1	11/16/2021 03:14	WG1774680
Dichlorodifluoromethane	U		0.00340	0.00528	1	11/17/2021 14:12	WG1775730
1,1-Dichloroethane	U		0.00104	0.00528	1	11/16/2021 03:14	WG1774680
1,2-Dichloroethane	U		0.00137	0.00528	1	11/17/2021 14:12	WG1775730
1,1-Dichloroethene	U		0.00128	0.00528	1	11/16/2021 03:14	WG1774680
cis-1,2-Dichloroethene	U		0.00155	0.00528	1	11/16/2021 03:14	WG1774680
trans-1,2-Dichloroethene	U		0.00219	0.0106	1	11/17/2021 14:12	WG1775730
1,2-Dichloropropane	U		0.00300	0.0106	1	11/16/2021 03:14	WG1774680
1,1-Dichloropropene	U		0.00171	0.00528	1	11/17/2021 14:12	WG1775730
1,3-Dichloropropane	U		0.00106	0.0106	1	11/16/2021 03:14	WG1774680

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00160	0.00528	1	11/17/2021 14:12	WG1775730
trans-1,3-Dichloropropene	U		0.00241	0.0106	1	11/16/2021 03:14	WG1774680
2,2-Dichloropropane	U		0.00291	0.00528	1	11/17/2021 14:12	WG1775730
Di-isopropyl ether	U		0.000865	0.00211	1	11/16/2021 03:14	WG1774680
Ethylbenzene	U		0.00156	0.00528	1	11/17/2021 14:12	WG1775730
Hexachloro-1,3-Butadiene	U		0.0127	0.0528	1	11/16/2021 03:14	WG1774680
Isopropylbenzene	U		0.000897	0.00528	1	11/16/2021 03:14	WG1774680
p-Isopropyltoluene	U		0.00538	0.0106	1	11/16/2021 03:14	WG1774680
2-Butanone (MEK)	U		0.134	0.211	1	11/16/2021 03:14	WG1774680
Methylene Chloride	U		0.0140	0.0528	1	11/16/2021 03:14	WG1774680
4-Methyl-2-pentanone (MIBK)	U		0.00481	0.0528	1	11/16/2021 03:14	WG1774680
Methyl tert-butyl ether	U		0.000739	0.00211	1	11/17/2021 14:12	WG1775730
Naphthalene	U		0.0103	0.0264	1	11/17/2021 14:12	WG1775730
n-Propylbenzene	U		0.00200	0.0106	1	11/17/2021 14:12	WG1775730
Styrene	U		0.000483	0.0264	1	11/16/2021 03:14	WG1774680
1,1,1,2-Tetrachloroethane	U		0.00200	0.00528	1	11/16/2021 03:14	WG1774680
1,1,2,2-Tetrachloroethane	U		0.00147	0.00528	1	11/16/2021 03:14	WG1774680
1,1,2-Trichlorotrifluoroethane	U		0.00159	0.00528	1	11/17/2021 14:12	WG1775730
Tetrachloroethene	U		0.00189	0.00528	1	11/16/2021 03:14	WG1774680
Toluene	U		0.00274	0.0106	1	11/16/2021 03:14	WG1774680
1,2,3-Trichlorobenzene	U		0.0155	0.0264	1	11/16/2021 03:14	WG1774680
1,2,4-Trichlorobenzene	U		0.00929	0.0264	1	11/16/2021 03:14	WG1774680
1,1,1-Trichloroethane	U		0.00195	0.00528	1	11/17/2021 14:12	WG1775730
1,1,2-Trichloroethane	U		0.00126	0.00528	1	11/16/2021 03:14	WG1774680
Trichloroethene	U		0.00123	0.00211	1	11/16/2021 03:14	WG1774680
Trichlorofluoromethane	U		0.00175	0.00528	1	11/17/2021 14:12	WG1775730
1,2,3-Trichloropropane	U		0.00342	0.0264	1	11/16/2021 03:14	WG1774680
1,2,4-Trimethylbenzene	0.0113		0.00333	0.0106	1	11/17/2021 14:12	WG1775730
1,2,3-Trimethylbenzene	0.00751	J	0.00333	0.0106	1	11/17/2021 14:12	WG1775730
1,3,5-Trimethylbenzene	U		0.00422	0.0106	1	11/17/2021 14:12	WG1775730
Vinyl chloride	U		0.00245	0.00528	1	11/17/2021 14:12	WG1775730
Xylenes, Total	0.00713	J	0.00186	0.0137	1	11/17/2021 14:12	WG1775730
(S) Toluene-d8	*124*			*75.0-131*		*11/16/2021 03:14*	WG1774680
(S) Toluene-d8	*128*			*75.0-131*		*11/17/2021 14:12*	WG1775730
(S) 4-Bromofluorobenzene	*99.4*			*67.0-138*		*11/16/2021 03:14*	WG1774680
(S) 4-Bromofluorobenzene	*99.5*			*67.0-138*		*11/17/2021 14:12*	WG1775730
(S) 1,2-Dichloroethane-d4	*75.3*			*70.0-130*		*11/16/2021 03:14*	WG1774680
(S) 1,2-Dichloroethane-d4	*84.1*			*70.0-130*		*11/17/2021 14:12*	WG1775730

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		20.6	68.6	1	11/22/2021 16:48	WG1777364
TPH C12 - C28	U		20.6	68.6	1	11/22/2021 16:48	WG1777364
TPH C28 - C35	U		20.6	68.6	1	11/22/2021 16:48	WG1777364
TPH C6 - C35	U		20.6	68.6	1	11/22/2021 16:48	WG1777364
(S) o-Terphenyl	*91.0*			*70.0-130*		*11/22/2021 16:48*	WG1777364
(S) 1-chlorooctane	*104*			*70.0-130*		*11/22/2021 16:48*	WG1777364

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0162	0.0466	1	11/21/2021 19:56	WG1777085
PCB 1221	U		0.0162	0.0466	1	11/21/2021 19:56	WG1777085
PCB 1232	U		0.0162	0.0466	1	11/21/2021 19:56	WG1777085
PCB 1242	U		0.0162	0.0466	1	11/21/2021 19:56	WG1777085
PCB 1248	U		0.0101	0.0233	1	11/21/2021 19:56	WG1777085
PCB 1254	U		0.0101	0.0233	1	11/21/2021 19:56	WG1777085
PCB 1260	U		0.0101	0.0233	1	11/21/2021 19:56	WG1777085
(S) Decachlorobiphenyl	*75.6*			*10.0-135*		*11/21/2021 19:56*	WG1777085
(S) Tetrachloro-m-xylene	*93.2*			*10.0-139*		*11/21/2021 19:56*	WG1777085

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00739	0.0457	1	11/22/2021 16:49	WG1778004
Acenaphthylene	U		0.00643	0.0457	1	11/22/2021 16:49	WG1778004
Anthracene	U		0.00813	0.0457	1	11/22/2021 16:49	WG1778004
Benzidine	U		0.0859	2.29	1	11/22/2021 16:49	WG1778004
Benzo(a)anthracene	U		0.00805	0.0457	1	11/22/2021 16:49	WG1778004
Benzo(b)fluoranthene	U		0.00852	0.0457	1	11/22/2021 16:49	WG1778004
Benzo(k)fluoranthene	U		0.00812	0.0457	1	11/22/2021 16:49	WG1778004
Benzo(g,h,i)perylene	U		0.00835	0.0457	1	11/22/2021 16:49	WG1778004
Benzo(a)pyrene	U		0.00849	0.0457	1	11/22/2021 16:49	WG1778004
Bis(2-chlorethoxy)methane	U		0.0137	0.457	1	11/22/2021 16:49	WG1778004
Bis(2-chloroethyl)ether	U		0.0151	0.457	1	11/22/2021 16:49	WG1778004
2,2-Oxybis(1-Chloropropane)	U		0.0197	0.457	1	11/22/2021 16:49	WG1778004
4-Bromophenyl-phenylether	U		0.0160	0.457	1	11/22/2021 16:49	WG1778004
2-Chloronaphthalene	U		0.00802	0.0457	1	11/22/2021 16:49	WG1778004
4-Chlorophenyl-phenylether	U		0.0159	0.457	1	11/22/2021 16:49	WG1778004
Chrysene	0.0106	J	0.00908	0.0457	1	11/22/2021 16:49	WG1778004
Dibenz(a,h)anthracene	U		0.0127	0.0457	1	11/22/2021 16:49	WG1778004
3,3-Dichlorobenzidine	U		0.0169	0.457	1	11/22/2021 16:49	WG1778004
2,4-Dinitrotoluene	U		0.0131	0.457	1	11/22/2021 16:49	WG1778004
2,6-Dinitrotoluene	U		0.0149	0.457	1	11/22/2021 16:49	WG1778004
Fluoranthene	0.0148	J	0.00824	0.0457	1	11/22/2021 16:49	WG1778004
Fluorene	U		0.00743	0.0457	1	11/22/2021 16:49	WG1778004
Hexachlorobenzene	U		0.0162	0.457	1	11/22/2021 16:49	WG1778004
Hexachloro-1,3-butadiene	U		0.0154	0.457	1	11/22/2021 16:49	WG1778004
Hexachlorocyclopentadiene	U		0.0240	0.457	1	11/22/2021 16:49	WG1778004
Hexachloroethane	U		0.0180	0.457	1	11/22/2021 16:49	WG1778004
Indeno(1,2,3-cd)pyrene	U		0.0129	0.0457	1	11/22/2021 16:49	WG1778004
Isophorone	U		0.0140	0.457	1	11/22/2021 16:49	WG1778004
Naphthalene	U		0.0115	0.0457	1	11/22/2021 16:49	WG1778004
Nitrobenzene	U		0.0159	0.457	1	11/22/2021 16:49	WG1778004
n-Nitrosodimethylamine	U		0.0677	0.457	1	11/22/2021 16:49	WG1778004
n-Nitrosodiphenylamine	U		0.0346	0.457	1	11/22/2021 16:49	WG1778004
n-Nitrosodi-n-propylamine	U		0.0152	0.457	1	11/22/2021 16:49	WG1778004
Phenanthrene	0.0160	J	0.00907	0.0457	1	11/22/2021 16:49	WG1778004
Benzylbutyl phthalate	U		0.0143	0.457	1	11/22/2021 16:49	WG1778004
Bis(2-ethylhexyl)phthalate	U		0.0579	0.457	1	11/22/2021 16:49	WG1778004
Di-n-butyl phthalate	U		0.0156	0.457	1	11/22/2021 16:49	WG1778004
Diethyl phthalate	U		0.0151	0.457	1	11/22/2021 16:49	WG1778004
Dimethyl phthalate	U		0.0968	0.457	1	11/22/2021 16:49	WG1778004
Di-n-octyl phthalate	U		0.0309	0.457	1	11/22/2021 16:49	WG1778004
Pyrene	0.0206	J	0.00889	0.0457	1	11/22/2021 16:49	WG1778004
1,2,4-Trichlorobenzene	U		0.0143	0.457	1	11/22/2021 16:49	WG1778004
4-Chloro-3-methylphenol	U		0.0148	0.457	1	11/22/2021 16:49	WG1778004

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0151	0.457	1	11/22/2021 16:49	WG1778004
2,4-Dichlorophenol	U		0.0133	0.457	1	11/22/2021 16:49	WG1778004
2,4-Dimethylphenol	U		0.0119	0.457	1	11/22/2021 16:49	WG1778004
4,6-Dinitro-2-methylphenol	U		0.104	0.457	1	11/22/2021 16:49	WG1778004
2,4-Dinitrophenol	U		0.107	0.457	1	11/22/2021 16:49	WG1778004
2-Nitrophenol	U		0.0163	0.457	1	11/22/2021 16:49	WG1778004
4-Nitrophenol	U		0.0143	0.457	1	11/22/2021 16:49	WG1778004
Pentachlorophenol	U		0.0123	0.457	1	11/22/2021 16:49	WG1778004
Phenol	U		0.0184	0.457	1	11/22/2021 16:49	WG1778004
2,4,6-Trichlorophenol	U		0.0147	0.457	1	11/22/2021 16:49	WG1778004
(S) 2-Fluorophenol	*66.9*			*12.0-120*		*11/22/2021 16:49*	WG1778004
(S) Phenol-d5	*59.0*			*10.0-120*		*11/22/2021 16:49*	WG1778004
(S) Nitrobenzene-d5	*61.0*			*10.0-122*		*11/22/2021 16:49*	WG1778004
(S) 2-Fluorobiphenyl	*64.7*			*15.0-120*		*11/22/2021 16:49*	WG1778004
(S) 2,4,6-Tribromophenol	*60.4*			*10.0-127*		*11/22/2021 16:49*	WG1778004
(S) p-Terphenyl-d14	*69.3*			*10.0-120*		*11/22/2021 16:49*	WG1778004

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	77.7		1	11/16/2021 09:31	WG1773299

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0521		0.0232	0.0515	1	11/17/2021 08:00	WG1774938

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	34.5		0.667	2.58	1	12/15/2021 17:56	WG1775229
Barium	96.0		0.110	0.644	1	12/15/2021 17:56	WG1775229
Cadmium	0.399	J	0.0607	0.644	1	12/15/2021 17:56	WG1775229
Chromium	23.7		0.171	1.29	1	12/15/2021 17:56	WG1775229
Lead	34.9		0.268	0.644	1	12/15/2021 17:56	WG1775229
Selenium	1.51	J	0.984	2.58	1	12/15/2021 17:56	WG1775229
Silver	U		0.164	1.29	1	12/15/2021 17:56	WG1775229

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	1.47		0.0646	0.0884	1.15	11/17/2021 14:31	WG1775730
Acrylonitrile	U		0.00638	0.0221	1.15	11/17/2021 14:31	WG1775730
Benzene	0.00115	J	0.000826	0.00177	1.15	11/17/2021 14:31	WG1775730
Bromobenzene	U		0.00160	0.0221	1.15	11/16/2021 03:33	WG1774680
Bromodichloromethane	U		0.00128	0.00443	1.15	11/17/2021 14:31	WG1775730
Bromoform	U		0.00208	0.0443	1.15	11/16/2021 03:33	WG1774680
Bromomethane	U		0.00349	0.0221	1.15	11/17/2021 14:31	WG1775730
n-Butylbenzene	0.0423		0.00929	0.0221	1.15	11/16/2021 03:33	WG1774680
sec-Butylbenzene	0.0120	J	0.00509	0.0221	1.15	11/16/2021 03:33	WG1774680
tert-Butylbenzene	U		0.00344	0.00884	1.15	11/16/2021 03:33	WG1774680
Carbon tetrachloride	U		0.00158	0.00884	1.15	11/16/2021 03:33	WG1774680
Chlorobenzene	U		0.000372	0.00443	1.15	11/16/2021 03:33	WG1774680
Chlorodibromomethane	U		0.00108	0.00443	1.15	11/16/2021 03:33	WG1774680
Chloroethane	U		0.00301	0.00884	1.15	11/16/2021 03:33	WG1774680
Chloroform	U		0.00181	0.00443	1.15	11/17/2021 14:31	WG1775730
Chloromethane	U		0.00769	0.0221	1.15	11/16/2021 03:33	WG1774680
2-Chlorotoluene	U		0.00153	0.00443	1.15	11/16/2021 03:33	WG1774680
4-Chlorotoluene	U		0.000797	0.00884	1.15	11/16/2021 03:33	WG1774680
1,2-Dibromo-3-Chloropropane	U		0.00690	0.0443	1.15	11/16/2021 03:33	WG1774680
1,2-Dibromoethane	U		0.00115	0.00443	1.15	11/16/2021 03:33	WG1774680
Dibromomethane	U		0.00133	0.00884	1.15	11/17/2021 14:31	WG1775730
1,2-Dichlorobenzene	U		0.000752	0.00884	1.15	11/16/2021 03:33	WG1774680
1,3-Dichlorobenzene	U		0.00106	0.00884	1.15	11/16/2021 03:33	WG1774680
1,4-Dichlorobenzene	U		0.00124	0.00884	1.15	11/16/2021 03:33	WG1774680
Dichlorodifluoromethane	U		0.00284	0.00443	1.15	11/17/2021 14:31	WG1775730
1,1-Dichloroethane	U		0.000869	0.00443	1.15	11/16/2021 03:33	WG1774680
1,2-Dichloroethane	U		0.00115	0.00443	1.15	11/17/2021 14:31	WG1775730
1,1-Dichloroethene	U		0.00107	0.00443	1.15	11/16/2021 03:33	WG1774680
cis-1,2-Dichloroethene	U		0.00130	0.00443	1.15	11/16/2021 03:33	WG1774680
trans-1,2-Dichloroethene	U		0.00185	0.00884	1.15	11/17/2021 14:31	WG1775730
1,2-Dichloropropane	U		0.00251	0.00884	1.15	11/16/2021 03:33	WG1774680
1,1-Dichloropropene	U		0.00143	0.00443	1.15	11/17/2021 14:31	WG1775730
1,3-Dichloropropane	U		0.000886	0.00884	1.15	11/16/2021 03:33	WG1774680

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00134	0.00443	1.15	11/17/2021 14:31	WG1775730
trans-1,3-Dichloropropene	U		0.00201	0.00884	1.15	11/16/2021 03:33	WG1774680
2,2-Dichloropropane	U		0.00244	0.00443	1.15	11/17/2021 14:31	WG1775730
Di-isopropyl ether	U		0.000726	0.00177	1.15	11/16/2021 03:33	WG1774680
Ethylbenzene	0.0747		0.00130	0.00443	1.15	11/16/2021 03:33	WG1774680
Hexachloro-1,3-Butadiene	U		0.0106	0.0443	1.15	11/16/2021 03:33	WG1774680
Isopropylbenzene	0.0321		0.000752	0.00443	1.15	11/16/2021 03:33	WG1774680
p-Isopropyltoluene	0.0354		0.00451	0.00884	1.15	11/16/2021 03:33	WG1774680
2-Butanone (MEK)	0.650	B	0.112	0.177	1.15	11/16/2021 03:33	WG1774680
Methylene Chloride	U		0.0117	0.0443	1.15	11/16/2021 03:33	WG1774680
4-Methyl-2-pentanone (MIBK)	U		0.00403	0.0443	1.15	11/16/2021 03:33	WG1774680
Methyl tert-butyl ether	U		0.000620	0.00177	1.15	11/17/2021 14:31	WG1775730
Naphthalene	0.158		0.00863	0.0221	1.15	11/16/2021 03:33	WG1774680
n-Propylbenzene	0.0644		0.00168	0.00884	1.15	11/16/2021 03:33	WG1774680
Styrene	U		0.000404	0.0221	1.15	11/16/2021 03:33	WG1774680
1,1,1,2-Tetrachloroethane	U		0.00168	0.00443	1.15	11/16/2021 03:33	WG1774680
1,1,2,2-Tetrachloroethane	U		0.00123	0.00443	1.15	11/16/2021 03:33	WG1774680
1,1,2-Trichlorotrifluoroethane	U		0.00133	0.00443	1.15	11/17/2021 14:31	WG1775730
Tetrachloroethene	U		0.00158	0.00443	1.15	11/16/2021 03:33	WG1774680
Toluene	0.0800		0.00229	0.00884	1.15	11/16/2021 03:33	WG1774680
1,2,3-Trichlorobenzene	U		0.0130	0.0221	1.15	11/16/2021 03:33	WG1774680
1,2,4-Trichlorobenzene	U		0.00778	0.0221	1.15	11/16/2021 03:33	WG1774680
1,1,1-Trichloroethane	U		0.00163	0.00443	1.15	11/17/2021 14:31	WG1775730
1,1,2-Trichloroethane	U		0.00106	0.00443	1.15	11/16/2021 03:33	WG1774680
Trichloroethene	U		0.00103	0.00177	1.15	11/16/2021 03:33	WG1774680
Trichlorofluoromethane	U		0.00146	0.00443	1.15	11/17/2021 14:31	WG1775730
1,2,3-Trichloropropane	U		0.00286	0.0221	1.15	11/16/2021 03:33	WG1774680
1,2,4-Trimethylbenzene	0.326		0.00280	0.00884	1.15	11/16/2021 03:33	WG1774680
1,2,3-Trimethylbenzene	0.150		0.00280	0.00884	1.15	11/16/2021 03:33	WG1774680
1,3,5-Trimethylbenzene	0.0761		0.00354	0.00884	1.15	11/16/2021 03:33	WG1774680
Vinyl chloride	U		0.00205	0.00443	1.15	11/17/2021 14:31	WG1775730
Xylenes, Total	0.475		0.00155	0.0115	1.15	11/16/2021 03:33	WG1774680
(S) Toluene-d8	*125*			*75.0-131*		*11/16/2021 03:33*	WG1774680
(S) Toluene-d8	*128*			*75.0-131*		*11/17/2021 14:31*	WG1775730
(S) 4-Bromofluorobenzene	*100*			*67.0-138*		*11/16/2021 03:33*	WG1774680
(S) 4-Bromofluorobenzene	*98.5*			*67.0-138*		*11/17/2021 14:31*	WG1775730
(S) 1,2-Dichloroethane-d4	*83.6*			*70.0-130*		*11/16/2021 03:33*	WG1774680
(S) 1,2-Dichloroethane-d4	*79.5*			*70.0-130*		*11/17/2021 14:31*	WG1775730

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		19.3	64.4	1	11/22/2021 17:01	WG1777364
TPH C12 - C28	U		19.3	64.4	1	11/22/2021 17:01	WG1777364
TPH C28 - C35	U		19.3	64.4	1	11/22/2021 17:01	WG1777364
TPH C6 - C35	U		19.3	64.4	1	11/22/2021 17:01	WG1777364
(S) o-Terphenyl	*90.2*			*70.0-130*		*11/22/2021 17:01*	WG1777364
(S) 1-chlorooctane	*103*			*70.0-130*		*11/22/2021 17:01*	WG1777364

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0152	0.0438	1	11/21/2021 20:05	WG1777085
PCB 1221	U		0.0152	0.0438	1	11/21/2021 20:05	WG1777085
PCB 1232	U		0.0152	0.0438	1	11/21/2021 20:05	WG1777085
PCB 1242	U		0.0152	0.0438	1	11/21/2021 20:05	WG1777085
PCB 1248	U		0.00950	0.0219	1	11/21/2021 20:05	WG1777085
PCB 1254	U		0.00950	0.0219	1	11/21/2021 20:05	WG1777085
PCB 1260	U		0.00950	0.0219	1	11/21/2021 20:05	WG1777085
(S) Decachlorobiphenyl	*59.6*			*10.0-135*		*11/21/2021 20:05*	WG1777085
(S) Tetrachloro-m-xylene	*73.5*			*10.0-139*		*11/21/2021 20:05*	WG1777085

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00694	0.0429	1	11/22/2021 16:08	WG1778004
Acenaphthylene	U		0.00604	0.0429	1	11/22/2021 16:08	WG1778004
Anthracene	U		0.00764	0.0429	1	11/22/2021 16:08	WG1778004
Benzidine	U		0.0806	2.15	1	11/22/2021 16:08	WG1778004
Benzo(a)anthracene	U		0.00756	0.0429	1	11/22/2021 16:08	WG1778004
Benzo(b)fluoranthene	U		0.00800	0.0429	1	11/22/2021 16:08	WG1778004
Benzo(k)fluoranthene	U		0.00762	0.0429	1	11/22/2021 16:08	WG1778004
Benzo(g,h,i)perylene	U		0.00784	0.0429	1	11/22/2021 16:08	WG1778004
Benzo(a)pyrene	U		0.00797	0.0429	1	11/22/2021 16:08	WG1778004
Bis(2-chlorethoxy)methane	U		0.0129	0.429	1	11/22/2021 16:08	WG1778004
Bis(2-chloroethyl)ether	U		0.0142	0.429	1	11/22/2021 16:08	WG1778004
2,2-Oxybis(1-Chloropropane)	U		0.0185	0.429	1	11/22/2021 16:08	WG1778004
4-Bromophenyl-phenylether	U		0.0151	0.429	1	11/22/2021 16:08	WG1778004
2-Chloronaphthalene	U		0.00753	0.0429	1	11/22/2021 16:08	WG1778004
4-Chlorophenyl-phenylether	U		0.0149	0.429	1	11/22/2021 16:08	WG1778004
Chrysene	U		0.00852	0.0429	1	11/22/2021 16:08	WG1778004
Dibenz(a,h)anthracene	U		0.0119	0.0429	1	11/22/2021 16:08	WG1778004
3,3-Dichlorobenzidine	U		0.0158	0.429	1	11/22/2021 16:08	WG1778004
2,4-Dinitrotoluene	U		0.0123	0.429	1	11/22/2021 16:08	WG1778004
2,6-Dinitrotoluene	U		0.0140	0.429	1	11/22/2021 16:08	WG1778004
Fluoranthene	U		0.00774	0.0429	1	11/22/2021 16:08	WG1778004
Fluorene	0.00932	J	0.00698	0.0429	1	11/22/2021 16:08	WG1778004
Hexachlorobenzene	U		0.0152	0.429	1	11/22/2021 16:08	WG1778004
Hexachloro-1,3-butadiene	U		0.0144	0.429	1	11/22/2021 16:08	WG1778004
Hexachlorocyclopentadiene	U		0.0225	0.429	1	11/22/2021 16:08	WG1778004
Hexachloroethane	U		0.0169	0.429	1	11/22/2021 16:08	WG1778004
Indeno(1,2,3-cd)pyrene	U		0.0121	0.0429	1	11/22/2021 16:08	WG1778004
Isophorone	U		0.0131	0.429	1	11/22/2021 16:08	WG1778004
Naphthalene	0.0461		0.0108	0.0429	1	11/22/2021 16:08	WG1778004
Nitrobenzene	U		0.0149	0.429	1	11/22/2021 16:08	WG1778004
n-Nitrosodimethylamine	U		0.0636	0.429	1	11/22/2021 16:08	WG1778004
n-Nitrosodiphenylamine	U		0.0325	0.429	1	11/22/2021 16:08	WG1778004
n-Nitrosodi-n-propylamine	U		0.0143	0.429	1	11/22/2021 16:08	WG1778004
Phenanthrene	0.0288	J	0.00851	0.0429	1	11/22/2021 16:08	WG1778004
Benzylbutyl phthalate	U		0.0134	0.429	1	11/22/2021 16:08	WG1778004
Bis(2-ethylhexyl)phthalate	U		0.0543	0.429	1	11/22/2021 16:08	WG1778004
Di-n-butyl phthalate	U		0.0147	0.429	1	11/22/2021 16:08	WG1778004
Diethyl phthalate	U		0.0142	0.429	1	11/22/2021 16:08	WG1778004
Dimethyl phthalate	U		0.0909	0.429	1	11/22/2021 16:08	WG1778004
Di-n-octyl phthalate	U		0.0290	0.429	1	11/22/2021 16:08	WG1778004
Pyrene	0.00867	J	0.00834	0.0429	1	11/22/2021 16:08	WG1778004
1,2,4-Trichlorobenzene	U		0.0134	0.429	1	11/22/2021 16:08	WG1778004
4-Chloro-3-methylphenol	U		0.0139	0.429	1	11/22/2021 16:08	WG1778004

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0142	0.429	1	11/22/2021 16:08	WG1778004
2,4-Dichlorophenol	U		0.0125	0.429	1	11/22/2021 16:08	WG1778004
2,4-Dimethylphenol	U		0.0112	0.429	1	11/22/2021 16:08	WG1778004
4,6-Dinitro-2-methylphenol	U		0.0972	0.429	1	11/22/2021 16:08	WG1778004
2,4-Dinitrophenol	U		0.100	0.429	1	11/22/2021 16:08	WG1778004
2-Nitrophenol	U		0.0153	0.429	1	11/22/2021 16:08	WG1778004
4-Nitrophenol	U		0.0134	0.429	1	11/22/2021 16:08	WG1778004
Pentachlorophenol	U		0.0115	0.429	1	11/22/2021 16:08	WG1778004
Phenol	U		0.0173	0.429	1	11/22/2021 16:08	WG1778004
2,4,6-Trichlorophenol	U		0.0138	0.429	1	11/22/2021 16:08	WG1778004
(S) 2-Fluorophenol	*73.2*			*12.0-120*		*11/22/2021 16:08*	WG1778004
(S) Phenol-d5	*64.0*			*10.0-120*		*11/22/2021 16:08*	WG1778004
(S) Nitrobenzene-d5	*70.2*			*10.0-122*		*11/22/2021 16:08*	WG1778004
(S) 2-Fluorobiphenyl	*70.8*			*15.0-120*		*11/22/2021 16:08*	WG1778004
(S) 2,4,6-Tribromophenol	*67.9*			*10.0-127*		*11/22/2021 16:08*	WG1778004
(S) p-Terphenyl-d14	*78.7*			*10.0-120*		*11/22/2021 16:08*	WG1778004

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	67.2		1	11/16/2021 09:31	WG1773299

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0396	J	0.0268	0.0595	1	11/17/2021 08:06	WG1774938

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	U		0.771	2.98	1	12/15/2021 17:59	WG1775229
Barium	149		0.127	0.744	1	12/15/2021 17:59	WG1775229
Cadmium	0.995		0.0701	0.744	1	12/15/2021 17:59	WG1775229
Chromium	24.4		0.198	1.49	1	12/15/2021 17:59	WG1775229
Lead	18.8		0.309	0.744	1	12/15/2021 17:59	WG1775229
Selenium	U		1.14	2.98	1	12/15/2021 17:59	WG1775229
Silver	U		0.189	1.49	1	12/15/2021 17:59	WG1775229

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0879	0.120	1	11/17/2021 14:50	WG1775730
Acrylonitrile	U		0.00869	0.0301	1	11/17/2021 14:50	WG1775730
Benzene	U		0.00112	0.00241	1	11/17/2021 14:50	WG1775730
Bromobenzene	U		0.00217	0.0301	1	11/16/2021 03:51	WG1774680
Bromodichloromethane	U		0.00175	0.00602	1	11/17/2021 14:50	WG1775730
Bromoform	U		0.00282	0.0602	1	11/16/2021 03:51	WG1774680
Bromomethane	U		0.00474	0.0301	1	11/17/2021 14:50	WG1775730
n-Butylbenzene	U		0.0126	0.0301	1	11/16/2021 03:51	WG1774680
sec-Butylbenzene	U		0.00693	0.0301	1	11/16/2021 03:51	WG1774680
tert-Butylbenzene	U		0.00469	0.0120	1	11/16/2021 03:51	WG1774680
Carbon tetrachloride	U		0.00216	0.0120	1	11/16/2021 03:51	WG1774680
Chlorobenzene	U		0.000505	0.00602	1	11/16/2021 03:51	WG1774680
Chlorodibromomethane	U		0.00147	0.00602	1	11/16/2021 03:51	WG1774680
Chloroethane	U		0.00409	0.0120	1	11/16/2021 03:51	WG1774680
Chloroform	U		0.00248	0.00602	1	11/17/2021 14:50	WG1775730
Chloromethane	U		0.0105	0.0301	1	11/16/2021 03:51	WG1774680
2-Chlorotoluene	U		0.00208	0.00602	1	11/16/2021 03:51	WG1774680
4-Chlorotoluene	U		0.00108	0.0120	1	11/16/2021 03:51	WG1774680
1,2-Dibromo-3-Chloropropane	U		0.00939	0.0602	1	11/16/2021 03:51	WG1774680
1,2-Dibromoethane	U		0.00156	0.00602	1	11/16/2021 03:51	WG1774680
Dibromomethane	U		0.00181	0.0120	1	11/17/2021 14:50	WG1775730
1,2-Dichlorobenzene	U		0.00102	0.0120	1	11/16/2021 03:51	WG1774680
1,3-Dichlorobenzene	U		0.00144	0.0120	1	11/16/2021 03:51	WG1774680
1,4-Dichlorobenzene	U		0.00168	0.0120	1	11/16/2021 03:51	WG1774680
Dichlorodifluoromethane	U		0.00388	0.00602	1	11/17/2021 14:50	WG1775730
1,1-Dichloroethane	U		0.00118	0.00602	1	11/16/2021 03:51	WG1774680
1,2-Dichloroethane	U		0.00156	0.00602	1	11/17/2021 14:50	WG1775730
1,1-Dichloroethene	U		0.00146	0.00602	1	11/16/2021 03:51	WG1774680
cis-1,2-Dichloroethene	U		0.00177	0.00602	1	11/16/2021 03:51	WG1774680
trans-1,2-Dichloroethene	U		0.00250	0.0120	1	11/17/2021 14:50	WG1775730
1,2-Dichloropropane	U		0.00342	0.0120	1	11/16/2021 03:51	WG1774680
1,1-Dichloropropene	U		0.00195	0.00602	1	11/17/2021 14:50	WG1775730
1,3-Dichloropropane	U		0.00121	0.0120	1	11/16/2021 03:51	WG1774680

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00182	0.00602	1	11/17/2021 14:50	WG1775730
trans-1,3-Dichloropropene	U		0.00274	0.0120	1	11/16/2021 03:51	WG1774680
2,2-Dichloropropane	U		0.00332	0.00602	1	11/17/2021 14:50	WG1775730
Di-isopropyl ether	U		0.000987	0.00241	1	11/16/2021 03:51	WG1774680
Ethylbenzene	U		0.00177	0.00602	1	11/16/2021 03:51	WG1774680
Hexachloro-1,3-Butadiene	U		0.0144	0.0602	1	11/16/2021 03:51	WG1774680
Isopropylbenzene	U		0.00102	0.00602	1	11/16/2021 03:51	WG1774680
p-Isopropyltoluene	U		0.00614	0.0120	1	11/16/2021 03:51	WG1774680
2-Butanone (MEK)	U		0.153	0.241	1	11/16/2021 03:51	WG1774680
Methylene Chloride	U		0.0160	0.0602	1	11/16/2021 03:51	WG1774680
4-Methyl-2-pentanone (MIBK)	U		0.00549	0.0602	1	11/16/2021 03:51	WG1774680
Methyl tert-butyl ether	U		0.000842	0.00241	1	11/17/2021 14:50	WG1775730
Naphthalene	U		0.0117	0.0301	1	11/16/2021 03:51	WG1774680
n-Propylbenzene	0.00239	J	0.00229	0.0120	1	11/16/2021 03:51	WG1774680
Styrene	U		0.000551	0.0301	1	11/16/2021 03:51	WG1774680
1,1,1,2-Tetrachloroethane	U		0.00228	0.00602	1	11/16/2021 03:51	WG1774680
1,1,2,2-Tetrachloroethane	U		0.00167	0.00602	1	11/16/2021 03:51	WG1774680
1,1,2-Trichlorotrifluoroethane	U		0.00181	0.00602	1	11/17/2021 14:50	WG1775730
Tetrachloroethene	U		0.00216	0.00602	1	11/16/2021 03:51	WG1774680
Toluene	U		0.00313	0.0120	1	11/16/2021 03:51	WG1774680
1,2,3-Trichlorobenzene	U		0.0176	0.0301	1	11/16/2021 03:51	WG1774680
1,2,4-Trichlorobenzene	U		0.0106	0.0301	1	11/16/2021 03:51	WG1774680
1,1,1-Trichloroethane	U		0.00222	0.00602	1	11/17/2021 14:50	WG1775730
1,1,2-Trichloroethane	U		0.00144	0.00602	1	11/16/2021 03:51	WG1774680
Trichloroethene	U		0.00141	0.00241	1	11/16/2021 03:51	WG1774680
Trichlorofluoromethane	U		0.00199	0.00602	1	11/17/2021 14:50	WG1775730
1,2,3-Trichloropropane	U		0.00390	0.0301	1	11/16/2021 03:51	WG1774680
1,2,4-Trimethylbenzene	0.00929	J	0.00380	0.0120	1	11/16/2021 03:51	WG1774680
1,2,3-Trimethylbenzene	0.00580	J	0.00380	0.0120	1	11/16/2021 03:51	WG1774680
1,3,5-Trimethylbenzene	U		0.00481	0.0120	1	11/16/2021 03:51	WG1774680
Vinyl chloride	U		0.00279	0.00602	1	11/17/2021 14:50	WG1775730
Xylenes, Total	0.0100	J	0.00212	0.0156	1	11/16/2021 03:51	WG1774680
(S) Toluene-d8	*126*			*75.0-131*		*11/16/2021 03:51*	WG1774680
(S) Toluene-d8	*127*			*75.0-131*		*11/17/2021 14:50*	WG1775730
(S) 4-Bromofluorobenzene	*99.0*			*67.0-138*		*11/16/2021 03:51*	WG1774680
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*11/17/2021 14:50*	WG1775730
(S) 1,2-Dichloroethane-d4	*72.3*			*70.0-130*		*11/16/2021 03:51*	WG1774680
(S) 1,2-Dichloroethane-d4	*77.4*			*70.0-130*		*11/17/2021 14:50*	WG1775730

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		22.3	74.4	1	11/22/2021 17:14	WG1777364
TPH C12 - C28	U		22.3	74.4	1	11/22/2021 17:14	WG1777364
TPH C28 - C35	U		22.3	74.4	1	11/22/2021 17:14	WG1777364
TPH C6 - C35	U		22.3	74.4	1	11/22/2021 17:14	WG1777364
(S) o-Terphenyl	*90.9*			*70.0-130*		*11/22/2021 17:14*	WG1777364
(S) 1-chlorooctane	*103*			*70.0-130*		*11/22/2021 17:14*	WG1777364

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0176	0.0506	1	11/21/2021 20:15	WG1777085
PCB 1221	U		0.0176	0.0506	1	11/21/2021 20:15	WG1777085
PCB 1232	U		0.0176	0.0506	1	11/21/2021 20:15	WG1777085
PCB 1242	U		0.0176	0.0506	1	11/21/2021 20:15	WG1777085
PCB 1248	U		0.0110	0.0253	1	11/21/2021 20:15	WG1777085
PCB 1254	U		0.0110	0.0253	1	11/21/2021 20:15	WG1777085
PCB 1260	U		0.0110	0.0253	1	11/21/2021 20:15	WG1777085
(S) Decachlorobiphenyl	*80.4*			*10.0-135*		*11/21/2021 20:15*	WG1777085
(S) Tetrachloro-m-xylene	*89.4*			*10.0-139*		*11/21/2021 20:15*	WG1777085

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00802	0.0495	1	11/22/2021 17:09	WG1778004
Acenaphthylene	U		0.00698	0.0495	1	11/22/2021 17:09	WG1778004
Anthracene	U		0.00882	0.0495	1	11/22/2021 17:09	WG1778004
Benzidine	U		0.0931	2.48	1	11/22/2021 17:09	WG1778004
Benzo(a)anthracene	U		0.00873	0.0495	1	11/22/2021 17:09	WG1778004
Benzo(b)fluoranthene	U		0.00924	0.0495	1	11/22/2021 17:09	WG1778004
Benzo(k)fluoranthene	U		0.00881	0.0495	1	11/22/2021 17:09	WG1778004
Benzo(g,h,i)perylene	U		0.00906	0.0495	1	11/22/2021 17:09	WG1778004
Benzo(a)pyrene	U		0.00921	0.0495	1	11/22/2021 17:09	WG1778004
Bis(2-chlorethoxy)methane	U		0.0149	0.495	1	11/22/2021 17:09	WG1778004
Bis(2-chloroethyl)ether	U		0.0164	0.495	1	11/22/2021 17:09	WG1778004
2,2-Oxybis(1-Chloropropane)	U		0.0214	0.495	1	11/22/2021 17:09	WG1778004
4-Bromophenyl-phenylether	U		0.0174	0.495	1	11/22/2021 17:09	WG1778004
2-Chloronaphthalene	U		0.00870	0.0495	1	11/22/2021 17:09	WG1778004
4-Chlorophenyl-phenylether	U		0.0173	0.495	1	11/22/2021 17:09	WG1778004
Chrysene	U		0.00985	0.0495	1	11/22/2021 17:09	WG1778004
Dibenz(a,h)anthracene	U		0.0137	0.0495	1	11/22/2021 17:09	WG1778004
3,3-Dichlorobenzidine	U		0.0183	0.495	1	11/22/2021 17:09	WG1778004
2,4-Dinitrotoluene	U		0.0142	0.495	1	11/22/2021 17:09	WG1778004
2,6-Dinitrotoluene	U		0.0162	0.495	1	11/22/2021 17:09	WG1778004
Fluoranthene	0.0153	J	0.00894	0.0495	1	11/22/2021 17:09	WG1778004
Fluorene	U		0.00806	0.0495	1	11/22/2021 17:09	WG1778004
Hexachlorobenzene	U		0.0176	0.495	1	11/22/2021 17:09	WG1778004
Hexachloro-1,3-butadiene	U		0.0167	0.495	1	11/22/2021 17:09	WG1778004
Hexachlorocyclopentadiene	U		0.0260	0.495	1	11/22/2021 17:09	WG1778004
Hexachloroethane	U		0.0195	0.495	1	11/22/2021 17:09	WG1778004
Indeno(1,2,3-cd)pyrene	U		0.0140	0.0495	1	11/22/2021 17:09	WG1778004
Isophorone	U		0.0152	0.495	1	11/22/2021 17:09	WG1778004
Naphthalene	U		0.0124	0.0495	1	11/22/2021 17:09	WG1778004
Nitrobenzene	U		0.0173	0.495	1	11/22/2021 17:09	WG1778004
n-Nitrosodimethylamine	U		0.0735	0.495	1	11/22/2021 17:09	WG1778004
n-Nitrosodiphenylamine	U		0.0375	0.495	1	11/22/2021 17:09	WG1778004
n-Nitrosodi-n-propylamine	U		0.0165	0.495	1	11/22/2021 17:09	WG1778004
Phenanthrene	0.0108	J	0.00983	0.0495	1	11/22/2021 17:09	WG1778004
Benzylbutyl phthalate	U		0.0155	0.495	1	11/22/2021 17:09	WG1778004
Bis(2-ethylhexyl)phthalate	U		0.0628	0.495	1	11/22/2021 17:09	WG1778004
Di-n-butyl phthalate	U		0.0170	0.495	1	11/22/2021 17:09	WG1778004
Diethyl phthalate	U		0.0164	0.495	1	11/22/2021 17:09	WG1778004
Dimethyl phthalate	U		0.105	0.495	1	11/22/2021 17:09	WG1778004
Di-n-octyl phthalate	U		0.0335	0.495	1	11/22/2021 17:09	WG1778004
Pyrene	0.0140	J	0.00964	0.0495	1	11/22/2021 17:09	WG1778004
1,2,4-Trichlorobenzene	U		0.0155	0.495	1	11/22/2021 17:09	WG1778004
4-Chloro-3-methylphenol	U		0.0161	0.495	1	11/22/2021 17:09	WG1778004

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0164	0.495	1	11/22/2021 17:09	WG1778004
2,4-Dichlorophenol	U		0.0144	0.495	1	11/22/2021 17:09	WG1778004
2,4-Dimethylphenol	U		0.0129	0.495	1	11/22/2021 17:09	WG1778004
4,6-Dinitro-2-methylphenol	U		0.112	0.495	1	11/22/2021 17:09	WG1778004
2,4-Dinitrophenol	U		0.116	0.495	1	11/22/2021 17:09	WG1778004
2-Nitrophenol	U		0.0177	0.495	1	11/22/2021 17:09	WG1778004
4-Nitrophenol	U		0.0155	0.495	1	11/22/2021 17:09	WG1778004
Pentachlorophenol	U		0.0133	0.495	1	11/22/2021 17:09	WG1778004
Phenol	U		0.0199	0.495	1	11/22/2021 17:09	WG1778004
2,4,6-Trichlorophenol	U		0.0159	0.495	1	11/22/2021 17:09	WG1778004
(S) 2-Fluorophenol	*72.1*			*12.0-120*		*11/22/2021 17:09*	WG1778004
(S) Phenol-d5	*62.5*			*10.0-120*		*11/22/2021 17:09*	WG1778004
(S) Nitrobenzene-d5	*67.7*			*10.0-122*		*11/22/2021 17:09*	WG1778004
(S) 2-Fluorobiphenyl	*69.6*			*15.0-120*		*11/22/2021 17:09*	WG1778004
(S) 2,4,6-Tribromophenol	*66.1*			*10.0-127*		*11/22/2021 17:09*	WG1778004
(S) p-Terphenyl-d14	*75.9*			*10.0-120*		*11/22/2021 17:09*	WG1778004

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3730147-1 11/16/21 09:43

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1430124-20 Original Sample (OS) • Duplicate (DUP)

(OS) L1430124-20 11/16/21 09:43 • (DUP) R3730147-3 11/16/21 09:43

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	89.9	89.4	1	0.463		10

Laboratory Control Sample (LCS)

(LCS) R3730147-2 11/16/21 09:43

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.1	100	85.0-115	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3730146-1 11/16/21 09:31

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1430162-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1430162-05 11/16/21 09:31 • (DUP) R3730146-3 11/16/21 09:31

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	85.9	85.7	1	0.236		10

Laboratory Control Sample (LCS)

(LCS) R3730146-2 11/16/21 09:31

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3730423-1 11/17/21 07:19

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3730423-2 11/17/21 07:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.488	97.6	80.0-120	

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3730423-3 11/17/21 07:25 • (MSD) R3730423-4 11/17/21 07:27

Analyte	Spike Amount mg/kg	Original Result	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.500		0.492	0.435	98.4	87.1	1	75.0-125			12.2	20

Cp Tc Ss Cn Sr Qc Gl Al Sc

Method Blank (MB)

(MB) R3741430-1 12/15/21 17:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Lead	U		0.208	0.500
Selenium	U		0.764	2.00
Silver	U		0.127	1.00

Laboratory Control Sample (LCS)

(LCS) R3741430-2 12/15/21 17:24

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	95.5	95.5	80.0-120	
Barium	100	102	102	80.0-120	
Cadmium	100	98.6	98.6	80.0-120	
Chromium	100	101	101	80.0-120	
Lead	100	97.3	97.3	80.0-120	
Selenium	100	98.7	98.7	80.0-120	
Silver	20.0	19.7	98.6	80.0-120	

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3741430-5 12/15/21 17:34 • (MSD) R3741430-6 12/15/21 17:37

Analyte	Spike Amount mg/kg	Original Result	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	113		87.8	90.3	87.8	90.3	1	75.0-125			2.85	20
Barium	113		119	140	97.6	119	1	75.0-125			16.2	20
Cadmium	113		93.7	96.6	93.4	96.4	1	75.0-125			3.10	20
Chromium	113		106	109	99.8	102	1	75.0-125			2.18	20
Lead	113		201	399	161	359	1	75.0-125	J5	J3 J5	66.1	20
Selenium	113		91.5	93.9	91.5	93.9	1	75.0-125			2.63	20
Silver	22.6		18.5	19.2	92.7	95.9	1	75.0-125			3.44	20

Method Blank (MB)

(MB) R3730381-2 11/16/21 01:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Bromobenzene	U		0.000900	0.0125
Bromoform	U		0.00117	0.0250
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	U		0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
1,1-Dichloroethane	U		0.000491	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
1,2-Dichloropropane	U		0.00142	0.00500
1,3-Dichloropropane	U		0.000501	0.00500
trans-1,3-Dichloropropene	U		0.00114	0.00500
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	U		0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	0.0754	J	0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
Tetrachloroethene	U		0.000896	0.00250
Toluene	U		0.00130	0.00500
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125

Method Blank (MB)

(MB) R3730381-2 11/16/21 01:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	*123*			*75.0-131*
(S) 4-Bromofluorobenzene	*100*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*86.2*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3730381-1 11/16/21 00:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromobenzene	0.125	0.132	106	73.0-121	
Bromoform	0.125	0.116	92.8	64.0-132	
n-Butylbenzene	0.125	0.107	85.6	68.0-135	
sec-Butylbenzene	0.125	0.122	97.6	74.0-130	
tert-Butylbenzene	0.125	0.131	105	75.0-127	
Carbon tetrachloride	0.125	0.103	82.4	66.0-128	
Chlorobenzene	0.125	0.129	103	76.0-128	
Chlorodibromomethane	0.125	0.124	99.2	74.0-127	
Chloroethane	0.125	0.101	80.8	61.0-134	
Chloromethane	0.125	0.118	94.4	51.0-138	
2-Chlorotoluene	0.125	0.138	110	75.0-124	
4-Chlorotoluene	0.125	0.115	92.0	75.0-124	
1,2-Dibromo-3-Chloropropane	0.125	0.112	89.6	59.0-130	
1,2-Dibromoethane	0.125	0.128	102	74.0-128	
1,2-Dichlorobenzene	0.125	0.134	107	76.0-124	
1,3-Dichlorobenzene	0.125	0.133	106	76.0-125	
1,4-Dichlorobenzene	0.125	0.120	96.0	77.0-121	
1,1-Dichloroethane	0.125	0.109	87.2	70.0-127	
1,1-Dichloroethene	0.125	0.111	88.8	65.0-131	
cis-1,2-Dichloroethene	0.125	0.100	80.0	73.0-125	
1,2-Dichloropropane	0.125	0.114	91.2	74.0-125	
1,3-Dichloropropane	0.125	0.120	96.0	80.0-125	
trans-1,3-Dichloropropene	0.125	0.120	96.0	73.0-127	

Laboratory Control Sample (LCS)

(LCS) R3730381-1 11/16/21 00:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Di-isopropyl ether	0.125	0.138	110	60.0-136	
Ethylbenzene	0.125	0.129	103	74.0-126	
Hexachloro-1,3-butadiene	0.125	0.120	96.0	57.0-150	
Isopropylbenzene	0.125	0.127	102	72.0-127	
p-Isopropyltoluene	0.125	0.122	97.6	72.0-133	
2-Butanone (MEK)	0.625	0.545	87.2	30.0-160	
Methylene Chloride	0.125	0.101	80.8	68.0-123	
4-Methyl-2-pentanone (MIBK)	0.625	0.852	136	56.0-143	
Naphthalene	0.125	0.112	89.6	59.0-130	
n-Propylbenzene	0.125	0.123	98.4	74.0-126	
Styrene	0.125	0.126	101	72.0-127	
1,1,1,2-Tetrachloroethane	0.125	0.128	102	74.0-129	
1,1,2,2-Tetrachloroethane	0.125	0.121	96.8	68.0-128	
Tetrachloroethene	0.125	0.138	110	70.0-136	
Toluene	0.125	0.125	100	75.0-121	
1,2,3-Trichlorobenzene	0.125	0.105	84.0	59.0-139	
1,2,4-Trichlorobenzene	0.125	0.109	87.2	62.0-137	
1,1,2-Trichloroethane	0.125	0.131	105	78.0-123	
Trichloroethene	0.125	0.110	88.0	76.0-126	
1,2,3-Trichloropropane	0.125	0.124	99.2	67.0-129	
1,2,3-Trimethylbenzene	0.125	0.124	99.2	74.0-124	
1,2,4-Trimethylbenzene	0.125	0.120	96.0	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.126	101	73.0-127	
Xylenes, Total	0.375	0.381	102	72.0-127	
(S) Toluene-d8			*123*	*75.0-131*	
(S) 4-Bromofluorobenzene			*101*	*67.0-138*	
(S) 1,2-Dichloroethane-d4			*89.4*	*70.0-130*	

Method Blank (MB)

(MB) R3730541-2 11/17/21 10:18

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromodichloromethane	U		0.000725	0.00250
Bromomethane	U		0.00197	0.0125
Chloroform	U		0.00103	0.00250
Dibromomethane	U		0.000750	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
cis-1,3-Dichloropropene	U		0.000757	0.00250
2,2-Dichloropropane	U		0.00138	0.00250
Ethylbenzene	U		0.000737	0.00250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Toluene	U		0.00130	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
1,1,1-Trichloroethane	U		0.000923	0.00250
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	*127*			*75.0-131*
(S) 4-Bromofluorobenzene	*100*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*84.6*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3730541-1 11/17/21 09:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetone	0.625	0.225	36.0	10.0-160	
Acrylonitrile	0.625	0.554	88.6	45.0-153	
Benzene	0.125	0.101	80.8	70.0-123	
Bromodichloromethane	0.125	0.101	80.8	73.0-121	

Laboratory Control Sample (LCS)

(LCS) R3730541-1 11/17/21 09:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromomethane	0.125	0.0899	71.9	56.0-147	
Chloroform	0.125	0.102	81.6	72.0-123	
Dibromomethane	0.125	0.0966	77.3	75.0-122	
Dichlorodifluoromethane	0.125	0.0858	68.6	43.0-156	
1,2-Dichloroethane	0.125	0.100	80.0	65.0-131	
trans-1,2-Dichloroethene	0.125	0.106	84.8	71.0-125	
1,1-Dichloropropene	0.125	0.107	85.6	73.0-125	
cis-1,3-Dichloropropene	0.125	0.104	83.2	76.0-127	
2,2-Dichloropropane	0.125	0.105	84.0	59.0-135	
Ethylbenzene	0.125	0.137	110	74.0-126	
Methyl tert-butyl ether	0.125	0.0949	75.9	66.0-132	
Naphthalene	0.125	0.117	93.6	59.0-130	
n-Propylbenzene	0.125	0.134	107	74.0-126	
Toluene	0.125	0.136	109	75.0-121	
1,1,2-Trichlorotrifluoroethane	0.125	0.108	86.4	61.0-139	
1,1,1-Trichloroethane	0.125	0.100	80.0	69.0-126	
Trichlorofluoromethane	0.125	0.103	82.4	61.0-142	
1,2,3-Trimethylbenzene	0.125	0.131	105	74.0-124	
1,2,4-Trimethylbenzene	0.125	0.129	103	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.136	109	73.0-127	
Vinyl chloride	0.125	0.110	88.0	63.0-134	
Xylenes, Total	0.375	0.423	113	72.0-127	
(S) Toluene-d8			*125*	*75.0-131*	
(S) 4-Bromofluorobenzene			*102*	*67.0-138*	
(S) 1,2-Dichloroethane-d4			*89.4*	*70.0-130*	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

QUALITY CONTROL SUMMARY

L1430150-02,03

Method Blank (MB)

(MB) R3731733-3 11/18/21 11:08

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Bromomethane	U		0.00197	0.0125
(S) Toluene-d8	*115*			*75.0-131*
(S) 4-Bromofluorobenzene	*106*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*96.9*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3731733-1 11/18/21 09:52 • (LCSD) R3731733-2 11/18/21 10:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.625	0.652	0.652	104	104	10.0-160			0.000	31
Bromomethane	0.125	0.116	0.115	92.8	92.0	56.0-147			0.866	20
(S) Toluene-d8				*113*	*112*	*75.0-131*				
(S) 4-Bromofluorobenzene				*108*	*108*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*107*	*107*	*70.0-130*				

Method Blank (MB)

(MB) R3732363-1 11/20/21 20:37

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*110*			*70.0-130*
(S) 1-chlorooctane	*111*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3732363-2 11/20/21 20:51 • (LCSD) R3732363-3 11/20/21 21:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	268	275	107	110	75.0-125			2.58	20
TPH C12 - C28	250	233	249	93.2	99.6	75.0-125			6.64	20
TPH C6 - C35	500	501	524	100	105	75.0-125			4.49	20
(S) o-Terphenyl				*110*	*118*	*70.0-130*				
(S) 1-chlorooctane				*126*	*132*	*70.0-130*		J1		

L1430150-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1430150-01 11/21/21 01:19 • (MS) R3732363-4 11/21/21 01:32 • (MSD) R3732363-5 11/21/21 01:46

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	368	U	396	384	108	104	1	75.0-125			3.09	20
TPH C12 - C28	368	U	347	366	94.3	99.2	1	75.0-125			5.50	20
TPH C6 - C35	737	U	743	750	101	102	1	75.0-125			1.01	20
(S) o-Terphenyl					*113*	*116*		*70.0-130*				
(S) 1-chlorooctane					*122*	*126*		*70.0-130*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3733146-1 11/22/21 15:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*89.2*			*70.0-130*
(S) 1-chlorooctane	*102*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3733146-2 11/22/21 15:54 • (LCSD) R3733146-3 11/22/21 16:07

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	220	217	88.0	86.8	75.0-125			1.37	20
TPH C12 - C28	250	209	217	83.6	86.8	75.0-125			3.76	20
TPH C6 - C35	500	429	434	85.8	86.8	75.0-125			1.16	20
(S) o-Terphenyl				*89.6*	*90.4*	*70.0-130*				
(S) 1-chlorooctane				*124*	*127*	*70.0-130*				

L1430760-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1430760-01 11/22/21 18:08 • (MS) R3733146-4 11/22/21 18:22 • (MSD) R3733146-5 11/22/21 18:35

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	282	151	414	430	93.1	99.2	1	75.0-125			3.79	20
TPH C12 - C28	282	7070	8250	7950	417	313	1	75.0-125	E V	E V	3.67	20
TPH C6 - C35	565	9100	8660	8390	0.000	0.000	1	75.0-125	V	V	3.22	20
(S) o-Terphenyl					*91.1*	*90.2*		*70.0-130*				
(S) 1-chlorooctane					*135*	*136*		*70.0-130*	J1	J1		

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3732348-1 11/21/21 16:16

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0118	0.0340
PCB 1221	U		0.0118	0.0340
PCB 1232	U		0.0118	0.0340
PCB 1242	U		0.0118	0.0340
PCB 1248	U		0.00738	0.0170
PCB 1254	U		0.00738	0.0170
PCB 1260	U		0.00738	0.0170
(S) Decachlorobiphenyl	*112*			*10.0-135*
(S) Tetrachloro-m-xylene	*101*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3732348-2 11/21/21 16:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	0.167	0.167	100	37.0-145	
PCB 1016	0.167	0.161	96.4	36.0-141	
(S) Decachlorobiphenyl			*103*	*10.0-135*	
(S) Tetrachloro-m-xylene			*94.9*	*10.0-139*	

L1429913-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1429913-04 11/21/21 16:35 • (MS) R3732348-3 11/21/21 16:45 • (MSD) R3732348-4 11/21/21 16:54

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.223	U	0.207	0.207	92.8	92.8	1	10.0-160	P	P	0.000	38
PCB 1016	0.223	U	6.22	4.63	2790	2080	1	10.0-160	J5 P	J5 P	29.3	37
(S) Decachlorobiphenyl					*101*	*89.5*		*10.0-135*				
(S) Tetrachloro-m-xylene					*99.8*	*98.0*		*10.0-139*				

Method Blank (MB)

(MB) R3732346-2 11/21/21 13:08

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	U		0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

Cp Tc Ss Cn Sr Qc Gl Al Sc

Method Blank (MB)

(MB) R3732346-2 11/21/21 13:08

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*43.5*			*10.0-122*
(S) 2-Fluorobiphenyl	*52.3*			*15.0-120*
(S) p-Terphenyl-d14	*51.4*			*10.0-120*
(S) Phenol-d5	*48.3*			*10.0-120*
(S) 2-Fluorophenol	*48.5*			*12.0-120*
(S) 2,4,6-Tribromophenol	*48.3*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3732346-1 11/21/21 12:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.340	51.1	38.0-120	
Acenaphthylene	0.666	0.348	52.3	40.0-120	
Anthracene	0.666	0.362	54.4	42.0-120	
Benzidine	1.33	0.426	32.0	10.0-120	
Benzo(a)anthracene	0.666	0.390	58.6	44.0-120	
Benzo(b)fluoranthene	0.666	0.368	55.3	43.0-120	
Benzo(k)fluoranthene	0.666	0.372	55.9	44.0-120	
Benzo(g,h,i)perylene	0.666	0.384	57.7	43.0-120	
Benzo(a)pyrene	0.666	0.371	55.7	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.295	44.3	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.382	57.4	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.317	47.6	23.0-120	
4-Bromophenyl-phenylether	0.666	0.380	57.1	40.0-120	
2-Chloronaphthalene	0.666	0.330	49.5	35.0-120	

Laboratory Control Sample (LCS)

(LCS) R3732346-1 11/21/21 12:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.353	53.0	40.0-120	
Chrysene	0.666	0.361	54.2	43.0-120	
Dibenz(a,h)anthracene	0.666	0.378	56.8	44.0-120	
3,3-Dichlorobenzidine	1.33	0.709	53.3	28.0-120	
2,4-Dinitrotoluene	0.666	0.383	57.5	45.0-120	
2,6-Dinitrotoluene	0.666	0.344	51.7	42.0-120	
Fluoranthene	0.666	0.388	58.3	44.0-120	
Fluorene	0.666	0.368	55.3	41.0-120	
Hexachlorobenzene	0.666	0.378	56.8	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.296	44.4	15.0-120	
Hexachlorocyclopentadiene	0.666	0.328	49.2	15.0-120	
Hexachloroethane	0.666	0.347	52.1	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.403	60.5	45.0-120	
Isophorone	0.666	0.305	45.8	23.0-120	
Naphthalene	0.666	0.280	42.0	18.0-120	
Nitrobenzene	0.666	0.302	45.3	17.0-120	
n-Nitrosodimethylamine	0.666	0.334	50.2	10.0-125	
n-Nitrosodiphenylamine	0.666	0.351	52.7	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.348	52.3	26.0-120	
Phenanthrene	0.666	0.364	54.7	42.0-120	
Benzylbutyl phthalate	0.666	0.402	60.4	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.404	60.7	41.0-120	
Di-n-butyl phthalate	0.666	0.390	58.6	43.0-120	
Diethyl phthalate	0.666	0.377	56.6	43.0-120	
Dimethyl phthalate	0.666	0.345	51.8	43.0-120	
Di-n-octyl phthalate	0.666	0.366	55.0	40.0-120	
Pyrene	0.666	0.383	57.5	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.296	44.4	17.0-120	
4-Chloro-3-methylphenol	0.666	0.333	50.0	28.0-120	
2-Chlorophenol	0.666	0.344	51.7	28.0-120	
2,4-Dichlorophenol	0.666	0.319	47.9	25.0-120	
2,4-Dimethylphenol	0.666	0.320	48.0	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.361	54.2	16.0-120	
2,4-Dinitrophenol	0.666	0.299	44.9	10.0-120	
2-Nitrophenol	0.666	0.337	50.6	20.0-120	
4-Nitrophenol	0.666	0.349	52.4	27.0-120	
Pentachlorophenol	0.666	0.370	55.6	29.0-120	
Phenol	0.666	0.322	48.3	28.0-120	
2,4,6-Trichlorophenol	0.666	0.409	61.4	37.0-120	
(S) Nitrobenzene-d5			*42.0*	*10.0-122*	

Laboratory Control Sample (LCS)

(LCS) R3732346-1 11/21/21 12:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*55.6*	*15.0-120*	
(S) p-Terphenyl-d14			*52.9*	*10.0-120*	
(S) Phenol-d5			*52.1*	*10.0-120*	
(S) 2-Fluorophenol			*55.3*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*62.5*	*10.0-127*	

L1432279-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1432279-05 11/21/21 19:11 • (MS) R3732132-1 11/21/21 19:35 • (MSD) R3732132-2 11/21/21 19:59

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.739	U	0.348	0.310	47.0	44.6	10	18.0-120			11.5	32
Acenaphthylene	0.739	U	0.302	0.246	40.8	35.5	10	25.0-120			20.2	32
Anthracene	0.739	U	0.239	0.235	32.3	33.9	10	22.0-120			1.41	29
Benzidine	1.48	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	40
Benzo(a)anthracene	0.739	U	0.301	0.272	40.7	39.1	10	25.0-120			10.1	29
Benzo(b)fluoranthene	0.739	U	0.268	0.236	36.2	34.0	10	19.0-122			12.3	31
Benzo(k)fluoranthene	0.739	U	0.253	0.238	34.2	34.2	10	23.0-120			6.33	30
Benzo(g,h,i)perylene	0.739	U	0.182	0.142	24.6	20.4	10	10.0-120			24.7	33
Benzo(a)pyrene	0.739	U	0.260	0.243	35.1	35.0	10	24.0-120			6.62	30
Bis(2-chlorethoxy)methane	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	34
Bis(2-chloroethyl)ether	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	40
2,2-Oxybis(1-Chloropropane)	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	40
4-Bromophenyl-phenylether	0.739	U	0.288	0.226	38.9	32.6	10	27.0-120			23.8	30
2-Chloronaphthalene	0.739	U	0.303	0.240	41.0	34.5	10	20.0-120			23.3	32
4-Chlorophenyl-phenylether	0.739	U	0.289	0.292	39.0	42.0	10	24.0-120			1.15	29
Chrysene	0.739	U	0.276	0.240	37.4	34.5	10	21.0-120			14.2	29
Dibenz(a,h)anthracene	0.739	U	0.193	0.192	26.1	27.6	10	10.0-120			0.576	32
3,3-Dichlorobenzidine	1.48	U	0.454	0.367	30.8	26.5	10	10.0-120			21.1	34
2,4-Dinitrotoluene	0.739	U	U	0.249	0.000	35.8	10	30.0-120	J6	J3	200	31
2,6-Dinitrotoluene	0.739	U	0.462	0.334	62.5	48.1	10	25.0-120		J3	32.1	31
Fluoranthene	0.739	0.0721	0.309	0.289	32.0	31.2	10	18.0-126			6.69	32
Fluorene	0.739	0.142	0.414	0.366	36.8	32.3	10	25.0-120			12.2	30
Hexachlorobenzene	0.739	U	0.216	0.222	29.3	31.9	10	27.0-120			2.53	28
Hexachloro-1,3-butadiene	0.739	U	0.263	0.283	35.6	40.7	10	10.0-120			7.32	38
Hexachlorocyclopentadiene	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	40
Hexachloroethane	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	40
Indeno(1,2,3-cd)pyrene	0.739	U	0.204	0.213	27.6	30.7	10	10.0-120			4.26	32
Isophorone	0.739	34.9	33.2	27.3	0.000	0.000	10	13.0-120	E V	E V	19.4	34

L1432279-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1432279-05 11/21/21 19:11 • (MS) R3732132-1 11/21/21 19:35 • (MSD) R3732132-2 11/21/21 19:59

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.739	15.2	14.9	13.4	0.000	0.000	10	10.0-120	V	V	10.2	35
Nitrobenzene	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	36
n-Nitrosodimethylamine	0.739	U	U	U	0.000	0.000	10	10.0-127	J6	J6	0.000	40
n-Nitrosodiphenylamine	0.739	0.413	0.639	0.590	30.6	25.4	10	17.0-120			8.13	29
n-Nitrosodi-n-propylamine	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	37
Phenanthrene	0.739	0.278	0.486	0.441	28.2	23.5	10	17.0-120			9.82	31
Benzylbutyl phthalate	0.739	0.925	1.13	1.18	28.1	36.3	10	23.0-120			3.85	30
Bis(2-ethylhexyl)phthalate	0.739	9.41	8.93	7.84	0.000	0.000	10	17.0-126	V	V	13.0	30
Di-n-butyl phthalate	0.739	1.85	2.02	1.82	22.5	0.000	10	30.0-120	J6	J6	10.4	29
Diethyl phthalate	0.739	U	0.381	0.314	51.5	45.2	10	26.0-120			19.2	28
Dimethyl phthalate	0.739	U	U	U	0.000	0.000	10	25.0-120	J6	J6	0.000	29
Di-n-octyl phthalate	0.739	U	0.546	0.451	73.9	64.9	10	21.0-123			19.2	29
Pyrene	0.739	U	0.322	0.285	43.5	41.1	10	16.0-121			12.1	32
1,2,4-Trichlorobenzene	0.739	0.135	0.371	0.365	31.8	33.1	10	12.0-120			1.51	37
4-Chloro-3-methylphenol	0.739	U	U	U	0.000	0.000	10	15.0-120	J6	J6	0.000	30
2-Chlorophenol	0.739	U	U	U	0.000	0.000	10	15.0-120	J6	J6	0.000	37
2,4-Dichlorophenol	0.739	U	U	U	0.000	0.000	10	20.0-120	J6	J6	0.000	31
2,4-Dimethylphenol	0.739	4.53	4.69	4.23	21.0	0.000	10	10.0-120		V	10.2	33
4,6-Dinitro-2-methylphenol	0.739	U	U	U	0.000	0.000	10	10.0-120	J6	J6	0.000	39
2,4-Dinitrophenol	0.739	U	U	U	0.000	0.000	10	10.0-121	J6	J6	0.000	40
2-Nitrophenol	0.739	U	U	U	0.000	0.000	10	12.0-120	J6	J6	0.000	39
4-Nitrophenol	0.739	U	U	U	0.000	0.000	10	10.0-137	J6	J6	0.000	32
Pentachlorophenol	0.739	U	0.319	0.228	43.1	32.7	10	10.0-160		J3	33.3	31
Phenol	0.739	3.00	3.03	2.63	4.50	0.000	10	12.0-120	V	V	14.1	38
2,4,6-Trichlorophenol	0.739	U	0.276	0.290	37.4	41.7	10	19.0-120			4.71	32
(S) Nitrobenzene-d5					*0.000*	*0.000*		*10.0-122*	J2	J2		
(S) 2-Fluorobiphenyl					*38.1*	*35.5*		*15.0-120*				
(S) p-Terphenyl-d14					*43.8*	*35.5*		*10.0-120*				
(S) Phenol-d5					*0.000*	*0.000*		*10.0-120*	J2	J2		
(S) 2-Fluorophenol					*0.000*	*0.000*		*12.0-120*	J2	J2		
(S) 2,4,6-Tribromophenol					*37.5*	*29.6*		*10.0-127*				

Sample Narrative:

OS: Dilution and surrogate failure due to matrix interference.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3732880-2 11/22/21 12:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	U		0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

1 Cp 2 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

Method Blank (MB)

(MB) R3732880-2 11/22/21 12:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*65.5*			*10.0-122*
(S) 2-Fluorobiphenyl	*68.5*			*15.0-120*
(S) p-Terphenyl-d14	*79.6*			*10.0-120*
(S) Phenol-d5	*60.4*			*10.0-120*
(S) 2-Fluorophenol	*67.7*			*12.0-120*
(S) 2,4,6-Tribromophenol	*58.4*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3732880-1 11/22/21 12:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.411	61.7	38.0-120	
Acenaphthylene	0.666	0.426	64.0	40.0-120	
Anthracene	0.666	0.441	66.2	42.0-120	
Benzidine	1.33	0.397	29.8	10.0-120	
Benzo(a)anthracene	0.666	0.485	72.8	44.0-120	
Benzo(b)fluoranthene	0.666	0.446	67.0	43.0-120	
Benzo(k)fluoranthene	0.666	0.443	66.5	44.0-120	
Benzo(g,h,i)perylene	0.666	0.460	69.1	43.0-120	
Benzo(a)pyrene	0.666	0.444	66.7	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.339	50.9	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.338	50.8	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.392	58.9	23.0-120	
4-Bromophenyl-phenylether	0.666	0.444	66.7	40.0-120	
2-Chloronaphthalene	0.666	0.424	63.7	35.0-120	

Laboratory Control Sample (LCS)

(LCS) R3732880-1 11/22/21 12:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.448	67.3	40.0-120	
Chrysene	0.666	0.461	69.2	43.0-120	
Dibenz(a,h)anthracene	0.666	0.453	68.0	44.0-120	
3,3-Dichlorobenzidine	1.33	0.878	66.0	28.0-120	
2,4-Dinitrotoluene	0.666	0.500	75.1	45.0-120	
2,6-Dinitrotoluene	0.666	0.454	68.2	42.0-120	
Fluoranthene	0.666	0.454	68.2	44.0-120	
Fluorene	0.666	0.442	66.4	41.0-120	
Hexachlorobenzene	0.666	0.446	67.0	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.354	53.2	15.0-120	
Hexachlorocyclopentadiene	0.666	0.422	63.4	15.0-120	
Hexachloroethane	0.666	0.395	59.3	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.457	68.6	45.0-120	
Isophorone	0.666	0.346	52.0	23.0-120	
Naphthalene	0.666	0.336	50.5	18.0-120	
Nitrobenzene	0.666	0.342	51.4	17.0-120	
n-Nitrosodimethylamine	0.666	0.339	50.9	10.0-125	
n-Nitrosodiphenylamine	0.666	0.443	66.5	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.403	60.5	26.0-120	
Phenanthrene	0.666	0.443	66.5	42.0-120	
Benzylbutyl phthalate	0.666	0.493	74.0	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.510	76.6	41.0-120	
Di-n-butyl phthalate	0.666	0.472	70.9	43.0-120	
Diethyl phthalate	0.666	0.501	75.2	43.0-120	
Dimethyl phthalate	0.666	0.462	69.4	43.0-120	
Di-n-octyl phthalate	0.666	0.500	75.1	40.0-120	
Pyrene	0.666	0.461	69.2	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.363	54.5	17.0-120	
4-Chloro-3-methylphenol	0.666	0.333	50.0	28.0-120	
2-Chlorophenol	0.666	0.415	62.3	28.0-120	
2,4-Dichlorophenol	0.666	0.346	52.0	25.0-120	
2,4-Dimethylphenol	0.666	0.355	53.3	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.496	74.5	16.0-120	
2,4-Dinitrophenol	0.666	0.362	54.4	10.0-120	
2-Nitrophenol	0.666	0.377	56.6	20.0-120	
4-Nitrophenol	0.666	0.491	73.7	27.0-120	
Pentachlorophenol	0.666	0.393	59.0	29.0-120	
Phenol	0.666	0.373	56.0	28.0-120	
2,4,6-Trichlorophenol	0.666	0.407	61.1	37.0-120	
(S) Nitrobenzene-d5			*51.7*	*10.0-122*	

Laboratory Control Sample (LCS)

(LCS) R3732880-1 11/22/21 12:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*62.8*	*15.0-120*	
(S) p-Terphenyl-d14			*68.5*	*10.0-120*	
(S) Phenol-d5			*57.2*	*10.0-120*	
(S) 2-Fluorophenol			*64.3*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*65.2*	*10.0-127*	

L1429375-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1429375-05 11/22/21 18:11 • (MS) R3732880-3 11/22/21 18:31 • (MSD) R3732880-4 11/22/21 18:52

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.679	U	0.372	0.333	54.8	48.3	1	18.0-120			11.0	32
Acenaphthylene	0.679	U	0.383	0.335	56.3	48.6	1	25.0-120			13.2	32
Anthracene	0.679	U	0.401	0.345	59.0	50.0	1	22.0-120			15.0	29
Benzidine	1.36	U	0.195	0.202	14.3	14.7	1	10.0-120			3.71	40
Benzo(a)anthracene	0.679	0.00957	0.435	0.394	62.7	55.8	1	25.0-120			9.89	29
Benzo(b)fluoranthene	0.679	0.0110	0.442	0.391	63.4	55.1	1	19.0-122			12.1	31
Benzo(k)fluoranthene	0.679	0.00927	0.434	0.386	62.6	54.6	1	23.0-120			11.8	30
Benzo(g,h,i)perylene	0.679	0.00692	0.267	0.239	38.3	33.6	1	10.0-120			11.2	33
Benzo(a)pyrene	0.679	0.00957	0.422	0.371	60.7	52.4	1	24.0-120			12.7	30
Bis(2-chlorethoxy)methane	0.679	U	0.308	0.272	45.4	39.5	1	10.0-120			12.3	34
Bis(2-chloroethyl)ether	0.679	U	0.332	0.291	48.9	42.2	1	10.0-120			13.2	40
2,2-Oxybis(1-Chloropropane)	0.679	U	0.359	0.317	52.8	45.9	1	10.0-120			12.5	40
4-Bromophenyl-phenylether	0.679	U	0.411	0.358	60.5	51.8	1	27.0-120			14.0	30
2-Chloronaphthalene	0.679	U	0.375	0.340	55.3	49.2	1	20.0-120			10.0	32
4-Chlorophenyl-phenylether	0.679	U	0.403	0.358	59.3	51.8	1	24.0-120			11.9	29
Chrysene	0.679	0.00991	0.410	0.368	58.9	51.9	1	21.0-120			10.8	29
Dibenz(a,h)anthracene	0.679	U	0.314	0.294	46.3	42.7	1	10.0-120			6.56	32
3,3-Dichlorobenzidine	1.36	U	0.714	0.662	52.6	48.1	1	10.0-120			7.49	34
2,4-Dinitrotoluene	0.679	U	0.456	0.404	67.2	58.5	1	30.0-120			12.2	31
2,6-Dinitrotoluene	0.679	U	0.410	0.358	60.4	51.8	1	25.0-120			13.7	31
Fluoranthene	0.679	U	0.419	0.366	61.6	53.0	1	18.0-126			13.4	32
Fluorene	0.679	U	0.397	0.355	58.5	51.5	1	25.0-120			11.2	30
Hexachlorobenzene	0.679	U	0.389	0.348	57.3	50.5	1	27.0-120			11.1	28
Hexachloro-1,3-butadiene	0.679	U	0.326	0.299	48.0	43.3	1	10.0-120			8.75	38
Hexachlorocyclopentadiene	0.679	U	0.117	0.103	17.2	15.0	1	10.0-120			12.0	40
Hexachloroethane	0.679	U	0.329	0.304	48.5	44.1	1	10.0-120			7.97	40
Indeno(1,2,3-cd)pyrene	0.679	U	0.312	0.283	46.0	41.0	1	10.0-120			9.89	32
Isophorone	0.679	U	0.317	0.284	46.6	41.2	1	13.0-120			10.9	34

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L1429375-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1429375-05 11/22/21 18:11 • (MS) R3732880-3 11/22/21 18:31 • (MSD) R3732880-4 11/22/21 18:52

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.679	U	0.310	0.283	45.7	41.0	1	10.0-120			9.22	35
Nitrobenzene	0.679	U	0.306	0.278	45.0	40.2	1	10.0-120			9.73	36
n-Nitrosodimethylamine	0.679	U	0.264	0.221	38.9	32.0	1	10.0-127			17.8	40
n-Nitrosodiphenylamine	0.679	U	0.394	0.349	58.0	50.6	1	17.0-120			12.2	29
n-Nitrosodi-n-propylamine	0.679	U	0.371	0.317	54.6	45.9	1	10.0-120			15.9	37
Phenanthrene	0.679	U	0.409	0.356	60.2	51.7	1	17.0-120			13.7	31
Benzylbutyl phthalate	0.679	0.0115	0.483	0.445	69.4	62.8	1	23.0-120			8.16	30
Bis(2-ethylhexyl)phthalate	0.679	U	0.492	0.449	72.4	65.1	1	17.0-126			9.16	30
Di-n-butyl phthalate	0.679	U	0.437	0.383	64.4	55.5	1	30.0-120			13.3	29
Diethyl phthalate	0.679	U	0.436	0.395	64.2	57.3	1	26.0-120			9.86	28
Dimethyl phthalate	0.679	U	0.403	0.356	59.3	51.7	1	25.0-120			12.2	29
Di-n-octyl phthalate	0.679	U	0.516	0.469	76.0	68.0	1	21.0-123			9.61	29
Pyrene	0.679	U	0.414	0.369	61.0	53.5	1	16.0-121			11.5	32
1,2,4-Trichlorobenzene	0.679	U	0.330	0.301	48.6	43.6	1	12.0-120			9.33	37
4-Chloro-3-methylphenol	0.679	U	0.324	0.283	47.7	41.0	1	15.0-120			13.5	30
2-Chlorophenol	0.679	U	0.376	0.339	55.4	49.1	1	15.0-120			10.6	37
2,4-Dichlorophenol	0.679	U	0.327	0.300	48.1	43.4	1	20.0-120			8.72	31
2,4-Dimethylphenol	0.679	U	0.309	0.279	45.5	40.4	1	10.0-120			10.4	33
4,6-Dinitro-2-methylphenol	0.679	U	0.379	0.303	55.7	43.9	1	10.0-120			22.2	39
2,4-Dinitrophenol	0.679	U	0.307	0.257	45.2	37.2	1	10.0-121			17.9	40
2-Nitrophenol	0.679	U	0.361	0.330	53.1	47.9	1	12.0-120			8.83	39
4-Nitrophenol	0.679	U	0.478	0.428	70.4	62.0	1	10.0-137			11.1	32
Pentachlorophenol	0.679	U	0.367	0.327	54.0	47.4	1	10.0-160			11.5	31
Phenol	0.679	U	0.340	0.307	50.0	44.5	1	12.0-120			10.1	38
2,4,6-Trichlorophenol	0.679	U	0.355	0.326	52.3	47.3	1	19.0-120			8.64	32
(S) Nitrobenzene-d5					*45.8*	*42.7*		*10.0-122*				
(S) 2-Fluorobiphenyl					*54.2*	*50.0*		*15.0-120*				
(S) p-Terphenyl-d14					*57.6*	*55.2*		*10.0-120*				
(S) Phenol-d5					*51.5*	*46.8*		*10.0-120*				
(S) 2-Fluorophenol					*57.0*	*51.5*		*12.0-120*				
(S) 2,4,6-Tribromophenol					*59.0*	*52.7*		*10.0-127*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.

Qualifier	Description
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:	Billing Information:	Pres Chk	Analysis / Container / Preservative	Chain of Custody Page 1 of 1
Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118			Pace Analytical® 12065 Lebanon Rd Mount Juliet, TN 37122 Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf
Report to: Rusty Lynch	Email To: rlynch@enercon.com			SDG # 1430150
Project Description: Red Rock Moorings update	City/State Collected: Catoosa, OK	Please Circle: PT MT CT ET		L-244
Phone: 405-722-7693	Client Project # CONSOR-00001	Lab Project # ENERCOOK-CONSOR00001		Acctnum: ENERCOOK
Collected by (print): Lauran Drummond	Site/Facility ID #	P.O. #		Template: T198286
Collected by (signature): [signature]	Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # / Date Results Needed		Prelogin: P883983
Immediately Packed on Ice N ___ Y X				PM: 104 - Jason Romer
				PB: 10/20/21 JED
				Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr						Remarks	Sample # (lab only)
SB-1	GRAB	SS		11/9/21	744	4	X	X	X	X							-01
SB-2		SS			1020	4	X	X	X	X							-02
SB-3		SS			1105	4	X	X	X	X							-03
SB-4		SS			1358	4	X	X	X	X							-04
SB-5		SS			1435	4	X	X	X	X							-05
SB-6		SS			1650	4	X	X	X	X							-06
		~~SS~~				~~4~~	~~X~~	~~X~~	~~X~~	~~X~~							

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # SWA

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y __N
COC Signed/Accurate: Y __N
Bottles arrive intact: Y __N
Correct bottles used: Y __N
Sufficient volume sent: Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeOH TBR	
[signature]	11/10/21	12:08	E. Davis	1	
Relinquished by : (Signature) E. Davis	Date: 11/10/21	Time: 17:00	Received by: (Signature)	Temp: AZ ℃ 1.1+0=1.1 Bottles Received: 24	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Mechelle Melto	Date: 11/11/21 Time: 1615	Hold: Condition: NCF / OK

11/11-NCF-L1430150-ENERCOOK PM

R5

Time estimate: oh **Time spent:** oh

Members

Paul Minnich (responsible) Jason Romer

Due on *15 November 2021 5:00 PM* for target *Done*

- [ ] Login Clarification needed
- [ ] Chain of custody is incomplete
- [ ] Please specify Metals requested
- [ ] Please specify TCLP requested
- [ ] Received additional samples not listed on COC
- [x] Sample IDs on containers do not match IDs on COC
- [ ] Client did not "X" analysis
- [ ] Chain of Custody is missing
- [ ] If no COC: Received by:____________________
- [ ] If no COC: Date/Time:____________________
- [ ] If no COC: Temp./Cont.Rec./pH:______________
- [ ] If no COC: Carrier:______________
- [ ] If no COC: Tracking #:______________
- [ ] Client informed by call
- [ ] Client informed by Email
- [ ] Client informed by Voicemail
- [ ] Date/Time:____________________
- [ ] PM initials:__________________
- [ ] Client Contact:____________________

Comments

Paul Minnich *11 November 2021 8:19 PM*

Sample SB-2 is labeled as W-2 on the container. Logged per COC

Paul Minnich *19 November 2021 5:45 PM*

Any word on this?

Jason Romer *22 November 2021 10:50 AM*

log per COC

Troy Dunlap *22 November 2021 11:23 AM*

Done.

ANALYTICAL REPORT

December 15, 2021

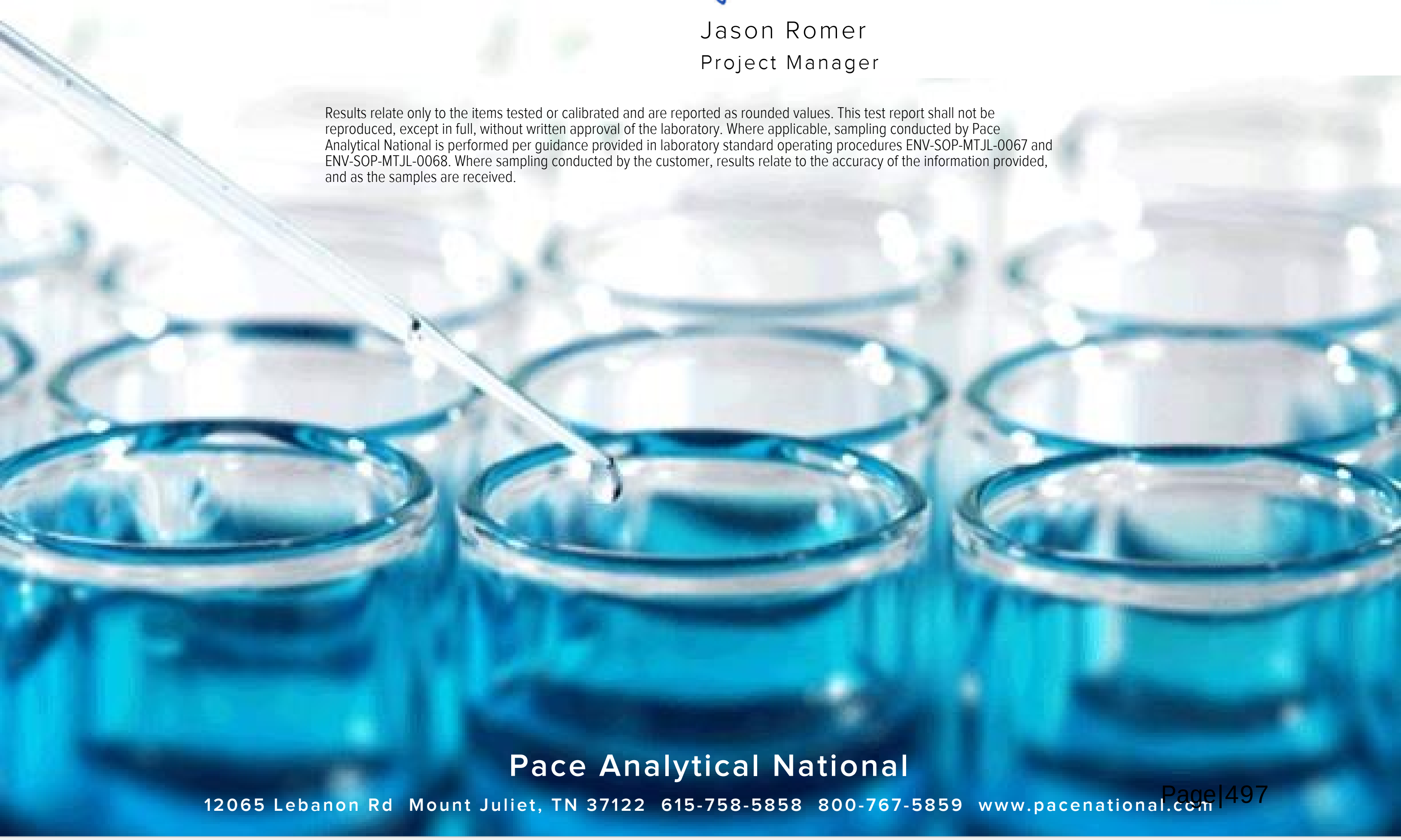
1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1430151
Samples Received:	11/11/2021
Project Number:	CONSOR-00001
Description:	Red Rock Moorings Update
Report To:	Rusty Lynch
	1601 Northwest Expressway
	Suite 1000
	Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager



Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 17:00	11/11/21 16:15

COMP L1430151-01 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG1775062	1	11/16/21 16:41	11/16/21 16:41	TDW	Mt. Juliet, TN
Wet Chemistry by Method 9012 B	WG1774846	1	11/16/21 10:44	11/17/21 02:43	SDL	Mt. Juliet, TN
Wet Chemistry by Method 9034-9030B	WG1774199	1	11/14/21 18:23	11/16/21 00:00	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1774188	1	11/15/21 09:00	11/15/21 09:00	RAF	Mt. Juliet, TN
Wet Chemistry by Method D93/1010A	WG1774771	1	11/16/21 02:48	11/16/21 02:48	CAT	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1775774	1	11/17/21 20:41	11/17/21 20:41	JTO	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151A	WG1779546	1	11/24/21 11:55	11/30/21 15:04	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081B	WG1779727	1	11/27/21 04:50	11/29/21 23:47	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1781821	1	11/30/21 17:36	12/01/21 17:39	AMG	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Lavran Drummond	11/09/21 17:00	11/11/21 16:15

COMP L1430151-02 Waste

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG1786549	1	12/09/21 13:54	12/09/21 13:54	KAH	Mt. Juliet, TN
Mercury by Method 7470A	WG1787516	1	12/10/21 14:35	12/14/21 13:13	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1787529	1	12/11/21 09:10	12/14/21 19:13	CCE	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Project Narrative

All Reactive Cyanide results reported in the attached report were determined as totals using method 9012 B.

All Reactive Sulfide results reported in the attached report were determined as totals using method 9034-9030B.

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP ZHE Extraction	-		11/16/2021 4:41:14 PM	WG1775062

Wet Chemistry by Method 9012 B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Reactive Cyanide	ND		0.250	1	11/17/2021 02:43	WG1774846

Wet Chemistry by Method 9034-9030B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Reactive Sulfide	ND		25.0	1	11/16/2021 00:00	WG1774199

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity by pH	7.97	T8	1	11/15/2021 09:00	WG1774188

Sample Narrative:

L1430151-01 WG1774188: 7.97 at 19.4C

Wet Chemistry by Method D93/1010A

Analyte	Result Deg. F	Qualifier	Dilution	Analysis date / time	Batch
Ignitability	DNI at 170		1	11/16/2021 02:48	WG1774771

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	11/17/2021 20:41	WG1775774
Carbon tetrachloride	ND		0.0500	0.50	1	11/17/2021 20:41	WG1775774
Chlorobenzene	ND		0.0500	100	1	11/17/2021 20:41	WG1775774
Chloroform	ND		0.250	6	1	11/17/2021 20:41	WG1775774
1,2-Dichloroethane	ND		0.0500	0.50	1	11/17/2021 20:41	WG1775774
1,1-Dichloroethene	ND		0.0500	0.70	1	11/17/2021 20:41	WG1775774
2-Butanone (MEK)	ND		0.500	200	1	11/17/2021 20:41	WG1775774
Tetrachloroethene	ND		0.0500	0.70	1	11/17/2021 20:41	WG1775774
Trichloroethene	ND		0.0500	0.50	1	11/17/2021 20:41	WG1775774
Vinyl chloride	ND		0.0500	0.20	1	11/17/2021 20:41	WG1775774
(S) Toluene-d8	*106*		*80.0-120*			*11/17/2021 20:41*	WG1775774
(S) 4-Bromofluorobenzene	*107*		*77.0-126*			*11/17/2021 20:41*	WG1775774
(S) 1,2-Dichloroethane-d4	*107*		*70.0-130*			*11/17/2021 20:41*	WG1775774

Chlorinated Acid Herbicides (GC) by Method 8151A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,5-TP (Silvex)	ND		0.00200	1	1	11/30/2021 15:04	WG1779546
2,4-D	ND		0.00200	10	1	11/30/2021 15:04	WG1779546
(S) 2,4-Dichlorophenyl Acetic Acid	*93.0*		*14.0-158*			*11/30/2021 15:04*	WG1779546

Pesticides (GC) by Method 8081B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Chlordane	ND		0.00500	0.03	1	11/29/2021 23:47	WG1779727
Endrin	ND		0.00500	0.02	1	11/29/2021 23:47	WG1779727
Heptachlor	ND		0.00500	0.0080	1	11/29/2021 23:47	WG1779727
Lindane	ND		0.00500	0.40	1	11/29/2021 23:47	WG1779727
Methoxychlor	ND		0.00500	10	1	11/29/2021 23:47	WG1779727
Toxaphene	ND		0.0100	0.50	1	11/29/2021 23:47	WG1779727
(S) Decachlorobiphenyl	*64.6*		*10.0-128*			*11/29/2021 23:47*	WG1779727
(S) Tetrachloro-m-xylene	*90.0*		*10.0-127*			*11/29/2021 23:47*	WG1779727

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	12/01/2021 17:39	WG1781821
2,4-Dinitrotoluene	ND		0.100	0.13	1	12/01/2021 17:39	WG1781821
Hexachlorobenzene	ND		0.100	0.13	1	12/01/2021 17:39	WG1781821
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	12/01/2021 17:39	WG1781821
Hexachloroethane	ND		0.100	3	1	12/01/2021 17:39	WG1781821
Nitrobenzene	ND		0.100	2	1	12/01/2021 17:39	WG1781821
Pyridine	ND	J4	0.100	5	1	12/01/2021 17:39	WG1781821
3&4-Methyl Phenol	ND		0.100	400	1	12/01/2021 17:39	WG1781821
2-Methylphenol	ND		0.100	200	1	12/01/2021 17:39	WG1781821
Pentachlorophenol	ND		0.100	100	1	12/01/2021 17:39	WG1781821
2,4,5-Trichlorophenol	ND		0.100	400	1	12/01/2021 17:39	WG1781821
2,4,6-Trichlorophenol	ND		0.100	2	1	12/01/2021 17:39	WG1781821
(S) 2-Fluorophenol	*31.6*		*10.0-120*			*12/01/2021 17:39*	WG1781821
(S) Phenol-d5	*22.0*		*10.0-120*			*12/01/2021 17:39*	WG1781821
(S) Nitrobenzene-d5	*59.5*		*10.0-127*			*12/01/2021 17:39*	WG1781821
(S) 2-Fluorobiphenyl	*61.3*		*10.0-130*			*12/01/2021 17:39*	WG1781821
(S) 2,4,6-Tribromophenol	*65.0*		*10.0-155*			*12/01/2021 17:39*	WG1781821
(S) p-Terphenyl-d14	*62.7*		*10.0-128*			*12/01/2021 17:39*	WG1781821

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		12/9/2021 1:54:52 PM	WG1786549
Fluid	1		12/9/2021 1:54:52 PM	WG1786549
Initial pH	8.37		12/9/2021 1:54:52 PM	WG1786549
Final pH	5.62		12/9/2021 1:54:52 PM	WG1786549

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	12/14/2021 13:13	WG1787516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	12/14/2021 19:13	WG1787529
Barium	1.23		0.100	100	1	12/14/2021 19:13	WG1787529
Cadmium	ND		0.100	1	1	12/14/2021 19:13	WG1787529
Chromium	ND		0.100	5	1	12/14/2021 19:13	WG1787529
Lead	ND		0.100	5	1	12/14/2021 19:13	WG1787529
Selenium	ND		0.100	1	1	12/14/2021 19:13	WG1787529
Silver	ND		0.100	5	1	12/14/2021 19:13	WG1787529

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L1430087-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1430087-02 11/17/21 02:39 • (DUP) R3730305-6 11/17/21 02:40

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3730305-2 11/17/21 02:23

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Cyanide	2.50	2.38	95.4	85.0-115	

L1430087-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1430087-02 11/17/21 02:39 • (MS) R3730305-7 11/17/21 02:41 • (MSD) R3730305-8 11/17/21 02:42

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	1.67	ND	1.40	1.39	84.0	83.3	1	75.0-125			0.835	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3730225-1 11/16/21 00:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Reactive Sulfide	U		7.63	25.0

Laboratory Control Sample (LCS)

(LCS) R3730225-2 11/16/21 00:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Sulfide	100	96.1	96.1	70.0-130	

L1431142-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1431142-01 11/16/21 00:00 • (MS) R3730225-3 11/16/21 00:00 • (MSD) R3730225-4 11/16/21 00:00

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Sulfide	100	90.0	116	123	26.0	32.8	1	70.0-130	J6	J6	5.69	20

L1429898-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1429898-03 11/15/21 09:00 • (DUP) R3729409-2 11/15/21 09:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
Corrosivity by pH	7.97	8.01	1	0.501		1

Sample Narrative:

OS: 7.97 at 19.6C

DUP: 8.01 at 19.5C

L1429898-13 Original Sample (OS) • Duplicate (DUP)

(OS) L1429898-13 11/15/21 09:00 • (DUP) R3729409-3 11/15/21 09:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
Corrosivity by pH	8.15	8.15	1	0.000		1

Sample Narrative:

OS: 8.15 at 19.3C

DUP: 8.15 at 19.2C

Laboratory Control Sample (LCS)

(LCS) R3729409-1 11/15/21 09:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
Corrosivity by pH	10.0	9.99	99.9	99.0-101	

Sample Narrative:

LCS: 9.99 at 19.7C

L1428498-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1428498-01 11/16/21 02:48 • (DUP) R3729785-3 11/16/21 02:48

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	Deg. F	Deg. F		%		%
Ignitability	DNI at 170	DNI at 170	1	0.000		10

L1430087-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1430087-02 11/16/21 02:48 • (DUP) R3729785-4 11/16/21 02:48

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	Deg. F	Deg. F		%		%
Ignitability	DNI at 170	DNI at 170	1	0.000		10

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3729785-1 11/16/21 02:48 • (LCSD) R3729785-2 11/16/21 02:48

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	Deg. F	Deg. F	Deg. F	%	%	%			%	%
Ignitability	126	122	124	96.6	98.1	95.6-104			1.63	10

Method Blank (MB)

(MB) R3740499-1 12/14/21 13:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00330	0.0100

Laboratory Control Sample (LCS)

(LCS) R3740499-2 12/14/21 13:03

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0302	101	80.0-120	

Cp Tc Ss Cn Sr Qc Gl Al Sc

Method Blank (MB)

(MB) R3740759-1 12/14/21 18:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0330	0.100
Barium	U		0.0330	0.100
Cadmium	U		0.0330	0.100
Chromium	U		0.0330	0.100
Lead	U		0.0330	0.100
Selenium	U		0.0330	0.100
Silver	U		0.0330	0.100

Laboratory Control Sample (LCS)

(LCS) R3740759-2 12/14/21 18:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	10.2	102	80.0-120	
Barium	10.0	10.1	101	80.0-120	
Cadmium	10.0	10.0	100	80.0-120	
Chromium	10.0	10.3	103	80.0-120	
Lead	10.0	10.4	104	80.0-120	
Selenium	10.0	10.7	107	80.0-120	
Silver	2.00	1.92	95.9	80.0-120	

L1430087-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1430087-05 12/14/21 18:58 • (MS) R3740759-4 12/14/21 19:04 • (MSD) R3740759-5 12/14/21 19:07

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.57	10.0	95.2	99.5	1	75.0-125			4.45	20
Barium	10.0	0.142	9.47	9.83	93.3	96.9	1	75.0-125			3.71	20
Cadmium	10.0	ND	9.31	9.78	93.1	97.8	1	75.0-125			4.87	20
Chromium	10.0	ND	9.64	10.0	96.4	100	1	75.0-125			3.75	20
Lead	10.0	ND	9.56	10.1	95.6	101	1	75.0-125			5.42	20
Selenium	10.0	ND	9.91	10.4	98.1	103	1	75.0-125			4.89	20
Silver	2.00	ND	1.77	1.86	88.7	92.8	1	75.0-125			4.60	20

Method Blank (MB)

(MB) R3730851-2 11/17/21 12:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*108*			*80.0-120*
(S) 4-Bromofluorobenzene	*113*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*102*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3730851-1 11/17/21 10:21 • (LCSD) R3730851-3 11/17/21 13:10

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	0.206	0.216	82.4	86.4	70.0-123			4.74	20
Carbon tetrachloride	0.250	0.190	0.199	76.0	79.6	68.0-126			4.63	20
Chlorobenzene	0.250	0.228	0.229	91.2	91.6	80.0-121			0.438	20
Chloroform	0.250	0.235	0.233	94.0	93.2	73.0-120			0.855	20
1,2-Dichloroethane	0.250	0.224	0.227	89.6	90.8	70.0-128			1.33	20
1,1-Dichloroethene	0.250	0.209	0.217	83.6	86.8	71.0-124			3.76	20
2-Butanone (MEK)	1.25	1.21	1.22	96.8	97.6	44.0-160			0.823	20
Tetrachloroethene	0.250	0.220	0.221	88.0	88.4	72.0-132			0.454	20
Trichloroethene	0.250	0.257	0.251	103	100	78.0-124			2.36	20
Vinyl chloride	0.250	0.213	0.233	85.2	93.2	67.0-131			8.97	20
(S) Toluene-d8				*106*	*106*	*80.0-120*				
(S) 4-Bromofluorobenzene				*109*	*107*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*101*	*105*	*70.0-130*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3735418-1 11/30/21 14:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
2,4-D	U		0.000667	0.00200
2,4,5-TP (Silvex)	U		0.000667	0.00200
(S) 2,4-Dichlorophenyl Acetic Acid	*77.2*			*14.0-158*

Laboratory Control Sample (LCS)

(LCS) R3735418-2 11/30/21 14:17

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2,4-D	0.0500	0.0370	74.0	50.0-120	P
2,4,5-TP (Silvex)	0.0500	0.0459	91.8	50.0-125	
(S) 2,4-Dichlorophenyl Acetic Acid			*81.4*	*14.0-158*	

L1432328-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1432328-01 11/30/21 15:51 • (MS) R3735418-3 11/30/21 16:07 • (MSD) R3735418-4 11/30/21 16:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2,4-D	0.0500	ND	0.0333	0.0379	66.6	75.8	1	50.0-120	P	P	12.9	20
2,4,5-TP (Silvex)	0.0500	ND	0.0419	0.0482	83.8	96.4	1	50.0-125			14.0	20
(S) 2,4-Dichlorophenyl Acetic Acid					*76.6*	*86.6*		*14.0-158*				

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Cp Tc Ss Cn Sr Qc Gl Al Sc

Method Blank (MB)

(MB) R3734896-1 11/27/21 17:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Gamma BHC	U		0.00167	0.00500
Endrin	U		0.00167	0.00500
Heptachlor	U		0.00167	0.00500
Methoxychlor	U		0.00167	0.00500
Chlordane	U		0.00167	0.00500
Toxaphene	U		0.00333	0.0100
(S) Decachlorobiphenyl	*117*			*10.0-128*
(S) Tetrachloro-m-xylene	*94.6*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3734896-2 11/27/21 18:02

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Gamma BHC	0.0100	0.00954	95.4	55.0-129	
Endrin	0.0100	0.00979	97.9	57.0-134	
Heptachlor	0.0100	0.00915	91.5	27.0-132	
Methoxychlor	0.0100	0.00911	91.1	54.0-155	
(S) Decachlorobiphenyl			*103*	*10.0-128*	
(S) Tetrachloro-m-xylene			*101*	*10.0-127*	

L1430047-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1430047-01 11/27/21 18:15 • (MS) R3734896-3 11/27/21 18:28 • (MSD) R3734896-4 11/27/21 18:41

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Gamma BHC	0.0100	ND	0.00966	0.00898	96.6	89.8	1	14.0-141			7.30	40
Endrin	0.0100	ND	0.0102	0.00901	102	90.1	1	10.0-160			12.4	39
Heptachlor	0.0100	ND	0.00984	0.00861	98.4	86.1	1	16.0-136			13.3	40
Methoxychlor	0.0100	ND	0.00976	0.00849	97.6	84.9	1	10.0-160			13.9	34
(S) Decachlorobiphenyl					*103*	*87.2*		*10.0-128*				
(S) Tetrachloro-m-xylene					*97.6*	*88.7*		*10.0-127*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3735900-2 12/01/21 12:00

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) Nitrobenzene-d5	*68.4*			*10.0-127*
(S) 2-Fluorobiphenyl	*67.3*			*10.0-130*
(S) p-Terphenyl-d14	*67.7*			*10.0-128*
(S) Phenol-d5	*24.8*			*10.0-120*
(S) 2-Fluorophenol	*37.4*			*10.0-120*
(S) 2,4,6-Tribromophenol	*76.0*			*10.0-155*

Laboratory Control Sample (LCS)

(LCS) R3735900-1 12/01/21 11:39

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.288	57.6	18.0-120	
2,4-Dinitrotoluene	0.500	0.409	81.8	49.0-124	
Hexachlorobenzene	0.500	0.344	68.8	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.352	70.4	19.0-120	
Hexachloroethane	0.500	0.295	59.0	15.0-120	
Nitrobenzene	0.500	0.317	63.4	27.0-120	
Pyridine	0.500	0.0201	4.02	10.0-120	J4
2-Methylphenol	0.500	0.221	44.2	28.0-120	
3&4-Methyl Phenol	0.500	0.239	47.8	31.0-120	
Pentachlorophenol	0.500	0.353	70.6	23.0-120	
2,4,5-Trichlorophenol	0.500	0.390	78.0	44.0-120	
2,4,6-Trichlorophenol	0.500	0.323	64.6	42.0-120	
(S) Nitrobenzene-d5			*57.1*	*10.0-127*	
(S) 2-Fluorobiphenyl			*61.9*	*10.0-130*	
(S) p-Terphenyl-d14			*63.1*	*10.0-128*	

Laboratory Control Sample (LCS)

(LCS) R3735900-1 12/01/21 11:39

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) Phenol-d5			*24.8*	*10.0-120*	
(S) 2-Fluorophenol			*33.6*	*10.0-120*	
(S) 2,4,6-Tribromophenol			*69.5*	*10.0-155*	

L1433625-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1433625-02 12/01/21 12:21 • (MS) R3735900-3 12/01/21 12:42 • (MSD) R3735900-4 12/01/21 13:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.159	0.308	31.8	61.6	1	17.0-120		J3	63.8	40
2,4-Dinitrotoluene	0.500	ND	0.355	0.439	71.0	87.8	1	39.0-125			21.2	25
Hexachlorobenzene	0.500	ND	0.231	0.354	46.2	70.8	1	35.0-122		J3	42.1	24
Hexachloro-1,3-butadiene	0.500	ND	0.190	0.390	38.0	78.0	1	12.0-120		J3	69.0	34
Hexachloroethane	0.500	ND	0.159	0.318	31.8	63.6	1	10.0-120		J3	66.7	40
Nitrobenzene	0.500	ND	0.229	0.348	45.8	69.6	1	12.0-120		J3	41.2	30
Pyridine	0.500	ND	ND	ND	0.000	12.3	1	10.0-120	J6	J3	200	37
2-Methylphenol	0.500	ND	0.194	0.217	38.8	43.4	1	10.0-120			11.2	30
3&4-Methyl Phenol	0.500	ND	0.206	0.233	41.2	46.6	1	10.0-120			12.3	36
Pentachlorophenol	0.500	ND	0.267	0.374	53.4	74.8	1	10.0-128			33.4	37
2,4,5-Trichlorophenol	0.500	ND	0.299	0.396	59.8	79.2	1	33.0-120			27.9	31
2,4,6-Trichlorophenol	0.500	ND	0.237	0.336	47.4	67.2	1	26.0-120		J3	34.6	31
(S) Nitrobenzene-d5					*40.8*	*60.5*		*10.0-127*				
(S) 2-Fluorobiphenyl					*33.5*	*63.6*		*10.0-130*				
(S) p-Terphenyl-d14					*47.6*	*60.9*		*10.0-128*				
(S) Phenol-d5					*20.4*	*22.5*		*10.0-120*				
(S) 2-Fluorophenol					*27.6*	*33.2*		*10.0-120*				
(S) 2,4,6-Tribromophenol					*52.5*	*71.5*		*10.0-155*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Company Name/Address:	Billing Information:	Pres Chk
Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118	
Report to: Rusty Lynch	Email To: rlynch@enercon.com	

Analysis / Container / Preservative: Full TCLP 1L-Clr-NoPres; RCI 8ozClr-NoPres

Chain of Custody Page 1 of 1

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SDG # 1430191

L-243

Acctnum: ENERCOOK
Template: T198288
Prelogin: P883985
PM: 104 - Jason Romer
PB: 10/26/21 [illegible]
Shipped Via: FedEX Ground

Project Description:	City/State Collected:	Please Circle:
Red Rock Moorings Update	Catoosa / OK	PT MT CT ET (CT circled)

Phone: 405-722-7693	Client Project # CONSOR-00001	Lab Project # ENERCOOK-CONSOR00001
Collected by (print): Lavran Drummond	Site/Facility ID #	P.O. #
Collected by (signature): [signature] Immediately Packed on Ice N ___ Y X	*Rush?* (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Full TCLP 1L-Clr-NoPres	RCI 8ozClr-NoPres	Remarks	Sample # (lab only)
COMP	COMP	SS		11/9/21	1700	2	X	X		-01
~~ ~~		~~SS~~				~~2~~	~~X~~	~~X~~		
~~ ~~		~~SS~~				~~2~~	~~X~~	~~X~~		

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # SWA

Sample Receipt Checklist

COC Seal Present/Intact:	NP	_Y _N
COC Signed/Accurate:		✓Y _N
Bottles arrive intact:		✓Y _N
Correct bottles used:		✓Y _N
Sufficient volume sent:		✓Y _N
If Applicable		
VOA Zero Headspace:		_Y _N
Preservation Correct/Checked:		✓Y _N
RAD Screen <0.5 mR/hr:		✓Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No (No circled) HCL / MeoH TBR
[signature]	11/10/21	1208	E. Davis	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.2 °C Bottles Received: 2 1.1+0=1.1
E. Davis	11/10/21	17:00		
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11/11/21 Time: 1615
			[signature]	

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK (OK circled)

Company Name/Address:
Enercon - Oklahoma City, OK
1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Report to: Rusty Lynch

Email To: rlynch@enercon.com

Project Description: Red Rock Moorings Update

City/State Collected: Catoosa / OK

Please Circle: PT MT CT ET

Phone: 405-722-7693

Client Project # CONSOR-00001

Lab Project # ENERCOOK-CONSOR00001

Collected by (print): [illegible]

Site/Facility ID #

P.O. #

Collected by (signature): [signature]

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Full TCLP 1L-Clr-NoPres	RCI 8ozClr-NoPres
COMP	COMP	SS		11/9/21	1700	2	X	X
		SS				2	X	X
		SS				2	X	X

Chain of Custody Page 1 of 1

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SDG #

Table #

Acctnum: ENERCOOK
Template: T198288
Prelogin: P883985
PM: 104 - Jason Romer
PB: 10/6/21 [illegible]
Shipped Via: FedEX Ground

Remarks	Sample # (lab only)

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH _______ Temp _______
Flow _______ Other _______

Samples returned via:
__ UPS __ FedEx __ Courier

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
[signature]	11/10/21	1208	[signature]	

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C	Bottles Received:	If preservation required by Login: Date/Time

Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:	Hold:	Condition: NCF / OK

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Enercon - Oklahoma City, OK
1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Report to: **Rusty Lynch**

Email To: **rlynch@enercon.com**

Project Description: Red Rock Moorings Update

City/State Collected: Catoosa, OK

Please Circle: PT MT CT ET

Phone: **405-722-7693**
Fax:

Client Project # **CONSOR-00001**

Lab Project # ENERCOOK-CONSOR00001

Collected by (print): Lavran Drummond

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

SDG #

Table #

Acctnum: ENERCOOK

Template:

Prelogin:

PM:

PB:

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	gamma ray isotopic method 901.1									Remarks	Sample # (lab only)
SB-1	Grab	SS		11/9/21	744	1	X										
SB-2	↓	SS		11/9/21	1020	1	X										
SB-3		SS		11/9/21	1105	1	X										
SB-4		SS		11/9/21	1358	1	X										
SB-5		SS		11/9/21	1435	1	X										
SB-6		SS		11/9/21	1650	1	X										

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ______

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
[signature]	11/10/21	1208	[signature]		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

Company Name/Address:
Enercon - Oklahoma City, OK
1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Email To: rlynch@enercon.com

Report to: Rusty Lynch

Project Description: Red Rock Moorings update
City/State Collected: Catoosa, OK
Please Circle: PT MT CT ET

Phone: 405-722-7693
Client Project # CONSOR-00001
Lab Project # ENERCOOK-CONSOR00001

Collected by (print): Lainey Drummond
Site/Facility ID #
P.O. #

Collected by (signature):
Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Quote #
Date Results Needed

Immediately Packed on Ice N___ Y X

Chain of Custody Page 1 of 1

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SDG #
Table #
Acctnum: ENERCOOK
Template: T198286
Prelogin: P883983
PM: 104 - Jason Romer
PB: 10/26/21
Shipped Via: FedEX Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr						Remarks	Sample # (lab only)
SB-1	GRAB	SS		11/9/21	744	4	X	X	X	X							
SB-2	|	SS		|	920	4	X	X	X	X							
SB-3	|	SS		|	1105	4	X	X	X	X							
SB-4	|	SS		|	1255	4	X	X	X	X							
SB-5	|	SS		|	1435	4	X	X	X	X							
SB-6	|	SS		|	1650	4	X	X	X	X							
		~~SS~~				~~4~~	~~X~~	~~X~~	~~X~~	~~X~~							

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:
pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
[signature]	11/10/21	12 07	[signature]	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time
Hold:
Condition: NCF / OK

Appendix D

Photographic Record

PHOTOGRAPHIC RECORD

Project No.: CONSOR-00001 **Project Name: Moorings Update**


Photo #1: Representative photograph of southeast mooring locations.


Photo #2: Representative photograph of northwest mooring locations.


Photo #3: Representative photograph of drill rig set-up on the barge.


Photo #4: Representative photo of SB1 mudline (0-2 feet). Sample collected from mudline.


Photo #5: Representative photo of SB1 24.5-26.5 feet and PID meter reading.


Photo #6: Representative photo of SB 2mudline (0-2 feet). Sample collected from mudline.

PHOTOGRAPHIC RECORD

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #7: Representative photo of SB3 mudline (0-2 feet). Sample collected from mudline.

Photo #8: Representative photo of SB3 24.5-27.5 feet.

Photo #9: Representative photo of SB3 27.5-32.5 feet.

Photo #10: Representative photo of SB4 mud (0-2 feet). Sample collected from mudline.

Photo #11: Representative photo of SB5 mudline (0-2 feet). Sample collected from mudline.

Photo #12: Representative photo of SB5 19.4-24.5 feet.

PHOTOGRAPHIC RECORD

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #13: Representative photo of SB5 24.5-29.5 feet.

Photo #14: Representative photo of SB5 24.5-29.5 feet.

Photo #15: Representative photo of SB5 29.5-34.5 feet.

Photo #16: Representative photo of SB5 29.5-34.5 feet.

Photo #17: Four 55-gallon drums of soil cuttings from the soil boring installation. Eight empty/unlabeled drums are also located on the trailer.

Photo #18: Four 55-gallon drums of soil cuttings from the soil boring installation. Eight empty/unlabeled drums are also located on the trailer.

PHOTOGRAPHIC RECORD

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #19: Non-Hazardous Waste drum label on one 55-gallon drum of soil cuttings from soil boring installation event.

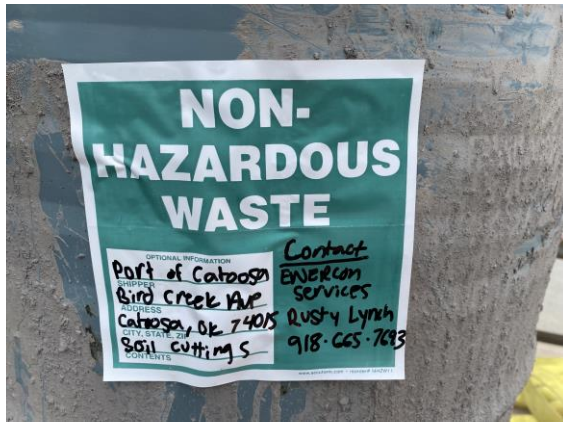

Photo #20: Non-Hazardous Waste drum label on one 55-gallon drum of soil cuttings from soil boring installation event.

Photo #21: Non-Hazardous Waste drum label on one 55-gallon drum of soil cuttings from soil boring installation event.

Photo #22: Non-Hazardous Waste drum label on one 55-gallon drum of soil cuttings from soil boring installation event.

Appendix E

Tables

Table 1
Soil Analytical Results Summary- Radioactive Materials
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	Actinium-228 (Ra-228)	Bismuth-212	Bismuth-214 (RA-226)	Lead-212	Lead-214	Potassium-40	Thallium-208	Uranium-235	Thorium-234 (U-238)	Radium-226 (186 KeV)
SB-1	11/9/2021	1.33	< 1.07	1.15	1.34	1.46	17.4	0.475	< 0.0879	1.46[J]	2.16
SB-2	11/9/2021	1.84	3.28	1.72	2.29	1.84	34.9	0.599	< 0.0950	1.41[J]	2.80
SB-3	11/9/2021	1.48	1.41[J]	1.02	1.38	1.25	17.2	0.284	< 0.0667	0.922[J]	1.35
SB-4	11/9/2021	0.876	1.17[J]	1.04	1.43	1.06	13.5	0.281	0.133[J]	< 1.38	1.35[J]
SB-5	11/9/2021	1.96	1.88[J]	1.66	1.81	1.59	28.7	0.553	< 0.0835	1.29[J]	1.58
SB-6	11/9/2021	1.24	1.82	1.03	1.40	1.10	12.4	0.367	0.123[J]	0.810[J]	1.14[J]

*EPA does not provide Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1) for radioactive materials. All results are within expected levels.

Radiochemistry tested by Method DOE Ga-01-R/901.1
Soil concentrations are reported in picocuries per gram (pCi/g).
[J] = The identification of the analyte is acceptable; the reported value is an estimate.

Table 2
Soil Analytical Results Summary- Solids, Mercury, and Metals (ICP)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	Total Solids (Method 2450 G-2011)	Mercury (Method 7471A)	Arsenic (Method 6010B)	Barium (Method 6010B)	Cadmium (Method 6010B)	Chromium (Method 6010B)	Lead (Method 6010B)	Selenium (Method 6010B)	Silver (Method 6010B)
SB-1	11/9/2021	66.4	0.0391[J]	< 0.781	142	1.13	29.8	18.9	< 1.15	< 0.191
SB-2	11/9/2021	81.0	0.0300[J]	< 0.639	81.5	0.667	24.7	10.5	< 0.943	< 0.157
SB-3	11/9/2021	65.8	0.0400[J]	< 0.788	179	1.23	26.0	20.5	< 1.16	< 0.193
SB-4	11/9/2021	72.9	0.0391[J]	< 0.710	162	0.894	21.4	18.0	< 1.05	< 0.174
SB-5	11/9/2021	77.7	0.0521	34.5	96.0	0.399[J]	23.7	34.9	1.51[J]	< 0.164
SB-6	11/9/2021	67.2	0.0396[J]	< 0.771	149	0.995	24.4	18.8	< 1.14	< 0.189
EPA RSL Industrial Soil [1]			4.6	3.0	22000.0	98.0	NC	800.0	580.0	580.0
EPA Inorganic Background [2]			0	1.1-16.7	430	0.01-1.0	38	10-18	0	.01-5

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)
2 - EPA Region 6 Human Health Medium-Specific Screening Levels, Naturally Occurring Inorganic Background Levels

Total Solids are reported in percentage.
Soil concentrations are reported in miligrams per kilogram (mg/kg).
[J] = The identification of the analyte is acceptable; the reported value is an estimate.

Table 3
Soil Analytical Results Summary- Volatile Organic Compounds (GC/MS)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon Tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene
SB-1	11/9/2021	< 0.106	< 0.0105	< 0.00136	< 0.00262	< 0.00211	< 0.00340	< 0.00573	< 0.0153	< 0.00837	< 0.00567	< 0.00261	< 0.000611	< 0.00178	< 0.00494	< 0.00299	< 0.0126	< 0.00252
SB-2	11/9/2021	< 0.520	< 0.00643	0.00127[J]	< 0.00160	< 0.00129	< 0.00208	< 0.00351	0.0292	0.0106[J]	< 0.00347	< 000160	< 0.000374	< 0.00109	< 0.00303	< 0.00184	< 0.00775	< 0.00154
SB-3	11/9/2021	< 0.0745	< 0.00737	< 0.000953	0.00873[J]	< 0.00148	< 0.00239	< 0.00402	< 0.0107	< 0.00588	< 0.00398	< 0.00183	< 0.000429	< 0.00125	< 0.00347	< 0.00210	< 0.00888	< 0.00177
SB-4	11/9/2021	< 0.0770	< 0.00762	< 0.000986	< 0.00190	< 0.00153	< 0.00247	< 0.00416	< 0.0111	< 0.00608	< 0.00412	< 0.00190	< 0.000443	< 0.00129	< 0.00359	< 0.00217	< 0.00918	< 0.00183
SB-5	11/9/2021	1.47	< 0.00638	0.00115[J]	< 0.00160	< 0.00128	< 0.00208	< 0.00349	0.0423	0.0120[J]	< 0.00344	< 0.00158	< 0.000372	< 0.00108	< 0.00301	< 0.00181	< 0.00769	< 0.00153
SB-6	11/9/2021	< 0.0879	< 0.00869	< 0.00112	< 0.00217	< 0.00175	< 0.00282	< 0.00474	< 0.0126	< 0.00693	< 0.00469	< 0.00216	< 0.000505	< 0.00147	< 0.00409	< 0.00248	< 0.0105	< 0.00208
EPA RSL Industrial Soil [1]		1,100,000	0.25	5.1	1800	1.3	86	30	58,000	120,000	120,000	2.9	1,300	39	5,700	1.4	460	23,000

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Volatile Organic Compounds tested by Method 8260B
Soil concentrations are reported in miligrams per kilogram (mg/kg).
[J] = The identification of the analyte is acceptable; the reported value is an estimate.
[B] = The same analyte is found in the associated blank.

4-Chlorotoluene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropane	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	2,2-Dichloropropane
< 0.00131	< 0.0113	< 0.00188	< 0.00218	< 0.00124	< 0.00174	< 0.00204	< 0.00468	< 0.00143	< 0.00189	< 0.00176	< 0.00213	< 0.00302	< 0.00413	< 0.00235	< 0.00146	< 0.00220	< 0.00331	< 0.00401
< 0.000802	< 0.00695	< 0.00115	< 0.00134	< 0.000757	< 0.00107	< 0.00125	< 0.00287	< 0.000875	< 0.00116	< 0.00108	< 0.00131	< 0.00185	< 0.00253	< 0.00144	< 0.000893	< 0.00135	< 0.00203	< 0.00246
< 0.000918	< 0.00796	< 0.00132	< 0.00153	< 0.000867	< 0.00122	< 0.00143	< 0.00329	< 0.00100	< 0.00132	< 0.00124	< 0.00150	< 0.00212	< 0.00290	< 0.00165	< 0.00102	< 0.00154	< 0.00233	< 0.00282
< 0.000950	< 0.00823	< 0.00137	< 0.00158	< 0.000897	< 0.00127	< 0.00148	< 0.00340	< 0.00104	< 0.00137	< 0.00128	< 0.00155	< 0.00219	< 0.00300	< 0.00171	< 0.00106	< 0.00160	< 0.00241	< 0.00291
< 0.000797	< 0.00690	< 0.00115	< 0.00133	< 0.000752	< 0.00106	< 0.00124	< 0.00284	< 0.000869	< 0.00115	< 0.00107	< 0.00130	< 0.00185	< 0.00251	< 0.00143	< 0.000886	< 0.00134	< 0.00201	< 0.00244
< 0.00108	< 0.00939	< 0.00156	< 0.00181	< 0.00102	< 0.00144	< 0.00168	< 0.00388	< 0.00118	< 0.00156	< 0.00146	< 0.00177	< 0.00250	< 0.00342	0.00195	< 0.00121	< 0.00182	< 0.00274	< 0.00332
2,300	0.064	0.16	9.9	9,300	NC	11	370	16	2	16	2,300	300	11	8.2	23,000	8.2	8.2	NC

Di-isopropyl ether	Ethylbenzene	Hexachloro-1,3-Butadiene	Isopropylbenzene	p-Isopropyltoluene	2-Butanone (MEK)	Methyl Chloride	4-Methyl-2-pentanone (MIBK)	Methyl tert-butyl ether	Naphalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichlorotrifluoroethane	Tetrachloroethane	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene
< 0.00119	< 0.00214	< 0.0174	0.00124[J]	< 0.00741	< 0.185	< 0.0193	< 0.00663	< 0.00102	< 0.0142	0.00477[J]	< 0.000666	< 0.00276	< 0.00202	< 0.00219	< 0.00261	< 0.00378	< 0.0213	< 0.0128
< 0.000731	0.233	< 0.0107	0.0506	0.036	1.09[B]	< 0.0118	< 0.00406	< 0.000624	0.251	0.0962	< 0.000408	< 0.00169	< 0.00124	< 0.00134	< 0.00160	0.440	< 0.0131	< 0.00784
< 0.000837	0.00863	< 0.0122	< 0.000867	< 0.00520	< 0.130	< 0.0135	< 0.00465	< 0.000714	0.0416	0.00551[J]	< 0.000467	< 0.00193	< 0.00142	< 0.00154	< 0.00183	0.0132	< 0.0150	< 0.00898
< 0.000865	< 0.00156	< 0.0127	< 0.000897	< 0.00538	< 0.134	< 0.0140	< 0.00481	< 0.000739	< 0.0103	< 0.00200	< 0.000483	< 0.00200	< 0.00147	< 0.00159	< 0.00189	< 0.00274	< 0.0155	< 0.00929
< 0.000726	0.0747	< 0.0106	0.0321	0.0354	0.650[B]	< 0.0117	< 0.00403	< 0.000620	0.158	0.0644	< 0.000404	< 0.00168	< 0.00123	< 0.00133	< 0.00158	0.0800	< 0.0130	< 0.00778
< 0.000987	< 0.00177	< 0.0144	< 0.00102	< 0.00614	< 0.153	< 0.0160	< 0.00549	< 0.000842	< 0.0117	0.00239[J]	< 0.000551	< 0.00228	< 0.00167	< 0.00181	< 0.00216	< 0.00313	< 0.0176	< 0.0106
9,400	25	5.3	NC	NC	19,000	460	14,000	210	17	NC	35,000	8.8	2.7	28,000	100	47,000	930	110

1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,2,3-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl Chloride	Xylenes, Total
< 0.00268	< 0.00174	< 0.00170	< 0.00240	< 0.00471	0.00898 J	< 0.00459	< 0.00582	< 0.00337	0.0124 J
< 0.00164	< 0.00106	< 0.00104	< 0.00147	< 0.00289	0.588	0.308	0.129	< 0.00207	1.41
< 0.00188	< 0.00122	< 0.00119	< 0.00169	< 0.00331	0.0269	0.0135	0.00541 J	< 0.00237	0.0329
< 0.00195	< 0.00126	< 0.00123	< 0.00175	< 0.00342	0.0113	0.00751 J	< 0.00422	< 0.00245	0.00713 J
< 0.00163	< 0.00106	< 0.00103	< 0.00146	< 0.00286	0.326	0.150	0.0761	< 0.00205	0.475
< 0.00222	< 0.00144	< 0.00141	< 0.00199	< 0.00390	0.00929 J	0.00580 J	< 0.00481	< 0.00279	0.0100 J
36,000	5	6	350,000	0.11	1,800	2,000	1,500	1.7	2,500

Table 4
Soil Analytical Results Summary-
Total Petroleum Hydrocarbons (TPH)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	TPH-GRO (C6-C12)	TPH-DRO (C12-C28)	TPH-ORO (C28-C35)	Total TPH (C6-C35)
SB-1	11/9/2021	< 22.6	< 22.6	< 22.6	< 22.6
SB-2	11/9/2021	< 18.5	< 18.5	< 18.5	< 18.5
SB-3	11/9/2021	< 22.8	< 22.8	< 22.8	< 22.8
SB-4	11/9/2021	< 20.6	< 20.6	< 20.6	< 20.6
SB-5	11/9/2021	< 19.3	< 19.3	< 19.3	< 19.3
SB-6	11/9/2021	< 22.3	< 22.3	< 22.3	< 22.3
ODEQ - Industrial Soil (1)		500.00	500.00	500.00	500.00

1 = Oklahoma Department of Environmental Quality (ODEQ) Risk-Based Levels for Total Petroleum Hydrocarbons (TPH) Tier 1 Generic Cleanup Levels (February 2020).

TPH tested by TCEQ Method 1005
Soil concentrations are reported in miligrams per kilogram (mg/kg).

Table 5
Soil Analytical Results Summary- Polychlorinated Biphenyls (GC)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	PCB 1016	PCB 1221	PCB 1232	PCB 1242	PCB 1248	PCB 1254	PCB 1260
SB-1	11/9/2021	< 0.0178	< 0.0178	< 0.0178	< 0.0178	< 0.0111	< 0.0111	< 0.0111
SB-2	11/9/2021	< 0.0146	< 0.0146	< 0.0146	< 0.0146	< 0.00911	< 0.00911	< 0.00911
SB-3	11/9/2021	< 0.0179	< 0.0179	< 0.0179	< 0.0179	< 0.0112	< 0.0112	< 0.0112
SB-4	11/9/2021	< 0.0162	< 0.0162	< 0.0162	< 0.0162	< 0.0101	< 0.0101	< 0.0101
SB-5	11/9/2021	< 0.0152	< 0.0152	< 0.0152	< 0.0152	< 0.00950	< 0.00950	< 0.00950
SB-6	11/9/2021	< 0.0176	< 0.0176	< 0.0176	< 0.0176	< 0.0110	< 0.0110	< 0.0110
EPA RSL Industrial Soil [1]		5.1	1	1	1	1	1	1

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Polychlorinated Biphenyls (GC) tested by Method 8082
Soil concentrations are reported in miligrams per kilogram (mg/kg).

Table 6
Soil Analytical Results Summary- Semi Volatile Organic Compounds (GC/MS)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	Acenaphthene	Acenaphthylene	Anthracene	Benzidine	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzo(a)pyrene	Bis(2-chlorethoxy)methane	Bis(2-chloroethyl)ether
SB-1	11/9/2021	< 0.00812	< 0.00707	< 0.00894	< 0.0943	0.0157[J]	0.0118[J]	< 0.00892	< 0.00918	< 0.00933	< 0.0151	< 0.0166
SB-2	11/9/2021	< 0.00665	< 0.00579	< 0.00732	< 0.0772	0.0114[J]	< 0.00766	< 0.00730	0.00796[J]	< 0.00764	< 0.0123	< 0.0136
SB-3	11/9/2021	< 0.00820	< 0.00713	< 0.00902	< 0.0952	0.0170[J]	0.0199[J]	< 0.00900	< 0.00926	0.0104[J]	< 0.0152	< 0.0167
SB-4	11/9/2021	< 0.00739	< 0.00643	< 0.00813	< 0.0859	< 0.00805	< 0.00852	< 0.00812	< 0.00835	< 0.00849	< 0.0137	< 0.0151
SB-5	11/9/2021	< 0.00694	< 0.00604	< 0.00764	< 0.0806	< 0.00756	< 0.00800	< 0.00762	< 0.00784	< 0.00797	< 0.0129	< 0.0142
SB-6	11/9/2021	< 0.00802	< 0.00698	< 0.00882	< 0.0931	< 0.00873	< 0.00924	< 0.00881	< 0.00906	< 0.00921	< 0.0149	< 0.0164
EPA RSL Industrial Soil [1]		4,500	4,500	23,000	0.01	2.9	2.9	29	NC	0.29	2,500	1

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Semi Volatile Organic Compound(GC/MS) tested by Method 8270C
Soil concentrations are reported in miligrams per kilogram (mg/kg).
[J] = The identification of the analyte is acceptable; the reported value is an estimate.

2,2-Oxybis(1-Chloropropane)	4-Bromophenyl-phenyl ether	2-Chloronaphthalene	4-Chlorophenyl-phenyl ether	Chrysene	Dibenz(a,h)anthracene	3,3-Dichlorobenzidine	2,4-Dinitrotoluene	2,6-Dinitrotoluene	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachloro-1,3-butadiene	Hexachlorocyclopentadiene
< 0.0217	< 0.0176	< 0.00882	< 0.0175	0.0134[J]	< 0.0139	< 0.0185	< 0.0144	< 0.0164	0.0282[J]	< 0.00817	< 0.0178	< 0.0169	< 0.0264
< 0.0178	< 0.0144	< 0.00722	< 0.0143	0.0105[J]	< 0.0114	< 0.0152	< 0.0118	< 0.0134	0.0118[J]	0.0142[J]	< 0.0146	< 0.0138	< 0.0216
< 0.0219	< 0.0178	< 0.00890	< 0.0176	0.0217[J]	< 0.0140	< 0.0187	< 0.0145	< 0.0166	0.0395[J]	0.00976[J]	< 0.0179	< 0.0170	< 0.0266
< 0.0197	< 0.0160	< 0.00802	< 0.0159	0.0106[J]	< 0.0127	< 0.0169	< 0.0131	< 0.0149	0.0148[J]	< 0.00743	< 0.0162	< 0.0154	< 0.0240
< 0.0185	< 0.0151	< 0.00753	< 0.0149	< 0.00852	< 0.0119	< 0.0158	< 0.0123	< 0.0140	< 0.00774	0.00932[J]	< 0.0152	< 0.0144	< 0.0225
< 0.0214	< 0.0174	< 0.00870	< 0.0173	< 0.00985	< 0.0137	< 00183	< 0.0142	< 0.0162	0.0153[J]	< 0.00806	< 0.0176	< 0.0167	< 0.0260
47,000	2,300	6,000	5,800	290	0.29	5.1	7.4	1.5	3,000	3,000	0.96	5.3	7.5

Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	Naphthalene	Nitrobenzene	n-Nitrosodimethylamine	n-Nitrosodiphenylamine	n-Nitrosodi-n-propylamine	Phenanthrene	Benzylbutyl phthalate	Bis(2-ethylhexyl)phthalate	Di-n-butyl phthalate	Diethyl phthalate
< 0.0197	< 0.0142	< 0.0154	0.0167[J]	< 0.0175	< 0.0744	< 0.0380	< 0.0167	0.0215[J]	< 0.0157	< 0.0636	< 0.0172	< 0.0166
< 0.0162	< 0.0116	< 0.0126	0.088	< 0.0143	< 0.0610	< 0.0311	< 0.0137	0.0482	< 0.0128	< 0.0521	< 0.0141	< 0.0136
< 0.0199	< 0.0143	< 0.0155	< 0.0127	< 0.0176	< 0.0751	< 0.0383	< 0.0169	0.0382[J]	< 0.0158	< 0.0642	< 0.0173	< 0.0167
< 0.0180	< 0.0129	< 0.0140	< 0.0115	< 0.0159	< 0.0677	< 0.0346	< 0.0152	0.0160[J]	< 0.0143	< 0.0579	< 0.0156	< 0.0151
< 0.0169	< 0.0121	< 0.0131	0.0461	< 0.0149	< 0.0636	< 0.0325	< 0.0143	0.0288[J]	< 0.0134	< 0.0543	< 0.0147	< 0.0142
< 0.0195	< 0.0140	< 0.0152	< 0.0124	< 0.0173	< 0.0735	< 0.0375	< 0.0165	0.0108[J]	< 0.0155	< 0.0628	< 0.0170	< 0.0164
8	2.9	2400	17	22	0.034	4,700	0.33	NC	1,200	160	82,000	660,000

Dimethyl phthalate	Di-n-octyl phthalate	Pyrene	1,2,4-Trichlorobenzene	4-Chloro-3-methylphenol	2-Chlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	2-Nitrophenol	4-Nitrophenol	Pentachlorophenol	Phenol	2,4,6-Trichlorophenol
< 0.106	< 0.0339	0.0374[J]	< 0.0157	< 0.0163	< 0.0166	< 0.0146	< 0.0131	< 0.114	< 0.117	< 0.0179	< 0.0157	< 0.0135	< 0.0202	< 0.0161
< 0.0871	< 0.0278	0.0312[J]	< 0.0128	< 0.0133	< 0.0136	< 0.0120	< 0.0107	< 0.0932	< 0.0961	< 0.0147	< 0.0128	< 0.0111	< 0.0165	< 0.0132
< 0.0107	< 0.0342	0.0566	< 0.0158	< 0.0164	< 0.0167	< 0.0148	< 0.0132	< 0.115	< 0.118	< 0.0181	< 0.0158	< 0.0136	< 0.0204	< 0.0163
< 0.0968	< 0.0309	0.0206[J]	< 0.0143	< 0.0148	< 0.0151	< 0.0133	< 0.0119	< 0.104	< 0.107	< 0.0163	< 0.0143	< 0.0123	< 0.0184	< 0.0147
< 0.0909	< 0.0290	0.00867[J]	< 0.0134	< 0.0139	< 0.0142	< 0.0125	< 0.0112	< 0.0972	< 0.100	< 0.0153	< 0.0134	< 0.0115	< 0.0173	< 0.0138
< 0.105	< 0.0335	0.0140[J]	< 0.0155	< 0.0161	< 0.0164	< 0.0144	< 0.0129	< 0.112	< 0.116	< 0.0177	< 0.0155	< 0.0133	< 0.0199	< 0.0159
1,200,000	8,200	2,300	110	82,000	5,800	2,500	1,300	5.1	1,600	1,600	1,600	4	250,000	210

Table 7
Soil Analytical Results Summary- Composite: Wet Chemistry
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	Reactive Cyanide (Method 9012B)	Reactive Sulfide (Method 9034-9030B)	Corrosivity pH (Method 9045D)	Ignitability (Method D93/1010A)
COMP-01	11/9/2021	ND	ND	7.97	DNI
EPA RSL Industrial Soil [1]		1,500			

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

pH reported in su.
Soil concentrations are reported in miligrams per kilogram (mg/kg).
ND= Not Reported at the Reporting Limit
DNI= Did Not Ignite at 170°F.

Table 8
Soil Analytical Results Summary- Composite: Volatile Organic Compounds (VOCs)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	Benzene	Carbon Tetrachloride	Chlorobenzene	Chloroform	1,2-Dichloroethane	1,1-Dichloroethane	2-Butanone (MEK)	Tetrachloroethane	Trichloroethane	Vinyl Chloride
COMP-01	11/9/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPA RSL Industrial Soil [1]		5.1	2.9	1,300	1.4	2	16	19,000	100	6	1.7

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

VOCs (GC/MS) tested by Method 8260B.
Soil concentrations are reported in miligrams per liter (mg/l).
ND= Not Reported at the Reporting Limit.

Table 9
Soil Analytical Results Summary- Composite:
Chlorinated Acid Herbicides (GC) and Pesticides (GC)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	2,4,5-TP (Silex) Method 8151A	2,4-D Method 8151A	Chlordane Method 8081B	Endrin Method 8081B	Heptachlor Method 8081B	Lindane Method 8081B	Methoxychlor Method 8081B	Toxaphene Method 8081B
COMP-01	11/9/2021	ND	ND	ND	ND	ND	ND	ND	ND
EPA RSL Industrial Soil [1]		6,600	9,600	7.7	250	0.63	2.50	4100.00	2.10

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Soil concentrations are reported in miligrams per liter (mg/l).
ND= Not Reported at the Reporting Limit.

Table 10
Soil Analytical Results Summary- Composite: Semi Volatile Organic Compounds (SVOCs)
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	1,4-Dichlorobenzene	2,4-Dinitrotoluene	Hexachlorobenzene	Hexachloro-1,3-butadiene	Hexachloroethane	Nitrobenzene	Pyridine	3&4-Methyl Phenol	2-Methyl phenol	Pentachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol
COMP-01	11/9/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPA RSL Industrial Soil [1]		11	7.4	0.96	5.3	8	22	1200	16000	41000	4	82,000	210

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

SVOCs (GC/MS) tested by Method 8270C
Soil concentrations are reported in miligrams per liter (mg/l).
ND= Not Reported at the Reporting Limit.

Table 11
Soil Analytical Results Summary- Waste Composite: Heavy Metals
CONSOR-00001
Tulsa Port of Catoosa
Rogers County, Oklahoma

Sample ID	Date Sampled	Mercury (Method 7470A)	Arsenic (Method 6010B)	Barium (Method 6010B)	Cadmium (Method 6010B)	Chromium (Method 6010B)	Lead (Method 6010B)	Selenium (Method 6010B)	Silver (Method 6010B)
COMP-02	11/9/2021	ND	ND	1.23	ND	ND	ND	ND	ND
EPA RSL Industrial Soil [1]		4.6	3.0	22,000	98	NC	800	580	580

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Soil concentrations are reported in miligrams per kilogram (mg/kg).
ND = Not Reported at the Reporting Limit.

SOIL BORING REPORT

PORT OF MUSKOGEE / OAKLEY GRAND RIVER
FORT GIBSON, OKLAHOMA

ENERCON PROJECT NO. CONSOR-00001

Prepared for:
CONSOR Engineers, LLC
3741 S. Peoria Avenue
Tulsa, Oklahoma 74015
Attention: Mr. Gregg Hostetler, PE

Date:
March 2, 2022

Prepared by:

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1.0 INTRODUCTION

Enercon Services, Inc. (ENERCON) was retained by Mr. Gregg Hostetler, PE of CONSOR Engineers, LLC., hereafter referred to as Client, to conduct environmental field screening and sampling of river sediment during geotechnical investigations at the Port of Muskogee and Oakley Grand River located in Fort Gibson, Oklahoma (subject property).

1.1 Purpose

The purpose of this screening and sampling event was to determine if river sediment has been impacted by chemicals of concern (COCs) at the subject property. All observations are current as of the date the field activities were conducted at the subject property (January 8-24, 2022). Property modification, events, or information made available subsequent to this date are not addressed herein.

1.2 Involved Parties

This project was authorized by CONSOR and the Oklahoma Department of Transportation (ODOT) by issuance of Purchase Order No. 170550 and ODOT Contract 2245B on October 18, 2021.

2.0 GENERAL SITE CHARACTERISTICS

ENERCON reviewed available sources of information in regard to the subject property and adjoining property uses. This section discusses the general characteristics of the subject property and vicinity that may influence the scope of work and potential findings.

2.1 Location

The subject property is located at the Port of Muskogee and Oakley Grand River in Fort Gibson, Oklahoma.

2.2 Site Description and Current Land Uses

The subject property is a multi-modal shipping complex consisting of approximately 2,560-acres of industrial park and is currently improved with steel dolphin mooring structures and deadman anchors. Twenty of the dolphin mooring structures are to be removed and replaced with twenty new monopile mooring structures, and six deadman anchors are to be removed and replaced with six new monopile mooring structures.

3.0 BACKGROUND

ENERCON reviewed available sources of information in regard to historical land use, site features, and site conditions. The purpose of this section is to identify and summarize available historical information pertinent to the current assessment.

3.1 Project Background

From January 8 through January 8 through January 24, 2022, ENERCON provided assistance with the geotechnical investigation in the Port of Catoosa and Oakley Grand River location and performed environmental screening and sampling to determine if river sediment has been impacted by Chemical of Concerns (COCs) at the construction locations. The field activities included continuous screening of sediment samples from the mudline to the bedrock interface with a photo-ionization detector (PID) and a Ludlum Model 19 MicroR. ENERCON also collected samples for laboratory analysis. These samples included one (1) sediment sample from each boring based on visual observations or field screening results and an investigation derived waste (sediment and drill cuttings) sample for waste characterization. Sediment samples were analyzed for total petroleum hydrocarbon (TPH) by Texas Method 1005, volatile organic compounds (VOCs) by United States Environmental Protection Agency (US EPA) Method 8260B, semi-volatile organic compounds (SVOCs) by US EPA Method 8270C, polychlorinated biphenyls (PCBs) by US EPA Method 8082, Resource Conservation Recovery Act (RCRA) metals by US EPA Method 6010D/7471A, and Gamma-Ray Isotopic by EPA Method 901.1. The composite waste sample was analyzed for TPH and heavy metals.

The soil sample collected from soil borings SB-1, SB-2, SB-3, SB-5, SB-15, and Drilling Mud Disposal contained detectable concentrations of Arsenic (9.07, 3.72, 6.51, 6.31, 3.07, and 3.98 mg/kg) respectively, which exceeded the EPA regulatory screening level (RSL) for Arsenic in industrial soils (3.0 mg/kg), however these concentrations are within the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg).

Concentrations of all other analyzed COCs in the samples collected from soil borings SB-1 through SB-26 and Drilling Mud Disposal were below their respective regulatory action level and/or laboratory detection limit.

3.2 Additional Background Information

No additional background information was provided by the client.

4.0 REGULATORY REQUIREMENTS AND SCOPE OF WORK

ENERCON considers current site conditions, site background, previously completed environmental assessments, and the subject property's environmental setting when developing the project scope of work. This section discusses the applicable regulatory programs and scope of work developed for the project.

4.1 Regulatory Requirements

The USEPA List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA), CERCLA and Section 112(r) of the Clean Air Act (June 2019) (List of Lists) provides reportable quantities for numerous hazardous chemicals which must be reported to the National Response Center, if exceeded. The reportable quantity for TPH, however, is not listed in the USEPA List of Lists publication as TPH is a combination of numerous petroleum-related compounds.

Selected soil samples were collected and submitted to an ODEQ certified laboratory for analysis. Following analysis, the laboratory results of the soil samples were compared to the EPA RSL for industrial soil, and ODEQ Tier 1 Generic TPH Cleanup Levels (February 2020) for industrial soils for each COC, as applicable.

4.2 Scope of Work Completed

The following provides a summary of the scope of work performed:

- ENERCON prepared a site-specific health and safety plan (HASP) for field screening and sampling from barges.

- ENERCON worked with CONSOR's geotechnical drillers and consultants in coordinating and documenting the location and depth of each screening and sampling interval. ENERCON continuously screened sediment samples with a (PID) and a Ludlum Model 19 MicroR survey meter from the mud line to the bedrock interface. Field screening using these devices and visual observation were used to evaluate areas for potential impact, and for the selection of samples for laboratory analysis.
- The sediment samples collected from the subject property were submitted to Pace Analytical National Center for Testing and Innovation (PACE), an ODEQ-certified laboratory, in Mt. Juliet, Tennessee under chain-of-custody documentation. The sediment samples collected from soil borings SB-1 through SB-26 were placed in laboratory provided containers and immediately

packed on ice. The laboratory analytical report and associated chain-of-custody for all sediment samples collected as part of this project are included in Appendix A.

- Upon completion of the above-referenced activities, ENERCON prepared this Soil Boring Report documenting the completed work and findings.

Note: The scope of this investigation was not intended to fully delineate the extent of any contamination identified in river sediment and/or groundwater.

5.0 RESULTS OF ASSESSMENT

This section provides a summary of the field observations and laboratory analytical results obtained through completion of the Scope of Work described in Section 4.2.

5.1 Field Observations

The following subsections summarize field observations and field screening results for the environmental media assessed during performance of this project.

Sediment observed from each soil boring SB-1 through SB-26 showed no signs of staining or hydrocarbon odor. Field screening of sediment from each soil boring SB-1 through SB-26 showed PID levels of 0.0 and Ludlum readings within in the acceptable range.

5.2 Sample Analytical Results

The following subsections summarize the laboratory analytical results for environmental media samples collected from soil borings SB-1 through SB-26. The laboratory analytical results of the sediment samples collected from the soil borings are summarized in Tables 1 through 8 included in Appendix A.

Sample Analytical Results Summary

The following provides a summary of the laboratory analytical results of the sediment samples collected from soil borings SB-1 through SB-26 and Drilling Mud Disposal.

Soil Boring SB-1

The detected concentration of Arsenic (9.07 mg/kg) exceeded the EPA RSL in industrial soil of 3.0 mg/kg. This concentration is within the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg). All other analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-2

The detected concentration of Arsenic (3.72 mg/kg) exceeded the EPA RSL in industrial soil of 3.0 mg/kg. This concentration is within the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg). All other analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-3

The detected concentration of Arsenic (6.51 mg/kg) exceeded the EPA RSL in industrial soil of 3.0 mg/kg. This concentration is within the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg).

All other analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-4

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-5

The detected concentration of Arsenic (6.31 mg/kg) exceeded the EPA RSL in industrial soil of 3.0 mg/kg. This concentration is within the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg). All other analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-6

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-7

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-8

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-9

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-10

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-11

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-12

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-13

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-14

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-15

The detected concentration of Arsenic (3.07 mg/kg) exceeded the EPA RSL in industrial soil of 3.0 mg/kg. This concentration is within the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg). All other analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-16

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-17

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-18

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-19

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-20

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-21

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-22

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-23

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-24

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-25

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Soil Boring SB-26

All analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

Drilling Mud Disposal

The detected concentration of Arsenic (3.98 mg/kg) exceeded the EPA RSL in industrial soil of 3.0 mg/kg. This concentration is within the EPA inorganic background levels for Arsenic (1.1-16.7 mg/kg). All other analyzed COCs were below the laboratory detection limits or applicable regulatory screening levels.

6.0 DISCUSSION OF FINDINGS

ENERCON has completed the geotechnical investigation activities at the subject property in accordance with the approved scope of work identified in the letter proposal dated October 18, 2021.

6.1 Conclusions

The sediment samples collected from soil boring SB-1, SB-2, SB-3, SB-5, SB-15, and Drilling Mud Disposal contained Arsenic in concentrations exceeding applicable regulatory screening levels. These concentrations, however, are within the EPA inorganic background levels. The sediment samples collected from the remaining soil borings did not contain any analyzed COCs in concentrations above the laboratory detection limits or applicable regulatory screening levels.

7.0 LIMITATIONS AND USER RELIANCE

The conclusions presented above are based on the agreed upon scope of work outlined in the above report. ENERCON makes no guarantees as to the accuracy or completeness of information obtained from others. It is possible that information exists beyond the scope of this assessment. Additional information which was not available to ENERCON at the time of writing the report may result in modification of the conclusions and recommendations presented. The services performed by ENERCON have been conducted in a manner consistent with the level of care ordinarily exercised by members of our profession currently practicing under similar conditions. This report is not a legal opinion but may under certain circumstances be prepared at the direction of counsel, may be in anticipation of litigation, and may be classified as an attorney-client communication or as an attorney-work product.

This report was prepared by ENERCON specifically for use by CONSOR Engineers (the Client), who may rely on its contents and conclusions. Use of or reliance upon this information by any other party without express written permission granted by ENERCON and the Client is not authorized and is completely at the risk of the user.

8.0 PUBLISHED REFERENCES

Oklahoma Administrative Code. September 15, 2019, Title 252 Department of Environmental Quality, Chapter 205 Hazardous Waste Management.

Oklahoma Department of Environmental Quality. February 2020, Tier 2 Generic TPH Cleanup Levels.

United States Environmental Protection Agency, Office of Land and Emergency Management. June 2019, List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 112(r) of the Clean Air Act.

Appendix A

Laboratory Analytical Report and Chain-of-Custody

ANALYTICAL REPORT

January 27, 2022

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1450956
Samples Received:	01/13/2022
Project Number:	CONSOR-00001
Description:	MKARNS Moorings Update
Report To:	Rusty Lynch 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

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1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

SB-9 L1450956-01 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/08/22 09:55	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802128	1	01/15/22 17:33	01/15/22 17:49	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 11:49	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:02	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 01:56	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802568	1	01/15/22 12:18	01/20/22 11:47	TJD	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/21/22 00:06	AO	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 13:43	JNJ	Mt. Juliet, TN

SB-10 L1450956-02 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/08/22 11:52	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802128	1	01/15/22 17:33	01/15/22 17:49	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 11:51	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:05	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 02:16	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802568	1	01/15/22 12:18	01/20/22 12:13	TJD	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/19/22 22:55	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 12:20	JNJ	Mt. Juliet, TN

SB-11 L1450956-03 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/08/22 13:34	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802129	1	01/15/22 10:25	01/15/22 10:36	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 11:53	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:07	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 02:35	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802568	1	01/15/22 12:18	01/20/22 12:40	TJD	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/21/22 00:15	AO	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 13:22	JNJ	Mt. Juliet, TN

SB-12 L1450956-04 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/10/22 09:30	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802129	1	01/15/22 10:25	01/15/22 10:36	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 11:55	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:10	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 02:54	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802568	1	01/15/22 12:18	01/16/22 13:25	CLG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/19/22 23:14	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 14:45	JNJ	Mt. Juliet, TN

SB-13 L1450956-05 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/10/22 11:30	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802129	1	01/15/22 10:25	01/15/22 10:36	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 11:57	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:13	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 03:14	BMB	Mt. Juliet, TN

SB-13 L1450956-05 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/10/22 11:30	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
TPH by TCEQ Method 1005	WG1802568	1	01/15/22 12:18	01/16/22 15:51	ALA	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/21/22 00:24	AO	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 12:40	JNJ	Mt. Juliet, TN

SB-14 L1450956-06 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/10/22 13:07	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802129	1	01/15/22 10:25	01/15/22 10:36	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 12:01	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:16	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 03:33	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802937	1	01/17/22 12:05	01/17/22 18:03	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/19/22 23:33	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 14:25	JNJ	Mt. Juliet, TN

SB-15 L1450956-07 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/10/22 14:13	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802129	1	01/15/22 10:25	01/15/22 10:36	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 12:03	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:19	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 03:53	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802937	1	01/17/22 12:05	01/17/22 18:17	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/21/22 00:33	AO	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 15:06	JNJ	Mt. Juliet, TN

SB-16 L1450956-08 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/11/22 09:18	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802129	1	01/15/22 10:25	01/15/22 10:36	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 12:09	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:22	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 04:13	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802937	1	01/17/22 12:05	01/17/22 18:30	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/19/22 23:52	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802108	1	01/14/22 04:08	01/14/22 14:04	JNJ	Mt. Juliet, TN

SB-17 L1450956-09 Solid

Collected by	Collected date/time	Received date/time
Zoe Silver	01/11/22 10:45	01/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1802129	1	01/15/22 10:25	01/15/22 10:36	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1802243	1	01/14/22 10:17	01/17/22 12:11	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1802801	1	01/19/22 17:52	01/27/22 01:25	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1802670	1	01/13/22 20:39	01/15/22 04:32	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1802937	1	01/17/22 12:05	01/17/22 18:43	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1802625	1	01/19/22 17:49	01/20/22 00:02	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1802218	1	01/14/22 18:24	01/15/22 20:52	JNJ	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	82.2		1	01/15/2022 17:49	WG1802128

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0219	0.0487	1	01/17/2022 11:49	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.01	J	0.630	2.43	1	01/27/2022 01:02	WG1802801
Barium	41.5		0.104	0.608	1	01/27/2022 01:02	WG1802801
Cadmium	0.0959	J	0.0573	0.608	1	01/27/2022 01:02	WG1802801
Chromium	8.60		0.162	1.22	1	01/27/2022 01:02	WG1802801
Lead	4.70		0.253	0.608	1	01/27/2022 01:02	WG1802801
Selenium	U		0.930	2.43	1	01/27/2022 01:02	WG1802801
Silver	U		0.155	1.22	1	01/27/2022 01:02	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0606	0.0830	1	01/15/2022 01:56	WG1802670
Acrylonitrile	U		0.00599	0.0207	1	01/15/2022 01:56	WG1802670
Benzene	U		0.000775	0.00166	1	01/15/2022 01:56	WG1802670
Bromobenzene	U		0.00149	0.0207	1	01/15/2022 01:56	WG1802670
Bromodichloromethane	U		0.00120	0.00415	1	01/15/2022 01:56	WG1802670
Bromoform	U		0.00194	0.0415	1	01/15/2022 01:56	WG1802670
Bromomethane	U		0.00327	0.0207	1	01/15/2022 01:56	WG1802670
n-Butylbenzene	U		0.00871	0.0207	1	01/15/2022 01:56	WG1802670
sec-Butylbenzene	U		0.00478	0.0207	1	01/15/2022 01:56	WG1802670
tert-Butylbenzene	U		0.00324	0.00830	1	01/15/2022 01:56	WG1802670
Carbon tetrachloride	U		0.00149	0.00830	1	01/15/2022 01:56	WG1802670
Chlorobenzene	U		0.000348	0.00415	1	01/15/2022 01:56	WG1802670
Chlorodibromomethane	U	J4	0.00102	0.00415	1	01/15/2022 01:56	WG1802670
Chloroethane	U		0.00282	0.00830	1	01/15/2022 01:56	WG1802670
Chloroform	U		0.00171	0.00415	1	01/15/2022 01:56	WG1802670
Chloromethane	U		0.00722	0.0207	1	01/15/2022 01:56	WG1802670
2-Chlorotoluene	U		0.00144	0.00415	1	01/15/2022 01:56	WG1802670
4-Chlorotoluene	U		0.000747	0.00830	1	01/15/2022 01:56	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00647	0.0415	1	01/15/2022 01:56	WG1802670
1,2-Dibromoethane	U		0.00108	0.00415	1	01/15/2022 01:56	WG1802670
Dibromomethane	U		0.00124	0.00830	1	01/15/2022 01:56	WG1802670
1,2-Dichlorobenzene	U		0.000705	0.00830	1	01/15/2022 01:56	WG1802670
1,3-Dichlorobenzene	U		0.000996	0.00830	1	01/15/2022 01:56	WG1802670
1,4-Dichlorobenzene	U		0.00116	0.00830	1	01/15/2022 01:56	WG1802670
Dichlorodifluoromethane	U		0.00267	0.00415	1	01/15/2022 01:56	WG1802670
1,1-Dichloroethane	U		0.000815	0.00415	1	01/15/2022 01:56	WG1802670
1,2-Dichloroethane	U		0.00108	0.00415	1	01/15/2022 01:56	WG1802670
1,1-Dichloroethene	U		0.00101	0.00415	1	01/15/2022 01:56	WG1802670
cis-1,2-Dichloroethene	U		0.00122	0.00415	1	01/15/2022 01:56	WG1802670
trans-1,2-Dichloroethene	U		0.00173	0.00830	1	01/15/2022 01:56	WG1802670
1,2-Dichloropropane	U		0.00236	0.00830	1	01/15/2022 01:56	WG1802670
1,1-Dichloropropene	U		0.00134	0.00415	1	01/15/2022 01:56	WG1802670
1,3-Dichloropropane	U		0.000831	0.00830	1	01/15/2022 01:56	WG1802670

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00126	0.00415	1	01/15/2022 01:56	WG1802670
trans-1,3-Dichloropropene	U		0.00189	0.00830	1	01/15/2022 01:56	WG1802670
2,2-Dichloropropane	U		0.00229	0.00415	1	01/15/2022 01:56	WG1802670
Di-isopropyl ether	U		0.000680	0.00166	1	01/15/2022 01:56	WG1802670
Ethylbenzene	U		0.00122	0.00415	1	01/15/2022 01:56	WG1802670
Hexachloro-1,3-Butadiene	U		0.00996	0.0415	1	01/15/2022 01:56	WG1802670
Isopropylbenzene	U		0.000705	0.00415	1	01/15/2022 01:56	WG1802670
p-Isopropyltoluene	U		0.00423	0.00830	1	01/15/2022 01:56	WG1802670
2-Butanone (MEK)	U		0.105	0.166	1	01/15/2022 01:56	WG1802670
Methylene Chloride	U		0.0110	0.0415	1	01/15/2022 01:56	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00378	0.0415	1	01/15/2022 01:56	WG1802670
Methyl tert-butyl ether	U		0.000581	0.00166	1	01/15/2022 01:56	WG1802670
Naphthalene	U		0.00810	0.0207	1	01/15/2022 01:56	WG1802670
n-Propylbenzene	U		0.00158	0.00830	1	01/15/2022 01:56	WG1802670
Styrene	U		0.000380	0.0207	1	01/15/2022 01:56	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00157	0.00415	1	01/15/2022 01:56	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00115	0.00415	1	01/15/2022 01:56	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00125	0.00415	1	01/15/2022 01:56	WG1802670
Tetrachloroethene	U		0.00149	0.00415	1	01/15/2022 01:56	WG1802670
Toluene	U		0.00216	0.00830	1	01/15/2022 01:56	WG1802670
1,2,3-Trichlorobenzene	U		0.0122	0.0207	1	01/15/2022 01:56	WG1802670
1,2,4-Trichlorobenzene	U		0.00730	0.0207	1	01/15/2022 01:56	WG1802670
1,1,1-Trichloroethane	U		0.00153	0.00415	1	01/15/2022 01:56	WG1802670
1,1,2-Trichloroethane	U		0.000991	0.00415	1	01/15/2022 01:56	WG1802670
Trichloroethene	U		0.000969	0.00166	1	01/15/2022 01:56	WG1802670
Trichlorofluoromethane	U		0.00137	0.00415	1	01/15/2022 01:56	WG1802670
1,2,3-Trichloropropane	U		0.00269	0.0207	1	01/15/2022 01:56	WG1802670
1,2,4-Trimethylbenzene	U		0.00262	0.00830	1	01/15/2022 01:56	WG1802670
1,2,3-Trimethylbenzene	U		0.00262	0.00830	1	01/15/2022 01:56	WG1802670
1,3,5-Trimethylbenzene	U		0.00332	0.00830	1	01/15/2022 01:56	WG1802670
Vinyl chloride	U		0.00192	0.00415	1	01/15/2022 01:56	WG1802670
Xylenes, Total	U		0.00146	0.0108	1	01/15/2022 01:56	WG1802670
(S) Toluene-d8	*112*			*75.0-131*		*01/15/2022 01:56*	WG1802670
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*01/15/2022 01:56*	WG1802670
(S) 1,2-Dichloroethane-d4	*83.6*			*70.0-130*		*01/15/2022 01:56*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		18.3	60.8	1	01/20/2022 11:47	WG1802568
TPH C12 - C28	23.7	J	18.3	60.8	1	01/20/2022 11:47	WG1802568
TPH C28 - C35	U		18.3	60.8	1	01/20/2022 11:47	WG1802568
TPH C6 - C35	23.7	J	18.3	60.8	1	01/20/2022 11:47	WG1802568
(S) o-Terphenyl	*98.0*			*70.0-130*		*01/20/2022 11:47*	WG1802568
(S) 1-chlorooctane	*110*			*70.0-130*		*01/20/2022 11:47*	WG1802568

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0144	0.0414	1	01/21/2022 00:06	WG1802625
PCB 1221	U		0.0144	0.0414	1	01/21/2022 00:06	WG1802625
PCB 1232	U		0.0144	0.0414	1	01/21/2022 00:06	WG1802625
PCB 1242	U		0.0144	0.0414	1	01/21/2022 00:06	WG1802625
PCB 1248	U		0.00898	0.0207	1	01/21/2022 00:06	WG1802625
PCB 1254	U		0.00898	0.0207	1	01/21/2022 00:06	WG1802625

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00898	0.0207	1	01/21/2022 00:06	WG1802625
(S) Decachlorobiphenyl	*81.9*			*10.0-135*		*01/21/2022 00:06*	WG1802625
(S) Tetrachloro-m-xylene	*113*			*10.0-139*		*01/21/2022 00:06*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00656	0.0405	1	01/14/2022 13:43	WG1802108
Acenaphthylene	U		0.00571	0.0405	1	01/14/2022 13:43	WG1802108
Anthracene	U		0.00722	0.0405	1	01/14/2022 13:43	WG1802108
Benzidine	U		0.0762	2.03	1	01/14/2022 13:43	WG1802108
Benzo(a)anthracene	U		0.00714	0.0405	1	01/14/2022 13:43	WG1802108
Benzo(b)fluoranthene	U		0.00756	0.0405	1	01/14/2022 13:43	WG1802108
Benzo(k)fluoranthene	U		0.00720	0.0405	1	01/14/2022 13:43	WG1802108
Benzo(g,h,i)perylene	U		0.00741	0.0405	1	01/14/2022 13:43	WG1802108
Benzo(a)pyrene	U		0.00753	0.0405	1	01/14/2022 13:43	WG1802108
Bis(2-chlorethoxy)methane	U		0.0122	0.405	1	01/14/2022 13:43	WG1802108
Bis(2-chloroethyl)ether	U		0.0134	0.405	1	01/14/2022 13:43	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0175	0.405	1	01/14/2022 13:43	WG1802108
4-Bromophenyl-phenylether	U		0.0142	0.405	1	01/14/2022 13:43	WG1802108
2-Chloronaphthalene	U		0.00712	0.0405	1	01/14/2022 13:43	WG1802108
4-Chlorophenyl-phenylether	U		0.0141	0.405	1	01/14/2022 13:43	WG1802108
Chrysene	U		0.00805	0.0405	1	01/14/2022 13:43	WG1802108
Dibenz(a,h)anthracene	U		0.0112	0.0405	1	01/14/2022 13:43	WG1802108
3,3-Dichlorobenzidine	U		0.0150	0.405	1	01/14/2022 13:43	WG1802108
2,4-Dinitrotoluene	U		0.0116	0.405	1	01/14/2022 13:43	WG1802108
2,6-Dinitrotoluene	U		0.0133	0.405	1	01/14/2022 13:43	WG1802108
Fluoranthene	U		0.00731	0.0405	1	01/14/2022 13:43	WG1802108
Fluorene	U		0.00659	0.0405	1	01/14/2022 13:43	WG1802108
Hexachlorobenzene	U		0.0144	0.405	1	01/14/2022 13:43	WG1802108
Hexachloro-1,3-butadiene	U		0.0136	0.405	1	01/14/2022 13:43	WG1802108
Hexachlorocyclopentadiene	U		0.0213	0.405	1	01/14/2022 13:43	WG1802108
Hexachloroethane	U		0.0159	0.405	1	01/14/2022 13:43	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0114	0.0405	1	01/14/2022 13:43	WG1802108
Isophorone	U		0.0124	0.405	1	01/14/2022 13:43	WG1802108
Naphthalene	U		0.0102	0.0405	1	01/14/2022 13:43	WG1802108
Nitrobenzene	U		0.0141	0.405	1	01/14/2022 13:43	WG1802108
n-Nitrosodimethylamine	U		0.0601	0.405	1	01/14/2022 13:43	WG1802108
n-Nitrosodiphenylamine	U		0.0307	0.405	1	01/14/2022 13:43	WG1802108
n-Nitrosodi-n-propylamine	U		0.0135	0.405	1	01/14/2022 13:43	WG1802108
Phenanthrene	U		0.00804	0.0405	1	01/14/2022 13:43	WG1802108
Benzylbutyl phthalate	U		0.0127	0.405	1	01/14/2022 13:43	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0513	0.405	1	01/14/2022 13:43	WG1802108
Di-n-butyl phthalate	U		0.0139	0.405	1	01/14/2022 13:43	WG1802108
Diethyl phthalate	U		0.0134	0.405	1	01/14/2022 13:43	WG1802108
Dimethyl phthalate	U		0.0859	0.405	1	01/14/2022 13:43	WG1802108
Di-n-octyl phthalate	U		0.0274	0.405	1	01/14/2022 13:43	WG1802108
Pyrene	U		0.00788	0.0405	1	01/14/2022 13:43	WG1802108
1,2,4-Trichlorobenzene	U		0.0127	0.405	1	01/14/2022 13:43	WG1802108
4-Chloro-3-methylphenol	U		0.0131	0.405	1	01/14/2022 13:43	WG1802108
2-Chlorophenol	U		0.0134	0.405	1	01/14/2022 13:43	WG1802108
2,4-Dichlorophenol	U		0.0118	0.405	1	01/14/2022 13:43	WG1802108
2,4-Dimethylphenol	U		0.0106	0.405	1	01/14/2022 13:43	WG1802108
4,6-Dinitro-2-methylphenol	U		0.0919	0.405	1	01/14/2022 13:43	WG1802108
2,4-Dinitrophenol	U		0.0948	0.405	1	01/14/2022 13:43	WG1802108
2-Nitrophenol	U		0.0145	0.405	1	01/14/2022 13:43	WG1802108

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0127	0.405	1	01/14/2022 13:43	WG1802108
Pentachlorophenol	U		0.0109	0.405	1	01/14/2022 13:43	WG1802108
Phenol	U		0.0163	0.405	1	01/14/2022 13:43	WG1802108
2,4,6-Trichlorophenol	U		0.0130	0.405	1	01/14/2022 13:43	WG1802108
(S) 2-Fluorophenol	*68.7*			*12.0-120*		*01/14/2022 13:43*	WG1802108
(S) Phenol-d5	*60.8*			*10.0-120*		*01/14/2022 13:43*	WG1802108
(S) Nitrobenzene-d5	*53.0*			*10.0-122*		*01/14/2022 13:43*	WG1802108
(S) 2-Fluorobiphenyl	*56.9*			*15.0-120*		*01/14/2022 13:43*	WG1802108
(S) 2,4,6-Tribromophenol	*65.2*			*10.0-127*		*01/14/2022 13:43*	WG1802108
(S) p-Terphenyl-d14	*71.7*			*10.0-120*		*01/14/2022 13:43*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	86.3		1	01/15/2022 17:49	WG1802128

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0209	0.0464	1	01/17/2022 11:51	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	0.840	J	0.600	2.32	1	01/27/2022 01:05	WG1802801
Barium	29.5		0.0987	0.580	1	01/27/2022 01:05	WG1802801
Cadmium	U		0.0546	0.580	1	01/27/2022 01:05	WG1802801
Chromium	3.30		0.154	1.16	1	01/27/2022 01:05	WG1802801
Lead	2.52		0.241	0.580	1	01/27/2022 01:05	WG1802801
Selenium	U		0.886	2.32	1	01/27/2022 01:05	WG1802801
Silver	U		0.147	1.16	1	01/27/2022 01:05	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0564	0.0772	1	01/15/2022 02:16	WG1802670
Acrylonitrile	U		0.00557	0.0193	1	01/15/2022 02:16	WG1802670
Benzene	U		0.000721	0.00154	1	01/15/2022 02:16	WG1802670
Bromobenzene	U		0.00139	0.0193	1	01/15/2022 02:16	WG1802670
Bromodichloromethane	U		0.00112	0.00386	1	01/15/2022 02:16	WG1802670
Bromoform	U		0.00181	0.0386	1	01/15/2022 02:16	WG1802670
Bromomethane	U		0.00304	0.0193	1	01/15/2022 02:16	WG1802670
n-Butylbenzene	U		0.00811	0.0193	1	01/15/2022 02:16	WG1802670
sec-Butylbenzene	U		0.00445	0.0193	1	01/15/2022 02:16	WG1802670
tert-Butylbenzene	U		0.00301	0.00772	1	01/15/2022 02:16	WG1802670
Carbon tetrachloride	U		0.00139	0.00772	1	01/15/2022 02:16	WG1802670
Chlorobenzene	U		0.000324	0.00386	1	01/15/2022 02:16	WG1802670
Chlorodibromomethane	U	J4	0.000945	0.00386	1	01/15/2022 02:16	WG1802670
Chloroethane	U		0.00262	0.00772	1	01/15/2022 02:16	WG1802670
Chloroform	U		0.00159	0.00386	1	01/15/2022 02:16	WG1802670
Chloromethane	U		0.00672	0.0193	1	01/15/2022 02:16	WG1802670
2-Chlorotoluene	U		0.00134	0.00386	1	01/15/2022 02:16	WG1802670
4-Chlorotoluene	U		0.000695	0.00772	1	01/15/2022 02:16	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00602	0.0386	1	01/15/2022 02:16	WG1802670
1,2-Dibromoethane	U		0.00100	0.00386	1	01/15/2022 02:16	WG1802670
Dibromomethane	U		0.00116	0.00772	1	01/15/2022 02:16	WG1802670
1,2-Dichlorobenzene	U		0.000656	0.00772	1	01/15/2022 02:16	WG1802670
1,3-Dichlorobenzene	U		0.000926	0.00772	1	01/15/2022 02:16	WG1802670
1,4-Dichlorobenzene	U		0.00108	0.00772	1	01/15/2022 02:16	WG1802670
Dichlorodifluoromethane	U		0.00249	0.00386	1	01/15/2022 02:16	WG1802670
1,1-Dichloroethane	U		0.000758	0.00386	1	01/15/2022 02:16	WG1802670
1,2-Dichloroethane	U		0.00100	0.00386	1	01/15/2022 02:16	WG1802670
1,1-Dichloroethene	U		0.000936	0.00386	1	01/15/2022 02:16	WG1802670
cis-1,2-Dichloroethene	U		0.00113	0.00386	1	01/15/2022 02:16	WG1802670
trans-1,2-Dichloroethene	U		0.00161	0.00772	1	01/15/2022 02:16	WG1802670
1,2-Dichloropropane	U		0.00219	0.00772	1	01/15/2022 02:16	WG1802670
1,1-Dichloropropene	U		0.00125	0.00386	1	01/15/2022 02:16	WG1802670
1,3-Dichloropropane	U		0.000774	0.00772	1	01/15/2022 02:16	WG1802670

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00117	0.00386	1	01/15/2022 02:16	WG1802670
trans-1,3-Dichloropropene	U		0.00176	0.00772	1	01/15/2022 02:16	WG1802670
2,2-Dichloropropane	U		0.00213	0.00386	1	01/15/2022 02:16	WG1802670
Di-isopropyl ether	U		0.000633	0.00154	1	01/15/2022 02:16	WG1802670
Ethylbenzene	U		0.00114	0.00386	1	01/15/2022 02:16	WG1802670
Hexachloro-1,3-Butadiene	U		0.00926	0.0386	1	01/15/2022 02:16	WG1802670
Isopropylbenzene	U		0.000656	0.00386	1	01/15/2022 02:16	WG1802670
p-Isopropyltoluene	U		0.00394	0.00772	1	01/15/2022 02:16	WG1802670
2-Butanone (MEK)	U		0.0980	0.154	1	01/15/2022 02:16	WG1802670
Methylene Chloride	U		0.0103	0.0386	1	01/15/2022 02:16	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00352	0.0386	1	01/15/2022 02:16	WG1802670
Methyl tert-butyl ether	U		0.000540	0.00154	1	01/15/2022 02:16	WG1802670
Naphthalene	U		0.00753	0.0193	1	01/15/2022 02:16	WG1802670
n-Propylbenzene	U		0.00147	0.00772	1	01/15/2022 02:16	WG1802670
Styrene	U		0.000354	0.0193	1	01/15/2022 02:16	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00146	0.00386	1	01/15/2022 02:16	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00107	0.00386	1	01/15/2022 02:16	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00116	0.00386	1	01/15/2022 02:16	WG1802670
Tetrachloroethene	U		0.00138	0.00386	1	01/15/2022 02:16	WG1802670
Toluene	0.00687	J	0.00201	0.00772	1	01/15/2022 02:16	WG1802670
1,2,3-Trichlorobenzene	U		0.0113	0.0193	1	01/15/2022 02:16	WG1802670
1,2,4-Trichlorobenzene	U		0.00679	0.0193	1	01/15/2022 02:16	WG1802670
1,1,1-Trichloroethane	U		0.00143	0.00386	1	01/15/2022 02:16	WG1802670
1,1,2-Trichloroethane	U		0.000922	0.00386	1	01/15/2022 02:16	WG1802670
Trichloroethene	U		0.000902	0.00154	1	01/15/2022 02:16	WG1802670
Trichlorofluoromethane	U		0.00128	0.00386	1	01/15/2022 02:16	WG1802670
1,2,3-Trichloropropane	U		0.00250	0.0193	1	01/15/2022 02:16	WG1802670
1,2,4-Trimethylbenzene	U		0.00244	0.00772	1	01/15/2022 02:16	WG1802670
1,2,3-Trimethylbenzene	U		0.00244	0.00772	1	01/15/2022 02:16	WG1802670
1,3,5-Trimethylbenzene	U		0.00309	0.00772	1	01/15/2022 02:16	WG1802670
Vinyl chloride	U		0.00179	0.00386	1	01/15/2022 02:16	WG1802670
Xylenes, Total	U		0.00136	0.0100	1	01/15/2022 02:16	WG1802670
(S) Toluene-d8	*111*			*75.0-131*		*01/15/2022 02:16*	WG1802670
(S) 4-Bromofluorobenzene	*95.8*			*67.0-138*		*01/15/2022 02:16*	WG1802670
(S) 1,2-Dichloroethane-d4	*87.2*			*70.0-130*		*01/15/2022 02:16*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		17.4	58.0	1	01/20/2022 12:13	WG1802568
TPH C12 - C28	U		17.4	58.0	1	01/20/2022 12:13	WG1802568
TPH C28 - C35	U		17.4	58.0	1	01/20/2022 12:13	WG1802568
TPH C6 - C35	U		17.4	58.0	1	01/20/2022 12:13	WG1802568
(S) o-Terphenyl	*98.0*			*70.0-130*		*01/20/2022 12:13*	WG1802568
(S) 1-chlorooctane	*110*			*70.0-130*		*01/20/2022 12:13*	WG1802568

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0137	0.0394	1	01/19/2022 22:55	WG1802625
PCB 1221	U		0.0137	0.0394	1	01/19/2022 22:55	WG1802625
PCB 1232	U		0.0137	0.0394	1	01/19/2022 22:55	WG1802625
PCB 1242	U		0.0137	0.0394	1	01/19/2022 22:55	WG1802625
PCB 1248	U		0.00855	0.0197	1	01/19/2022 22:55	WG1802625
PCB 1254	U		0.00855	0.0197	1	01/19/2022 22:55	WG1802625

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00855	0.0197	1	01/19/2022 22:55	WG1802625
(S) Decachlorobiphenyl	*53.8*			*10.0-135*		*01/19/2022 22:55*	WG1802625
(S) Tetrachloro-m-xylene	*23.1*			*10.0-139*		*01/19/2022 22:55*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00625	0.0386	1	01/14/2022 12:20	WG1802108
Acenaphthylene	U		0.00544	0.0386	1	01/14/2022 12:20	WG1802108
Anthracene	U		0.00687	0.0386	1	01/14/2022 12:20	WG1802108
Benzidine	U		0.0726	1.94	1	01/14/2022 12:20	WG1802108
Benzo(a)anthracene	U		0.00680	0.0386	1	01/14/2022 12:20	WG1802108
Benzo(b)fluoranthene	U		0.00720	0.0386	1	01/14/2022 12:20	WG1802108
Benzo(k)fluoranthene	U		0.00686	0.0386	1	01/14/2022 12:20	WG1802108
Benzo(g,h,i)perylene	U		0.00706	0.0386	1	01/14/2022 12:20	WG1802108
Benzo(a)pyrene	U		0.00717	0.0386	1	01/14/2022 12:20	WG1802108
Bis(2-chlorethoxy)methane	U		0.0116	0.386	1	01/14/2022 12:20	WG1802108
Bis(2-chloroethyl)ether	U		0.0127	0.386	1	01/14/2022 12:20	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0167	0.386	1	01/14/2022 12:20	WG1802108
4-Bromophenyl-phenylether	U		0.0136	0.386	1	01/14/2022 12:20	WG1802108
2-Chloronaphthalene	U		0.00678	0.0386	1	01/14/2022 12:20	WG1802108
4-Chlorophenyl-phenylether	U		0.0134	0.386	1	01/14/2022 12:20	WG1802108
Chrysene	U		0.00767	0.0386	1	01/14/2022 12:20	WG1802108
Dibenz(a,h)anthracene	U		0.0107	0.0386	1	01/14/2022 12:20	WG1802108
3,3-Dichlorobenzidine	U		0.0143	0.386	1	01/14/2022 12:20	WG1802108
2,4-Dinitrotoluene	U		0.0111	0.386	1	01/14/2022 12:20	WG1802108
2,6-Dinitrotoluene	U		0.0126	0.386	1	01/14/2022 12:20	WG1802108
Fluoranthene	U		0.00697	0.0386	1	01/14/2022 12:20	WG1802108
Fluorene	U		0.00628	0.0386	1	01/14/2022 12:20	WG1802108
Hexachlorobenzene	U		0.0137	0.386	1	01/14/2022 12:20	WG1802108
Hexachloro-1,3-butadiene	U		0.0130	0.386	1	01/14/2022 12:20	WG1802108
Hexachlorocyclopentadiene	U		0.0203	0.386	1	01/14/2022 12:20	WG1802108
Hexachloroethane	U		0.0152	0.386	1	01/14/2022 12:20	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0109	0.0386	1	01/14/2022 12:20	WG1802108
Isophorone	U		0.0118	0.386	1	01/14/2022 12:20	WG1802108
Naphthalene	U		0.00969	0.0386	1	01/14/2022 12:20	WG1802108
Nitrobenzene	U		0.0134	0.386	1	01/14/2022 12:20	WG1802108
n-Nitrosodimethylamine	U		0.0573	0.386	1	01/14/2022 12:20	WG1802108
n-Nitrosodiphenylamine	U		0.0292	0.386	1	01/14/2022 12:20	WG1802108
n-Nitrosodi-n-propylamine	U		0.0129	0.386	1	01/14/2022 12:20	WG1802108
Phenanthrene	U		0.00766	0.0386	1	01/14/2022 12:20	WG1802108
Benzylbutyl phthalate	U		0.0121	0.386	1	01/14/2022 12:20	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0489	0.386	1	01/14/2022 12:20	WG1802108
Di-n-butyl phthalate	U		0.0132	0.386	1	01/14/2022 12:20	WG1802108
Diethyl phthalate	U		0.0127	0.386	1	01/14/2022 12:20	WG1802108
Dimethyl phthalate	U		0.0818	0.386	1	01/14/2022 12:20	WG1802108
Di-n-octyl phthalate	U		0.0261	0.386	1	01/14/2022 12:20	WG1802108
Pyrene	U		0.00751	0.0386	1	01/14/2022 12:20	WG1802108
1,2,4-Trichlorobenzene	U		0.0121	0.386	1	01/14/2022 12:20	WG1802108
4-Chloro-3-methylphenol	U		0.0125	0.386	1	01/14/2022 12:20	WG1802108
2-Chlorophenol	U		0.0127	0.386	1	01/14/2022 12:20	WG1802108
2,4-Dichlorophenol	U		0.0112	0.386	1	01/14/2022 12:20	WG1802108
2,4-Dimethylphenol	U		0.0101	0.386	1	01/14/2022 12:20	WG1802108
4,6-Dinitro-2-methylphenol	U		0.0875	0.386	1	01/14/2022 12:20	WG1802108
2,4-Dinitrophenol	U		0.0903	0.386	1	01/14/2022 12:20	WG1802108
2-Nitrophenol	U		0.0138	0.386	1	01/14/2022 12:20	WG1802108

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0121	0.386	1	01/14/2022 12:20	WG1802108
Pentachlorophenol	U		0.0104	0.386	1	01/14/2022 12:20	WG1802108
Phenol	U		0.0155	0.386	1	01/14/2022 12:20	WG1802108
2,4,6-Trichlorophenol	U		0.0124	0.386	1	01/14/2022 12:20	WG1802108
(S) 2-Fluorophenol	*72.6*			*12.0-120*		*01/14/2022 12:20*	WG1802108
(S) Phenol-d5	*61.8*			*10.0-120*		*01/14/2022 12:20*	WG1802108
(S) Nitrobenzene-d5	*51.9*			*10.0-122*		*01/14/2022 12:20*	WG1802108
(S) 2-Fluorobiphenyl	*59.1*			*15.0-120*		*01/14/2022 12:20*	WG1802108
(S) 2,4,6-Tribromophenol	*70.9*			*10.0-127*		*01/14/2022 12:20*	WG1802108
(S) p-Terphenyl-d14	*65.4*			*10.0-120*		*01/14/2022 12:20*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	87.0		1	01/15/2022 10:36	WG1802129

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0207	0.0460	1	01/17/2022 11:53	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.79	J	0.595	2.30	1	01/27/2022 01:07	WG1802801
Barium	26.2		0.0979	0.575	1	01/27/2022 01:07	WG1802801
Cadmium	U		0.0541	0.575	1	01/27/2022 01:07	WG1802801
Chromium	3.53		0.153	1.15	1	01/27/2022 01:07	WG1802801
Lead	2.24		0.239	0.575	1	01/27/2022 01:07	WG1802801
Selenium	U		0.878	2.30	1	01/27/2022 01:07	WG1802801
Silver	U		0.146	1.15	1	01/27/2022 01:07	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0572	0.0783	1	01/15/2022 02:35	WG1802670
Acrylonitrile	U		0.00566	0.0196	1	01/15/2022 02:35	WG1802670
Benzene	U		0.000732	0.00157	1	01/15/2022 02:35	WG1802670
Bromobenzene	U		0.00141	0.0196	1	01/15/2022 02:35	WG1802670
Bromodichloromethane	U		0.00114	0.00392	1	01/15/2022 02:35	WG1802670
Bromoform	U		0.00183	0.0392	1	01/15/2022 02:35	WG1802670
Bromomethane	U		0.00309	0.0196	1	01/15/2022 02:35	WG1802670
n-Butylbenzene	U		0.00823	0.0196	1	01/15/2022 02:35	WG1802670
sec-Butylbenzene	U		0.00451	0.0196	1	01/15/2022 02:35	WG1802670
tert-Butylbenzene	U		0.00306	0.00783	1	01/15/2022 02:35	WG1802670
Carbon tetrachloride	U		0.00141	0.00783	1	01/15/2022 02:35	WG1802670
Chlorobenzene	U		0.000329	0.00392	1	01/15/2022 02:35	WG1802670
Chlorodibromomethane	U	J4	0.000959	0.00392	1	01/15/2022 02:35	WG1802670
Chloroethane	U		0.00266	0.00783	1	01/15/2022 02:35	WG1802670
Chloroform	U		0.00161	0.00392	1	01/15/2022 02:35	WG1802670
Chloromethane	U		0.00682	0.0196	1	01/15/2022 02:35	WG1802670
2-Chlorotoluene	U		0.00136	0.00392	1	01/15/2022 02:35	WG1802670
4-Chlorotoluene	U		0.000705	0.00783	1	01/15/2022 02:35	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00611	0.0392	1	01/15/2022 02:35	WG1802670
1,2-Dibromoethane	U		0.00102	0.00392	1	01/15/2022 02:35	WG1802670
Dibromomethane	U		0.00118	0.00783	1	01/15/2022 02:35	WG1802670
1,2-Dichlorobenzene	U		0.000666	0.00783	1	01/15/2022 02:35	WG1802670
1,3-Dichlorobenzene	U		0.000940	0.00783	1	01/15/2022 02:35	WG1802670
1,4-Dichlorobenzene	U		0.00110	0.00783	1	01/15/2022 02:35	WG1802670
Dichlorodifluoromethane	U		0.00252	0.00392	1	01/15/2022 02:35	WG1802670
1,1-Dichloroethane	U		0.000769	0.00392	1	01/15/2022 02:35	WG1802670
1,2-Dichloroethane	U		0.00102	0.00392	1	01/15/2022 02:35	WG1802670
1,1-Dichloroethene	U		0.000949	0.00392	1	01/15/2022 02:35	WG1802670
cis-1,2-Dichloroethene	U		0.00115	0.00392	1	01/15/2022 02:35	WG1802670
trans-1,2-Dichloroethene	U		0.00163	0.00783	1	01/15/2022 02:35	WG1802670
1,2-Dichloropropane	U		0.00222	0.00783	1	01/15/2022 02:35	WG1802670
1,1-Dichloropropene	U		0.00127	0.00392	1	01/15/2022 02:35	WG1802670
1,3-Dichloropropane	U		0.000785	0.00783	1	01/15/2022 02:35	WG1802670

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00119	0.00392	1	01/15/2022 02:35	WG1802670
trans-1,3-Dichloropropene	U		0.00179	0.00783	1	01/15/2022 02:35	WG1802670
2,2-Dichloropropane	U		0.00216	0.00392	1	01/15/2022 02:35	WG1802670
Di-isopropyl ether	U		0.000642	0.00157	1	01/15/2022 02:35	WG1802670
Ethylbenzene	U		0.00115	0.00392	1	01/15/2022 02:35	WG1802670
Hexachloro-1,3-Butadiene	U		0.00940	0.0392	1	01/15/2022 02:35	WG1802670
Isopropylbenzene	U		0.000666	0.00392	1	01/15/2022 02:35	WG1802670
p-Isopropyltoluene	U		0.00400	0.00783	1	01/15/2022 02:35	WG1802670
2-Butanone (MEK)	U		0.0995	0.157	1	01/15/2022 02:35	WG1802670
Methylene Chloride	U		0.0104	0.0392	1	01/15/2022 02:35	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00357	0.0392	1	01/15/2022 02:35	WG1802670
Methyl tert-butyl ether	U		0.000548	0.00157	1	01/15/2022 02:35	WG1802670
Naphthalene	U		0.00765	0.0196	1	01/15/2022 02:35	WG1802670
n-Propylbenzene	U		0.00149	0.00783	1	01/15/2022 02:35	WG1802670
Styrene	U		0.000359	0.0196	1	01/15/2022 02:35	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00149	0.00392	1	01/15/2022 02:35	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00109	0.00392	1	01/15/2022 02:35	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00118	0.00392	1	01/15/2022 02:35	WG1802670
Tetrachloroethene	U		0.00140	0.00392	1	01/15/2022 02:35	WG1802670
Toluene	0.0143		0.00204	0.00783	1	01/15/2022 02:35	WG1802670
1,2,3-Trichlorobenzene	U		0.0115	0.0196	1	01/15/2022 02:35	WG1802670
1,2,4-Trichlorobenzene	U		0.00689	0.0196	1	01/15/2022 02:35	WG1802670
1,1,1-Trichloroethane	U		0.00145	0.00392	1	01/15/2022 02:35	WG1802670
1,1,2-Trichloroethane	U		0.000935	0.00392	1	01/15/2022 02:35	WG1802670
Trichloroethene	U		0.000915	0.00157	1	01/15/2022 02:35	WG1802670
Trichlorofluoromethane	U		0.00130	0.00392	1	01/15/2022 02:35	WG1802670
1,2,3-Trichloropropane	U		0.00254	0.0196	1	01/15/2022 02:35	WG1802670
1,2,4-Trimethylbenzene	U		0.00248	0.00783	1	01/15/2022 02:35	WG1802670
1,2,3-Trimethylbenzene	U		0.00248	0.00783	1	01/15/2022 02:35	WG1802670
1,3,5-Trimethylbenzene	U		0.00313	0.00783	1	01/15/2022 02:35	WG1802670
Vinyl chloride	U		0.00182	0.00392	1	01/15/2022 02:35	WG1802670
Xylenes, Total	0.00526	J	0.00138	0.0102	1	01/15/2022 02:35	WG1802670
(S) Toluene-d8	*109*			*75.0-131*		*01/15/2022 02:35*	WG1802670
(S) 4-Bromofluorobenzene	*98.4*			*67.0-138*		*01/15/2022 02:35*	WG1802670
(S) 1,2-Dichloroethane-d4	*93.6*			*70.0-130*		*01/15/2022 02:35*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		17.2	57.5	1	01/20/2022 12:40	WG1802568
TPH C12 - C28	U		17.2	57.5	1	01/20/2022 12:40	WG1802568
TPH C28 - C35	U		17.2	57.5	1	01/20/2022 12:40	WG1802568
TPH C6 - C35	U		17.2	57.5	1	01/20/2022 12:40	WG1802568
(S) o-Terphenyl	*101*			*70.0-130*		*01/20/2022 12:40*	WG1802568
(S) 1-chlorooctane	*109*			*70.0-130*		*01/20/2022 12:40*	WG1802568

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0136	0.0391	1	01/21/2022 00:15	WG1802625
PCB 1221	U		0.0136	0.0391	1	01/21/2022 00:15	WG1802625
PCB 1232	U		0.0136	0.0391	1	01/21/2022 00:15	WG1802625
PCB 1242	U		0.0136	0.0391	1	01/21/2022 00:15	WG1802625
PCB 1248	U		0.00848	0.0195	1	01/21/2022 00:15	WG1802625
PCB 1254	U		0.00848	0.0195	1	01/21/2022 00:15	WG1802625

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00848	0.0195	1	01/21/2022 00:15	WG1802625
(S) Decachlorobiphenyl	*72.2*			*10.0-135*		*01/21/2022 00:15*	WG1802625
(S) Tetrachloro-m-xylene	*75.1*			*10.0-139*		*01/21/2022 00:15*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00619	0.0383	1	01/14/2022 13:22	WG1802108
Acenaphthylene	U		0.00539	0.0383	1	01/14/2022 13:22	WG1802108
Anthracene	U		0.00681	0.0383	1	01/14/2022 13:22	WG1802108
Benzidine	U		0.0719	1.92	1	01/14/2022 13:22	WG1802108
Benzo(a)anthracene	U		0.00675	0.0383	1	01/14/2022 13:22	WG1802108
Benzo(b)fluoranthene	U		0.00714	0.0383	1	01/14/2022 13:22	WG1802108
Benzo(k)fluoranthene	U		0.00680	0.0383	1	01/14/2022 13:22	WG1802108
Benzo(g,h,i)perylene	U		0.00700	0.0383	1	01/14/2022 13:22	WG1802108
Benzo(a)pyrene	U		0.00711	0.0383	1	01/14/2022 13:22	WG1802108
Bis(2-chlorethoxy)methane	U		0.0115	0.383	1	01/14/2022 13:22	WG1802108
Bis(2-chloroethyl)ether	U		0.0126	0.383	1	01/14/2022 13:22	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0165	0.383	1	01/14/2022 13:22	WG1802108
4-Bromophenyl-phenylether	U		0.0134	0.383	1	01/14/2022 13:22	WG1802108
2-Chloronaphthalene	U		0.00672	0.0383	1	01/14/2022 13:22	WG1802108
4-Chlorophenyl-phenylether	U		0.0133	0.383	1	01/14/2022 13:22	WG1802108
Chrysene	U		0.00761	0.0383	1	01/14/2022 13:22	WG1802108
Dibenz(a,h)anthracene	U		0.0106	0.0383	1	01/14/2022 13:22	WG1802108
3,3-Dichlorobenzidine	U		0.0141	0.383	1	01/14/2022 13:22	WG1802108
2,4-Dinitrotoluene	U		0.0110	0.383	1	01/14/2022 13:22	WG1802108
2,6-Dinitrotoluene	U		0.0125	0.383	1	01/14/2022 13:22	WG1802108
Fluoranthene	U		0.00691	0.0383	1	01/14/2022 13:22	WG1802108
Fluorene	U		0.00623	0.0383	1	01/14/2022 13:22	WG1802108
Hexachlorobenzene	U		0.0136	0.383	1	01/14/2022 13:22	WG1802108
Hexachloro-1,3-butadiene	U		0.0129	0.383	1	01/14/2022 13:22	WG1802108
Hexachlorocyclopentadiene	U		0.0201	0.383	1	01/14/2022 13:22	WG1802108
Hexachloroethane	U		0.0151	0.383	1	01/14/2022 13:22	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0108	0.0383	1	01/14/2022 13:22	WG1802108
Isophorone	U		0.0117	0.383	1	01/14/2022 13:22	WG1802108
Naphthalene	U		0.00961	0.0383	1	01/14/2022 13:22	WG1802108
Nitrobenzene	U		0.0133	0.383	1	01/14/2022 13:22	WG1802108
n-Nitrosodimethylamine	U		0.0568	0.383	1	01/14/2022 13:22	WG1802108
n-Nitrosodiphenylamine	U		0.0290	0.383	1	01/14/2022 13:22	WG1802108
n-Nitrosodi-n-propylamine	U		0.0128	0.383	1	01/14/2022 13:22	WG1802108
Phenanthrene	U		0.00760	0.0383	1	01/14/2022 13:22	WG1802108
Benzylbutyl phthalate	U		0.0120	0.383	1	01/14/2022 13:22	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0485	0.383	1	01/14/2022 13:22	WG1802108
Di-n-butyl phthalate	U		0.0131	0.383	1	01/14/2022 13:22	WG1802108
Diethyl phthalate	U		0.0126	0.383	1	01/14/2022 13:22	WG1802108
Dimethyl phthalate	U		0.0811	0.383	1	01/14/2022 13:22	WG1802108
Di-n-octyl phthalate	U		0.0259	0.383	1	01/14/2022 13:22	WG1802108
Pyrene	U		0.00745	0.0383	1	01/14/2022 13:22	WG1802108
1,2,4-Trichlorobenzene	U		0.0120	0.383	1	01/14/2022 13:22	WG1802108
4-Chloro-3-methylphenol	U		0.0124	0.383	1	01/14/2022 13:22	WG1802108
2-Chlorophenol	U		0.0126	0.383	1	01/14/2022 13:22	WG1802108
2,4-Dichlorophenol	U		0.0111	0.383	1	01/14/2022 13:22	WG1802108
2,4-Dimethylphenol	U		0.0100	0.383	1	01/14/2022 13:22	WG1802108
4,6-Dinitro-2-methylphenol	U		0.0868	0.383	1	01/14/2022 13:22	WG1802108
2,4-Dinitrophenol	U		0.0895	0.383	1	01/14/2022 13:22	WG1802108
2-Nitrophenol	U		0.0137	0.383	1	01/14/2022 13:22	WG1802108

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0120	0.383	1	01/14/2022 13:22	WG1802108
Pentachlorophenol	U		0.0103	0.383	1	01/14/2022 13:22	WG1802108
Phenol	U		0.0154	0.383	1	01/14/2022 13:22	WG1802108
2,4,6-Trichlorophenol	U		0.0123	0.383	1	01/14/2022 13:22	WG1802108
(S) 2-Fluorophenol	*69.0*			*12.0-120*		*01/14/2022 13:22*	WG1802108
(S) Phenol-d5	*59.4*			*10.0-120*		*01/14/2022 13:22*	WG1802108
(S) Nitrobenzene-d5	*53.5*			*10.0-122*		*01/14/2022 13:22*	WG1802108
(S) 2-Fluorobiphenyl	*56.2*			*15.0-120*		*01/14/2022 13:22*	WG1802108
(S) 2,4,6-Tribromophenol	*60.7*			*10.0-127*		*01/14/2022 13:22*	WG1802108
(S) p-Terphenyl-d14	*65.9*			*10.0-120*		*01/14/2022 13:22*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	68.3		1	01/15/2022 10:36	WG1802129

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0264	0.0586	1	01/17/2022 11:55	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.97		0.758	2.93	1	01/27/2022 01:10	WG1802801
Barium	107		0.125	0.732	1	01/27/2022 01:10	WG1802801
Cadmium	0.390	J	0.0690	0.732	1	01/27/2022 01:10	WG1802801
Chromium	18.6		0.195	1.46	1	01/27/2022 01:10	WG1802801
Lead	10.6		0.305	0.732	1	01/27/2022 01:10	WG1802801
Selenium	U		1.12	2.93	1	01/27/2022 01:10	WG1802801
Silver	U		0.186	1.46	1	01/27/2022 01:10	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0752	0.103	1	01/15/2022 02:54	WG1802670
Acrylonitrile	U		0.00744	0.0257	1	01/15/2022 02:54	WG1802670
Benzene	U		0.000962	0.00206	1	01/15/2022 02:54	WG1802670
Bromobenzene	U		0.00185	0.0257	1	01/15/2022 02:54	WG1802670
Bromodichloromethane	U		0.00149	0.00515	1	01/15/2022 02:54	WG1802670
Bromoform	U		0.00241	0.0515	1	01/15/2022 02:54	WG1802670
Bromomethane	U		0.00406	0.0257	1	01/15/2022 02:54	WG1802670
n-Butylbenzene	U		0.0108	0.0257	1	01/15/2022 02:54	WG1802670
sec-Butylbenzene	U		0.00593	0.0257	1	01/15/2022 02:54	WG1802670
tert-Butylbenzene	U		0.00402	0.0103	1	01/15/2022 02:54	WG1802670
Carbon tetrachloride	U		0.00185	0.0103	1	01/15/2022 02:54	WG1802670
Chlorobenzene	U		0.000433	0.00515	1	01/15/2022 02:54	WG1802670
Chlorodibromomethane	U	J4	0.00126	0.00515	1	01/15/2022 02:54	WG1802670
Chloroethane	U		0.00350	0.0103	1	01/15/2022 02:54	WG1802670
Chloroform	U		0.00212	0.00515	1	01/15/2022 02:54	WG1802670
Chloromethane	U		0.00896	0.0257	1	01/15/2022 02:54	WG1802670
2-Chlorotoluene	U		0.00178	0.00515	1	01/15/2022 02:54	WG1802670
4-Chlorotoluene	U		0.000927	0.0103	1	01/15/2022 02:54	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00803	0.0515	1	01/15/2022 02:54	WG1802670
1,2-Dibromoethane	U		0.00133	0.00515	1	01/15/2022 02:54	WG1802670
Dibromomethane	U		0.00154	0.0103	1	01/15/2022 02:54	WG1802670
1,2-Dichlorobenzene	U		0.000875	0.0103	1	01/15/2022 02:54	WG1802670
1,3-Dichlorobenzene	U		0.00124	0.0103	1	01/15/2022 02:54	WG1802670
1,4-Dichlorobenzene	U		0.00144	0.0103	1	01/15/2022 02:54	WG1802670
Dichlorodifluoromethane	U		0.00332	0.00515	1	01/15/2022 02:54	WG1802670
1,1-Dichloroethane	U		0.00101	0.00515	1	01/15/2022 02:54	WG1802670
1,2-Dichloroethane	U		0.00134	0.00515	1	01/15/2022 02:54	WG1802670
1,1-Dichloroethene	U		0.00125	0.00515	1	01/15/2022 02:54	WG1802670
cis-1,2-Dichloroethene	U		0.00151	0.00515	1	01/15/2022 02:54	WG1802670
trans-1,2-Dichloroethene	U		0.00214	0.0103	1	01/15/2022 02:54	WG1802670
1,2-Dichloropropane	U		0.00293	0.0103	1	01/15/2022 02:54	WG1802670
1,1-Dichloropropene	U		0.00167	0.00515	1	01/15/2022 02:54	WG1802670
1,3-Dichloropropane	U		0.00103	0.0103	1	01/15/2022 02:54	WG1802670

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00156	0.00515	1	01/15/2022 02:54	WG1802670
trans-1,3-Dichloropropene	U		0.00235	0.0103	1	01/15/2022 02:54	WG1802670
2,2-Dichloropropane	U		0.00284	0.00515	1	01/15/2022 02:54	WG1802670
Di-isopropyl ether	U		0.000845	0.00206	1	01/15/2022 02:54	WG1802670
Ethylbenzene	U		0.00152	0.00515	1	01/15/2022 02:54	WG1802670
Hexachloro-1,3-Butadiene	U		0.0124	0.0515	1	01/15/2022 02:54	WG1802670
Isopropylbenzene	U		0.000875	0.00515	1	01/15/2022 02:54	WG1802670
p-Isopropyltoluene	U		0.00525	0.0103	1	01/15/2022 02:54	WG1802670
2-Butanone (MEK)	U		0.131	0.206	1	01/15/2022 02:54	WG1802670
Methylene Chloride	U		0.0137	0.0515	1	01/15/2022 02:54	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00470	0.0515	1	01/15/2022 02:54	WG1802670
Methyl tert-butyl ether	U		0.000721	0.00206	1	01/15/2022 02:54	WG1802670
Naphthalene	U		0.0101	0.0257	1	01/15/2022 02:54	WG1802670
n-Propylbenzene	U		0.00196	0.0103	1	01/15/2022 02:54	WG1802670
Styrene	U		0.000472	0.0257	1	01/15/2022 02:54	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00195	0.00515	1	01/15/2022 02:54	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00143	0.00515	1	01/15/2022 02:54	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00155	0.00515	1	01/15/2022 02:54	WG1802670
Tetrachloroethene	U		0.00185	0.00515	1	01/15/2022 02:54	WG1802670
Toluene	0.0164		0.00268	0.0103	1	01/15/2022 02:54	WG1802670
1,2,3-Trichlorobenzene	U		0.0151	0.0257	1	01/15/2022 02:54	WG1802670
1,2,4-Trichlorobenzene	U		0.00906	0.0257	1	01/15/2022 02:54	WG1802670
1,1,1-Trichloroethane	U		0.00190	0.00515	1	01/15/2022 02:54	WG1802670
1,1,2-Trichloroethane	U		0.00123	0.00515	1	01/15/2022 02:54	WG1802670
Trichloroethene	U		0.00120	0.00206	1	01/15/2022 02:54	WG1802670
Trichlorofluoromethane	U		0.00170	0.00515	1	01/15/2022 02:54	WG1802670
1,2,3-Trichloropropane	U		0.00334	0.0257	1	01/15/2022 02:54	WG1802670
1,2,4-Trimethylbenzene	U		0.00325	0.0103	1	01/15/2022 02:54	WG1802670
1,2,3-Trimethylbenzene	U		0.00325	0.0103	1	01/15/2022 02:54	WG1802670
1,3,5-Trimethylbenzene	U		0.00412	0.0103	1	01/15/2022 02:54	WG1802670
Vinyl chloride	U		0.00239	0.00515	1	01/15/2022 02:54	WG1802670
Xylenes, Total	U		0.00181	0.0134	1	01/15/2022 02:54	WG1802670
(S) Toluene-d8	*112*			*75.0-131*		*01/15/2022 02:54*	WG1802670
(S) 4-Bromofluorobenzene	*99.5*			*67.0-138*		*01/15/2022 02:54*	WG1802670
(S) 1,2-Dichloroethane-d4	*90.5*			*70.0-130*		*01/15/2022 02:54*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		22.0	73.2	1	01/16/2022 13:25	WG1802568
TPH C12 - C28	U		22.0	73.2	1	01/16/2022 13:25	WG1802568
TPH C28 - C35	U		22.0	73.2	1	01/16/2022 13:25	WG1802568
TPH C6 - C35	U		22.0	73.2	1	01/16/2022 13:25	WG1802568
(S) o-Terphenyl	*105*			*70.0-130*		*01/16/2022 13:25*	WG1802568
(S) 1-chlorooctane	*120*			*70.0-130*		*01/16/2022 13:25*	WG1802568

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0173	0.0498	1	01/19/2022 23:14	WG1802625
PCB 1221	U		0.0173	0.0498	1	01/19/2022 23:14	WG1802625
PCB 1232	U		0.0173	0.0498	1	01/19/2022 23:14	WG1802625
PCB 1242	U		0.0173	0.0498	1	01/19/2022 23:14	WG1802625
PCB 1248	U		0.0108	0.0249	1	01/19/2022 23:14	WG1802625
PCB 1254	U		0.0108	0.0249	1	01/19/2022 23:14	WG1802625

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.0108	0.0249	1	01/19/2022 23:14	WG1802625
(S) Decachlorobiphenyl	*49.2*			*10.0-135*		*01/19/2022 23:14*	WG1802625
(S) Tetrachloro-m-xylene	*54.6*			*10.0-139*		*01/19/2022 23:14*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00789	0.0488	1	01/14/2022 14:45	WG1802108
Acenaphthylene	U		0.00687	0.0488	1	01/14/2022 14:45	WG1802108
Anthracene	U		0.00868	0.0488	1	01/14/2022 14:45	WG1802108
Benzidine	U		0.0917	2.45	1	01/14/2022 14:45	WG1802108
Benzo(a)anthracene	U		0.00860	0.0488	1	01/14/2022 14:45	WG1802108
Benzo(b)fluoranthene	U		0.00909	0.0488	1	01/14/2022 14:45	WG1802108
Benzo(k)fluoranthene	U		0.00867	0.0488	1	01/14/2022 14:45	WG1802108
Benzo(g,h,i)perylene	U		0.00892	0.0488	1	01/14/2022 14:45	WG1802108
Benzo(a)pyrene	U		0.00906	0.0488	1	01/14/2022 14:45	WG1802108
Bis(2-chlorethoxy)methane	U		0.0146	0.488	1	01/14/2022 14:45	WG1802108
Bis(2-chloroethyl)ether	U		0.0161	0.488	1	01/14/2022 14:45	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0211	0.488	1	01/14/2022 14:45	WG1802108
4-Bromophenyl-phenylether	U		0.0171	0.488	1	01/14/2022 14:45	WG1802108
2-Chloronaphthalene	U		0.00857	0.0488	1	01/14/2022 14:45	WG1802108
4-Chlorophenyl-phenylether	U		0.0170	0.488	1	01/14/2022 14:45	WG1802108
Chrysene	U		0.00969	0.0488	1	01/14/2022 14:45	WG1802108
Dibenz(a,h)anthracene	U		0.0135	0.0488	1	01/14/2022 14:45	WG1802108
3,3-Dichlorobenzidine	U		0.0180	0.488	1	01/14/2022 14:45	WG1802108
2,4-Dinitrotoluene	U		0.0140	0.488	1	01/14/2022 14:45	WG1802108
2,6-Dinitrotoluene	U		0.0160	0.488	1	01/14/2022 14:45	WG1802108
Fluoranthene	U		0.00880	0.0488	1	01/14/2022 14:45	WG1802108
Fluorene	U		0.00794	0.0488	1	01/14/2022 14:45	WG1802108
Hexachlorobenzene	U		0.0173	0.488	1	01/14/2022 14:45	WG1802108
Hexachloro-1,3-butadiene	U		0.0164	0.488	1	01/14/2022 14:45	WG1802108
Hexachlorocyclopentadiene	U		0.0256	0.488	1	01/14/2022 14:45	WG1802108
Hexachloroethane	U		0.0192	0.488	1	01/14/2022 14:45	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0138	0.0488	1	01/14/2022 14:45	WG1802108
Isophorone	U		0.0149	0.488	1	01/14/2022 14:45	WG1802108
Naphthalene	U		0.0122	0.0488	1	01/14/2022 14:45	WG1802108
Nitrobenzene	U		0.0170	0.488	1	01/14/2022 14:45	WG1802108
n-Nitrosodimethylamine	U		0.0723	0.488	1	01/14/2022 14:45	WG1802108
n-Nitrosodiphenylamine	U		0.0369	0.488	1	01/14/2022 14:45	WG1802108
n-Nitrosodi-n-propylamine	U		0.0163	0.488	1	01/14/2022 14:45	WG1802108
Phenanthrene	U		0.00968	0.0488	1	01/14/2022 14:45	WG1802108
Benzylbutyl phthalate	U		0.0152	0.488	1	01/14/2022 14:45	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0618	0.488	1	01/14/2022 14:45	WG1802108
Di-n-butyl phthalate	U		0.0167	0.488	1	01/14/2022 14:45	WG1802108
Diethyl phthalate	U		0.0161	0.488	1	01/14/2022 14:45	WG1802108
Dimethyl phthalate	U		0.103	0.488	1	01/14/2022 14:45	WG1802108
Di-n-octyl phthalate	U		0.0329	0.488	1	01/14/2022 14:45	WG1802108
Pyrene	U		0.00949	0.0488	1	01/14/2022 14:45	WG1802108
1,2,4-Trichlorobenzene	U		0.0152	0.488	1	01/14/2022 14:45	WG1802108
4-Chloro-3-methylphenol	U		0.0158	0.488	1	01/14/2022 14:45	WG1802108
2-Chlorophenol	U		0.0161	0.488	1	01/14/2022 14:45	WG1802108
2,4-Dichlorophenol	U		0.0142	0.488	1	01/14/2022 14:45	WG1802108
2,4-Dimethylphenol	U		0.0127	0.488	1	01/14/2022 14:45	WG1802108
4,6-Dinitro-2-methylphenol	U		0.111	0.488	1	01/14/2022 14:45	WG1802108
2,4-Dinitrophenol	U		0.114	0.488	1	01/14/2022 14:45	WG1802108
2-Nitrophenol	U		0.0174	0.488	1	01/14/2022 14:45	WG1802108

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0152	0.488	1	01/14/2022 14:45	WG1802108
Pentachlorophenol	U		0.0131	0.488	1	01/14/2022 14:45	WG1802108
Phenol	U		0.0196	0.488	1	01/14/2022 14:45	WG1802108
2,4,6-Trichlorophenol	U		0.0157	0.488	1	01/14/2022 14:45	WG1802108
(S) 2-Fluorophenol	*64.7*			*12.0-120*		*01/14/2022 14:45*	WG1802108
(S) Phenol-d5	*58.4*			*10.0-120*		*01/14/2022 14:45*	WG1802108
(S) Nitrobenzene-d5	*49.4*			*10.0-122*		*01/14/2022 14:45*	WG1802108
(S) 2-Fluorobiphenyl	*55.2*			*15.0-120*		*01/14/2022 14:45*	WG1802108
(S) 2,4,6-Tribromophenol	*64.1*			*10.0-127*		*01/14/2022 14:45*	WG1802108
(S) p-Terphenyl-d14	*60.1*			*10.0-120*		*01/14/2022 14:45*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	77.9		1	01/15/2022 10:36	WG1802129

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0231	0.0514	1	01/17/2022 11:57	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.87	J	0.665	2.57	1	01/27/2022 01:13	WG1802801
Barium	91.0		0.109	0.642	1	01/27/2022 01:13	WG1802801
Cadmium	0.230	J	0.0605	0.642	1	01/27/2022 01:13	WG1802801
Chromium	10.5		0.171	1.28	1	01/27/2022 01:13	WG1802801
Lead	7.62		0.267	0.642	1	01/27/2022 01:13	WG1802801
Selenium	1.16	J	0.981	2.57	1	01/27/2022 01:13	WG1802801
Silver	0.338	J	0.163	1.28	1	01/27/2022 01:13	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0654	0.0896	1	01/15/2022 03:14	WG1802670
Acrylonitrile	U		0.00647	0.0224	1	01/15/2022 03:14	WG1802670
Benzene	U		0.000836	0.00179	1	01/15/2022 03:14	WG1802670
Bromobenzene	U		0.00161	0.0224	1	01/15/2022 03:14	WG1802670
Bromodichloromethane	U		0.00130	0.00448	1	01/15/2022 03:14	WG1802670
Bromoform	U		0.00210	0.0448	1	01/15/2022 03:14	WG1802670
Bromomethane	U		0.00353	0.0224	1	01/15/2022 03:14	WG1802670
n-Butylbenzene	U		0.00940	0.0224	1	01/15/2022 03:14	WG1802670
sec-Butylbenzene	U		0.00516	0.0224	1	01/15/2022 03:14	WG1802670
tert-Butylbenzene	U		0.00349	0.00896	1	01/15/2022 03:14	WG1802670
Carbon tetrachloride	U		0.00161	0.00896	1	01/15/2022 03:14	WG1802670
Chlorobenzene	U		0.000376	0.00448	1	01/15/2022 03:14	WG1802670
Chlorodibromomethane	U	J4	0.00110	0.00448	1	01/15/2022 03:14	WG1802670
Chloroethane	U		0.00304	0.00896	1	01/15/2022 03:14	WG1802670
Chloroform	U		0.00184	0.00448	1	01/15/2022 03:14	WG1802670
Chloromethane	U		0.00779	0.0224	1	01/15/2022 03:14	WG1802670
2-Chlorotoluene	U		0.00155	0.00448	1	01/15/2022 03:14	WG1802670
4-Chlorotoluene	U		0.000806	0.00896	1	01/15/2022 03:14	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00699	0.0448	1	01/15/2022 03:14	WG1802670
1,2-Dibromoethane	U		0.00116	0.00448	1	01/15/2022 03:14	WG1802670
Dibromomethane	U		0.00134	0.00896	1	01/15/2022 03:14	WG1802670
1,2-Dichlorobenzene	U		0.000761	0.00896	1	01/15/2022 03:14	WG1802670
1,3-Dichlorobenzene	U		0.00107	0.00896	1	01/15/2022 03:14	WG1802670
1,4-Dichlorobenzene	U		0.00125	0.00896	1	01/15/2022 03:14	WG1802670
Dichlorodifluoromethane	U		0.00288	0.00448	1	01/15/2022 03:14	WG1802670
1,1-Dichloroethane	U		0.000879	0.00448	1	01/15/2022 03:14	WG1802670
1,2-Dichloroethane	U		0.00116	0.00448	1	01/15/2022 03:14	WG1802670
1,1-Dichloroethene	U		0.00109	0.00448	1	01/15/2022 03:14	WG1802670
cis-1,2-Dichloroethene	U		0.00131	0.00448	1	01/15/2022 03:14	WG1802670
trans-1,2-Dichloroethene	U		0.00186	0.00896	1	01/15/2022 03:14	WG1802670
1,2-Dichloropropane	U		0.00254	0.00896	1	01/15/2022 03:14	WG1802670
1,1-Dichloropropene	U		0.00145	0.00448	1	01/15/2022 03:14	WG1802670
1,3-Dichloropropane	U		0.000897	0.00896	1	01/15/2022 03:14	WG1802670

Cp Tc Ss Cn Sr Qc Gl Al Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00136	0.00448	1	01/15/2022 03:14	WG1802670
trans-1,3-Dichloropropene	U		0.00204	0.00896	1	01/15/2022 03:14	WG1802670
2,2-Dichloropropane	U		0.00247	0.00448	1	01/15/2022 03:14	WG1802670
Di-isopropyl ether	U		0.000734	0.00179	1	01/15/2022 03:14	WG1802670
Ethylbenzene	U		0.00132	0.00448	1	01/15/2022 03:14	WG1802670
Hexachloro-1,3-Butadiene	U		0.0107	0.0448	1	01/15/2022 03:14	WG1802670
Isopropylbenzene	U		0.000761	0.00448	1	01/15/2022 03:14	WG1802670
p-Isopropyltoluene	U		0.00457	0.00896	1	01/15/2022 03:14	WG1802670
2-Butanone (MEK)	U		0.114	0.179	1	01/15/2022 03:14	WG1802670
Methylene Chloride	U		0.0119	0.0448	1	01/15/2022 03:14	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00408	0.0448	1	01/15/2022 03:14	WG1802670
Methyl tert-butyl ether	U		0.000627	0.00179	1	01/15/2022 03:14	WG1802670
Naphthalene	U		0.00874	0.0224	1	01/15/2022 03:14	WG1802670
n-Propylbenzene	U		0.00170	0.00896	1	01/15/2022 03:14	WG1802670
Styrene	U		0.000410	0.0224	1	01/15/2022 03:14	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00170	0.00448	1	01/15/2022 03:14	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00124	0.00448	1	01/15/2022 03:14	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00135	0.00448	1	01/15/2022 03:14	WG1802670
Tetrachloroethene	U		0.00160	0.00448	1	01/15/2022 03:14	WG1802670
Toluene	U		0.00233	0.00896	1	01/15/2022 03:14	WG1802670
1,2,3-Trichlorobenzene	U		0.0131	0.0224	1	01/15/2022 03:14	WG1802670
1,2,4-Trichlorobenzene	U		0.00788	0.0224	1	01/15/2022 03:14	WG1802670
1,1,1-Trichloroethane	U		0.00165	0.00448	1	01/15/2022 03:14	WG1802670
1,1,2-Trichloroethane	U		0.00107	0.00448	1	01/15/2022 03:14	WG1802670
Trichloroethene	U		0.00105	0.00179	1	01/15/2022 03:14	WG1802670
Trichlorofluoromethane	U		0.00148	0.00448	1	01/15/2022 03:14	WG1802670
1,2,3-Trichloropropane	U		0.00290	0.0224	1	01/15/2022 03:14	WG1802670
1,2,4-Trimethylbenzene	U		0.00283	0.00896	1	01/15/2022 03:14	WG1802670
1,2,3-Trimethylbenzene	U		0.00283	0.00896	1	01/15/2022 03:14	WG1802670
1,3,5-Trimethylbenzene	U		0.00358	0.00896	1	01/15/2022 03:14	WG1802670
Vinyl chloride	U		0.00208	0.00448	1	01/15/2022 03:14	WG1802670
Xylenes, Total	U		0.00158	0.0116	1	01/15/2022 03:14	WG1802670
(S) Toluene-d8	*112*			*75.0-131*		*01/15/2022 03:14*	WG1802670
(S) 4-Bromofluorobenzene	*97.4*			*67.0-138*		*01/15/2022 03:14*	WG1802670
(S) 1,2-Dichloroethane-d4	*88.9*			*70.0-130*		*01/15/2022 03:14*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		19.3	64.2	1	01/16/2022 15:51	WG1802568
TPH C12 - C28	U		19.3	64.2	1	01/16/2022 15:51	WG1802568
TPH C28 - C35	U		19.3	64.2	1	01/16/2022 15:51	WG1802568
TPH C6 - C35	U		19.3	64.2	1	01/16/2022 15:51	WG1802568
(S) o-Terphenyl	*105*			*70.0-130*		*01/16/2022 15:51*	WG1802568
(S) 1-chlorooctane	*117*			*70.0-130*		*01/16/2022 15:51*	WG1802568

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0152	0.0437	1	01/21/2022 00:24	WG1802625
PCB 1221	U		0.0152	0.0437	1	01/21/2022 00:24	WG1802625
PCB 1232	U		0.0152	0.0437	1	01/21/2022 00:24	WG1802625
PCB 1242	U		0.0152	0.0437	1	01/21/2022 00:24	WG1802625
PCB 1248	U		0.00948	0.0218	1	01/21/2022 00:24	WG1802625
PCB 1254	U		0.00948	0.0218	1	01/21/2022 00:24	WG1802625

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00948	0.0218	1	01/21/2022 00:24	WG1802625
(S) Decachlorobiphenyl	*43.1*			*10.0-135*		*01/21/2022 00:24*	WG1802625
(S) Tetrachloro-m-xylene	*38.2*			*10.0-139*		*01/21/2022 00:24*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00692	0.0428	1	01/14/2022 12:40	WG1802108
Acenaphthylene	U		0.00602	0.0428	1	01/14/2022 12:40	WG1802108
Anthracene	U		0.00762	0.0428	1	01/14/2022 12:40	WG1802108
Benzidine	U		0.0804	2.14	1	01/14/2022 12:40	WG1802108
Benzo(a)anthracene	U		0.00754	0.0428	1	01/14/2022 12:40	WG1802108
Benzo(b)fluoranthene	U		0.00798	0.0428	1	01/14/2022 12:40	WG1802108
Benzo(k)fluoranthene	U		0.00760	0.0428	1	01/14/2022 12:40	WG1802108
Benzo(g,h,i)perylene	U		0.00782	0.0428	1	01/14/2022 12:40	WG1802108
Benzo(a)pyrene	U		0.00795	0.0428	1	01/14/2022 12:40	WG1802108
Bis(2-chlorethoxy)methane	U		0.0128	0.428	1	01/14/2022 12:40	WG1802108
Bis(2-chloroethyl)ether	U		0.0141	0.428	1	01/14/2022 12:40	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0185	0.428	1	01/14/2022 12:40	WG1802108
4-Bromophenyl-phenylether	U		0.0150	0.428	1	01/14/2022 12:40	WG1802108
2-Chloronaphthalene	U		0.00751	0.0428	1	01/14/2022 12:40	WG1802108
4-Chlorophenyl-phenylether	U		0.0149	0.428	1	01/14/2022 12:40	WG1802108
Chrysene	U		0.00850	0.0428	1	01/14/2022 12:40	WG1802108
Dibenz(a,h)anthracene	U		0.0119	0.0428	1	01/14/2022 12:40	WG1802108
3,3-Dichlorobenzidine	U		0.0158	0.428	1	01/14/2022 12:40	WG1802108
2,4-Dinitrotoluene	U		0.0123	0.428	1	01/14/2022 12:40	WG1802108
2,6-Dinitrotoluene	U		0.0140	0.428	1	01/14/2022 12:40	WG1802108
Fluoranthene	U		0.00772	0.0428	1	01/14/2022 12:40	WG1802108
Fluorene	U		0.00696	0.0428	1	01/14/2022 12:40	WG1802108
Hexachlorobenzene	U		0.0152	0.428	1	01/14/2022 12:40	WG1802108
Hexachloro-1,3-butadiene	U		0.0144	0.428	1	01/14/2022 12:40	WG1802108
Hexachlorocyclopentadiene	U		0.0225	0.428	1	01/14/2022 12:40	WG1802108
Hexachloroethane	U		0.0168	0.428	1	01/14/2022 12:40	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0121	0.0428	1	01/14/2022 12:40	WG1802108
Isophorone	U		0.0131	0.428	1	01/14/2022 12:40	WG1802108
Naphthalene	U		0.0107	0.0428	1	01/14/2022 12:40	WG1802108
Nitrobenzene	U		0.0149	0.428	1	01/14/2022 12:40	WG1802108
n-Nitrosodimethylamine	U		0.0634	0.428	1	01/14/2022 12:40	WG1802108
n-Nitrosodiphenylamine	U		0.0324	0.428	1	01/14/2022 12:40	WG1802108
n-Nitrosodi-n-propylamine	U		0.0143	0.428	1	01/14/2022 12:40	WG1802108
Phenanthrene	U		0.00849	0.0428	1	01/14/2022 12:40	WG1802108
Benzylbutyl phthalate	U		0.0134	0.428	1	01/14/2022 12:40	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0542	0.428	1	01/14/2022 12:40	WG1802108
Di-n-butyl phthalate	U		0.0146	0.428	1	01/14/2022 12:40	WG1802108
Diethyl phthalate	U		0.0141	0.428	1	01/14/2022 12:40	WG1802108
Dimethyl phthalate	U		0.0907	0.428	1	01/14/2022 12:40	WG1802108
Di-n-octyl phthalate	U		0.0289	0.428	1	01/14/2022 12:40	WG1802108
Pyrene	U		0.00832	0.0428	1	01/14/2022 12:40	WG1802108
1,2,4-Trichlorobenzene	U		0.0134	0.428	1	01/14/2022 12:40	WG1802108
4-Chloro-3-methylphenol	U		0.0139	0.428	1	01/14/2022 12:40	WG1802108
2-Chlorophenol	U		0.0141	0.428	1	01/14/2022 12:40	WG1802108
2,4-Dichlorophenol	U		0.0125	0.428	1	01/14/2022 12:40	WG1802108
2,4-Dimethylphenol	U		0.0112	0.428	1	01/14/2022 12:40	WG1802108
4,6-Dinitro-2-methylphenol	U		0.0970	0.428	1	01/14/2022 12:40	WG1802108
2,4-Dinitrophenol	U		0.100	0.428	1	01/14/2022 12:40	WG1802108
2-Nitrophenol	U		0.0153	0.428	1	01/14/2022 12:40	WG1802108

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0134	0.428	1	01/14/2022 12:40	WG1802108
Pentachlorophenol	U		0.0115	0.428	1	01/14/2022 12:40	WG1802108
Phenol	U		0.0172	0.428	1	01/14/2022 12:40	WG1802108
2,4,6-Trichlorophenol	U		0.0137	0.428	1	01/14/2022 12:40	WG1802108
(S) 2-Fluorophenol	*59.3*			*12.0-120*		*01/14/2022 12:40*	WG1802108
(S) Phenol-d5	*51.1*			*10.0-120*		*01/14/2022 12:40*	WG1802108
(S) Nitrobenzene-d5	*45.7*			*10.0-122*		*01/14/2022 12:40*	WG1802108
(S) 2-Fluorobiphenyl	*48.1*			*15.0-120*		*01/14/2022 12:40*	WG1802108
(S) 2,4,6-Tribromophenol	*58.5*			*10.0-127*		*01/14/2022 12:40*	WG1802108
(S) p-Terphenyl-d14	*58.0*			*10.0-120*		*01/14/2022 12:40*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	75.2		1	01/15/2022 10:36	WG1802129

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0239	0.0532	1	01/17/2022 12:01	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.83	J	0.689	2.66	1	01/27/2022 01:16	WG1802801
Barium	105		0.113	0.665	1	01/27/2022 01:16	WG1802801
Cadmium	0.194	J	0.0626	0.665	1	01/27/2022 01:16	WG1802801
Chromium	11.7		0.177	1.33	1	01/27/2022 01:16	WG1802801
Lead	9.25		0.277	0.665	1	01/27/2022 01:16	WG1802801
Selenium	U		1.02	2.66	1	01/27/2022 01:16	WG1802801
Silver	U		0.169	1.33	1	01/27/2022 01:16	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0677	0.0928	1	01/15/2022 03:33	WG1802670
Acrylonitrile	U		0.00670	0.0232	1	01/15/2022 03:33	WG1802670
Benzene	U		0.000867	0.00186	1	01/15/2022 03:33	WG1802670
Bromobenzene	U		0.00167	0.0232	1	01/15/2022 03:33	WG1802670
Bromodichloromethane	U		0.00135	0.00464	1	01/15/2022 03:33	WG1802670
Bromoform	U		0.00217	0.0464	1	01/15/2022 03:33	WG1802670
Bromomethane	U		0.00366	0.0232	1	01/15/2022 03:33	WG1802670
n-Butylbenzene	U		0.00974	0.0232	1	01/15/2022 03:33	WG1802670
sec-Butylbenzene	U		0.00534	0.0232	1	01/15/2022 03:33	WG1802670
tert-Butylbenzene	U		0.00362	0.00928	1	01/15/2022 03:33	WG1802670
Carbon tetrachloride	U		0.00167	0.00928	1	01/15/2022 03:33	WG1802670
Chlorobenzene	U		0.000390	0.00464	1	01/15/2022 03:33	WG1802670
Chlorodibromomethane	U	J4	0.00114	0.00464	1	01/15/2022 03:33	WG1802670
Chloroethane	U		0.00315	0.00928	1	01/15/2022 03:33	WG1802670
Chloroform	U		0.00191	0.00464	1	01/15/2022 03:33	WG1802670
Chloromethane	U		0.00807	0.0232	1	01/15/2022 03:33	WG1802670
2-Chlorotoluene	U		0.00161	0.00464	1	01/15/2022 03:33	WG1802670
4-Chlorotoluene	U		0.000835	0.00928	1	01/15/2022 03:33	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00724	0.0464	1	01/15/2022 03:33	WG1802670
1,2-Dibromoethane	U		0.00120	0.00464	1	01/15/2022 03:33	WG1802670
Dibromomethane	U		0.00139	0.00928	1	01/15/2022 03:33	WG1802670
1,2-Dichlorobenzene	U		0.000789	0.00928	1	01/15/2022 03:33	WG1802670
1,3-Dichlorobenzene	U		0.00111	0.00928	1	01/15/2022 03:33	WG1802670
1,4-Dichlorobenzene	U		0.00130	0.00928	1	01/15/2022 03:33	WG1802670
Dichlorodifluoromethane	U		0.00299	0.00464	1	01/15/2022 03:33	WG1802670
1,1-Dichloroethane	U		0.000911	0.00464	1	01/15/2022 03:33	WG1802670
1,2-Dichloroethane	U		0.00120	0.00464	1	01/15/2022 03:33	WG1802670
1,1-Dichloroethene	U		0.00112	0.00464	1	01/15/2022 03:33	WG1802670
cis-1,2-Dichloroethene	U		0.00136	0.00464	1	01/15/2022 03:33	WG1802670
trans-1,2-Dichloroethene	U		0.00193	0.00928	1	01/15/2022 03:33	WG1802670
1,2-Dichloropropane	U		0.00264	0.00928	1	01/15/2022 03:33	WG1802670
1,1-Dichloropropene	U		0.00150	0.00464	1	01/15/2022 03:33	WG1802670
1,3-Dichloropropane	U		0.000930	0.00928	1	01/15/2022 03:33	WG1802670

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00140	0.00464	1	01/15/2022 03:33	WG1802670
trans-1,3-Dichloropropene	U		0.00212	0.00928	1	01/15/2022 03:33	WG1802670
2,2-Dichloropropane	U		0.00256	0.00464	1	01/15/2022 03:33	WG1802670
Di-isopropyl ether	U		0.000761	0.00186	1	01/15/2022 03:33	WG1802670
Ethylbenzene	U		0.00137	0.00464	1	01/15/2022 03:33	WG1802670
Hexachloro-1,3-Butadiene	U		0.0111	0.0464	1	01/15/2022 03:33	WG1802670
Isopropylbenzene	U		0.000789	0.00464	1	01/15/2022 03:33	WG1802670
p-Isopropyltoluene	U		0.00473	0.00928	1	01/15/2022 03:33	WG1802670
2-Butanone (MEK)	U		0.118	0.186	1	01/15/2022 03:33	WG1802670
Methylene Chloride	U		0.0123	0.0464	1	01/15/2022 03:33	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00423	0.0464	1	01/15/2022 03:33	WG1802670
Methyl tert-butyl ether	U		0.000649	0.00186	1	01/15/2022 03:33	WG1802670
Naphthalene	U		0.00906	0.0232	1	01/15/2022 03:33	WG1802670
n-Propylbenzene	U		0.00176	0.00928	1	01/15/2022 03:33	WG1802670
Styrene	U		0.000425	0.0232	1	01/15/2022 03:33	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00176	0.00464	1	01/15/2022 03:33	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00129	0.00464	1	01/15/2022 03:33	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00140	0.00464	1	01/15/2022 03:33	WG1802670
Tetrachloroethene	U		0.00166	0.00464	1	01/15/2022 03:33	WG1802670
Toluene	0.00742	J	0.00241	0.00928	1	01/15/2022 03:33	WG1802670
1,2,3-Trichlorobenzene	U		0.0136	0.0232	1	01/15/2022 03:33	WG1802670
1,2,4-Trichlorobenzene	U		0.00817	0.0232	1	01/15/2022 03:33	WG1802670
1,1,1-Trichloroethane	U		0.00171	0.00464	1	01/15/2022 03:33	WG1802670
1,1,2-Trichloroethane	U		0.00111	0.00464	1	01/15/2022 03:33	WG1802670
Trichloroethene	U		0.00108	0.00186	1	01/15/2022 03:33	WG1802670
Trichlorofluoromethane	U		0.00153	0.00464	1	01/15/2022 03:33	WG1802670
1,2,3-Trichloropropane	U		0.00301	0.0232	1	01/15/2022 03:33	WG1802670
1,2,4-Trimethylbenzene	U		0.00293	0.00928	1	01/15/2022 03:33	WG1802670
1,2,3-Trimethylbenzene	U		0.00293	0.00928	1	01/15/2022 03:33	WG1802670
1,3,5-Trimethylbenzene	U		0.00371	0.00928	1	01/15/2022 03:33	WG1802670
Vinyl chloride	U		0.00215	0.00464	1	01/15/2022 03:33	WG1802670
Xylenes, Total	U		0.00163	0.0121	1	01/15/2022 03:33	WG1802670
(S) Toluene-d8	*117*			*75.0-131*		*01/15/2022 03:33*	WG1802670
(S) 4-Bromofluorobenzene	*94.6*			*67.0-138*		*01/15/2022 03:33*	WG1802670
(S) 1,2-Dichloroethane-d4	*88.8*			*70.0-130*		*01/15/2022 03:33*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		19.9	66.5	1	01/17/2022 18:03	WG1802937
TPH C12 - C28	U		19.9	66.5	1	01/17/2022 18:03	WG1802937
TPH C28 - C35	U		19.9	66.5	1	01/17/2022 18:03	WG1802937
TPH C6 - C35	U		19.9	66.5	1	01/17/2022 18:03	WG1802937
(S) o-Terphenyl	*96.7*			*70.0-130*		*01/17/2022 18:03*	WG1802937
(S) 1-chlorooctane	*110*			*70.0-130*		*01/17/2022 18:03*	WG1802937

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0157	0.0452	1	01/19/2022 23:33	WG1802625
PCB 1221	U		0.0157	0.0452	1	01/19/2022 23:33	WG1802625
PCB 1232	U		0.0157	0.0452	1	01/19/2022 23:33	WG1802625
PCB 1242	U		0.0157	0.0452	1	01/19/2022 23:33	WG1802625
PCB 1248	U		0.00981	0.0226	1	01/19/2022 23:33	WG1802625
PCB 1254	U		0.00981	0.0226	1	01/19/2022 23:33	WG1802625

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00981	0.0226	1	01/19/2022 23:33	WG1802625
(S) Decachlorobiphenyl	*56.1*			*10.0-135*		*01/19/2022 23:33*	WG1802625
(S) Tetrachloro-m-xylene	*57.5*			*10.0-139*		*01/19/2022 23:33*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00717	0.0443	1	01/14/2022 14:25	WG1802108
Acenaphthylene	U		0.00624	0.0443	1	01/14/2022 14:25	WG1802108
Anthracene	U		0.00789	0.0443	1	01/14/2022 14:25	WG1802108
Benzidine	U		0.0833	2.22	1	01/14/2022 14:25	WG1802108
Benzo(a)anthracene	U		0.00781	0.0443	1	01/14/2022 14:25	WG1802108
Benzo(b)fluoranthene	U		0.00826	0.0443	1	01/14/2022 14:25	WG1802108
Benzo(k)fluoranthene	U		0.00787	0.0443	1	01/14/2022 14:25	WG1802108
Benzo(g,h,i)perylene	U		0.00810	0.0443	1	01/14/2022 14:25	WG1802108
Benzo(a)pyrene	U		0.00823	0.0443	1	01/14/2022 14:25	WG1802108
Bis(2-chlorethoxy)methane	U		0.0133	0.443	1	01/14/2022 14:25	WG1802108
Bis(2-chloroethyl)ether	U		0.0146	0.443	1	01/14/2022 14:25	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0192	0.443	1	01/14/2022 14:25	WG1802108
4-Bromophenyl-phenylether	U		0.0156	0.443	1	01/14/2022 14:25	WG1802108
2-Chloronaphthalene	U		0.00778	0.0443	1	01/14/2022 14:25	WG1802108
4-Chlorophenyl-phenylether	U		0.0154	0.443	1	01/14/2022 14:25	WG1802108
Chrysene	U		0.00880	0.0443	1	01/14/2022 14:25	WG1802108
Dibenz(a,h)anthracene	U		0.0123	0.0443	1	01/14/2022 14:25	WG1802108
3,3-Dichlorobenzidine	U		0.0164	0.443	1	01/14/2022 14:25	WG1802108
2,4-Dinitrotoluene	U		0.0127	0.443	1	01/14/2022 14:25	WG1802108
2,6-Dinitrotoluene	U		0.0145	0.443	1	01/14/2022 14:25	WG1802108
Fluoranthene	U		0.00799	0.0443	1	01/14/2022 14:25	WG1802108
Fluorene	U		0.00721	0.0443	1	01/14/2022 14:25	WG1802108
Hexachlorobenzene	U		0.0157	0.443	1	01/14/2022 14:25	WG1802108
Hexachloro-1,3-butadiene	U		0.0149	0.443	1	01/14/2022 14:25	WG1802108
Hexachlorocyclopentadiene	U		0.0233	0.443	1	01/14/2022 14:25	WG1802108
Hexachloroethane	U		0.0174	0.443	1	01/14/2022 14:25	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0125	0.0443	1	01/14/2022 14:25	WG1802108
Isophorone	U		0.0136	0.443	1	01/14/2022 14:25	WG1802108
Naphthalene	U		0.0111	0.0443	1	01/14/2022 14:25	WG1802108
Nitrobenzene	U		0.0154	0.443	1	01/14/2022 14:25	WG1802108
n-Nitrosodimethylamine	U		0.0657	0.443	1	01/14/2022 14:25	WG1802108
n-Nitrosodiphenylamine	U		0.0335	0.443	1	01/14/2022 14:25	WG1802108
n-Nitrosodi-n-propylamine	U		0.0148	0.443	1	01/14/2022 14:25	WG1802108
Phenanthrene	U		0.00879	0.0443	1	01/14/2022 14:25	WG1802108
Benzylbutyl phthalate	U		0.0138	0.443	1	01/14/2022 14:25	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0561	0.443	1	01/14/2022 14:25	WG1802108
Di-n-butyl phthalate	U		0.0152	0.443	1	01/14/2022 14:25	WG1802108
Diethyl phthalate	U		0.0146	0.443	1	01/14/2022 14:25	WG1802108
Dimethyl phthalate	U		0.0939	0.443	1	01/14/2022 14:25	WG1802108
Di-n-octyl phthalate	U		0.0299	0.443	1	01/14/2022 14:25	WG1802108
Pyrene	U		0.00862	0.0443	1	01/14/2022 14:25	WG1802108
1,2,4-Trichlorobenzene	U		0.0138	0.443	1	01/14/2022 14:25	WG1802108
4-Chloro-3-methylphenol	U		0.0144	0.443	1	01/14/2022 14:25	WG1802108
2-Chlorophenol	U		0.0146	0.443	1	01/14/2022 14:25	WG1802108
2,4-Dichlorophenol	U		0.0129	0.443	1	01/14/2022 14:25	WG1802108
2,4-Dimethylphenol	U		0.0116	0.443	1	01/14/2022 14:25	WG1802108
4,6-Dinitro-2-methylphenol	U		0.100	0.443	1	01/14/2022 14:25	WG1802108
2,4-Dinitrophenol	U		0.104	0.443	1	01/14/2022 14:25	WG1802108
2-Nitrophenol	U		0.0158	0.443	1	01/14/2022 14:25	WG1802108

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0138	0.443	1	01/14/2022 14:25	WG1802108
Pentachlorophenol	U		0.0119	0.443	1	01/14/2022 14:25	WG1802108
Phenol	U		0.0178	0.443	1	01/14/2022 14:25	WG1802108
2,4,6-Trichlorophenol	U		0.0142	0.443	1	01/14/2022 14:25	WG1802108
(S) 2-Fluorophenol	*54.5*			*12.0-120*		*01/14/2022 14:25*	WG1802108
(S) Phenol-d5	*46.9*			*10.0-120*		*01/14/2022 14:25*	WG1802108
(S) Nitrobenzene-d5	*38.0*			*10.0-122*		*01/14/2022 14:25*	WG1802108
(S) 2-Fluorobiphenyl	*48.1*			*15.0-120*		*01/14/2022 14:25*	WG1802108
(S) 2,4,6-Tribromophenol	*52.0*			*10.0-127*		*01/14/2022 14:25*	WG1802108
(S) p-Terphenyl-d14	*47.8*			*10.0-120*		*01/14/2022 14:25*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	64.0		1	01/15/2022 10:36	WG1802129

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0281	0.0625	1	01/17/2022 12:03	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.07	J	0.809	3.12	1	01/27/2022 01:19	WG1802801
Barium	156		0.133	0.781	1	01/27/2022 01:19	WG1802801
Cadmium	0.330	J	0.0736	0.781	1	01/27/2022 01:19	WG1802801
Chromium	20.6		0.208	1.56	1	01/27/2022 01:19	WG1802801
Lead	14.8		0.325	0.781	1	01/27/2022 01:19	WG1802801
Selenium	1.38	J	1.19	3.12	1	01/27/2022 01:19	WG1802801
Silver	U		0.198	1.56	1	01/27/2022 01:19	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0864	0.118	1	01/15/2022 03:53	WG1802670
Acrylonitrile	U		0.00855	0.0296	1	01/15/2022 03:53	WG1802670
Benzene	U		0.00111	0.00237	1	01/15/2022 03:53	WG1802670
Bromobenzene	U		0.00213	0.0296	1	01/15/2022 03:53	WG1802670
Bromodichloromethane	U		0.00172	0.00592	1	01/15/2022 03:53	WG1802670
Bromoform	U		0.00277	0.0592	1	01/15/2022 03:53	WG1802670
Bromomethane	U		0.00466	0.0296	1	01/15/2022 03:53	WG1802670
n-Butylbenzene	U		0.0124	0.0296	1	01/15/2022 03:53	WG1802670
sec-Butylbenzene	U		0.00682	0.0296	1	01/15/2022 03:53	WG1802670
tert-Butylbenzene	U		0.00462	0.0118	1	01/15/2022 03:53	WG1802670
Carbon tetrachloride	U		0.00213	0.0118	1	01/15/2022 03:53	WG1802670
Chlorobenzene	U		0.000497	0.00592	1	01/15/2022 03:53	WG1802670
Chlorodibromomethane	U	J4	0.00145	0.00592	1	01/15/2022 03:53	WG1802670
Chloroethane	U		0.00403	0.0118	1	01/15/2022 03:53	WG1802670
Chloroform	U		0.00244	0.00592	1	01/15/2022 03:53	WG1802670
Chloromethane	U		0.0103	0.0296	1	01/15/2022 03:53	WG1802670
2-Chlorotoluene	U		0.00205	0.00592	1	01/15/2022 03:53	WG1802670
4-Chlorotoluene	U		0.00107	0.0118	1	01/15/2022 03:53	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00923	0.0592	1	01/15/2022 03:53	WG1802670
1,2-Dibromoethane	U		0.00153	0.00592	1	01/15/2022 03:53	WG1802670
Dibromomethane	U		0.00178	0.0118	1	01/15/2022 03:53	WG1802670
1,2-Dichlorobenzene	U		0.00101	0.0118	1	01/15/2022 03:53	WG1802670
1,3-Dichlorobenzene	U		0.00142	0.0118	1	01/15/2022 03:53	WG1802670
1,4-Dichlorobenzene	U		0.00166	0.0118	1	01/15/2022 03:53	WG1802670
Dichlorodifluoromethane	U		0.00381	0.00592	1	01/15/2022 03:53	WG1802670
1,1-Dichloroethane	U		0.00116	0.00592	1	01/15/2022 03:53	WG1802670
1,2-Dichloroethane	U		0.00154	0.00592	1	01/15/2022 03:53	WG1802670
1,1-Dichloroethene	U		0.00143	0.00592	1	01/15/2022 03:53	WG1802670
cis-1,2-Dichloroethene	U		0.00174	0.00592	1	01/15/2022 03:53	WG1802670
trans-1,2-Dichloroethene	U		0.00246	0.0118	1	01/15/2022 03:53	WG1802670
1,2-Dichloropropane	U		0.00336	0.0118	1	01/15/2022 03:53	WG1802670
1,1-Dichloropropene	U		0.00192	0.00592	1	01/15/2022 03:53	WG1802670
1,3-Dichloropropane	U		0.00119	0.0118	1	01/15/2022 03:53	WG1802670

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00179	0.00592	1	01/15/2022 03:53	WG1802670
trans-1,3-Dichloropropene	U		0.00270	0.0118	1	01/15/2022 03:53	WG1802670
2,2-Dichloropropane	U		0.00327	0.00592	1	01/15/2022 03:53	WG1802670
Di-isopropyl ether	U		0.000971	0.00237	1	01/15/2022 03:53	WG1802670
Ethylbenzene	U		0.00174	0.00592	1	01/15/2022 03:53	WG1802670
Hexachloro-1,3-Butadiene	U		0.0142	0.0592	1	01/15/2022 03:53	WG1802670
Isopropylbenzene	U		0.00101	0.00592	1	01/15/2022 03:53	WG1802670
p-Isopropyltoluene	U		0.00604	0.0118	1	01/15/2022 03:53	WG1802670
2-Butanone (MEK)	U		0.150	0.237	1	01/15/2022 03:53	WG1802670
Methylene Chloride	U		0.0157	0.0592	1	01/15/2022 03:53	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00540	0.0592	1	01/15/2022 03:53	WG1802670
Methyl tert-butyl ether	U		0.000829	0.00237	1	01/15/2022 03:53	WG1802670
Naphthalene	U		0.0116	0.0296	1	01/15/2022 03:53	WG1802670
n-Propylbenzene	U		0.00225	0.0118	1	01/15/2022 03:53	WG1802670
Styrene	U		0.000542	0.0296	1	01/15/2022 03:53	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00224	0.00592	1	01/15/2022 03:53	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00165	0.00592	1	01/15/2022 03:53	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00179	0.00592	1	01/15/2022 03:53	WG1802670
Tetrachloroethene	U		0.00212	0.00592	1	01/15/2022 03:53	WG1802670
Toluene	U		0.00308	0.0118	1	01/15/2022 03:53	WG1802670
1,2,3-Trichlorobenzene	U		0.0174	0.0296	1	01/15/2022 03:53	WG1802670
1,2,4-Trichlorobenzene	U		0.0104	0.0296	1	01/15/2022 03:53	WG1802670
1,1,1-Trichloroethane	U		0.00219	0.00592	1	01/15/2022 03:53	WG1802670
1,1,2-Trichloroethane	U		0.00141	0.00592	1	01/15/2022 03:53	WG1802670
Trichloroethene	U		0.00138	0.00237	1	01/15/2022 03:53	WG1802670
Trichlorofluoromethane	U		0.00196	0.00592	1	01/15/2022 03:53	WG1802670
1,2,3-Trichloropropane	U		0.00384	0.0296	1	01/15/2022 03:53	WG1802670
1,2,4-Trimethylbenzene	U		0.00374	0.0118	1	01/15/2022 03:53	WG1802670
1,2,3-Trimethylbenzene	U		0.00374	0.0118	1	01/15/2022 03:53	WG1802670
1,3,5-Trimethylbenzene	U		0.00474	0.0118	1	01/15/2022 03:53	WG1802670
Vinyl chloride	U		0.00275	0.00592	1	01/15/2022 03:53	WG1802670
Xylenes, Total	U		0.00208	0.0154	1	01/15/2022 03:53	WG1802670
(S) Toluene-d8	*114*			*75.0-131*		*01/15/2022 03:53*	WG1802670
(S) 4-Bromofluorobenzene	*96.1*			*67.0-138*		*01/15/2022 03:53*	WG1802670
(S) 1,2-Dichloroethane-d4	*92.8*			*70.0-130*		*01/15/2022 03:53*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		23.4	78.1	1	01/17/2022 18:17	WG1802937
TPH C12 - C28	U		23.4	78.1	1	01/17/2022 18:17	WG1802937
TPH C28 - C35	U		23.4	78.1	1	01/17/2022 18:17	WG1802937
TPH C6 - C35	U		23.4	78.1	1	01/17/2022 18:17	WG1802937
(S) o-Terphenyl	*102*			*70.0-130*		*01/17/2022 18:17*	WG1802937
(S) 1-chlorooctane	*115*			*70.0-130*		*01/17/2022 18:17*	WG1802937

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0184	0.0531	1	01/21/2022 00:33	WG1802625
PCB 1221	U		0.0184	0.0531	1	01/21/2022 00:33	WG1802625
PCB 1232	U		0.0184	0.0531	1	01/21/2022 00:33	WG1802625
PCB 1242	U		0.0184	0.0531	1	01/21/2022 00:33	WG1802625
PCB 1248	U		0.0115	0.0266	1	01/21/2022 00:33	WG1802625
PCB 1254	U		0.0115	0.0266	1	01/21/2022 00:33	WG1802625

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.0115	0.0266	1	01/21/2022 00:33	WG1802625
(S) Decachlorobiphenyl	*66.4*			*10.0-135*		*01/21/2022 00:33*	WG1802625
(S) Tetrachloro-m-xylene	*59.5*			*10.0-139*		*01/21/2022 00:33*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00842	0.0520	1	01/14/2022 15:06	WG1802108
Acenaphthylene	U		0.00733	0.0520	1	01/14/2022 15:06	WG1802108
Anthracene	U		0.00926	0.0520	1	01/14/2022 15:06	WG1802108
Benzidine	U		0.0978	2.61	1	01/14/2022 15:06	WG1802108
Benzo(a)anthracene	U		0.00917	0.0520	1	01/14/2022 15:06	WG1802108
Benzo(b)fluoranthene	U		0.00970	0.0520	1	01/14/2022 15:06	WG1802108
Benzo(k)fluoranthene	U		0.00925	0.0520	1	01/14/2022 15:06	WG1802108
Benzo(g,h,i)perylene	U		0.00951	0.0520	1	01/14/2022 15:06	WG1802108
Benzo(a)pyrene	U		0.00967	0.0520	1	01/14/2022 15:06	WG1802108
Bis(2-chlorethoxy)methane	U		0.0156	0.520	1	01/14/2022 15:06	WG1802108
Bis(2-chloroethyl)ether	U		0.0172	0.520	1	01/14/2022 15:06	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0225	0.520	1	01/14/2022 15:06	WG1802108
4-Bromophenyl-phenylether	U		0.0183	0.520	1	01/14/2022 15:06	WG1802108
2-Chloronaphthalene	U		0.00914	0.0520	1	01/14/2022 15:06	WG1802108
4-Chlorophenyl-phenylether	U		0.0181	0.520	1	01/14/2022 15:06	WG1802108
Chrysene	U		0.0103	0.0520	1	01/14/2022 15:06	WG1802108
Dibenz(a,h)anthracene	U		0.0144	0.0520	1	01/14/2022 15:06	WG1802108
3,3-Dichlorobenzidine	U		0.0192	0.520	1	01/14/2022 15:06	WG1802108
2,4-Dinitrotoluene	U		0.0149	0.520	1	01/14/2022 15:06	WG1802108
2,6-Dinitrotoluene	U		0.0170	0.520	1	01/14/2022 15:06	WG1802108
Fluoranthene	U		0.00939	0.0520	1	01/14/2022 15:06	WG1802108
Fluorene	U		0.00847	0.0520	1	01/14/2022 15:06	WG1802108
Hexachlorobenzene	U		0.0184	0.520	1	01/14/2022 15:06	WG1802108
Hexachloro-1,3-butadiene	U		0.0175	0.520	1	01/14/2022 15:06	WG1802108
Hexachlorocyclopentadiene	U		0.0273	0.520	1	01/14/2022 15:06	WG1802108
Hexachloroethane	U		0.0205	0.520	1	01/14/2022 15:06	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0147	0.0520	1	01/14/2022 15:06	WG1802108
Isophorone	U		0.0159	0.520	1	01/14/2022 15:06	WG1802108
Naphthalene	U		0.0131	0.0520	1	01/14/2022 15:06	WG1802108
Nitrobenzene	U		0.0181	0.520	1	01/14/2022 15:06	WG1802108
n-Nitrosodimethylamine	U		0.0772	0.520	1	01/14/2022 15:06	WG1802108
n-Nitrosodiphenylamine	U		0.0394	0.520	1	01/14/2022 15:06	WG1802108
n-Nitrosodi-n-propylamine	U		0.0173	0.520	1	01/14/2022 15:06	WG1802108
Phenanthrene	U		0.0103	0.0520	1	01/14/2022 15:06	WG1802108
Benzylbutyl phthalate	U		0.0162	0.520	1	01/14/2022 15:06	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0659	0.520	1	01/14/2022 15:06	WG1802108
Di-n-butyl phthalate	U		0.0178	0.520	1	01/14/2022 15:06	WG1802108
Diethyl phthalate	U		0.0172	0.520	1	01/14/2022 15:06	WG1802108
Dimethyl phthalate	U		0.110	0.520	1	01/14/2022 15:06	WG1802108
Di-n-octyl phthalate	U		0.0352	0.520	1	01/14/2022 15:06	WG1802108
Pyrene	U		0.0101	0.0520	1	01/14/2022 15:06	WG1802108
1,2,4-Trichlorobenzene	U		0.0162	0.520	1	01/14/2022 15:06	WG1802108
4-Chloro-3-methylphenol	U		0.0169	0.520	1	01/14/2022 15:06	WG1802108
2-Chlorophenol	U		0.0172	0.520	1	01/14/2022 15:06	WG1802108
2,4-Dichlorophenol	U		0.0152	0.520	1	01/14/2022 15:06	WG1802108
2,4-Dimethylphenol	U		0.0136	0.520	1	01/14/2022 15:06	WG1802108
4,6-Dinitro-2-methylphenol	U		0.118	0.520	1	01/14/2022 15:06	WG1802108
2,4-Dinitrophenol	U		0.122	0.520	1	01/14/2022 15:06	WG1802108
2-Nitrophenol	U		0.0186	0.520	1	01/14/2022 15:06	WG1802108

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0162	0.520	1	01/14/2022 15:06	WG1802108
Pentachlorophenol	U		0.0140	0.520	1	01/14/2022 15:06	WG1802108
Phenol	U		0.0209	0.520	1	01/14/2022 15:06	WG1802108
2,4,6-Trichlorophenol	U		0.0167	0.520	1	01/14/2022 15:06	WG1802108
(S) 2-Fluorophenol	*66.6*			*12.0-120*		*01/14/2022 15:06*	WG1802108
(S) Phenol-d5	*58.4*			*10.0-120*		*01/14/2022 15:06*	WG1802108
(S) Nitrobenzene-d5	*50.3*			*10.0-122*		*01/14/2022 15:06*	WG1802108
(S) 2-Fluorobiphenyl	*55.8*			*15.0-120*		*01/14/2022 15:06*	WG1802108
(S) 2,4,6-Tribromophenol	*65.5*			*10.0-127*		*01/14/2022 15:06*	WG1802108
(S) p-Terphenyl-d14	*63.7*			*10.0-120*		*01/14/2022 15:06*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	67.8		1	01/15/2022 10:36	WG1802129

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0265	0.0590	1	01/17/2022 12:09	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.64	J	0.764	2.95	1	01/27/2022 01:22	WG1802801
Barium	111		0.126	0.737	1	01/27/2022 01:22	WG1802801
Cadmium	0.213	J	0.0694	0.737	1	01/27/2022 01:22	WG1802801
Chromium	14.8		0.196	1.47	1	01/27/2022 01:22	WG1802801
Lead	9.86		0.307	0.737	1	01/27/2022 01:22	WG1802801
Selenium	1.82	J	1.13	2.95	1	01/27/2022 01:22	WG1802801
Silver	U		0.187	1.47	1	01/27/2022 01:22	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0832	0.114	1	01/15/2022 04:13	WG1802670
Acrylonitrile	U		0.00823	0.0285	1	01/15/2022 04:13	WG1802670
Benzene	U		0.00106	0.00228	1	01/15/2022 04:13	WG1802670
Bromobenzene	U		0.00205	0.0285	1	01/15/2022 04:13	WG1802670
Bromodichloromethane	U		0.00165	0.00570	1	01/15/2022 04:13	WG1802670
Bromoform	U		0.00267	0.0570	1	01/15/2022 04:13	WG1802670
Bromomethane	U		0.00449	0.0285	1	01/15/2022 04:13	WG1802670
n-Butylbenzene	U		0.0120	0.0285	1	01/15/2022 04:13	WG1802670
sec-Butylbenzene	U		0.00657	0.0285	1	01/15/2022 04:13	WG1802670
tert-Butylbenzene	U		0.00445	0.0114	1	01/15/2022 04:13	WG1802670
Carbon tetrachloride	U		0.00205	0.0114	1	01/15/2022 04:13	WG1802670
Chlorobenzene	U		0.000479	0.00570	1	01/15/2022 04:13	WG1802670
Chlorodibromomethane	U	J4	0.00140	0.00570	1	01/15/2022 04:13	WG1802670
Chloroethane	U		0.00388	0.0114	1	01/15/2022 04:13	WG1802670
Chloroform	U		0.00235	0.00570	1	01/15/2022 04:13	WG1802670
Chloromethane	U		0.00992	0.0285	1	01/15/2022 04:13	WG1802670
2-Chlorotoluene	U		0.00197	0.00570	1	01/15/2022 04:13	WG1802670
4-Chlorotoluene	U		0.00103	0.0114	1	01/15/2022 04:13	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00889	0.0570	1	01/15/2022 04:13	WG1802670
1,2-Dibromoethane	U		0.00148	0.00570	1	01/15/2022 04:13	WG1802670
Dibromomethane	U		0.00171	0.0114	1	01/15/2022 04:13	WG1802670
1,2-Dichlorobenzene	U		0.000969	0.0114	1	01/15/2022 04:13	WG1802670
1,3-Dichlorobenzene	U		0.00137	0.0114	1	01/15/2022 04:13	WG1802670
1,4-Dichlorobenzene	U		0.00160	0.0114	1	01/15/2022 04:13	WG1802670
Dichlorodifluoromethane	U		0.00367	0.00570	1	01/15/2022 04:13	WG1802670
1,1-Dichloroethane	U		0.00112	0.00570	1	01/15/2022 04:13	WG1802670
1,2-Dichloroethane	U		0.00148	0.00570	1	01/15/2022 04:13	WG1802670
1,1-Dichloroethene	U		0.00138	0.00570	1	01/15/2022 04:13	WG1802670
cis-1,2-Dichloroethene	U		0.00167	0.00570	1	01/15/2022 04:13	WG1802670
trans-1,2-Dichloroethene	U		0.00237	0.0114	1	01/15/2022 04:13	WG1802670
1,2-Dichloropropane	U		0.00324	0.0114	1	01/15/2022 04:13	WG1802670
1,1-Dichloropropene	U		0.00184	0.00570	1	01/15/2022 04:13	WG1802670
1,3-Dichloropropane	U		0.00114	0.0114	1	01/15/2022 04:13	WG1802670

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00173	0.00570	1	01/15/2022 04:13	WG1802670
trans-1,3-Dichloropropene	U		0.00260	0.0114	1	01/15/2022 04:13	WG1802670
2,2-Dichloropropane	U		0.00315	0.00570	1	01/15/2022 04:13	WG1802670
Di-isopropyl ether	U		0.000935	0.00228	1	01/15/2022 04:13	WG1802670
Ethylbenzene	U		0.00168	0.00570	1	01/15/2022 04:13	WG1802670
Hexachloro-1,3-Butadiene	U		0.0137	0.0570	1	01/15/2022 04:13	WG1802670
Isopropylbenzene	U		0.000969	0.00570	1	01/15/2022 04:13	WG1802670
p-Isopropyltoluene	U		0.00581	0.0114	1	01/15/2022 04:13	WG1802670
2-Butanone (MEK)	U		0.145	0.228	1	01/15/2022 04:13	WG1802670
Methylene Chloride	U		0.0151	0.0570	1	01/15/2022 04:13	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00520	0.0570	1	01/15/2022 04:13	WG1802670
Methyl tert-butyl ether	U		0.000798	0.00228	1	01/15/2022 04:13	WG1802670
Naphthalene	U		0.0111	0.0285	1	01/15/2022 04:13	WG1802670
n-Propylbenzene	U		0.00217	0.0114	1	01/15/2022 04:13	WG1802670
Styrene	U		0.000522	0.0285	1	01/15/2022 04:13	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00216	0.00570	1	01/15/2022 04:13	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00158	0.00570	1	01/15/2022 04:13	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00172	0.00570	1	01/15/2022 04:13	WG1802670
Tetrachloroethene	U		0.00204	0.00570	1	01/15/2022 04:13	WG1802670
Toluene	U		0.00296	0.0114	1	01/15/2022 04:13	WG1802670
1,2,3-Trichlorobenzene	U		0.0167	0.0285	1	01/15/2022 04:13	WG1802670
1,2,4-Trichlorobenzene	U		0.0100	0.0285	1	01/15/2022 04:13	WG1802670
1,1,1-Trichloroethane	U		0.00210	0.00570	1	01/15/2022 04:13	WG1802670
1,1,2-Trichloroethane	U		0.00136	0.00570	1	01/15/2022 04:13	WG1802670
Trichloroethene	U		0.00133	0.00228	1	01/15/2022 04:13	WG1802670
Trichlorofluoromethane	U		0.00189	0.00570	1	01/15/2022 04:13	WG1802670
1,2,3-Trichloropropane	U		0.00369	0.0285	1	01/15/2022 04:13	WG1802670
1,2,4-Trimethylbenzene	U		0.00360	0.0114	1	01/15/2022 04:13	WG1802670
1,2,3-Trimethylbenzene	U		0.00360	0.0114	1	01/15/2022 04:13	WG1802670
1,3,5-Trimethylbenzene	U		0.00456	0.0114	1	01/15/2022 04:13	WG1802670
Vinyl chloride	U		0.00264	0.00570	1	01/15/2022 04:13	WG1802670
Xylenes, Total	U		0.00201	0.0148	1	01/15/2022 04:13	WG1802670
(S) Toluene-d8	*110*			*75.0-131*		*01/15/2022 04:13*	WG1802670
(S) 4-Bromofluorobenzene	*93.3*			*67.0-138*		*01/15/2022 04:13*	WG1802670
(S) 1,2-Dichloroethane-d4	*87.0*			*70.0-130*		*01/15/2022 04:13*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		22.1	73.7	1	01/17/2022 18:30	WG1802937
TPH C12 - C28	U		22.1	73.7	1	01/17/2022 18:30	WG1802937
TPH C28 - C35	U		22.1	73.7	1	01/17/2022 18:30	WG1802937
TPH C6 - C35	U		22.1	73.7	1	01/17/2022 18:30	WG1802937
(S) o-Terphenyl	*98.8*			*70.0-130*		*01/17/2022 18:30*	WG1802937
(S) 1-chlorooctane	*112*			*70.0-130*		*01/17/2022 18:30*	WG1802937

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0174	0.0501	1	01/19/2022 23:52	WG1802625
PCB 1221	U		0.0174	0.0501	1	01/19/2022 23:52	WG1802625
PCB 1232	U		0.0174	0.0501	1	01/19/2022 23:52	WG1802625
PCB 1242	U		0.0174	0.0501	1	01/19/2022 23:52	WG1802625
PCB 1248	U		0.0109	0.0251	1	01/19/2022 23:52	WG1802625
PCB 1254	U		0.0109	0.0251	1	01/19/2022 23:52	WG1802625

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.0109	0.0251	1	01/19/2022 23:52	WG1802625
(S) Decachlorobiphenyl	*49.3*			*10.0-135*		*01/19/2022 23:52*	WG1802625
(S) Tetrachloro-m-xylene	*47.3*			*10.0-139*		*01/19/2022 23:52*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00795	0.0491	1	01/14/2022 14:04	WG1802108
Acenaphthylene	U		0.00691	0.0491	1	01/14/2022 14:04	WG1802108
Anthracene	U		0.00874	0.0491	1	01/14/2022 14:04	WG1802108
Benzidine	U		0.0923	2.46	1	01/14/2022 14:04	WG1802108
Benzo(a)anthracene	U		0.00865	0.0491	1	01/14/2022 14:04	WG1802108
Benzo(b)fluoranthene	U		0.00916	0.0491	1	01/14/2022 14:04	WG1802108
Benzo(k)fluoranthene	U		0.00873	0.0491	1	01/14/2022 14:04	WG1802108
Benzo(g,h,i)perylene	U		0.00898	0.0491	1	01/14/2022 14:04	WG1802108
Benzo(a)pyrene	U		0.00913	0.0491	1	01/14/2022 14:04	WG1802108
Bis(2-chlorethoxy)methane	U		0.0147	0.491	1	01/14/2022 14:04	WG1802108
Bis(2-chloroethyl)ether	U		0.0162	0.491	1	01/14/2022 14:04	WG1802108
2,2-Oxybis(1-Chloropropane)	U		0.0212	0.491	1	01/14/2022 14:04	WG1802108
4-Bromophenyl-phenylether	U		0.0173	0.491	1	01/14/2022 14:04	WG1802108
2-Chloronaphthalene	U		0.00863	0.0491	1	01/14/2022 14:04	WG1802108
4-Chlorophenyl-phenylether	U		0.0171	0.491	1	01/14/2022 14:04	WG1802108
Chrysene	U		0.00976	0.0491	1	01/14/2022 14:04	WG1802108
Dibenz(a,h)anthracene	U		0.0136	0.0491	1	01/14/2022 14:04	WG1802108
3,3-Dichlorobenzidine	U		0.0181	0.491	1	01/14/2022 14:04	WG1802108
2,4-Dinitrotoluene	U		0.0141	0.491	1	01/14/2022 14:04	WG1802108
2,6-Dinitrotoluene	U		0.0161	0.491	1	01/14/2022 14:04	WG1802108
Fluoranthene	U		0.00886	0.0491	1	01/14/2022 14:04	WG1802108
Fluorene	U		0.00799	0.0491	1	01/14/2022 14:04	WG1802108
Hexachlorobenzene	U		0.0174	0.491	1	01/14/2022 14:04	WG1802108
Hexachloro-1,3-butadiene	U		0.0165	0.491	1	01/14/2022 14:04	WG1802108
Hexachlorocyclopentadiene	U		0.0258	0.491	1	01/14/2022 14:04	WG1802108
Hexachloroethane	U		0.0193	0.491	1	01/14/2022 14:04	WG1802108
Indeno(1,2,3-cd)pyrene	U		0.0139	0.0491	1	01/14/2022 14:04	WG1802108
Isophorone	U		0.0150	0.491	1	01/14/2022 14:04	WG1802108
Naphthalene	U		0.0123	0.0491	1	01/14/2022 14:04	WG1802108
Nitrobenzene	U		0.0171	0.491	1	01/14/2022 14:04	WG1802108
n-Nitrosodimethylamine	U		0.0728	0.491	1	01/14/2022 14:04	WG1802108
n-Nitrosodiphenylamine	U		0.0372	0.491	1	01/14/2022 14:04	WG1802108
n-Nitrosodi-n-propylamine	U		0.0164	0.491	1	01/14/2022 14:04	WG1802108
Phenanthrene	U		0.00975	0.0491	1	01/14/2022 14:04	WG1802108
Benzylbutyl phthalate	U		0.0153	0.491	1	01/14/2022 14:04	WG1802108
Bis(2-ethylhexyl)phthalate	U		0.0622	0.491	1	01/14/2022 14:04	WG1802108
Di-n-butyl phthalate	U		0.0168	0.491	1	01/14/2022 14:04	WG1802108
Diethyl phthalate	U		0.0162	0.491	1	01/14/2022 14:04	WG1802108
Dimethyl phthalate	U		0.104	0.491	1	01/14/2022 14:04	WG1802108
Di-n-octyl phthalate	U		0.0332	0.491	1	01/14/2022 14:04	WG1802108
Pyrene	U		0.00955	0.0491	1	01/14/2022 14:04	WG1802108
1,2,4-Trichlorobenzene	U		0.0153	0.491	1	01/14/2022 14:04	WG1802108
4-Chloro-3-methylphenol	U		0.0159	0.491	1	01/14/2022 14:04	WG1802108
2-Chlorophenol	U		0.0162	0.491	1	01/14/2022 14:04	WG1802108
2,4-Dichlorophenol	U		0.0143	0.491	1	01/14/2022 14:04	WG1802108
2,4-Dimethylphenol	U		0.0128	0.491	1	01/14/2022 14:04	WG1802108
4,6-Dinitro-2-methylphenol	U		0.111	0.491	1	01/14/2022 14:04	WG1802108
2,4-Dinitrophenol	U		0.115	0.491	1	01/14/2022 14:04	WG1802108
2-Nitrophenol	U		0.0175	0.491	1	01/14/2022 14:04	WG1802108

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0153	0.491	1	01/14/2022 14:04	WG1802108
Pentachlorophenol	U		0.0132	0.491	1	01/14/2022 14:04	WG1802108
Phenol	U		0.0198	0.491	1	01/14/2022 14:04	WG1802108
2,4,6-Trichlorophenol	U		0.0158	0.491	1	01/14/2022 14:04	WG1802108
(S) 2-Fluorophenol	*66.3*			*12.0-120*		*01/14/2022 14:04*	WG1802108
(S) Phenol-d5	*58.8*			*10.0-120*		*01/14/2022 14:04*	WG1802108
(S) Nitrobenzene-d5	*52.6*			*10.0-122*		*01/14/2022 14:04*	WG1802108
(S) 2-Fluorobiphenyl	*56.0*			*15.0-120*		*01/14/2022 14:04*	WG1802108
(S) 2,4,6-Tribromophenol	*67.5*			*10.0-127*		*01/14/2022 14:04*	WG1802108
(S) p-Terphenyl-d14	*65.2*			*10.0-120*		*01/14/2022 14:04*	WG1802108

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	84.3		1	01/15/2022 10:36	WG1802129

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0213	0.0474	1	01/17/2022 12:11	WG1802243

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.11	J	0.614	2.37	1	01/27/2022 01:25	WG1802801
Barium	151		0.101	0.593	1	01/27/2022 01:25	WG1802801
Cadmium	0.242	J	0.0559	0.593	1	01/27/2022 01:25	WG1802801
Chromium	8.98		0.158	1.19	1	01/27/2022 01:25	WG1802801
Lead	223		0.247	0.593	1	01/27/2022 01:25	WG1802801
Selenium	U		0.906	2.37	1	01/27/2022 01:25	WG1802801
Silver	U		0.151	1.19	1	01/27/2022 01:25	WG1802801

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0603	0.0825	1	01/15/2022 04:32	WG1802670
Acrylonitrile	U		0.00596	0.0206	1	01/15/2022 04:32	WG1802670
Benzene	U		0.000771	0.00165	1	01/15/2022 04:32	WG1802670
Bromobenzene	U		0.00149	0.0206	1	01/15/2022 04:32	WG1802670
Bromodichloromethane	U		0.00120	0.00413	1	01/15/2022 04:32	WG1802670
Bromoform	U		0.00193	0.0413	1	01/15/2022 04:32	WG1802670
Bromomethane	U		0.00325	0.0206	1	01/15/2022 04:32	WG1802670
n-Butylbenzene	U		0.00867	0.0206	1	01/15/2022 04:32	WG1802670
sec-Butylbenzene	U		0.00475	0.0206	1	01/15/2022 04:32	WG1802670
tert-Butylbenzene	U		0.00322	0.00825	1	01/15/2022 04:32	WG1802670
Carbon tetrachloride	U		0.00148	0.00825	1	01/15/2022 04:32	WG1802670
Chlorobenzene	U		0.000347	0.00413	1	01/15/2022 04:32	WG1802670
Chlorodibromomethane	U	J4	0.00101	0.00413	1	01/15/2022 04:32	WG1802670
Chloroethane	U		0.00281	0.00825	1	01/15/2022 04:32	WG1802670
Chloroform	U		0.00170	0.00413	1	01/15/2022 04:32	WG1802670
Chloromethane	U		0.00718	0.0206	1	01/15/2022 04:32	WG1802670
2-Chlorotoluene	U		0.00143	0.00413	1	01/15/2022 04:32	WG1802670
4-Chlorotoluene	U		0.000743	0.00825	1	01/15/2022 04:32	WG1802670
1,2-Dibromo-3-Chloropropane	U		0.00644	0.0413	1	01/15/2022 04:32	WG1802670
1,2-Dibromoethane	U		0.00107	0.00413	1	01/15/2022 04:32	WG1802670
Dibromomethane	U		0.00124	0.00825	1	01/15/2022 04:32	WG1802670
1,2-Dichlorobenzene	U		0.000702	0.00825	1	01/15/2022 04:32	WG1802670
1,3-Dichlorobenzene	U		0.000991	0.00825	1	01/15/2022 04:32	WG1802670
1,4-Dichlorobenzene	U		0.00116	0.00825	1	01/15/2022 04:32	WG1802670
Dichlorodifluoromethane	U		0.00266	0.00413	1	01/15/2022 04:32	WG1802670
1,1-Dichloroethane	U		0.000811	0.00413	1	01/15/2022 04:32	WG1802670
1,2-Dichloroethane	U		0.00107	0.00413	1	01/15/2022 04:32	WG1802670
1,1-Dichloroethene	U		0.00100	0.00413	1	01/15/2022 04:32	WG1802670
cis-1,2-Dichloroethene	U		0.00121	0.00413	1	01/15/2022 04:32	WG1802670
trans-1,2-Dichloroethene	U		0.00172	0.00825	1	01/15/2022 04:32	WG1802670
1,2-Dichloropropane	U		0.00234	0.00825	1	01/15/2022 04:32	WG1802670
1,1-Dichloropropene	U		0.00134	0.00413	1	01/15/2022 04:32	WG1802670
1,3-Dichloropropane	U		0.000827	0.00825	1	01/15/2022 04:32	WG1802670

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00125	0.00413	1	01/15/2022 04:32	WG1802670
trans-1,3-Dichloropropene	U		0.00188	0.00825	1	01/15/2022 04:32	WG1802670
2,2-Dichloropropane	U		0.00228	0.00413	1	01/15/2022 04:32	WG1802670
Di-isopropyl ether	U		0.000677	0.00165	1	01/15/2022 04:32	WG1802670
Ethylbenzene	U		0.00122	0.00413	1	01/15/2022 04:32	WG1802670
Hexachloro-1,3-Butadiene	U		0.00991	0.0413	1	01/15/2022 04:32	WG1802670
Isopropylbenzene	U		0.000702	0.00413	1	01/15/2022 04:32	WG1802670
p-Isopropyltoluene	U		0.00421	0.00825	1	01/15/2022 04:32	WG1802670
2-Butanone (MEK)	U		0.105	0.165	1	01/15/2022 04:32	WG1802670
Methylene Chloride	U		0.0110	0.0413	1	01/15/2022 04:32	WG1802670
4-Methyl-2-pentanone (MIBK)	U		0.00376	0.0413	1	01/15/2022 04:32	WG1802670
Methyl tert-butyl ether	U		0.000578	0.00165	1	01/15/2022 04:32	WG1802670
Naphthalene	0.0215		0.00806	0.0206	1	01/15/2022 04:32	WG1802670
n-Propylbenzene	0.00158	J	0.00157	0.00825	1	01/15/2022 04:32	WG1802670
Styrene	U		0.000378	0.0206	1	01/15/2022 04:32	WG1802670
1,1,1,2-Tetrachloroethane	U		0.00157	0.00413	1	01/15/2022 04:32	WG1802670
1,1,2,2-Tetrachloroethane	U		0.00115	0.00413	1	01/15/2022 04:32	WG1802670
1,1,2-Trichlorotrifluoroethane	U		0.00124	0.00413	1	01/15/2022 04:32	WG1802670
Tetrachloroethene	U		0.00148	0.00413	1	01/15/2022 04:32	WG1802670
Toluene	0.0114		0.00215	0.00825	1	01/15/2022 04:32	WG1802670
1,2,3-Trichlorobenzene	U		0.0121	0.0206	1	01/15/2022 04:32	WG1802670
1,2,4-Trichlorobenzene	U		0.00726	0.0206	1	01/15/2022 04:32	WG1802670
1,1,1-Trichloroethane	U		0.00152	0.00413	1	01/15/2022 04:32	WG1802670
1,1,2-Trichloroethane	U		0.000986	0.00413	1	01/15/2022 04:32	WG1802670
Trichloroethene	U		0.000964	0.00165	1	01/15/2022 04:32	WG1802670
Trichlorofluoromethane	U		0.00137	0.00413	1	01/15/2022 04:32	WG1802670
1,2,3-Trichloropropane	U		0.00267	0.0206	1	01/15/2022 04:32	WG1802670
1,2,4-Trimethylbenzene	0.00730	J	0.00261	0.00825	1	01/15/2022 04:32	WG1802670
1,2,3-Trimethylbenzene	U		0.00261	0.00825	1	01/15/2022 04:32	WG1802670
1,3,5-Trimethylbenzene	U		0.00330	0.00825	1	01/15/2022 04:32	WG1802670
Vinyl chloride	U		0.00192	0.00413	1	01/15/2022 04:32	WG1802670
Xylenes, Total	0.0117		0.00145	0.0107	1	01/15/2022 04:32	WG1802670
(S) Toluene-d8	*111*			*75.0-131*		*01/15/2022 04:32*	WG1802670
(S) 4-Bromofluorobenzene	*96.1*			*67.0-138*		*01/15/2022 04:32*	WG1802670
(S) 1,2-Dichloroethane-d4	*87.1*			*70.0-130*		*01/15/2022 04:32*	WG1802670

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		17.8	59.3	1	01/17/2022 18:43	WG1802937
TPH C12 - C28	U		17.8	59.3	1	01/17/2022 18:43	WG1802937
TPH C28 - C35	U		17.8	59.3	1	01/17/2022 18:43	WG1802937
TPH C6 - C35	U		17.8	59.3	1	01/17/2022 18:43	WG1802937
(S) o-Terphenyl	*98.4*			*70.0-130*		*01/17/2022 18:43*	WG1802937
(S) 1-chlorooctane	*112*			*70.0-130*		*01/17/2022 18:43*	WG1802937

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0140	0.0403	1	01/20/2022 00:02	WG1802625
PCB 1221	U		0.0140	0.0403	1	01/20/2022 00:02	WG1802625
PCB 1232	U		0.0140	0.0403	1	01/20/2022 00:02	WG1802625
PCB 1242	U		0.0140	0.0403	1	01/20/2022 00:02	WG1802625
PCB 1248	U		0.00875	0.0202	1	01/20/2022 00:02	WG1802625
PCB 1254	U		0.00875	0.0202	1	01/20/2022 00:02	WG1802625

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00875	0.0202	1	01/20/2022 00:02	WG1802625
(S) Decachlorobiphenyl	*60.8*			*10.0-135*		*01/20/2022 00:02*	WG1802625
(S) Tetrachloro-m-xylene	*58.8*			*10.0-139*		*01/20/2022 00:02*	WG1802625

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00639	0.0395	1	01/15/2022 20:52	WG1802218
Acenaphthylene	U		0.00556	0.0395	1	01/15/2022 20:52	WG1802218
Anthracene	U		0.00703	0.0395	1	01/15/2022 20:52	WG1802218
Benzidine	U		0.0742	1.98	1	01/15/2022 20:52	WG1802218
Benzo(a)anthracene	U		0.00696	0.0395	1	01/15/2022 20:52	WG1802218
Benzo(b)fluoranthene	U		0.00736	0.0395	1	01/15/2022 20:52	WG1802218
Benzo(k)fluoranthene	U		0.00702	0.0395	1	01/15/2022 20:52	WG1802218
Benzo(g,h,i)perylene	U		0.00722	0.0395	1	01/15/2022 20:52	WG1802218
Benzo(a)pyrene	U		0.00734	0.0395	1	01/15/2022 20:52	WG1802218
Bis(2-chlorethoxy)methane	U		0.0119	0.395	1	01/15/2022 20:52	WG1802218
Bis(2-chloroethyl)ether	U		0.0130	0.395	1	01/15/2022 20:52	WG1802218
2,2-Oxybis(1-Chloropropane)	U		0.0171	0.395	1	01/15/2022 20:52	WG1802218
4-Bromophenyl-phenylether	U		0.0139	0.395	1	01/15/2022 20:52	WG1802218
2-Chloronaphthalene	U		0.00694	0.0395	1	01/15/2022 20:52	WG1802218
4-Chlorophenyl-phenylether	U		0.0138	0.395	1	01/15/2022 20:52	WG1802218
Chrysene	U		0.00785	0.0395	1	01/15/2022 20:52	WG1802218
Dibenz(a,h)anthracene	U		0.0109	0.0395	1	01/15/2022 20:52	WG1802218
3,3-Dichlorobenzidine	U		0.0146	0.395	1	01/15/2022 20:52	WG1802218
2,4-Dinitrotoluene	U		0.0113	0.395	1	01/15/2022 20:52	WG1802218
2,6-Dinitrotoluene	U		0.0129	0.395	1	01/15/2022 20:52	WG1802218
Fluoranthene	U		0.00713	0.0395	1	01/15/2022 20:52	WG1802218
Fluorene	U		0.00643	0.0395	1	01/15/2022 20:52	WG1802218
Hexachlorobenzene	U		0.0140	0.395	1	01/15/2022 20:52	WG1802218
Hexachloro-1,3-butadiene	U		0.0133	0.395	1	01/15/2022 20:52	WG1802218
Hexachlorocyclopentadiene	U		0.0208	0.395	1	01/15/2022 20:52	WG1802218
Hexachloroethane	U		0.0155	0.395	1	01/15/2022 20:52	WG1802218
Indeno(1,2,3-cd)pyrene	U		0.0112	0.0395	1	01/15/2022 20:52	WG1802218
Isophorone	U		0.0121	0.395	1	01/15/2022 20:52	WG1802218
Naphthalene	U		0.00991	0.0395	1	01/15/2022 20:52	WG1802218
Nitrobenzene	U		0.0138	0.395	1	01/15/2022 20:52	WG1802218
n-Nitrosodimethylamine	U		0.0586	0.395	1	01/15/2022 20:52	WG1802218
n-Nitrosodiphenylamine	U		0.0299	0.395	1	01/15/2022 20:52	WG1802218
n-Nitrosodi-n-propylamine	U		0.0132	0.395	1	01/15/2022 20:52	WG1802218
Phenanthrene	U		0.00784	0.0395	1	01/15/2022 20:52	WG1802218
Benzylbutyl phthalate	U		0.0123	0.395	1	01/15/2022 20:52	WG1802218
Bis(2-ethylhexyl)phthalate	U		0.0500	0.395	1	01/15/2022 20:52	WG1802218
Di-n-butyl phthalate	U		0.0135	0.395	1	01/15/2022 20:52	WG1802218
Diethyl phthalate	U		0.0130	0.395	1	01/15/2022 20:52	WG1802218
Dimethyl phthalate	U		0.0837	0.395	1	01/15/2022 20:52	WG1802218
Di-n-octyl phthalate	U		0.0267	0.395	1	01/15/2022 20:52	WG1802218
Pyrene	U		0.00768	0.0395	1	01/15/2022 20:52	WG1802218
1,2,4-Trichlorobenzene	U		0.0123	0.395	1	01/15/2022 20:52	WG1802218
4-Chloro-3-methylphenol	U		0.0128	0.395	1	01/15/2022 20:52	WG1802218
2-Chlorophenol	U		0.0130	0.395	1	01/15/2022 20:52	WG1802218
2,4-Dichlorophenol	U		0.0115	0.395	1	01/15/2022 20:52	WG1802218
2,4-Dimethylphenol	U		0.0103	0.395	1	01/15/2022 20:52	WG1802218
4,6-Dinitro-2-methylphenol	U		0.0895	0.395	1	01/15/2022 20:52	WG1802218
2,4-Dinitrophenol	U		0.0924	0.395	1	01/15/2022 20:52	WG1802218
2-Nitrophenol	U		0.0141	0.395	1	01/15/2022 20:52	WG1802218

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0123	0.395	1	01/15/2022 20:52	WG1802218
Pentachlorophenol	U		0.0106	0.395	1	01/15/2022 20:52	WG1802218
Phenol	U		0.0159	0.395	1	01/15/2022 20:52	WG1802218
2,4,6-Trichlorophenol	U		0.0127	0.395	1	01/15/2022 20:52	WG1802218
(S) 2-Fluorophenol	*72.9*			*12.0-120*		*01/15/2022 20:52*	WG1802218
(S) Phenol-d5	*64.8*			*10.0-120*		*01/15/2022 20:52*	WG1802218
(S) Nitrobenzene-d5	*61.4*			*10.0-122*		*01/15/2022 20:52*	WG1802218
(S) 2-Fluorobiphenyl	*64.2*			*15.0-120*		*01/15/2022 20:52*	WG1802218
(S) 2,4,6-Tribromophenol	*70.5*			*10.0-127*		*01/15/2022 20:52*	WG1802218
(S) p-Terphenyl-d14	*71.1*			*10.0-120*		*01/15/2022 20:52*	WG1802218

Method Blank (MB)

(MB) R3750677-1 01/15/22 17:49

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1450945-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1450945-04 01/15/22 17:49 • (DUP) R3750677-3 01/15/22 17:49

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	85.9	89.6	1	4.20		10

Laboratory Control Sample (LCS)

(LCS) R3750677-2 01/15/22 17:49

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3750495-1 01/15/22 10:36

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1450956-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1450956-09 01/15/22 10:36 • (DUP) R3750495-3 01/15/22 10:36

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	84.3	87.7	1	3.93		10

Laboratory Control Sample (LCS)

(LCS) R3750495-2 01/15/22 10:36

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3750549-1 01/17/22 11:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3750549-2 01/17/22 11:37

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Mercury	0.500	0.532	106	80.0-120	

L1451073-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1451073-14 01/17/22 11:39 • (MS) R3750549-3 01/17/22 11:45 • (MSD) R3750549-4 01/17/22 11:47

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.500	U	0.571	0.527	114	105	1	75.0-125			8.00	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3754018-1 01/27/22 00:16

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Lead	U		0.208	0.500
Selenium	U		0.764	2.00
Silver	U		0.127	1.00

Laboratory Control Sample (LCS)

(LCS) R3754018-2 01/27/22 00:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	94.1	94.1	80.0-120	
Barium	100	102	102	80.0-120	
Cadmium	100	97.2	97.2	80.0-120	
Chromium	100	97.6	97.6	80.0-120	
Lead	100	96.4	96.4	80.0-120	
Selenium	100	99.9	99.9	80.0-120	
Silver	20.0	17.4	87.2	80.0-120	

Method Blank (MB)

(MB) R3750430-3 01/14/22 23:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromobenzene	U		0.000900	0.0125
Bromodichloromethane	U		0.000725	0.00250
Bromoform	U		0.00117	0.0250
Bromomethane	U		0.00197	0.0125
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloroform	U		0.00103	0.00250
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	U		0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
Dibromomethane	U		0.000750	0.00500
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,1-Dichloroethane	U		0.000491	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,2-Dichloropropane	U		0.00142	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
1,3-Dichloropropane	U		0.000501	0.00500
cis-1,3-Dichloropropene	U		0.000757	0.00250
trans-1,3-Dichloropropene	U		0.00114	0.00500
2,2-Dichloropropane	U		0.00138	0.00250
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	U		0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250

1 Cp 2 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

Method Blank (MB)

(MB) R3750430-3 01/14/22 23:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	U		0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
Tetrachloroethene	U		0.000896	0.00250
Toluene	U		0.00130	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125
1,1,1-Trichloroethane	U		0.000923	0.00250
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	*112*			*75.0-131*
(S) 4-Bromofluorobenzene	*97.1*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*93.9*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3750430-1 01/14/22 22:27 • (LCSD) R3750430-2 01/14/22 22:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.625	0.744	0.667	119	107	10.0-160			10.9	31
Acrylonitrile	0.625	0.631	0.635	101	102	45.0-153			0.632	22
Benzene	0.125	0.128	0.134	102	107	70.0-123			4.58	20
Bromobenzene	0.125	0.139	0.145	111	116	73.0-121			4.23	20
Bromodichloromethane	0.125	0.134	0.131	107	105	73.0-121			2.26	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3750430-1 01/14/22 22:27 • (LCSD) R3750430-2 01/14/22 22:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromoform	0.125	0.140	0.137	112	110	64.0-132			2.17	20
Bromomethane	0.125	0.154	0.156	123	125	56.0-147			1.29	20
n-Butylbenzene	0.125	0.110	0.110	88.0	88.0	68.0-135			0.000	20
sec-Butylbenzene	0.125	0.136	0.137	109	110	74.0-130			0.733	20
tert-Butylbenzene	0.125	0.132	0.135	106	108	75.0-127			2.25	20
Carbon tetrachloride	0.125	0.151	0.152	121	122	66.0-128			0.660	20
Chlorobenzene	0.125	0.133	0.133	106	106	76.0-128			0.000	20
Chlorodibromomethane	0.125	0.160	0.159	128	127	74.0-127	J4		0.627	20
Chloroethane	0.125	0.146	0.145	117	116	61.0-134			0.687	20
Chloroform	0.125	0.128	0.125	102	100	72.0-123			2.37	20
Chloromethane	0.125	0.117	0.113	93.6	90.4	51.0-138			3.48	20
2-Chlorotoluene	0.125	0.137	0.141	110	113	75.0-124			2.88	20
4-Chlorotoluene	0.125	0.139	0.143	111	114	75.0-124			2.84	20
1,2-Dibromo-3-Chloropropane	0.125	0.125	0.123	100	98.4	59.0-130			1.61	20
1,2-Dibromoethane	0.125	0.141	0.138	113	110	74.0-128			2.15	20
Dibromomethane	0.125	0.135	0.133	108	106	75.0-122			1.49	20
1,2-Dichlorobenzene	0.125	0.129	0.129	103	103	76.0-124			0.000	20
1,3-Dichlorobenzene	0.125	0.135	0.131	108	105	76.0-125			3.01	20
1,4-Dichlorobenzene	0.125	0.131	0.130	105	104	77.0-121			0.766	20
Dichlorodifluoromethane	0.125	0.130	0.130	104	104	43.0-156			0.000	20
1,1-Dichloroethane	0.125	0.125	0.125	100	100	70.0-127			0.000	20
1,2-Dichloroethane	0.125	0.132	0.130	106	104	65.0-131			1.53	20
1,1-Dichloroethene	0.125	0.134	0.134	107	107	65.0-131			0.000	20
cis-1,2-Dichloroethene	0.125	0.134	0.134	107	107	73.0-125			0.000	20
trans-1,2-Dichloroethene	0.125	0.125	0.129	100	103	71.0-125			3.15	20
1,2-Dichloropropane	0.125	0.117	0.116	93.6	92.8	74.0-125			0.858	20
1,1-Dichloropropene	0.125	0.134	0.139	107	111	73.0-125			3.66	20
1,3-Dichloropropane	0.125	0.136	0.139	109	111	80.0-125			2.18	20
cis-1,3-Dichloropropene	0.125	0.138	0.146	110	117	76.0-127			5.63	20
trans-1,3-Dichloropropene	0.125	0.144	0.149	115	119	73.0-127			3.41	20
2,2-Dichloropropane	0.125	0.163	0.158	130	126	59.0-135			3.12	20
Di-isopropyl ether	0.125	0.114	0.113	91.2	90.4	60.0-136			0.881	20
Ethylbenzene	0.125	0.137	0.142	110	114	74.0-126			3.58	20
Hexachloro-1,3-butadiene	0.125	0.118	0.117	94.4	93.6	57.0-150			0.851	20
Isopropylbenzene	0.125	0.130	0.132	104	106	72.0-127			1.53	20
p-Isopropyltoluene	0.125	0.130	0.125	104	100	72.0-133			3.92	20
2-Butanone (MEK)	0.625	0.683	0.831	109	133	30.0-160			19.6	24
Methylene Chloride	0.125	0.138	0.136	110	109	68.0-123			1.46	20
4-Methyl-2-pentanone (MIBK)	0.625	0.648	0.636	104	102	56.0-143			1.87	20
Methyl tert-butyl ether	0.125	0.141	0.133	113	106	66.0-132			5.84	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3750430-1 01/14/22 22:27 • (LCSD) R3750430-2 01/14/22 22:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.125	0.0903	0.0885	72.2	70.8	59.0-130			2.01	20
n-Propylbenzene	0.125	0.135	0.140	108	112	74.0-126			3.64	20
Styrene	0.125	0.131	0.130	105	104	72.0-127			0.766	20
1,1,1,2-Tetrachloroethane	0.125	0.145	0.141	116	113	74.0-129			2.80	20
1,1,2,2-Tetrachloroethane	0.125	0.142	0.145	114	116	68.0-128			2.09	20
Tetrachloroethene	0.125	0.154	0.159	123	127	70.0-136			3.19	20
Toluene	0.125	0.131	0.135	105	108	75.0-121			3.01	20
1,1,2-Trichlorotrifluoroethane	0.125	0.136	0.139	109	111	61.0-139			2.18	20
1,2,3-Trichlorobenzene	0.125	0.116	0.109	92.8	87.2	59.0-139			6.22	20
1,2,4-Trichlorobenzene	0.125	0.101	0.102	80.8	81.6	62.0-137			0.985	20
1,1,1-Trichloroethane	0.125	0.137	0.141	110	113	69.0-126			2.88	20
1,1,2-Trichloroethane	0.125	0.147	0.148	118	118	78.0-123			0.678	20
Trichloroethene	0.125	0.134	0.145	107	116	76.0-126			7.89	20
Trichlorofluoromethane	0.125	0.125	0.129	100	103	61.0-142			3.15	20
1,2,3-Trichloropropane	0.125	0.134	0.131	107	105	67.0-129			2.26	20
1,2,3-Trimethylbenzene	0.125	0.115	0.114	92.0	91.2	74.0-124			0.873	20
1,2,4-Trimethylbenzene	0.125	0.124	0.125	99.2	100	70.0-126			0.803	20
1,3,5-Trimethylbenzene	0.125	0.122	0.124	97.6	99.2	73.0-127			1.63	20
Vinyl chloride	0.125	0.124	0.128	99.2	102	63.0-134			3.17	20
Xylenes, Total	0.375	0.395	0.406	105	108	72.0-127			2.75	20
(S) Toluene-d8				*106*	*106*	*75.0-131*				
(S) 4-Bromofluorobenzene				*101*	*99.5*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*98.6*	*99.4*	*70.0-130*				

L1450852-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450852-01 01/15/22 07:46 • (MS) R3750430-4 01/15/22 08:06 • (MSD) R3750430-5 01/15/22 08:25

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	343	309	341	0.000	0.000	40	10.0-160	V	V	9.85	40
Acrylonitrile	25.0	U	21.7	18.4	86.8	73.6	40	10.0-160			16.5	40
Benzene	5.00	U	4.94	4.61	98.8	92.2	40	10.0-149			6.91	37
Bromobenzene	5.00	U	5.44	4.99	109	99.8	40	10.0-156			8.63	38
Bromodichloromethane	5.00	U	5.05	4.59	101	91.8	40	10.0-143			9.54	37
Bromoform	5.00	U	5.06	4.67	101	93.4	40	10.0-146			8.02	36
Bromomethane	5.00	U	5.49	5.10	110	102	40	10.0-149			7.37	38
n-Butylbenzene	5.00	U	4.53	4.23	90.6	84.6	40	10.0-160			6.85	40
sec-Butylbenzene	5.00	U	5.65	5.10	113	102	40	10.0-159			10.2	39
tert-Butylbenzene	5.00	U	5.54	5.02	111	100	40	10.0-156			9.85	39

L1450852-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450852-01 01/15/22 07:46 • (MS) R3750430-4 01/15/22 08:06 • (MSD) R3750430-5 01/15/22 08:25

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Carbon tetrachloride	5.00	U	6.05	5.69	121	114	40	10.0-145			6.13	37
Chlorobenzene	5.00	U	5.23	4.69	105	93.8	40	10.0-152			10.9	39
Chlorodibromomethane	5.00	U	6.06	5.45	121	109	40	10.0-146			10.6	37
Chloroethane	5.00	U	5.38	5.00	108	100	40	10.0-146			7.32	40
Chloroform	5.00	U	4.73	4.36	94.6	87.2	40	10.0-146			8.14	37
Chloromethane	5.00	U	3.34	3.55	66.8	71.0	40	10.0-159			6.10	37
2-Chlorotoluene	5.00	U	5.41	5.01	108	100	40	10.0-159			7.68	38
4-Chlorotoluene	5.00	U	5.21	4.88	104	97.6	40	10.0-155			6.54	39
1,2-Dibromo-3-Chloropropane	5.00	U	4.52	4.21	90.4	84.2	40	10.0-151			7.10	39
1,2-Dibromoethane	5.00	U	5.30	4.73	106	94.6	40	10.0-148			11.4	34
Dibromomethane	5.00	U	4.71	4.34	94.2	86.8	40	10.0-147			8.18	35
1,2-Dichlorobenzene	5.00	U	4.95	4.54	99.0	90.8	40	10.0-155			8.64	37
1,3-Dichlorobenzene	5.00	U	5.03	4.72	101	94.4	40	10.0-153			6.36	38
1,4-Dichlorobenzene	5.00	U	4.96	4.49	99.2	89.8	40	10.0-151			9.95	38
Dichlorodifluoromethane	5.00	U	4.27	3.92	85.4	78.4	40	10.0-160			8.55	35
1,1-Dichloroethane	5.00	U	4.70	4.37	94.0	87.4	40	10.0-147			7.28	37
1,2-Dichloroethane	5.00	U	4.62	4.48	92.4	89.6	40	10.0-148			3.08	35
1,1-Dichloroethene	5.00	U	5.06	4.67	101	93.4	40	10.0-155			8.02	37
cis-1,2-Dichloroethene	5.00	U	5.00	4.71	100	94.2	40	10.0-149			5.97	37
trans-1,2-Dichloroethene	5.00	U	4.77	4.49	95.4	89.8	40	10.0-150			6.05	37
1,2-Dichloropropane	5.00	U	4.41	4.12	88.2	82.4	40	10.0-148			6.80	37
1,1-Dichloropropene	5.00	U	5.24	4.72	105	94.4	40	10.0-153			10.4	35
1,3-Dichloropropane	5.00	U	5.27	4.74	105	94.8	40	10.0-154			10.6	35
cis-1,3-Dichloropropene	5.00	U	5.28	4.91	106	98.2	40	10.0-151			7.26	37
trans-1,3-Dichloropropene	5.00	U	5.58	5.00	112	100	40	10.0-148			11.0	37
2,2-Dichloropropane	5.00	U	6.06	5.99	121	120	40	10.0-138			1.16	36
Di-isopropyl ether	5.00	U	4.19	3.96	83.8	79.2	40	10.0-147			5.64	36
Ethylbenzene	5.00	U	5.47	4.88	109	97.6	40	10.0-160			11.4	38
Hexachloro-1,3-butadiene	5.00	U	6.14	5.59	123	112	40	10.0-160			9.38	40
Isopropylbenzene	5.00	U	5.24	4.68	105	93.6	40	10.0-155			11.3	38
p-Isopropyltoluene	5.00	U	5.21	4.65	104	93.0	40	10.0-160			11.4	40
2-Butanone (MEK)	25.0	U	28.9	27.3	116	109	40	10.0-160			5.69	40
Methylene Chloride	5.00	U	4.76	4.51	95.2	90.2	40	10.0-141			5.39	37
4-Methyl-2-pentanone (MIBK)	25.0	U	23.9	21.6	95.6	86.4	40	10.0-160			10.1	35
Methyl tert-butyl ether	5.00	U	4.70	4.67	94.0	93.4	40	11.0-147			0.640	35
Naphthalene	5.00	U	3.52	3.36	70.4	67.2	40	10.0-160			4.65	36
n-Propylbenzene	5.00	0.0470	5.31	4.83	105	95.7	40	10.0-158			9.47	38
Styrene	5.00	U	5.02	4.49	100	89.8	40	10.0-160			11.1	40
1,1,1,2-Tetrachloroethane	5.00	U	5.40	5.01	108	100	40	10.0-149			7.49	39
1,1,2,2-Tetrachloroethane	5.00	U	5.29	4.96	106	99.2	40	10.0-160			6.44	35

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L1450852-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450852-01 01/15/22 07:46 • (MS) R3750430-4 01/15/22 08:06 • (MSD) R3750430-5 01/15/22 08:25

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	5.00	U	6.25	5.45	125	109	40	10.0-156			13.7	39
Toluene	5.00	0.0820	5.25	4.77	103	93.8	40	10.0-156			9.58	38
1,1,2-Trichlorotrifluoroethane	5.00	U	5.65	5.50	113	110	40	10.0-160			2.69	36
1,2,3-Trichlorobenzene	5.00	U	4.53	4.21	90.6	84.2	40	10.0-160			7.32	40
1,2,4-Trichlorobenzene	5.00	U	3.82	3.71	76.4	74.2	40	10.0-160			2.92	40
1,1,1-Trichloroethane	5.00	U	5.50	5.16	110	103	40	10.0-144			6.38	35
1,1,2-Trichloroethane	5.00	U	5.76	5.25	115	105	40	10.0-160			9.26	35
Trichloroethene	5.00	U	5.36	4.90	107	98.0	40	10.0-156			8.97	38
Trichlorofluoromethane	5.00	U	5.31	4.90	106	98.0	40	10.0-160			8.03	40
1,2,3-Trichloropropane	5.00	U	5.03	4.70	101	94.0	40	10.0-156			6.78	35
1,2,3-Trimethylbenzene	5.00	0.130	4.42	4.19	85.8	81.2	40	10.0-160			5.34	36
1,2,4-Trimethylbenzene	5.00	0.563	4.97	4.63	88.1	81.3	40	10.0-160			7.08	36
1,3,5-Trimethylbenzene	5.00	0.151	4.80	4.49	93.0	86.8	40	10.0-160			6.67	38
Vinyl chloride	5.00	U	4.33	4.03	86.6	80.6	40	10.0-160			7.18	37
Xylenes, Total	15.0	U	15.2	13.7	101	91.3	40	10.0-160			10.4	38
(S) Toluene-d8					*108*	*107*		*75.0-131*				
(S) 4-Bromofluorobenzene					*97.0*	*95.4*		*67.0-138*				
(S) 1,2-Dichloroethane-d4					*88.9*	*92.3*		*70.0-130*				

Sample Narrative:

OS: Lowest possible dilution due to sample foaming.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3751030-1 01/16/22 07:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*104*			*70.0-130*
(S) 1-chlorooctane	*117*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3751030-2 01/16/22 07:54 • (LCSD) R3751030-3 01/16/22 08:07

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	251	234	100	93.6	75.0-125			7.01	20
TPH C12 - C28	250	243	237	97.2	94.8	75.0-125			2.50	20
TPH C6 - C35	500	494	471	98.8	94.2	75.0-125			4.77	20
(S) o-Terphenyl				*105*	*103*	*70.0-130*				
(S) 1-chlorooctane				*130*	*128*	*70.0-130*				

L1450956-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450956-03 01/20/22 12:40 • (MS) R3751975-1 01/20/22 12:53 • (MSD) R3751975-2 01/20/22 13:07

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	279	U	247	244	88.5	86.5	1	75.0-125			1.41	20
TPH C12 - C28	279	U	247	249	88.5	88.6	1	75.0-125			0.926	20
TPH C6 - C35	558	U	494	493	88.5	87.7	1	75.0-125			0.233	20
(S) o-Terphenyl					*95.1*	*95.1*		*70.0-130*				
(S) 1-chlorooctane					*133*	*133*		*70.0-130*	J1	J1		

Method Blank (MB)

(MB) R3750757-1 01/17/22 17:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*98.0*			*70.0-130*
(S) 1-chlorooctane	*112*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3750757-2 01/17/22 17:37 • (LCSD) R3750757-3 01/17/22 17:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	238	218	95.2	91.6	75.0-125			8.77	20
TPH C12 - C28	250	232	217	92.8	91.2	75.0-125			6.68	20
TPH C6 - C35	499	470	435	94.2	91.4	75.0-125			7.73	20
(S) o-Terphenyl				*98.4*	*100*	*70.0-130*				
(S) 1-chlorooctane				*125*	*123*	*70.0-130*				

Method Blank (MB)

(MB) R3751988-1 01/19/22 22:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0118	0.0340
PCB 1221	U		0.0118	0.0340
PCB 1232	U		0.0118	0.0340
PCB 1242	U		0.0118	0.0340
PCB 1248	U		0.00738	0.0170
PCB 1254	U		0.00738	0.0170
PCB 1260	U		0.00738	0.0170
(S) Decachlorobiphenyl	*100*			*10.0-135*
(S) Tetrachloro-m-xylene	*90.4*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3751988-2 01/19/22 22:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	0.167	0.200	120	37.0-145	
PCB 1016	0.167	0.151	90.4	36.0-141	
(S) Decachlorobiphenyl			*92.8*	*10.0-135*	
(S) Tetrachloro-m-xylene			*91.0*	*10.0-139*	

L1451143-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1451143-05 01/20/22 00:50 • (MS) R3751988-3 01/20/22 00:59 • (MSD) R3751988-4 01/20/22 01:09

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.167	U	0.0762	0.0608	37.0	29.5	1	10.0-160			22.5	38
PCB 1016	0.167	U	0.367	0.244	178	119	1	10.0-160	J5 P	J3 P	40.3	37
(S) Decachlorobiphenyl					*32.4*	*19.8*		*10.0-135*				
(S) Tetrachloro-m-xylene					*38.3*	*27.5*		*10.0-139*				

Method Blank (MB)

(MB) R3750487-2 01/14/22 10:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	U		0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

Method Blank (MB)

(MB) R3750487-2 01/14/22 10:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*51.1*			*10.0-122*
(S) 2-Fluorobiphenyl	*56.2*			*15.0-120*
(S) p-Terphenyl-d14	*61.0*			*10.0-120*
(S) Phenol-d5	*54.8*			*10.0-120*
(S) 2-Fluorophenol	*61.1*			*12.0-120*
(S) 2,4,6-Tribromophenol	*55.6*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3750487-1 01/14/22 10:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.344	51.7	38.0-120	
Acenaphthylene	0.666	0.372	55.9	40.0-120	
Anthracene	0.666	0.392	58.9	42.0-120	
Benzidine	1.33	0.370	27.8	10.0-120	
Benzo(a)anthracene	0.666	0.430	64.6	44.0-120	
Benzo(b)fluoranthene	0.666	0.421	63.2	43.0-120	
Benzo(k)fluoranthene	0.666	0.423	63.5	44.0-120	
Benzo(g,h,i)perylene	0.666	0.405	60.8	43.0-120	
Benzo(a)pyrene	0.666	0.424	63.7	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.328	49.2	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.389	58.4	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.342	51.4	23.0-120	
4-Bromophenyl-phenylether	0.666	0.438	65.8	40.0-120	
2-Chloronaphthalene	0.666	0.350	52.6	35.0-120	

Laboratory Control Sample (LCS)

(LCS) R3750487-1 01/14/22 10:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.372	55.9	40.0-120	
Chrysene	0.666	0.418	62.8	43.0-120	
Dibenz(a,h)anthracene	0.666	0.388	58.3	44.0-120	
3,3-Dichlorobenzidine	1.33	0.574	43.2	28.0-120	
2,4-Dinitrotoluene	0.666	0.422	63.4	45.0-120	
2,6-Dinitrotoluene	0.666	0.393	59.0	42.0-120	
Fluoranthene	0.666	0.400	60.1	44.0-120	
Fluorene	0.666	0.396	59.5	41.0-120	
Hexachlorobenzene	0.666	0.372	55.9	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.345	51.8	15.0-120	
Hexachlorocyclopentadiene	0.666	0.300	45.0	15.0-120	
Hexachloroethane	0.666	0.375	56.3	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.405	60.8	45.0-120	
Isophorone	0.666	0.330	49.5	23.0-120	
Naphthalene	0.666	0.305	45.8	18.0-120	
Nitrobenzene	0.666	0.326	48.9	17.0-120	
n-Nitrosodimethylamine	0.666	0.420	63.1	10.0-125	
n-Nitrosodiphenylamine	0.666	0.385	57.8	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.370	55.6	26.0-120	
Phenanthrene	0.666	0.383	57.5	42.0-120	
Benzylbutyl phthalate	0.666	0.415	62.3	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.432	64.9	41.0-120	
Di-n-butyl phthalate	0.666	0.396	59.5	43.0-120	
Diethyl phthalate	0.666	0.384	57.7	43.0-120	
Dimethyl phthalate	0.666	0.376	56.5	43.0-120	
Di-n-octyl phthalate	0.666	0.436	65.5	40.0-120	
Pyrene	0.666	0.405	60.8	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.325	48.8	17.0-120	
4-Chloro-3-methylphenol	0.666	0.350	52.6	28.0-120	
2-Chlorophenol	0.666	0.359	53.9	28.0-120	
2,4-Dichlorophenol	0.666	0.369	55.4	25.0-120	
2,4-Dimethylphenol	0.666	0.333	50.0	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.377	56.6	16.0-120	
2,4-Dinitrophenol	0.666	0.256	38.4	10.0-120	
2-Nitrophenol	0.666	0.333	50.0	20.0-120	
4-Nitrophenol	0.666	0.324	48.6	27.0-120	
Pentachlorophenol	0.666	0.394	59.2	29.0-120	
Phenol	0.666	0.375	56.3	28.0-120	
2,4,6-Trichlorophenol	0.666	0.408	61.3	37.0-120	
(S) Nitrobenzene-d5			*45.6*	*10.0-122*	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Laboratory Control Sample (LCS)

(LCS) R3750487-1 01/14/22 10:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*57.1*	*15.0-120*	
(S) p-Terphenyl-d14			*60.7*	*10.0-120*	
(S) Phenol-d5			*57.8*	*10.0-120*	
(S) 2-Fluorophenol			*62.2*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*65.3*	*10.0-127*	

L1450855-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450855-01 01/14/22 15:48 • (MS) R3750487-3 01/14/22 16:08 • (MSD) R3750487-4 01/14/22 16:29

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.650	U	0.275	0.308	42.3	46.9	1	18.0-120			11.2	32
Acenaphthylene	0.650	U	0.294	0.328	45.3	50.0	1	25.0-120			10.8	32
Anthracene	0.650	U	0.311	0.332	47.8	50.6	1	22.0-120			6.66	29
Benzidine	1.30	U	0.291	0.360	22.3	27.4	1	10.0-120			21.0	40
Benzo(a)anthracene	0.650	U	0.343	0.394	52.8	60.1	1	25.0-120			13.8	29
Benzo(b)fluoranthene	0.650	U	0.333	0.380	51.3	57.9	1	19.0-122			13.1	31
Benzo(k)fluoranthene	0.650	U	0.336	0.381	51.7	58.1	1	23.0-120			12.5	30
Benzo(g,h,i)perylene	0.650	U	0.335	0.380	51.6	57.9	1	10.0-120			12.5	33
Benzo(a)pyrene	0.650	U	0.343	0.384	52.8	58.5	1	24.0-120			11.2	30
Bis(2-chlorethoxy)methane	0.650	U	0.263	0.282	40.4	43.0	1	10.0-120			7.10	34
Bis(2-chloroethyl)ether	0.650	U	0.300	0.339	46.1	51.7	1	10.0-120			12.4	40
2,2-Oxybis(1-Chloropropane)	0.650	U	0.262	0.289	40.3	44.1	1	10.0-120			9.98	40
4-Bromophenyl-phenylether	0.650	U	0.348	0.377	53.6	57.5	1	27.0-120			7.87	30
2-Chloronaphthalene	0.650	U	0.282	0.320	43.4	48.8	1	20.0-120			12.5	32
4-Chlorophenyl-phenylether	0.650	U	0.306	0.337	47.0	51.4	1	24.0-120			9.83	29
Chrysene	0.650	U	0.337	0.393	51.9	59.9	1	21.0-120			15.3	29
Dibenz(a,h)anthracene	0.650	U	0.327	0.360	50.3	54.8	1	10.0-120			9.50	32
3,3-Dichlorobenzidine	1.30	U	0.533	0.655	40.9	49.8	1	10.0-120			20.6	34
2,4-Dinitrotoluene	0.650	U	0.315	0.371	48.4	56.5	1	30.0-120			16.3	31
2,6-Dinitrotoluene	0.650	U	0.329	0.354	50.6	53.9	1	25.0-120			7.16	31
Fluoranthene	0.650	U	0.317	0.347	48.7	53.0	1	18.0-126			9.20	32
Fluorene	0.650	U	0.311	0.360	47.8	54.8	1	25.0-120			14.6	30
Hexachlorobenzene	0.650	U	0.297	0.316	45.8	48.1	1	27.0-120			5.98	28
Hexachloro-1,3-butadiene	0.650	U	0.291	0.309	44.8	47.0	1	10.0-120			5.77	38
Hexachlorocyclopentadiene	0.650	U	0.109	0.133	16.8	20.3	1	10.0-120			20.2	40
Hexachloroethane	0.650	U	0.271	0.332	41.7	50.6	1	10.0-120			20.3	40
Indeno(1,2,3-cd)pyrene	0.650	U	0.344	0.372	53.0	56.7	1	10.0-120			7.68	32
Isophorone	0.650	U	0.268	0.301	41.2	45.8	1	13.0-120			11.5	34

L1450855-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450855-01 01/14/22 15:48 • (MS) R3750487-3 01/14/22 16:08 • (MSD) R3750487-4 01/14/22 16:29

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.650	U	0.243	0.273	37.5	41.6	1	10.0-120			11.4	35
Nitrobenzene	0.650	U	0.263	0.286	40.4	43.6	1	10.0-120			8.53	36
n-Nitrosodimethylamine	0.650	U	0.310	0.355	47.6	54.0	1	10.0-127			13.5	40
n-Nitrosodiphenylamine	0.650	U	0.306	0.328	47.0	50.0	1	17.0-120			7.07	29
n-Nitrosodi-n-propylamine	0.650	U	0.281	0.339	43.3	51.7	1	10.0-120			18.7	37
Phenanthrene	0.650	U	0.297	0.324	45.8	49.4	1	17.0-120			8.52	31
Benzylbutyl phthalate	0.650	U	0.326	0.388	50.2	59.2	1	23.0-120			17.4	30
Bis(2-ethylhexyl)phthalate	0.650	U	0.358	0.403	55.0	61.5	1	17.0-126			12.0	30
Di-n-butyl phthalate	0.650	U	0.316	0.334	48.6	50.9	1	30.0-120			5.64	29
Diethyl phthalate	0.650	U	0.310	0.349	47.6	53.3	1	26.0-120			12.1	28
Dimethyl phthalate	0.650	U	0.294	0.336	45.3	51.2	1	25.0-120			13.2	29
Di-n-octyl phthalate	0.650	U	0.350	0.403	53.9	61.5	1	21.0-123			14.1	29
Pyrene	0.650	U	0.325	0.381	50.0	58.1	1	16.0-121			15.9	32
1,2,4-Trichlorobenzene	0.650	U	0.273	0.297	42.0	45.3	1	12.0-120			8.57	37
4-Chloro-3-methylphenol	0.650	U	0.284	0.320	43.7	48.8	1	15.0-120			11.8	30
2-Chlorophenol	0.650	U	0.285	0.319	43.9	48.6	1	15.0-120			11.1	37
2,4-Dichlorophenol	0.650	U	0.294	0.320	45.3	48.8	1	20.0-120			8.29	31
2,4-Dimethylphenol	0.650	U	0.278	0.294	42.8	44.9	1	10.0-120			5.69	33
4,6-Dinitro-2-methylphenol	0.650	U	0.320	0.337	49.2	51.4	1	10.0-120			5.27	39
2,4-Dinitrophenol	0.650	U	0.273	0.287	42.0	43.8	1	10.0-121			5.09	40
2-Nitrophenol	0.650	U	0.279	0.319	42.9	48.6	1	12.0-120			13.3	39
4-Nitrophenol	0.650	U	0.221	0.250	34.0	38.0	1	10.0-137			12.1	32
Pentachlorophenol	0.650	U	0.292	0.335	45.0	51.1	1	10.0-160			13.6	31
Phenol	0.650	U	0.284	0.332	43.7	50.6	1	12.0-120			15.5	38
2,4,6-Trichlorophenol	0.650	U	0.307	0.361	47.2	55.0	1	19.0-120			16.2	32
(S) Nitrobenzene-d5					*37.0*	*39.8*		*10.0-122*				
(S) 2-Fluorobiphenyl					*44.5*	*52.5*		*15.0-120*				
(S) p-Terphenyl-d14					*50.8*	*55.6*		*10.0-120*				
(S) Phenol-d5					*44.4*	*53.0*		*10.0-120*				
(S) 2-Fluorophenol					*46.2*	*54.0*		*12.0-120*				
(S) 2,4,6-Tribromophenol					*55.3*	*58.7*		*10.0-127*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3750531-2 01/15/22 14:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	U		0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

1 Cp 2 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

Method Blank (MB)

(MB) R3750531-2 01/15/22 14:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*62.2*			*10.0-122*
(S) 2-Fluorobiphenyl	*72.1*			*15.0-120*
(S) p-Terphenyl-d14	*79.3*			*10.0-120*
(S) Phenol-d5	*69.7*			*10.0-120*
(S) 2-Fluorophenol	*75.8*			*12.0-120*
(S) 2,4,6-Tribromophenol	*73.6*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3750531-1 01/15/22 14:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.456	68.5	38.0-120	
Acenaphthylene	0.666	0.477	71.6	40.0-120	
Anthracene	0.666	0.533	80.0	42.0-120	
Benzidine	1.33	0.602	45.3	10.0-120	
Benzo(a)anthracene	0.666	0.566	85.0	44.0-120	
Benzo(b)fluoranthene	0.666	0.560	84.1	43.0-120	
Benzo(k)fluoranthene	0.666	0.578	86.8	44.0-120	
Benzo(g,h,i)perylene	0.666	0.551	82.7	43.0-120	
Benzo(a)pyrene	0.666	0.585	87.8	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.402	60.4	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.497	74.6	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.457	68.6	23.0-120	
4-Bromophenyl-phenylether	0.666	0.565	84.8	40.0-120	
2-Chloronaphthalene	0.666	0.470	70.6	35.0-120	

QUALITY CONTROL SUMMARY

Laboratory Control Sample (LCS)

(LCS) R3750531-1 01/15/22 14:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.500	75.1	40.0-120	
Chrysene	0.666	0.564	84.7	43.0-120	
Dibenz(a,h)anthracene	0.666	0.541	81.2	44.0-120	
3,3-Dichlorobenzidine	1.33	0.934	70.2	28.0-120	
2,4-Dinitrotoluene	0.666	0.553	83.0	45.0-120	
2,6-Dinitrotoluene	0.666	0.506	76.0	42.0-120	
Fluoranthene	0.666	0.540	81.1	44.0-120	
Fluorene	0.666	0.518	77.8	41.0-120	
Hexachlorobenzene	0.666	0.514	77.2	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.422	63.4	15.0-120	
Hexachlorocyclopentadiene	0.666	0.349	52.4	15.0-120	
Hexachloroethane	0.666	0.512	76.9	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.543	81.5	45.0-120	
Isophorone	0.666	0.404	60.7	23.0-120	
Naphthalene	0.666	0.379	56.9	18.0-120	
Nitrobenzene	0.666	0.394	59.2	17.0-120	
n-Nitrosodimethylamine	0.666	0.579	86.9	10.0-125	
n-Nitrosodiphenylamine	0.666	0.511	76.7	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.494	74.2	26.0-120	
Phenanthrene	0.666	0.502	75.4	42.0-120	
Benzylbutyl phthalate	0.666	0.531	79.7	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.566	85.0	41.0-120	
Di-n-butyl phthalate	0.666	0.515	77.3	43.0-120	
Diethyl phthalate	0.666	0.505	75.8	43.0-120	
Dimethyl phthalate	0.666	0.498	74.8	43.0-120	
Di-n-octyl phthalate	0.666	0.552	82.9	40.0-120	
Pyrene	0.666	0.545	81.8	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.405	60.8	17.0-120	
4-Chloro-3-methylphenol	0.666	0.429	64.4	28.0-120	
2-Chlorophenol	0.666	0.475	71.3	28.0-120	
2,4-Dichlorophenol	0.666	0.453	68.0	25.0-120	
2,4-Dimethylphenol	0.666	0.412	61.9	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.487	73.1	16.0-120	
2,4-Dinitrophenol	0.666	0.371	55.7	10.0-120	
2-Nitrophenol	0.666	0.430	64.6	20.0-120	
4-Nitrophenol	0.666	0.309	46.4	27.0-120	
Pentachlorophenol	0.666	0.459	68.9	29.0-120	
Phenol	0.666	0.507	76.1	28.0-120	
2,4,6-Trichlorophenol	0.666	0.510	76.6	37.0-120	
(S) Nitrobenzene-d5			*58.3*	*10.0-122*	

Laboratory Control Sample (LCS)

(LCS) R3750531-1 01/15/22 14:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*76.0*	*15.0-120*	
(S) p-Terphenyl-d14			*85.0*	*10.0-120*	
(S) Phenol-d5			*80.8*	*10.0-120*	
(S) 2-Fluorophenol			*83.6*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*88.7*	*10.0-127*	

L1450997-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450997-03 01/15/22 17:04 • (MS) R3750531-3 01/15/22 17:25 • (MSD) R3750531-4 01/15/22 17:45

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.779	U	0.468	0.476	60.1	61.1	1	18.0-120			1.73	32
Acenaphthylene	0.779	U	0.460	0.460	59.0	59.0	1	25.0-120			0.000	32
Anthracene	0.779	U	0.485	0.495	62.3	63.5	1	22.0-120			1.91	29
Benzidine	1.56	U	0.603	0.616	38.8	39.6	1	10.0-120			2.11	40
Benzo(a)anthracene	0.779	U	0.551	0.516	70.7	66.2	1	25.0-120			6.58	29
Benzo(b)fluoranthene	0.779	U	0.515	0.504	66.1	64.7	1	19.0-122			2.07	31
Benzo(k)fluoranthene	0.779	U	0.520	0.511	66.8	65.6	1	23.0-120			1.81	30
Benzo(g,h,i)perylene	0.779	U	0.490	0.485	62.9	62.3	1	10.0-120			0.959	33
Benzo(a)pyrene	0.779	U	0.530	0.512	68.0	65.8	1	24.0-120			3.37	30
Bis(2-chlorethoxy)methane	0.779	U	0.454	0.463	58.3	59.5	1	10.0-120			2.04	34
Bis(2-chloroethyl)ether	0.779	U	0.725	0.568	93.1	73.0	1	10.0-120			24.2	40
2,2-Oxybis(1-Chloropropane)	0.779	U	0.488	0.429	62.6	55.1	1	10.0-120			12.8	40
4-Bromophenyl-phenylether	0.779	U	0.596	0.594	76.6	76.3	1	27.0-120			0.393	30
2-Chloronaphthalene	0.779	U	0.476	0.477	61.1	61.3	1	20.0-120			0.245	32
4-Chlorophenyl-phenylether	0.779	U	0.496	0.491	63.7	63.1	1	24.0-120			0.948	29
Chrysene	0.779	U	0.529	0.492	67.9	63.2	1	21.0-120			7.10	29
Dibenz(a,h)anthracene	0.779	U	0.471	0.462	60.5	59.3	1	10.0-120			2.01	32
3,3-Dichlorobenzidine	1.56	U	1.02	0.927	65.3	59.6	1	10.0-120			9.03	34
2,4-Dinitrotoluene	0.779	U	0.559	0.605	71.8	77.6	1	30.0-120			7.84	31
2,6-Dinitrotoluene	0.779	U	0.553	0.541	71.0	69.5	1	25.0-120			2.14	31
Fluoranthene	0.779	U	0.540	0.529	69.4	67.9	1	18.0-126			2.19	32
Fluorene	0.779	U	0.548	0.562	70.4	72.2	1	25.0-120			2.53	30
Hexachlorobenzene	0.779	U	0.489	0.482	62.8	61.9	1	27.0-120			1.45	28
Hexachloro-1,3-butadiene	0.779	U	0.413	0.415	53.0	53.3	1	10.0-120			0.565	38
Hexachlorocyclopentadiene	0.779	U	0.235	0.248	30.2	31.8	1	10.0-120			5.33	40
Hexachloroethane	0.779	U	U	U	0.000	0.000	1	10.0-120	J6	J6	0.000	40
Indeno(1,2,3-cd)pyrene	0.779	U	0.493	0.481	63.4	61.7	1	10.0-120			2.64	32
Isophorone	0.779	U	0.653	0.677	83.8	86.9	1	13.0-120			3.69	34

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L1450997-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1450997-03 01/15/22 17:04 • (MS) R3750531-3 01/15/22 17:25 • (MSD) R3750531-4 01/15/22 17:45

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.779	U	0.401	0.414	51.5	53.2	1	10.0-120			3.16	35
Nitrobenzene	0.779	U	0.460	0.479	59.0	61.6	1	10.0-120			4.23	36
n-Nitrosodimethylamine	0.779	U	0.460	0.433	59.0	55.6	1	10.0-127			6.03	40
n-Nitrosodiphenylamine	0.779	U	0.699	0.690	89.8	88.6	1	17.0-120			1.35	29
n-Nitrosodi-n-propylamine	0.779	U	U	U	0.000	0.000	1	10.0-120	J6	J6	0.000	37
Phenanthrene	0.779	U	0.497	0.491	63.8	63.1	1	17.0-120			1.18	31
Benzylbutyl phthalate	0.779	U	0.545	0.519	70.0	66.7	1	23.0-120			4.84	30
Bis(2-ethylhexyl)phthalate	0.779	U	0.544	0.509	69.8	65.3	1	17.0-126			6.67	30
Di-n-butyl phthalate	0.779	U	0.513	0.511	65.9	65.6	1	30.0-120			0.457	29
Diethyl phthalate	0.779	U	0.512	0.523	65.8	67.1	1	26.0-120			2.03	28
Dimethyl phthalate	0.779	U	0.486	0.509	62.5	65.3	1	25.0-120			4.47	29
Di-n-octyl phthalate	0.779	U	0.561	0.531	72.1	68.2	1	21.0-123			5.57	29
Pyrene	0.779	U	0.522	0.490	67.0	62.9	1	16.0-121			6.24	32
1,2,4-Trichlorobenzene	0.779	U	0.399	0.398	51.2	51.1	1	12.0-120			0.294	37
4-Chloro-3-methylphenol	0.779	U	0.489	0.502	62.8	64.4	1	15.0-120			2.60	30
2-Chlorophenol	0.779	U	0.515	0.471	66.1	60.5	1	15.0-120			8.78	37
2,4-Dichlorophenol	0.779	U	0.351	0.522	45.0	67.0	1	20.0-120		J3	39.1	31
2,4-Dimethylphenol	0.779	U	0.567	0.589	72.8	75.7	1	10.0-120			3.84	33
4,6-Dinitro-2-methylphenol	0.779	U	0.503	0.527	64.6	67.7	1	10.0-120			4.77	39
2,4-Dinitrophenol	0.779	U	0.543	0.615	69.7	79.0	1	10.0-121			12.5	40
2-Nitrophenol	0.779	U	0.759	0.765	97.4	98.2	1	12.0-120			0.767	39
4-Nitrophenol	0.779	U	0.173	0.302	22.2	38.7	1	10.0-137		J3	54.2	32
Pentachlorophenol	0.779	U	0.504	0.530	64.7	68.0	1	10.0-160			4.98	31
Phenol	0.779	U	0.636	0.601	81.7	77.2	1	12.0-120			5.67	38
2,4,6-Trichlorophenol	0.779	U	0.577	0.552	74.0	70.9	1	19.0-120			4.35	32
(S) Nitrobenzene-d5					*61.3*	*69.7*		*10.0-122*				
(S) 2-Fluorobiphenyl					*61.6*	*63.1*		*15.0-120*				
(S) p-Terphenyl-d14					*67.6*	*60.7*		*10.0-120*				
(S) Phenol-d5					*74.5*	*70.7*		*10.0-120*				
(S) 2-Fluorophenol					*77.5*	*69.8*		*12.0-120*				
(S) 2,4,6-Tribromophenol					*74.6*	*73.3*		*10.0-127*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Company Name/Address:	Billing Information:	Pres Chk
Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118	
Report to: Rusty Lynch	Email To: rlynch@enercon.com ~~zs.silver@enercon~~	

Project Description:	City/State Collected:	Please Circle:
MKARNS Moorings Update	Muskogee, OK	PT MT CT ET

Phone:	Client Project #	Lab Project #
405-722-7693	CONSOR-00001	ENERCOOK-CONSOR00001

Collected by (print):	Site/Facility ID #	P.O. #
Zoe Silver		

Collected by (signature): Zoe Silver

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
- ___ Same Day
- ___ Five Day
- ___ Next Day
- ___ 5 Day (Rad Only)
- ___ Two Day
- ___ 10 Day (Rad Only)
- ___ Three Day

Quote #

Date Results Needed: standard

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs 5	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr	Gamma-Ray isotopic epa method 901.1						Remarks	Sample # (lab only)
SB-9	G	SS	N/A	1/8/22	955	4	X	X	X	X	X							-01
SB-10	G	SS		1/8/22	1152	4	X	X	X	X	X							-02
SB-11	G	SS		1/8/22	1334	4	X	X	X	X	X							-03
SB-12	G	SS		1/10/22	950	4	X	X	X	X	X							-04
SB-13	G	SS		1/10/22	1130	4	X	X	X	X	X							-05
SB-14	G	SS		1/10/22	1307	4	X	X	X	X	X							-06
SB-15	G	SS		1/10/22	1413	4	X	X	X	X	X							-07
SB-16	G	SS		1/11/22	918		X	X	X	X	X							-08
SB-17	G	SS		1/11/22	1045		X	X	X	X	X							-09

Chain of Custody Page 1 of 1

Pace Analytical®

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1450956

B123

Acctnum: **ENERCOOK**
Template: **T198286**
Prelogin: **P883980**
PM: **104 - Jason Romer**
PB: 10/21/21 Ted
Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
- COC Seal Present/Intact: __NP ✓Y __N
- COC Signed/Accurate: ✓Y __N
- Bottles arrive intact: ✓Y __N
- Correct bottles used: ✓Y __N
- Sufficient volume sent: ✓Y __N
- If Applicable
- VOA Zero Headspace: __Y __N
- Preservation Correct/Checked: __Y __N
- RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Vaughn	1/12/22	7:42	E Davis	

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3A47 °C	Bottles Received:
E Davis	1/12/22	14:00		1.3+0=1.3	45

If preservation required by Login: Date/Time

Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:	Hold:	Condition: NCF / OK
			[signature]	1/13/22	8:00		OK

ANALYTICAL REPORT

January 31, 2022

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1453350
Samples Received:	01/20/2022
Project Number:	CONSOR-00001
Description:	MKARNS Moorings
Report To:	Rusty Lynch 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

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1 Cp
2 Tc
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6 Qc
7 Gl
8 Al
9 Sc

SB-18 L1453350-01 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 08:59	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807079	1	01/24/22 16:49	01/30/22 13:50	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1.42	01/14/22 15:05	01/22/22 16:38	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1807575	1.42	01/14/22 15:05	01/25/22 12:37	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1806245	1	01/21/22 23:44	01/22/22 14:57	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806252	1	01/22/22 13:24	01/22/22 23:20	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1806705	2	01/25/22 09:25	01/25/22 21:39	AGW	Mt. Juliet, TN

SB-24 L1453350-02 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 16:00	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 09:01	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807079	1	01/24/22 16:49	01/29/22 17:39	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1	01/14/22 16:00	01/22/22 16:59	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1807575	1	01/14/22 16:00	01/25/22 12:56	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1806245	1	01/21/22 23:44	01/22/22 15:43	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806252	1	01/22/22 13:24	01/22/22 23:31	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1806705	1	01/25/22 09:25	01/25/22 17:10	AGW	Mt. Juliet, TN

SB-25 L1453350-03 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/16/22 14:00	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 08:30	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807069	1	01/24/22 17:06	01/29/22 15:44	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1	01/16/22 14:00	01/22/22 17:21	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1807575	1	01/16/22 14:00	01/25/22 13:15	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1806245	1	01/21/22 23:44	01/22/22 15:58	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806252	1	01/22/22 13:24	01/24/22 01:01	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1806705	2	01/25/22 09:25	01/25/22 20:17	AGW	Mt. Juliet, TN

SB-22 L1453350-04 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/16/22 15:45	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 09:03	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807079	1	01/24/22 16:49	01/29/22 17:42	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1	01/16/22 15:45	01/22/22 17:42	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1807575	1	01/16/22 15:45	01/25/22 13:33	BMB	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1806245	1	01/21/22 23:44	01/22/22 16:14	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806252	1	01/22/22 13:24	01/23/22 00:33	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1806705	2	01/25/22 09:25	01/25/22 20:37	AGW	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/17/22 11:00	01/20/22 13:00

SB-19 L1453350-05 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 09:05	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807079	1	01/24/22 16:49	01/29/22 17:45	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1	01/17/22 11:00	01/22/22 18:02	JAH	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1806245	1	01/21/22 23:44	01/22/22 16:29	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806716	1	01/27/22 12:45	01/27/22 18:39	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1806705	2	01/25/22 09:25	01/25/22 20:58	AGW	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/17/22 13:00	01/20/22 13:00

SB-21 L1453350-06 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 09:07	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807079	1	01/24/22 16:49	01/29/22 17:47	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1	01/17/22 13:00	01/22/22 18:23	JAH	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1806245	1	01/21/22 23:44	01/22/22 16:45	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806716	1	01/27/22 12:45	01/27/22 18:47	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1806705	2	01/25/22 09:25	01/25/22 21:19	AGW	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/17/22 15:00	01/20/22 13:00

SB-20 L1453350-07 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 09:13	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807079	1	01/24/22 16:49	01/29/22 17:50	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1	01/17/22 15:00	01/22/22 18:45	JAH	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1806245	1	01/21/22 23:44	01/22/22 17:31	JN	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806716	1	01/27/22 12:45	01/27/22 18:56	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1806705	1	01/25/22 09:25	01/25/22 19:15	AGW	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/18/22 09:20	01/20/22 13:00

SB-26 L1453350-08 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806098	1	01/24/22 14:36	01/24/22 14:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1806687	1	01/23/22 13:17	01/24/22 09:15	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1807079	1	01/24/22 16:49	01/29/22 17:52	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1806515	1	01/18/22 09:20	01/22/22 19:06	JAH	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1807686	1	01/25/22 17:42	01/26/22 04:11	ALA	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1806716	1	01/27/22 12:45	01/27/22 19:05	JMB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1807167	1	01/24/22 16:17	01/25/22 04:22	AGW	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	81.7		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0220	0.0489	1	01/24/2022 08:59	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	0.868	J	0.634	2.45	1	01/30/2022 13:50	WG1807079
Barium	36.8		0.104	0.612	1	01/30/2022 13:50	WG1807079
Cadmium	0.190	J	0.0576	0.612	1	01/30/2022 13:50	WG1807079
Chromium	6.56		0.163	1.22	1	01/30/2022 13:50	WG1807079
Lead	21.2		0.254	0.612	1	01/30/2022 13:50	WG1807079
Selenium	U		0.935	2.45	1	01/30/2022 13:50	WG1807079
Silver	U		0.155	1.22	1	01/30/2022 13:50	WG1807079

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0715	0.0980	1.42	01/22/2022 16:38	WG1806515
Acrylonitrile	U		0.00708	0.0246	1.42	01/22/2022 16:38	WG1806515
Benzene	U		0.000915	0.00196	1.42	01/25/2022 12:37	WG1807575
Bromobenzene	U		0.00177	0.0246	1.42	01/22/2022 16:38	WG1806515
Bromodichloromethane	U		0.00142	0.00490	1.42	01/22/2022 16:38	WG1806515
Bromoform	U		0.00229	0.0490	1.42	01/22/2022 16:38	WG1806515
Bromomethane	U		0.00387	0.0246	1.42	01/22/2022 16:38	WG1806515
n-Butylbenzene	U		0.0103	0.0246	1.42	01/22/2022 16:38	WG1806515
sec-Butylbenzene	U		0.00565	0.0246	1.42	01/22/2022 16:38	WG1806515
tert-Butylbenzene	U		0.00382	0.00980	1.42	01/22/2022 16:38	WG1806515
Carbon tetrachloride	U		0.00177	0.00980	1.42	01/22/2022 16:38	WG1806515
Chlorobenzene	U		0.000411	0.00490	1.42	01/22/2022 16:38	WG1806515
Chlorodibromomethane	U		0.00120	0.00490	1.42	01/22/2022 16:38	WG1806515
Chloroethane	U		0.00333	0.00980	1.42	01/22/2022 16:38	WG1806515
Chloroform	U		0.00202	0.00490	1.42	01/22/2022 16:38	WG1806515
Chloromethane	U		0.00853	0.0246	1.42	01/22/2022 16:38	WG1806515
2-Chlorotoluene	U		0.00170	0.00490	1.42	01/22/2022 16:38	WG1806515
4-Chlorotoluene	U		0.000882	0.00980	1.42	01/22/2022 16:38	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00765	0.0490	1.42	01/22/2022 16:38	WG1806515
1,2-Dibromoethane	U		0.00127	0.00490	1.42	01/22/2022 16:38	WG1806515
Dibromomethane	U		0.00148	0.00980	1.42	01/22/2022 16:38	WG1806515
1,2-Dichlorobenzene	U		0.000832	0.00980	1.42	01/22/2022 16:38	WG1806515
1,3-Dichlorobenzene	U		0.00118	0.00980	1.42	01/22/2022 16:38	WG1806515
1,4-Dichlorobenzene	U		0.00137	0.00980	1.42	01/22/2022 16:38	WG1806515
Dichlorodifluoromethane	U		0.00316	0.00490	1.42	01/22/2022 16:38	WG1806515
1,1-Dichloroethane	U		0.000962	0.00490	1.42	01/22/2022 16:38	WG1806515
1,2-Dichloroethane	U		0.00127	0.00490	1.42	01/22/2022 16:38	WG1806515
1,1-Dichloroethene	U		0.00119	0.00490	1.42	01/22/2022 16:38	WG1806515
cis-1,2-Dichloroethene	U		0.00144	0.00490	1.42	01/22/2022 16:38	WG1806515
trans-1,2-Dichloroethene	U		0.00204	0.00980	1.42	01/22/2022 16:38	WG1806515
1,2-Dichloropropane	U		0.00279	0.00980	1.42	01/22/2022 16:38	WG1806515
1,1-Dichloropropene	U		0.00159	0.00490	1.42	01/22/2022 16:38	WG1806515
1,3-Dichloropropane	U		0.000982	0.00980	1.42	01/22/2022 16:38	WG1806515

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00148	0.00490	1.42	01/22/2022 16:38	WG1806515
trans-1,3-Dichloropropene	U		0.00224	0.00980	1.42	01/22/2022 16:38	WG1806515
2,2-Dichloropropane	U		0.00271	0.00490	1.42	01/22/2022 16:38	WG1806515
Di-isopropyl ether	U		0.000803	0.00196	1.42	01/22/2022 16:38	WG1806515
Ethylbenzene	U		0.00145	0.00490	1.42	01/22/2022 16:38	WG1806515
Hexachloro-1,3-Butadiene	U		0.0118	0.0490	1.42	01/22/2022 16:38	WG1806515
Isopropylbenzene	U		0.000832	0.00490	1.42	01/22/2022 16:38	WG1806515
p-Isopropyltoluene	U		0.00500	0.00980	1.42	01/22/2022 16:38	WG1806515
2-Butanone (MEK)	U		0.125	0.196	1.42	01/22/2022 16:38	WG1806515
Methylene Chloride	U		0.0130	0.0490	1.42	01/22/2022 16:38	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00447	0.0490	1.42	01/22/2022 16:38	WG1806515
Methyl tert-butyl ether	U		0.000686	0.00196	1.42	01/25/2022 12:37	WG1807575
Naphthalene	U		0.00957	0.0246	1.42	01/22/2022 16:38	WG1806515
n-Propylbenzene	U		0.00186	0.00980	1.42	01/22/2022 16:38	WG1806515
Styrene	U		0.000449	0.0246	1.42	01/22/2022 16:38	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00186	0.00490	1.42	01/22/2022 16:38	WG1806515
1,1,2,2-Tetrachloroethane	U		0.00136	0.00490	1.42	01/22/2022 16:38	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00148	0.00490	1.42	01/22/2022 16:38	WG1806515
Tetrachloroethene	U		0.00175	0.00490	1.42	01/22/2022 16:38	WG1806515
Toluene	0.0120		0.00255	0.00980	1.42	01/25/2022 12:37	WG1807575
1,2,3-Trichlorobenzene	U		0.0144	0.0246	1.42	01/22/2022 16:38	WG1806515
1,2,4-Trichlorobenzene	U		0.00863	0.0246	1.42	01/22/2022 16:38	WG1806515
1,1,1-Trichloroethane	U		0.00181	0.00490	1.42	01/22/2022 16:38	WG1806515
1,1,2-Trichloroethane	U		0.00117	0.00490	1.42	01/22/2022 16:38	WG1806515
Trichloroethene	U		0.00114	0.00196	1.42	01/22/2022 16:38	WG1806515
Trichlorofluoromethane	U		0.00162	0.00490	1.42	01/22/2022 16:38	WG1806515
1,2,3-Trichloropropane	U		0.00318	0.0246	1.42	01/22/2022 16:38	WG1806515
1,2,4-Trimethylbenzene	U		0.00309	0.00980	1.42	01/25/2022 12:37	WG1807575
1,2,3-Trimethylbenzene	U		0.00309	0.00980	1.42	01/22/2022 16:38	WG1806515
1,3,5-Trimethylbenzene	U		0.00392	0.00980	1.42	01/22/2022 16:38	WG1806515
Vinyl chloride	U		0.00228	0.00490	1.42	01/22/2022 16:38	WG1806515
Xylenes, Total	0.00446	J	0.00173	0.0127	1.42	01/25/2022 12:37	WG1807575
(S) Toluene-d8	*102*			*75.0-131*		*01/22/2022 16:38*	WG1806515
(S) Toluene-d8	*102*			*75.0-131*		*01/25/2022 12:37*	WG1807575
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*01/22/2022 16:38*	WG1806515
(S) 4-Bromofluorobenzene	*98.1*			*67.0-138*		*01/25/2022 12:37*	WG1807575
(S) 1,2-Dichloroethane-d4	*98.2*			*70.0-130*		*01/22/2022 16:38*	WG1806515
(S) 1,2-Dichloroethane-d4	*102*			*70.0-130*		*01/25/2022 12:37*	WG1807575

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		18.4	61.2	1	01/22/2022 14:57	WG1806245
TPH C12 - C28	U		18.4	61.2	1	01/22/2022 14:57	WG1806245
TPH C28 - C35	U		18.4	61.2	1	01/22/2022 14:57	WG1806245
TPH C6 - C35	U		18.4	61.2	1	01/22/2022 14:57	WG1806245
(S) o-Terphenyl	*96.7*			*70.0-130*		*01/22/2022 14:57*	WG1806245
(S) 1-chlorooctane	*117*			*70.0-130*		*01/22/2022 14:57*	WG1806245

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0144	0.0416	1	01/22/2022 23:20	WG1806252
PCB 1221	U		0.0144	0.0416	1	01/22/2022 23:20	WG1806252
PCB 1232	U		0.0144	0.0416	1	01/22/2022 23:20	WG1806252
PCB 1242	U		0.0144	0.0416	1	01/22/2022 23:20	WG1806252
PCB 1248	U		0.00903	0.0208	1	01/22/2022 23:20	WG1806252
PCB 1254	U		0.00903	0.0208	1	01/22/2022 23:20	WG1806252
PCB 1260	U		0.00903	0.0208	1	01/22/2022 23:20	WG1806252
(S) Decachlorobiphenyl	*88.9*			*10.0-135*		*01/22/2022 23:20*	WG1806252
(S) Tetrachloro-m-xylene	*94.9*			*10.0-139*		*01/22/2022 23:20*	WG1806252

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.0132	0.0815	2	01/25/2022 21:39	WG1806705
Acenaphthylene	U		0.0115	0.0815	2	01/25/2022 21:39	WG1806705
Anthracene	U		0.0146	0.0815	2	01/25/2022 21:39	WG1806705
Benzidine	U		0.153	4.09	2	01/25/2022 21:39	WG1806705
Benzo(a)anthracene	U		0.0143	0.0815	2	01/25/2022 21:39	WG1806705
Benzo(b)fluoranthene	U		0.0152	0.0815	2	01/25/2022 21:39	WG1806705
Benzo(k)fluoranthene	U		0.0144	0.0815	2	01/25/2022 21:39	WG1806705
Benzo(g,h,i)perylene	U		0.0149	0.0815	2	01/25/2022 21:39	WG1806705
Benzo(a)pyrene	U		0.0152	0.0815	2	01/25/2022 21:39	WG1806705
Bis(2-chlorethoxy)methane	U		0.0245	0.815	2	01/25/2022 21:39	WG1806705
Bis(2-chloroethyl)ether	U		0.0269	0.815	2	01/25/2022 21:39	WG1806705
2,2-Oxybis(1-Chloropropane)	U		0.0352	0.815	2	01/25/2022 21:39	WG1806705
4-Bromophenyl-phenylether	U		0.0286	0.815	2	01/25/2022 21:39	WG1806705
2-Chloronaphthalene	U		0.0143	0.0815	2	01/25/2022 21:39	WG1806705
4-Chlorophenyl-phenylether	U		0.0284	0.815	2	01/25/2022 21:39	WG1806705
Chrysene	U		0.0162	0.0815	2	01/25/2022 21:39	WG1806705
Dibenz(a,h)anthracene	U		0.0226	0.0815	2	01/25/2022 21:39	WG1806705
3,3-Dichlorobenzidine	U		0.0301	0.815	2	01/25/2022 21:39	WG1806705
2,4-Dinitrotoluene	U		0.0234	0.815	2	01/25/2022 21:39	WG1806705
2,6-Dinitrotoluene	U		0.0267	0.815	2	01/25/2022 21:39	WG1806705
Fluoranthene	0.0165	J	0.0147	0.0815	2	01/25/2022 21:39	WG1806705
Fluorene	U		0.0132	0.0815	2	01/25/2022 21:39	WG1806705
Hexachlorobenzene	U		0.0289	0.815	2	01/25/2022 21:39	WG1806705
Hexachloro-1,3-butadiene	U		0.0274	0.815	2	01/25/2022 21:39	WG1806705
Hexachlorocyclopentadiene	U		0.0428	0.815	2	01/25/2022 21:39	WG1806705
Hexachloroethane	U		0.0321	0.815	2	01/25/2022 21:39	WG1806705
Indeno(1,2,3-cd)pyrene	U		0.0230	0.0815	2	01/25/2022 21:39	WG1806705
Isophorone	U		0.0250	0.815	2	01/25/2022 21:39	WG1806705
Naphthalene	U		0.0204	0.0815	2	01/25/2022 21:39	WG1806705
Nitrobenzene	U		0.0284	0.815	2	01/25/2022 21:39	WG1806705
n-Nitrosodimethylamine	U		0.121	0.815	2	01/25/2022 21:39	WG1806705
n-Nitrosodiphenylamine	U		0.0617	0.815	2	01/25/2022 21:39	WG1806705
n-Nitrosodi-n-propylamine	U		0.0272	0.815	2	01/25/2022 21:39	WG1806705
Phenanthrene	U		0.0162	0.0815	2	01/25/2022 21:39	WG1806705
Benzylbutyl phthalate	U		0.0254	0.815	2	01/25/2022 21:39	WG1806705
Bis(2-ethylhexyl)phthalate	U		0.103	0.815	2	01/25/2022 21:39	WG1806705
Di-n-butyl phthalate	U		0.0279	0.815	2	01/25/2022 21:39	WG1806705
Diethyl phthalate	U		0.0269	0.815	2	01/25/2022 21:39	WG1806705
Dimethyl phthalate	U		0.173	0.815	2	01/25/2022 21:39	WG1806705
Di-n-octyl phthalate	U		0.0551	0.815	2	01/25/2022 21:39	WG1806705
Pyrene	0.0208	J	0.0159	0.0815	2	01/25/2022 21:39	WG1806705
1,2,4-Trichlorobenzene	U		0.0254	0.815	2	01/25/2022 21:39	WG1806705
4-Chloro-3-methylphenol	U		0.0264	0.815	2	01/25/2022 21:39	WG1806705

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0269	0.815	2	01/25/2022 21:39	WG1806705
2,4-Dichlorophenol	U		0.0237	0.815	2	01/25/2022 21:39	WG1806705
2,4-Dimethylphenol	U		0.0213	0.815	2	01/25/2022 21:39	WG1806705
4,6-Dinitro-2-methylphenol	U		0.185	0.815	2	01/25/2022 21:39	WG1806705
2,4-Dinitrophenol	U		0.191	0.815	2	01/25/2022 21:39	WG1806705
2-Nitrophenol	U		0.0291	0.815	2	01/25/2022 21:39	WG1806705
4-Nitrophenol	U		0.0254	0.815	2	01/25/2022 21:39	WG1806705
Pentachlorophenol	U		0.0219	0.815	2	01/25/2022 21:39	WG1806705
Phenol	U		0.0328	0.815	2	01/25/2022 21:39	WG1806705
2,4,6-Trichlorophenol	U		0.0262	0.815	2	01/25/2022 21:39	WG1806705
(S) 2-Fluorophenol	*45.2*			*12.0-120*		*01/25/2022 21:39*	WG1806705
(S) Phenol-d5	*56.1*			*10.0-120*		*01/25/2022 21:39*	WG1806705
(S) Nitrobenzene-d5	*56.2*			*10.0-122*		*01/25/2022 21:39*	WG1806705
(S) 2-Fluorobiphenyl	*55.9*			*15.0-120*		*01/25/2022 21:39*	WG1806705
(S) 2,4,6-Tribromophenol	*73.0*			*10.0-127*		*01/25/2022 21:39*	WG1806705
(S) p-Terphenyl-d14	*68.6*			*10.0-120*		*01/25/2022 21:39*	WG1806705

Sample Narrative:

L1453350-01 WG1806705: Dilution due to matrix impact during extract concentration procedure

Cp Tc Ss Cn Sr Qc Gl Al Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	85.6		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0210	0.0467	1	01/24/2022 09:01	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	0.889	J	0.605	2.34	1	01/29/2022 17:39	WG1807079
Barium	21.3		0.0995	0.584	1	01/29/2022 17:39	WG1807079
Cadmium	U		0.0550	0.584	1	01/29/2022 17:39	WG1807079
Chromium	1.96		0.155	1.17	1	01/29/2022 17:39	WG1807079
Lead	1.72		0.243	0.584	1	01/29/2022 17:39	WG1807079
Selenium	U		0.893	2.34	1	01/29/2022 17:39	WG1807079
Silver	U		0.148	1.17	1	01/29/2022 17:39	WG1807079

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0495	0.0678	1	01/22/2022 16:59	WG1806515
Acrylonitrile	U		0.00489	0.0169	1	01/22/2022 16:59	WG1806515
Benzene	U		0.000633	0.00136	1	01/22/2022 16:59	WG1806515
Bromobenzene	U		0.00122	0.0169	1	01/22/2022 16:59	WG1806515
Bromodichloromethane	U		0.000983	0.00339	1	01/22/2022 16:59	WG1806515
Bromoform	U		0.00159	0.0339	1	01/22/2022 16:59	WG1806515
Bromomethane	U		0.00267	0.0169	1	01/22/2022 16:59	WG1806515
n-Butylbenzene	U		0.00712	0.0169	1	01/22/2022 16:59	WG1806515
sec-Butylbenzene	U		0.00390	0.0169	1	01/22/2022 16:59	WG1806515
tert-Butylbenzene	U		0.00264	0.00678	1	01/22/2022 16:59	WG1806515
Carbon tetrachloride	U		0.00122	0.00678	1	01/22/2022 16:59	WG1806515
Chlorobenzene	U		0.000285	0.00339	1	01/22/2022 16:59	WG1806515
Chlorodibromomethane	U		0.000830	0.00339	1	01/22/2022 16:59	WG1806515
Chloroethane	U		0.00230	0.00678	1	01/22/2022 16:59	WG1806515
Chloroform	U		0.00140	0.00339	1	01/22/2022 16:59	WG1806515
Chloromethane	U		0.00590	0.0169	1	01/22/2022 16:59	WG1806515
2-Chlorotoluene	U		0.00117	0.00339	1	01/22/2022 16:59	WG1806515
4-Chlorotoluene	U		0.000610	0.00678	1	01/22/2022 16:59	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00529	0.0339	1	01/22/2022 16:59	WG1806515
1,2-Dibromoethane	U		0.000878	0.00339	1	01/22/2022 16:59	WG1806515
Dibromomethane	U		0.00102	0.00678	1	01/22/2022 16:59	WG1806515
1,2-Dichlorobenzene	U		0.000576	0.00678	1	01/22/2022 16:59	WG1806515
1,3-Dichlorobenzene	U		0.000813	0.00678	1	01/22/2022 16:59	WG1806515
1,4-Dichlorobenzene	U		0.000949	0.00678	1	01/22/2022 16:59	WG1806515
Dichlorodifluoromethane	U		0.00218	0.00339	1	01/22/2022 16:59	WG1806515
1,1-Dichloroethane	U		0.000666	0.00339	1	01/22/2022 16:59	WG1806515
1,2-Dichloroethane	U		0.000880	0.00339	1	01/22/2022 16:59	WG1806515
1,1-Dichloroethene	U		0.000822	0.00339	1	01/22/2022 16:59	WG1806515
cis-1,2-Dichloroethene	U		0.000995	0.00339	1	01/22/2022 16:59	WG1806515
trans-1,2-Dichloroethene	U		0.00141	0.00678	1	01/22/2022 16:59	WG1806515
1,2-Dichloropropane	U		0.00193	0.00678	1	01/22/2022 16:59	WG1806515
1,1-Dichloropropene	U		0.00110	0.00339	1	01/22/2022 16:59	WG1806515
1,3-Dichloropropane	U		0.000679	0.00678	1	01/22/2022 16:59	WG1806515

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00103	0.00339	1	01/22/2022 16:59	WG1806515
trans-1,3-Dichloropropene	U		0.00155	0.00678	1	01/22/2022 16:59	WG1806515
2,2-Dichloropropane	U		0.00187	0.00339	1	01/22/2022 16:59	WG1806515
Di-isopropyl ether	U		0.000556	0.00136	1	01/22/2022 16:59	WG1806515
Ethylbenzene	U		0.000999	0.00339	1	01/22/2022 16:59	WG1806515
Hexachloro-1,3-Butadiene	U		0.00813	0.0339	1	01/22/2022 16:59	WG1806515
Isopropylbenzene	U		0.000576	0.00339	1	01/22/2022 16:59	WG1806515
p-Isopropyltoluene	U		0.00346	0.00678	1	01/22/2022 16:59	WG1806515
2-Butanone (MEK)	U		0.0861	0.136	1	01/22/2022 16:59	WG1806515
Methylene Chloride	U		0.00900	0.0339	1	01/22/2022 16:59	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00309	0.0339	1	01/22/2022 16:59	WG1806515
Methyl tert-butyl ether	U		0.000474	0.00136	1	01/25/2022 12:56	WG1807575
Naphthalene	U		0.00662	0.0169	1	01/22/2022 16:59	WG1806515
n-Propylbenzene	U		0.00129	0.00678	1	01/22/2022 16:59	WG1806515
Styrene	U		0.000310	0.0169	1	01/22/2022 16:59	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00129	0.00339	1	01/22/2022 16:59	WG1806515
1,1,2,2-Tetrachloroethane	U		0.000942	0.00339	1	01/22/2022 16:59	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00102	0.00339	1	01/22/2022 16:59	WG1806515
Tetrachloroethene	U		0.00121	0.00339	1	01/22/2022 16:59	WG1806515
Toluene	0.00588	J	0.00176	0.00678	1	01/25/2022 12:56	WG1807575
1,2,3-Trichlorobenzene	U		0.00994	0.0169	1	01/22/2022 16:59	WG1806515
1,2,4-Trichlorobenzene	U		0.00597	0.0169	1	01/22/2022 16:59	WG1806515
1,1,1-Trichloroethane	U		0.00125	0.00339	1	01/22/2022 16:59	WG1806515
1,1,2-Trichloroethane	U		0.000809	0.00339	1	01/22/2022 16:59	WG1806515
Trichloroethene	U		0.000792	0.00136	1	01/22/2022 16:59	WG1806515
Trichlorofluoromethane	U		0.00112	0.00339	1	01/22/2022 16:59	WG1806515
1,2,3-Trichloropropane	U		0.00220	0.0169	1	01/22/2022 16:59	WG1806515
1,2,4-Trimethylbenzene	U		0.00214	0.00678	1	01/25/2022 12:56	WG1807575
1,2,3-Trimethylbenzene	U		0.00214	0.00678	1	01/22/2022 16:59	WG1806515
1,3,5-Trimethylbenzene	U		0.00271	0.00678	1	01/22/2022 16:59	WG1806515
Vinyl chloride	U		0.00157	0.00339	1	01/22/2022 16:59	WG1806515
Xylenes, Total	0.00205	J	0.00119	0.00881	1	01/25/2022 12:56	WG1807575
(S) Toluene-d8	*101*			*75.0-131*		*01/22/2022 16:59*	WG1806515
(S) Toluene-d8	*101*			*75.0-131*		*01/25/2022 12:56*	WG1807575
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*01/22/2022 16:59*	WG1806515
(S) 4-Bromofluorobenzene	*98.1*			*67.0-138*		*01/25/2022 12:56*	WG1807575
(S) 1,2-Dichloroethane-d4	*95.5*			*70.0-130*		*01/22/2022 16:59*	WG1806515
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*		*01/25/2022 12:56*	WG1807575

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		17.5	58.4	1	01/22/2022 15:43	WG1806245
TPH C12 - C28	U		17.5	58.4	1	01/22/2022 15:43	WG1806245
TPH C28 - C35	U		17.5	58.4	1	01/22/2022 15:43	WG1806245
TPH C6 - C35	U		17.5	58.4	1	01/22/2022 15:43	WG1806245
(S) o-Terphenyl	*91.1*			*70.0-130*		*01/22/2022 15:43*	WG1806245
(S) 1-chlorooctane	*112*			*70.0-130*		*01/22/2022 15:43*	WG1806245

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0138	0.0397	1	01/22/2022 23:31	WG1806252
PCB 1221	U		0.0138	0.0397	1	01/22/2022 23:31	WG1806252
PCB 1232	U		0.0138	0.0397	1	01/22/2022 23:31	WG1806252
PCB 1242	U		0.0138	0.0397	1	01/22/2022 23:31	WG1806252
PCB 1248	U		0.00862	0.0199	1	01/22/2022 23:31	WG1806252
PCB 1254	U		0.00862	0.0199	1	01/22/2022 23:31	WG1806252
PCB 1260	U		0.00862	0.0199	1	01/22/2022 23:31	WG1806252
(S) Decachlorobiphenyl	*82.2*			*10.0-135*		*01/22/2022 23:31*	WG1806252
(S) Tetrachloro-m-xylene	*86.7*			*10.0-139*		*01/22/2022 23:31*	WG1806252

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00630	0.0389	1	01/25/2022 17:10	WG1806705
Acenaphthylene	U		0.00548	0.0389	1	01/25/2022 17:10	WG1806705
Anthracene	U		0.00693	0.0389	1	01/25/2022 17:10	WG1806705
Benzidine	U		0.0731	1.95	1	01/25/2022 17:10	WG1806705
Benzo(a)anthracene	U		0.00686	0.0389	1	01/25/2022 17:10	WG1806705
Benzo(b)fluoranthene	U		0.00725	0.0389	1	01/25/2022 17:10	WG1806705
Benzo(k)fluoranthene	U		0.00692	0.0389	1	01/25/2022 17:10	WG1806705
Benzo(g,h,i)perylene	U		0.00711	0.0389	1	01/25/2022 17:10	WG1806705
Benzo(a)pyrene	U		0.00723	0.0389	1	01/25/2022 17:10	WG1806705
Bis(2-chlorethoxy)methane	U		0.0117	0.389	1	01/25/2022 17:10	WG1806705
Bis(2-chloroethyl)ether	U		0.0129	0.389	1	01/25/2022 17:10	WG1806705
2,2-Oxybis(1-Chloropropane)	U		0.0168	0.389	1	01/25/2022 17:10	WG1806705
4-Bromophenyl-phenylether	U		0.0137	0.389	1	01/25/2022 17:10	WG1806705
2-Chloronaphthalene	U		0.00683	0.0389	1	01/25/2022 17:10	WG1806705
4-Chlorophenyl-phenylether	U		0.0136	0.389	1	01/25/2022 17:10	WG1806705
Chrysene	U		0.00773	0.0389	1	01/25/2022 17:10	WG1806705
Dibenz(a,h)anthracene	U		0.0108	0.0389	1	01/25/2022 17:10	WG1806705
3,3-Dichlorobenzidine	U		0.0144	0.389	1	01/25/2022 17:10	WG1806705
2,4-Dinitrotoluene	U		0.0112	0.389	1	01/25/2022 17:10	WG1806705
2,6-Dinitrotoluene	U		0.0127	0.389	1	01/25/2022 17:10	WG1806705
Fluoranthene	U		0.00702	0.0389	1	01/25/2022 17:10	WG1806705
Fluorene	U		0.00633	0.0389	1	01/25/2022 17:10	WG1806705
Hexachlorobenzene	U		0.0138	0.389	1	01/25/2022 17:10	WG1806705
Hexachloro-1,3-butadiene	U		0.0131	0.389	1	01/25/2022 17:10	WG1806705
Hexachlorocyclopentadiene	U		0.0204	0.389	1	01/25/2022 17:10	WG1806705
Hexachloroethane	U		0.0153	0.389	1	01/25/2022 17:10	WG1806705
Indeno(1,2,3-cd)pyrene	U		0.0110	0.0389	1	01/25/2022 17:10	WG1806705
Isophorone	U		0.0119	0.389	1	01/25/2022 17:10	WG1806705
Naphthalene	U		0.00977	0.0389	1	01/25/2022 17:10	WG1806705
Nitrobenzene	U		0.0136	0.389	1	01/25/2022 17:10	WG1806705
n-Nitrosodimethylamine	U		0.0577	0.389	1	01/25/2022 17:10	WG1806705
n-Nitrosodiphenylamine	U		0.0294	0.389	1	01/25/2022 17:10	WG1806705
n-Nitrosodi-n-propylamine	U		0.0130	0.389	1	01/25/2022 17:10	WG1806705
Phenanthrene	U		0.00772	0.0389	1	01/25/2022 17:10	WG1806705
Benzylbutyl phthalate	U		0.0121	0.389	1	01/25/2022 17:10	WG1806705
Bis(2-ethylhexyl)phthalate	U		0.0493	0.389	1	01/25/2022 17:10	WG1806705
Di-n-butyl phthalate	U		0.0133	0.389	1	01/25/2022 17:10	WG1806705
Diethyl phthalate	U		0.0129	0.389	1	01/25/2022 17:10	WG1806705
Dimethyl phthalate	U		0.0825	0.389	1	01/25/2022 17:10	WG1806705
Di-n-octyl phthalate	U		0.0263	0.389	1	01/25/2022 17:10	WG1806705
Pyrene	U		0.00757	0.0389	1	01/25/2022 17:10	WG1806705
1,2,4-Trichlorobenzene	U		0.0121	0.389	1	01/25/2022 17:10	WG1806705
4-Chloro-3-methylphenol	U		0.0126	0.389	1	01/25/2022 17:10	WG1806705

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0129	0.389	1	01/25/2022 17:10	WG1806705
2,4-Dichlorophenol	U		0.0113	0.389	1	01/25/2022 17:10	WG1806705
2,4-Dimethylphenol	U		0.0102	0.389	1	01/25/2022 17:10	WG1806705
4,6-Dinitro-2-methylphenol	U		0.0882	0.389	1	01/25/2022 17:10	WG1806705
2,4-Dinitrophenol	U		0.0910	0.389	1	01/25/2022 17:10	WG1806705
2-Nitrophenol	U		0.0139	0.389	1	01/25/2022 17:10	WG1806705
4-Nitrophenol	U		0.0121	0.389	1	01/25/2022 17:10	WG1806705
Pentachlorophenol	U		0.0105	0.389	1	01/25/2022 17:10	WG1806705
Phenol	U		0.0157	0.389	1	01/25/2022 17:10	WG1806705
2,4,6-Trichlorophenol	U		0.0125	0.389	1	01/25/2022 17:10	WG1806705
(S) 2-Fluorophenol	*83.1*			*12.0-120*		*01/25/2022 17:10*	WG1806705
(S) Phenol-d5	*72.0*			*10.0-120*		*01/25/2022 17:10*	WG1806705
(S) Nitrobenzene-d5	*63.3*			*10.0-122*		*01/25/2022 17:10*	WG1806705
(S) 2-Fluorobiphenyl	*69.0*			*15.0-120*		*01/25/2022 17:10*	WG1806705
(S) 2,4,6-Tribromophenol	*81.6*			*10.0-127*		*01/25/2022 17:10*	WG1806705
(S) p-Terphenyl-d14	*70.3*			*10.0-120*		*01/25/2022 17:10*	WG1806705

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	72.3		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0249	0.0554	1	01/24/2022 08:30	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.98		0.717	2.77	1	01/29/2022 15:44	WG1807069
Barium	119		0.118	0.692	1	01/29/2022 15:44	WG1807069
Cadmium	0.197	J	0.0652	0.692	1	01/29/2022 15:44	WG1807069
Chromium	14.8		0.184	1.38	1	01/29/2022 15:44	WG1807069
Lead	10.5		0.288	0.692	1	01/29/2022 15:44	WG1807069
Selenium	U		1.06	2.77	1	01/29/2022 15:44	WG1807069
Silver	U		0.176	1.38	1	01/29/2022 15:44	WG1807069

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	0.0689	J	0.0647	0.0886	1	01/22/2022 17:21	WG1806515
Acrylonitrile	U		0.00640	0.0222	1	01/22/2022 17:21	WG1806515
Benzene	U		0.000828	0.00177	1	01/22/2022 17:21	WG1806515
Bromobenzene	U		0.00159	0.0222	1	01/22/2022 17:21	WG1806515
Bromodichloromethane	U		0.00128	0.00443	1	01/22/2022 17:21	WG1806515
Bromoform	U		0.00207	0.0443	1	01/22/2022 17:21	WG1806515
Bromomethane	U		0.00349	0.0222	1	01/22/2022 17:21	WG1806515
n-Butylbenzene	U		0.00930	0.0222	1	01/22/2022 17:21	WG1806515
sec-Butylbenzene	U		0.00510	0.0222	1	01/22/2022 17:21	WG1806515
tert-Butylbenzene	U		0.00346	0.00886	1	01/22/2022 17:21	WG1806515
Carbon tetrachloride	U		0.00159	0.00886	1	01/22/2022 17:21	WG1806515
Chlorobenzene	U		0.000372	0.00443	1	01/22/2022 17:21	WG1806515
Chlorodibromomethane	U		0.00108	0.00443	1	01/22/2022 17:21	WG1806515
Chloroethane	U		0.00301	0.00886	1	01/22/2022 17:21	WG1806515
Chloroform	U		0.00183	0.00443	1	01/22/2022 17:21	WG1806515
Chloromethane	U		0.00771	0.0222	1	01/22/2022 17:21	WG1806515
2-Chlorotoluene	U		0.00153	0.00443	1	01/22/2022 17:21	WG1806515
4-Chlorotoluene	U		0.000797	0.00886	1	01/22/2022 17:21	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00691	0.0443	1	01/22/2022 17:21	WG1806515
1,2-Dibromoethane	U		0.00115	0.00443	1	01/22/2022 17:21	WG1806515
Dibromomethane	U		0.00133	0.00886	1	01/22/2022 17:21	WG1806515
1,2-Dichlorobenzene	U		0.000753	0.00886	1	01/22/2022 17:21	WG1806515
1,3-Dichlorobenzene	U		0.00106	0.00886	1	01/22/2022 17:21	WG1806515
1,4-Dichlorobenzene	U		0.00124	0.00886	1	01/22/2022 17:21	WG1806515
Dichlorodifluoromethane	U		0.00285	0.00443	1	01/22/2022 17:21	WG1806515
1,1-Dichloroethane	U		0.000870	0.00443	1	01/22/2022 17:21	WG1806515
1,2-Dichloroethane	U		0.00115	0.00443	1	01/22/2022 17:21	WG1806515
1,1-Dichloroethene	U		0.00107	0.00443	1	01/22/2022 17:21	WG1806515
cis-1,2-Dichloroethene	U		0.00130	0.00443	1	01/22/2022 17:21	WG1806515
trans-1,2-Dichloroethene	U		0.00184	0.00886	1	01/22/2022 17:21	WG1806515
1,2-Dichloropropane	U		0.00252	0.00886	1	01/22/2022 17:21	WG1806515
1,1-Dichloropropene	U		0.00143	0.00443	1	01/22/2022 17:21	WG1806515
1,3-Dichloropropane	U		0.000888	0.00886	1	01/22/2022 17:21	WG1806515

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00134	0.00443	1	01/22/2022 17:21	WG1806515
trans-1,3-Dichloropropene	U		0.00202	0.00886	1	01/22/2022 17:21	WG1806515
2,2-Dichloropropane	U		0.00245	0.00443	1	01/22/2022 17:21	WG1806515
Di-isopropyl ether	U		0.000727	0.00177	1	01/22/2022 17:21	WG1806515
Ethylbenzene	U		0.00131	0.00443	1	01/22/2022 17:21	WG1806515
Hexachloro-1,3-Butadiene	U		0.0106	0.0443	1	01/22/2022 17:21	WG1806515
Isopropylbenzene	U		0.000753	0.00443	1	01/22/2022 17:21	WG1806515
p-Isopropyltoluene	U		0.00452	0.00886	1	01/22/2022 17:21	WG1806515
2-Butanone (MEK)	U		0.113	0.177	1	01/22/2022 17:21	WG1806515
Methylene Chloride	U		0.0118	0.0443	1	01/22/2022 17:21	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00404	0.0443	1	01/22/2022 17:21	WG1806515
Methyl tert-butyl ether	U		0.000620	0.00177	1	01/22/2022 17:21	WG1806515
Naphthalene	U		0.00865	0.0222	1	01/22/2022 17:21	WG1806515
n-Propylbenzene	U		0.00168	0.00886	1	01/22/2022 17:21	WG1806515
Styrene	U		0.000406	0.0222	1	01/22/2022 17:21	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00168	0.00443	1	01/22/2022 17:21	WG1806515
1,1,2,2-Tetrachloroethane	U		0.00123	0.00443	1	01/22/2022 17:21	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00134	0.00443	1	01/22/2022 17:21	WG1806515
Tetrachloroethene	U		0.00159	0.00443	1	01/22/2022 17:21	WG1806515
Toluene	0.0146		0.00230	0.00886	1	01/25/2022 13:15	WG1807575
1,2,3-Trichlorobenzene	U		0.0130	0.0222	1	01/22/2022 17:21	WG1806515
1,2,4-Trichlorobenzene	U		0.00780	0.0222	1	01/22/2022 17:21	WG1806515
1,1,1-Trichloroethane	U		0.00164	0.00443	1	01/22/2022 17:21	WG1806515
1,1,2-Trichloroethane	U		0.00106	0.00443	1	01/22/2022 17:21	WG1806515
Trichloroethene	U		0.00103	0.00177	1	01/22/2022 17:21	WG1806515
Trichlorofluoromethane	U		0.00147	0.00443	1	01/22/2022 17:21	WG1806515
1,2,3-Trichloropropane	U		0.00287	0.0222	1	01/22/2022 17:21	WG1806515
1,2,4-Trimethylbenzene	0.00315	J	0.00280	0.00886	1	01/25/2022 13:15	WG1807575
1,2,3-Trimethylbenzene	0.00443	J	0.00280	0.00886	1	01/22/2022 17:21	WG1806515
1,3,5-Trimethylbenzene	U		0.00354	0.00886	1	01/22/2022 17:21	WG1806515
Vinyl chloride	U		0.00206	0.00443	1	01/22/2022 17:21	WG1806515
Xylenes, Total	0.00530	J	0.00156	0.0115	1	01/25/2022 13:15	WG1807575
(S) Toluene-d8	*101*			*75.0-131*		*01/22/2022 17:21*	WG1806515
(S) Toluene-d8	*103*			*75.0-131*		*01/25/2022 13:15*	WG1807575
(S) 4-Bromofluorobenzene	*99.9*			*67.0-138*		*01/22/2022 17:21*	WG1806515
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*01/25/2022 13:15*	WG1807575
(S) 1,2-Dichloroethane-d4	*95.7*			*70.0-130*		*01/22/2022 17:21*	WG1806515
(S) 1,2-Dichloroethane-d4	*106*			*70.0-130*		*01/25/2022 13:15*	WG1807575

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		20.8	69.2	1	01/22/2022 15:58	WG1806245
TPH C12 - C28	U		20.8	69.2	1	01/22/2022 15:58	WG1806245
TPH C28 - C35	U		20.8	69.2	1	01/22/2022 15:58	WG1806245
TPH C6 - C35	U		20.8	69.2	1	01/22/2022 15:58	WG1806245
(S) o-Terphenyl	*93.0*			*70.0-130*		*01/22/2022 15:58*	WG1806245
(S) 1-chlorooctane	*114*			*70.0-130*		*01/22/2022 15:58*	WG1806245

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0163	0.0471	1	01/24/2022 01:01	WG1806252
PCB 1221	U		0.0163	0.0471	1	01/24/2022 01:01	WG1806252
PCB 1232	U		0.0163	0.0471	1	01/24/2022 01:01	WG1806252
PCB 1242	U		0.0163	0.0471	1	01/24/2022 01:01	WG1806252
PCB 1248	U		0.0102	0.0235	1	01/24/2022 01:01	WG1806252
PCB 1254	U		0.0102	0.0235	1	01/24/2022 01:01	WG1806252
PCB 1260	U		0.0102	0.0235	1	01/24/2022 01:01	WG1806252
(S) Decachlorobiphenyl	*48.0*			*10.0-135*		*01/24/2022 01:01*	WG1806252
(S) Tetrachloro-m-xylene	*57.0*			*10.0-139*		*01/24/2022 01:01*	WG1806252

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.0149	0.0922	2	01/25/2022 20:17	WG1806705
Acenaphthylene	U		0.0130	0.0922	2	01/25/2022 20:17	WG1806705
Anthracene	U		0.0165	0.0922	2	01/25/2022 20:17	WG1806705
Benzidine	U		0.173	4.62	2	01/25/2022 20:17	WG1806705
Benzo(a)anthracene	U		0.0162	0.0922	2	01/25/2022 20:17	WG1806705
Benzo(b)fluoranthene	U		0.0172	0.0922	2	01/25/2022 20:17	WG1806705
Benzo(k)fluoranthene	U		0.0163	0.0922	2	01/25/2022 20:17	WG1806705
Benzo(g,h,i)perylene	U		0.0169	0.0922	2	01/25/2022 20:17	WG1806705
Benzo(a)pyrene	U		0.0172	0.0922	2	01/25/2022 20:17	WG1806705
Bis(2-chlorethoxy)methane	U		0.0277	0.922	2	01/25/2022 20:17	WG1806705
Bis(2-chloroethyl)ether	U		0.0304	0.922	2	01/25/2022 20:17	WG1806705
2,2-Oxybis(1-Chloropropane)	U		0.0399	0.922	2	01/25/2022 20:17	WG1806705
4-Bromophenyl-phenylether	U		0.0324	0.922	2	01/25/2022 20:17	WG1806705
2-Chloronaphthalene	U		0.0162	0.0922	2	01/25/2022 20:17	WG1806705
4-Chlorophenyl-phenylether	U		0.0321	0.922	2	01/25/2022 20:17	WG1806705
Chrysene	U		0.0183	0.0922	2	01/25/2022 20:17	WG1806705
Dibenz(a,h)anthracene	U		0.0256	0.0922	2	01/25/2022 20:17	WG1806705
3,3-Dichlorobenzidine	U		0.0340	0.922	2	01/25/2022 20:17	WG1806705
2,4-Dinitrotoluene	U		0.0264	0.922	2	01/25/2022 20:17	WG1806705
2,6-Dinitrotoluene	U		0.0302	0.922	2	01/25/2022 20:17	WG1806705
Fluoranthene	0.0241	J	0.0166	0.0922	2	01/25/2022 20:17	WG1806705
Fluorene	U		0.0149	0.0922	2	01/25/2022 20:17	WG1806705
Hexachlorobenzene	U		0.0327	0.922	2	01/25/2022 20:17	WG1806705
Hexachloro-1,3-butadiene	U		0.0310	0.922	2	01/25/2022 20:17	WG1806705
Hexachlorocyclopentadiene	U		0.0484	0.922	2	01/25/2022 20:17	WG1806705
Hexachloroethane	U		0.0363	0.922	2	01/25/2022 20:17	WG1806705
Indeno(1,2,3-cd)pyrene	U		0.0260	0.0922	2	01/25/2022 20:17	WG1806705
Isophorone	U		0.0282	0.922	2	01/25/2022 20:17	WG1806705
Naphthalene	U		0.0231	0.0922	2	01/25/2022 20:17	WG1806705
Nitrobenzene	U		0.0321	0.922	2	01/25/2022 20:17	WG1806705
n-Nitrosodimethylamine	U		0.137	0.922	2	01/25/2022 20:17	WG1806705
n-Nitrosodiphenylamine	U		0.0698	0.922	2	01/25/2022 20:17	WG1806705
n-Nitrosodi-n-propylamine	U		0.0307	0.922	2	01/25/2022 20:17	WG1806705
Phenanthrene	U		0.0183	0.0922	2	01/25/2022 20:17	WG1806705
Benzylbutyl phthalate	U		0.0288	0.922	2	01/25/2022 20:17	WG1806705
Bis(2-ethylhexyl)phthalate	U		0.117	0.922	2	01/25/2022 20:17	WG1806705
Di-n-butyl phthalate	U		0.0316	0.922	2	01/25/2022 20:17	WG1806705
Diethyl phthalate	U		0.0304	0.922	2	01/25/2022 20:17	WG1806705
Dimethyl phthalate	U		0.195	0.922	2	01/25/2022 20:17	WG1806705
Di-n-octyl phthalate	U		0.0623	0.922	2	01/25/2022 20:17	WG1806705
Pyrene	0.0185	J	0.0180	0.0922	2	01/25/2022 20:17	WG1806705
1,2,4-Trichlorobenzene	U		0.0288	0.922	2	01/25/2022 20:17	WG1806705
4-Chloro-3-methylphenol	U		0.0299	0.922	2	01/25/2022 20:17	WG1806705

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0304	0.922	2	01/25/2022 20:17	WG1806705
2,4-Dichlorophenol	U		0.0268	0.922	2	01/25/2022 20:17	WG1806705
2,4-Dimethylphenol	U		0.0241	0.922	2	01/25/2022 20:17	WG1806705
4,6-Dinitro-2-methylphenol	U		0.209	0.922	2	01/25/2022 20:17	WG1806705
2,4-Dinitrophenol	U		0.216	0.922	2	01/25/2022 20:17	WG1806705
2-Nitrophenol	U		0.0329	0.922	2	01/25/2022 20:17	WG1806705
4-Nitrophenol	U		0.0288	0.922	2	01/25/2022 20:17	WG1806705
Pentachlorophenol	U		0.0248	0.922	2	01/25/2022 20:17	WG1806705
Phenol	U		0.0371	0.922	2	01/25/2022 20:17	WG1806705
2,4,6-Trichlorophenol	U		0.0296	0.922	2	01/25/2022 20:17	WG1806705
(S) 2-Fluorophenol	*71.5*			*12.0-120*		*01/25/2022 20:17*	WG1806705
(S) Phenol-d5	*65.0*			*10.0-120*		*01/25/2022 20:17*	WG1806705
(S) Nitrobenzene-d5	*60.1*			*10.0-122*		*01/25/2022 20:17*	WG1806705
(S) 2-Fluorobiphenyl	*60.1*			*15.0-120*		*01/25/2022 20:17*	WG1806705
(S) 2,4,6-Tribromophenol	*71.8*			*10.0-127*		*01/25/2022 20:17*	WG1806705
(S) p-Terphenyl-d14	*65.5*			*10.0-120*		*01/25/2022 20:17*	WG1806705

Sample Narrative:

L1453350-03 WG1806705: Dilution due to matrix impact during extract concentration procedure

Cp Tc Ss Cn Sr Qc Gl Al Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	66.0		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0273	0.0606	1	01/24/2022 09:03	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.99	J	0.785	3.03	1	01/29/2022 17:42	WG1807079
Barium	103		0.129	0.757	1	01/29/2022 17:42	WG1807079
Cadmium	0.215	J	0.0713	0.757	1	01/29/2022 17:42	WG1807079
Chromium	15.3		0.201	1.51	1	01/29/2022 17:42	WG1807079
Lead	9.09		0.315	0.757	1	01/29/2022 17:42	WG1807079
Selenium	1.37	J	1.16	3.03	1	01/29/2022 17:42	WG1807079
Silver	U		0.192	1.51	1	01/29/2022 17:42	WG1807079

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0780	0.107	1	01/22/2022 17:42	WG1806515
Acrylonitrile	U		0.00771	0.0267	1	01/22/2022 17:42	WG1806515
Benzene	U		0.000998	0.00214	1	01/22/2022 17:42	WG1806515
Bromobenzene	U		0.00192	0.0267	1	01/22/2022 17:42	WG1806515
Bromodichloromethane	U		0.00155	0.00534	1	01/22/2022 17:42	WG1806515
Bromoform	U		0.00250	0.0534	1	01/22/2022 17:42	WG1806515
Bromomethane	U		0.00421	0.0267	1	01/22/2022 17:42	WG1806515
n-Butylbenzene	U		0.0112	0.0267	1	01/22/2022 17:42	WG1806515
sec-Butylbenzene	U		0.00615	0.0267	1	01/22/2022 17:42	WG1806515
tert-Butylbenzene	U		0.00417	0.0107	1	01/22/2022 17:42	WG1806515
Carbon tetrachloride	U		0.00192	0.0107	1	01/22/2022 17:42	WG1806515
Chlorobenzene	U		0.000449	0.00534	1	01/22/2022 17:42	WG1806515
Chlorodibromomethane	U		0.00131	0.00534	1	01/22/2022 17:42	WG1806515
Chloroethane	U		0.00363	0.0107	1	01/22/2022 17:42	WG1806515
Chloroform	U		0.00220	0.00534	1	01/22/2022 17:42	WG1806515
Chloromethane	U		0.00929	0.0267	1	01/22/2022 17:42	WG1806515
2-Chlorotoluene	U		0.00185	0.00534	1	01/22/2022 17:42	WG1806515
4-Chlorotoluene	U		0.000961	0.0107	1	01/22/2022 17:42	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00833	0.0534	1	01/22/2022 17:42	WG1806515
1,2-Dibromoethane	U		0.00138	0.00534	1	01/22/2022 17:42	WG1806515
Dibromomethane	U		0.00160	0.0107	1	01/22/2022 17:42	WG1806515
1,2-Dichlorobenzene	U		0.000908	0.0107	1	01/22/2022 17:42	WG1806515
1,3-Dichlorobenzene	U		0.00128	0.0107	1	01/22/2022 17:42	WG1806515
1,4-Dichlorobenzene	U		0.00150	0.0107	1	01/22/2022 17:42	WG1806515
Dichlorodifluoromethane	U		0.00344	0.00534	1	01/22/2022 17:42	WG1806515
1,1-Dichloroethane	U		0.00105	0.00534	1	01/22/2022 17:42	WG1806515
1,2-Dichloroethane	U		0.00139	0.00534	1	01/22/2022 17:42	WG1806515
1,1-Dichloroethene	U		0.00129	0.00534	1	01/22/2022 17:42	WG1806515
cis-1,2-Dichloroethene	U		0.00157	0.00534	1	01/22/2022 17:42	WG1806515
trans-1,2-Dichloroethene	U		0.00222	0.0107	1	01/22/2022 17:42	WG1806515
1,2-Dichloropropane	U		0.00303	0.0107	1	01/22/2022 17:42	WG1806515
1,1-Dichloropropene	U		0.00173	0.00534	1	01/22/2022 17:42	WG1806515
1,3-Dichloropropane	U		0.00107	0.0107	1	01/22/2022 17:42	WG1806515

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00162	0.00534	1	01/22/2022 17:42	WG1806515
trans-1,3-Dichloropropene	U		0.00244	0.0107	1	01/22/2022 17:42	WG1806515
2,2-Dichloropropane	U		0.00295	0.00534	1	01/22/2022 17:42	WG1806515
Di-isopropyl ether	U		0.000876	0.00214	1	01/22/2022 17:42	WG1806515
Ethylbenzene	U		0.00157	0.00534	1	01/22/2022 17:42	WG1806515
Hexachloro-1,3-Butadiene	U		0.0128	0.0534	1	01/22/2022 17:42	WG1806515
Isopropylbenzene	U		0.000908	0.00534	1	01/22/2022 17:42	WG1806515
p-Isopropyltoluene	U		0.00545	0.0107	1	01/22/2022 17:42	WG1806515
2-Butanone (MEK)	U		0.136	0.214	1	01/22/2022 17:42	WG1806515
Methylene Chloride	U		0.0142	0.0534	1	01/22/2022 17:42	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00487	0.0534	1	01/22/2022 17:42	WG1806515
Methyl tert-butyl ether	U		0.000748	0.00214	1	01/22/2022 17:42	WG1806515
Naphthalene	U		0.0104	0.0267	1	01/22/2022 17:42	WG1806515
n-Propylbenzene	U		0.00203	0.0107	1	01/22/2022 17:42	WG1806515
Styrene	U		0.000489	0.0267	1	01/22/2022 17:42	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00202	0.00534	1	01/22/2022 17:42	WG1806515
1,1,2,2-Tetrachloroethane	U		0.00148	0.00534	1	01/22/2022 17:42	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00161	0.00534	1	01/22/2022 17:42	WG1806515
Tetrachloroethene	U		0.00191	0.00534	1	01/22/2022 17:42	WG1806515
Toluene	0.0172		0.00278	0.0107	1	01/22/2022 17:42	WG1806515
1,2,3-Trichlorobenzene	U		0.0157	0.0267	1	01/22/2022 17:42	WG1806515
1,2,4-Trichlorobenzene	U		0.00940	0.0267	1	01/22/2022 17:42	WG1806515
1,1,1-Trichloroethane	U		0.00197	0.00534	1	01/22/2022 17:42	WG1806515
1,1,2-Trichloroethane	U		0.00128	0.00534	1	01/22/2022 17:42	WG1806515
Trichloroethene	U		0.00125	0.00214	1	01/22/2022 17:42	WG1806515
Trichlorofluoromethane	U		0.00177	0.00534	1	01/22/2022 17:42	WG1806515
1,2,3-Trichloropropane	U		0.00346	0.0267	1	01/22/2022 17:42	WG1806515
1,2,4-Trimethylbenzene	U		0.00337	0.0107	1	01/22/2022 17:42	WG1806515
1,2,3-Trimethylbenzene	U		0.00337	0.0107	1	01/22/2022 17:42	WG1806515
1,3,5-Trimethylbenzene	U		0.00427	0.0107	1	01/22/2022 17:42	WG1806515
Vinyl chloride	U		0.00248	0.00534	1	01/22/2022 17:42	WG1806515
Xylenes, Total	0.00252	J	0.00188	0.0139	1	01/25/2022 13:33	WG1807575
(S) Toluene-d8	*100*			*75.0-131*		*01/22/2022 17:42*	WG1806515
(S) Toluene-d8	*99.9*			*75.0-131*		*01/25/2022 13:33*	WG1807575
(S) 4-Bromofluorobenzene	*102*			*67.0-138*		*01/22/2022 17:42*	WG1806515
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*01/25/2022 13:33*	WG1807575
(S) 1,2-Dichloroethane-d4	*98.2*			*70.0-130*		*01/22/2022 17:42*	WG1806515
(S) 1,2-Dichloroethane-d4	*107*			*70.0-130*		*01/25/2022 13:33*	WG1807575

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		22.7	75.7	1	01/22/2022 16:14	WG1806245
TPH C12 - C28	U		22.7	75.7	1	01/22/2022 16:14	WG1806245
TPH C28 - C35	U		22.7	75.7	1	01/22/2022 16:14	WG1806245
TPH C6 - C35	U		22.7	75.7	1	01/22/2022 16:14	WG1806245
(S) o-Terphenyl	*90.9*			*70.0-130*		*01/22/2022 16:14*	WG1806245
(S) 1-chlorooctane	*113*			*70.0-130*		*01/22/2022 16:14*	WG1806245

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0179	0.0515	1	01/23/2022 00:33	WG1806252
PCB 1221	U		0.0179	0.0515	1	01/23/2022 00:33	WG1806252
PCB 1232	U		0.0179	0.0515	1	01/23/2022 00:33	WG1806252
PCB 1242	U		0.0179	0.0515	1	01/23/2022 00:33	WG1806252
PCB 1248	U		0.0112	0.0257	1	01/23/2022 00:33	WG1806252
PCB 1254	U		0.0112	0.0257	1	01/23/2022 00:33	WG1806252
PCB 1260	U		0.0112	0.0257	1	01/23/2022 00:33	WG1806252
(S) Decachlorobiphenyl	*64.7*			*10.0-135*		*01/23/2022 00:33*	WG1806252
(S) Tetrachloro-m-xylene	*76.4*			*10.0-139*		*01/23/2022 00:33*	WG1806252

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.0164	0.101	2	01/25/2022 20:37	WG1806705
Acenaphthylene	U		0.0142	0.101	2	01/25/2022 20:37	WG1806705
Anthracene	U		0.0180	0.101	2	01/25/2022 20:37	WG1806705
Benzidine	U		0.189	5.06	2	01/25/2022 20:37	WG1806705
Benzo(a)anthracene	U		0.0177	0.101	2	01/25/2022 20:37	WG1806705
Benzo(b)fluoranthene	U		0.0188	0.101	2	01/25/2022 20:37	WG1806705
Benzo(k)fluoranthene	U		0.0179	0.101	2	01/25/2022 20:37	WG1806705
Benzo(g,h,i)perylene	U		0.0185	0.101	2	01/25/2022 20:37	WG1806705
Benzo(a)pyrene	U		0.0188	0.101	2	01/25/2022 20:37	WG1806705
Bis(2-chlorethoxy)methane	U		0.0303	1.01	2	01/25/2022 20:37	WG1806705
Bis(2-chloroethyl)ether	U		0.0333	1.01	2	01/25/2022 20:37	WG1806705
2,2-Oxybis(1-Chloropropane)	U		0.0436	1.01	2	01/25/2022 20:37	WG1806705
4-Bromophenyl-phenylether	U		0.0354	1.01	2	01/25/2022 20:37	WG1806705
2-Chloronaphthalene	U		0.0177	0.101	2	01/25/2022 20:37	WG1806705
4-Chlorophenyl-phenylether	U		0.0351	1.01	2	01/25/2022 20:37	WG1806705
Chrysene	U		0.0200	0.101	2	01/25/2022 20:37	WG1806705
Dibenz(a,h)anthracene	U		0.0280	0.101	2	01/25/2022 20:37	WG1806705
3,3-Dichlorobenzidine	U		0.0373	1.01	2	01/25/2022 20:37	WG1806705
2,4-Dinitrotoluene	U		0.0289	1.01	2	01/25/2022 20:37	WG1806705
2,6-Dinitrotoluene	U		0.0330	1.01	2	01/25/2022 20:37	WG1806705
Fluoranthene	U		0.0182	0.101	2	01/25/2022 20:37	WG1806705
Fluorene	U		0.0164	0.101	2	01/25/2022 20:37	WG1806705
Hexachlorobenzene	U		0.0357	1.01	2	01/25/2022 20:37	WG1806705
Hexachloro-1,3-butadiene	U		0.0339	1.01	2	01/25/2022 20:37	WG1806705
Hexachlorocyclopentadiene	U		0.0530	1.01	2	01/25/2022 20:37	WG1806705
Hexachloroethane	U		0.0397	1.01	2	01/25/2022 20:37	WG1806705
Indeno(1,2,3-cd)pyrene	U		0.0285	0.101	2	01/25/2022 20:37	WG1806705
Isophorone	U		0.0309	1.01	2	01/25/2022 20:37	WG1806705
Naphthalene	U		0.0253	0.101	2	01/25/2022 20:37	WG1806705
Nitrobenzene	U		0.0351	1.01	2	01/25/2022 20:37	WG1806705
n-Nitrosodimethylamine	U		0.150	1.01	2	01/25/2022 20:37	WG1806705
n-Nitrosodiphenylamine	U		0.0763	1.01	2	01/25/2022 20:37	WG1806705
n-Nitrosodi-n-propylamine	U		0.0336	1.01	2	01/25/2022 20:37	WG1806705
Phenanthrene	U		0.0200	0.101	2	01/25/2022 20:37	WG1806705
Benzylbutyl phthalate	U		0.0315	1.01	2	01/25/2022 20:37	WG1806705
Bis(2-ethylhexyl)phthalate	U		0.128	1.01	2	01/25/2022 20:37	WG1806705
Di-n-butyl phthalate	U		0.0345	1.01	2	01/25/2022 20:37	WG1806705
Diethyl phthalate	U		0.0333	1.01	2	01/25/2022 20:37	WG1806705
Dimethyl phthalate	U		0.214	1.01	2	01/25/2022 20:37	WG1806705
Di-n-octyl phthalate	U		0.0682	1.01	2	01/25/2022 20:37	WG1806705
Pyrene	U		0.0197	0.101	2	01/25/2022 20:37	WG1806705
1,2,4-Trichlorobenzene	U		0.0315	1.01	2	01/25/2022 20:37	WG1806705
4-Chloro-3-methylphenol	U		0.0327	1.01	2	01/25/2022 20:37	WG1806705

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.0333	1.01	2	01/25/2022 20:37	WG1806705
2,4-Dichlorophenol	U		0.0294	1.01	2	01/25/2022 20:37	WG1806705
2,4-Dimethylphenol	U		0.0264	1.01	2	01/25/2022 20:37	WG1806705
4,6-Dinitro-2-methylphenol	U		0.229	1.01	2	01/25/2022 20:37	WG1806705
2,4-Dinitrophenol	U		0.236	1.01	2	01/25/2022 20:37	WG1806705
2-Nitrophenol	U		0.0360	1.01	2	01/25/2022 20:37	WG1806705
4-Nitrophenol	U		0.0315	1.01	2	01/25/2022 20:37	WG1806705
Pentachlorophenol	U		0.0271	1.01	2	01/25/2022 20:37	WG1806705
Phenol	U		0.0406	1.01	2	01/25/2022 20:37	WG1806705
2,4,6-Trichlorophenol	U		0.0324	1.01	2	01/25/2022 20:37	WG1806705
(S) 2-Fluorophenol	*62.4*			*12.0-120*		*01/25/2022 20:37*	WG1806705
(S) Phenol-d5	*55.5*			*10.0-120*		*01/25/2022 20:37*	WG1806705
(S) Nitrobenzene-d5	*43.4*			*10.0-122*		*01/25/2022 20:37*	WG1806705
(S) 2-Fluorobiphenyl	*51.1*			*15.0-120*		*01/25/2022 20:37*	WG1806705
(S) 2,4,6-Tribromophenol	*60.6*			*10.0-127*		*01/25/2022 20:37*	WG1806705
(S) p-Terphenyl-d14	*52.0*			*10.0-120*		*01/25/2022 20:37*	WG1806705

Sample Narrative:

L1453350-04 WG1806705: Dilution due to matrix impact during extract concentration procedure

Cp Tc Ss Cn Sr Qc Gl Al Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	76.2		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0236	0.0525	1	01/24/2022 09:05	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.06	J	0.680	2.63	1	01/29/2022 17:45	WG1807079
Barium	59.4		0.112	0.656	1	01/29/2022 17:45	WG1807079
Cadmium	0.117	J	0.0618	0.656	1	01/29/2022 17:45	WG1807079
Chromium	6.81		0.175	1.31	1	01/29/2022 17:45	WG1807079
Lead	4.57		0.273	0.656	1	01/29/2022 17:45	WG1807079
Selenium	U		1.00	2.63	1	01/29/2022 17:45	WG1807079
Silver	U		0.167	1.31	1	01/29/2022 17:45	WG1807079

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0647	0.0886	1	01/22/2022 18:02	WG1806515
Acrylonitrile	U		0.00640	0.0222	1	01/22/2022 18:02	WG1806515
Benzene	U		0.000828	0.00177	1	01/22/2022 18:02	WG1806515
Bromobenzene	U		0.00160	0.0222	1	01/22/2022 18:02	WG1806515
Bromodichloromethane	U		0.00129	0.00443	1	01/22/2022 18:02	WG1806515
Bromoform	U		0.00207	0.0443	1	01/22/2022 18:02	WG1806515
Bromomethane	U		0.00349	0.0222	1	01/22/2022 18:02	WG1806515
n-Butylbenzene	U		0.00931	0.0222	1	01/22/2022 18:02	WG1806515
sec-Butylbenzene	U		0.00511	0.0222	1	01/22/2022 18:02	WG1806515
tert-Butylbenzene	U		0.00346	0.00886	1	01/22/2022 18:02	WG1806515
Carbon tetrachloride	U		0.00159	0.00886	1	01/22/2022 18:02	WG1806515
Chlorobenzene	U		0.000372	0.00443	1	01/22/2022 18:02	WG1806515
Chlorodibromomethane	U		0.00109	0.00443	1	01/22/2022 18:02	WG1806515
Chloroethane	U		0.00301	0.00886	1	01/22/2022 18:02	WG1806515
Chloroform	U		0.00183	0.00443	1	01/22/2022 18:02	WG1806515
Chloromethane	U		0.00771	0.0222	1	01/22/2022 18:02	WG1806515
2-Chlorotoluene	U		0.00153	0.00443	1	01/22/2022 18:02	WG1806515
4-Chlorotoluene	U		0.000798	0.00886	1	01/22/2022 18:02	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00691	0.0443	1	01/22/2022 18:02	WG1806515
1,2-Dibromoethane	U		0.00115	0.00443	1	01/22/2022 18:02	WG1806515
Dibromomethane	U		0.00133	0.00886	1	01/22/2022 18:02	WG1806515
1,2-Dichlorobenzene	U		0.000754	0.00886	1	01/22/2022 18:02	WG1806515
1,3-Dichlorobenzene	U		0.00106	0.00886	1	01/22/2022 18:02	WG1806515
1,4-Dichlorobenzene	U		0.00124	0.00886	1	01/22/2022 18:02	WG1806515
Dichlorodifluoromethane	U		0.00285	0.00443	1	01/22/2022 18:02	WG1806515
1,1-Dichloroethane	U		0.000871	0.00443	1	01/22/2022 18:02	WG1806515
1,2-Dichloroethane	U		0.00115	0.00443	1	01/22/2022 18:02	WG1806515
1,1-Dichloroethene	U		0.00107	0.00443	1	01/22/2022 18:02	WG1806515
cis-1,2-Dichloroethene	U		0.00130	0.00443	1	01/22/2022 18:02	WG1806515
trans-1,2-Dichloroethene	U		0.00184	0.00886	1	01/22/2022 18:02	WG1806515
1,2-Dichloropropane	U		0.00252	0.00886	1	01/22/2022 18:02	WG1806515
1,1-Dichloropropene	U		0.00143	0.00443	1	01/22/2022 18:02	WG1806515
1,3-Dichloropropane	U		0.000888	0.00886	1	01/22/2022 18:02	WG1806515

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00134	0.00443	1	01/22/2022 18:02	WG1806515
trans-1,3-Dichloropropene	U		0.00202	0.00886	1	01/22/2022 18:02	WG1806515
2,2-Dichloropropane	U		0.00245	0.00443	1	01/22/2022 18:02	WG1806515
Di-isopropyl ether	U		0.000727	0.00177	1	01/22/2022 18:02	WG1806515
Ethylbenzene	U		0.00131	0.00443	1	01/22/2022 18:02	WG1806515
Hexachloro-1,3-Butadiene	U		0.0106	0.0443	1	01/22/2022 18:02	WG1806515
Isopropylbenzene	U		0.000754	0.00443	1	01/22/2022 18:02	WG1806515
p-Isopropyltoluene	U		0.00452	0.00886	1	01/22/2022 18:02	WG1806515
2-Butanone (MEK)	U		0.113	0.177	1	01/22/2022 18:02	WG1806515
Methylene Chloride	U		0.0118	0.0443	1	01/22/2022 18:02	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00404	0.0443	1	01/22/2022 18:02	WG1806515
Methyl tert-butyl ether	U		0.000621	0.00177	1	01/22/2022 18:02	WG1806515
Naphthalene	U		0.00865	0.0222	1	01/22/2022 18:02	WG1806515
n-Propylbenzene	U		0.00168	0.00886	1	01/22/2022 18:02	WG1806515
Styrene	U		0.000406	0.0222	1	01/22/2022 18:02	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00168	0.00443	1	01/22/2022 18:02	WG1806515
1,1,2,2-Tetrachloroethane	U		0.00123	0.00443	1	01/22/2022 18:02	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00134	0.00443	1	01/22/2022 18:02	WG1806515
Tetrachloroethene	U		0.00159	0.00443	1	01/22/2022 18:02	WG1806515
Toluene	0.00943		0.00230	0.00886	1	01/22/2022 18:02	WG1806515
1,2,3-Trichlorobenzene	U		0.0130	0.0222	1	01/22/2022 18:02	WG1806515
1,2,4-Trichlorobenzene	U		0.00780	0.0222	1	01/22/2022 18:02	WG1806515
1,1,1-Trichloroethane	U		0.00164	0.00443	1	01/22/2022 18:02	WG1806515
1,1,2-Trichloroethane	U		0.00106	0.00443	1	01/22/2022 18:02	WG1806515
Trichloroethene	U		0.00104	0.00177	1	01/22/2022 18:02	WG1806515
Trichlorofluoromethane	U		0.00147	0.00443	1	01/22/2022 18:02	WG1806515
1,2,3-Trichloropropane	U		0.00287	0.0222	1	01/22/2022 18:02	WG1806515
1,2,4-Trimethylbenzene	U		0.00280	0.00886	1	01/22/2022 18:02	WG1806515
1,2,3-Trimethylbenzene	U		0.00280	0.00886	1	01/22/2022 18:02	WG1806515
1,3,5-Trimethylbenzene	U		0.00355	0.00886	1	01/22/2022 18:02	WG1806515
Vinyl chloride	U		0.00206	0.00443	1	01/22/2022 18:02	WG1806515
Xylenes, Total	U		0.00156	0.0115	1	01/22/2022 18:02	WG1806515
(S) Toluene-d8	*99.4*			*75.0-131*		*01/22/2022 18:02*	WG1806515
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*01/22/2022 18:02*	WG1806515
(S) 1,2-Dichloroethane-d4	*100*			*70.0-130*		*01/22/2022 18:02*	WG1806515

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		19.7	65.6	1	01/22/2022 16:29	WG1806245
TPH C12 - C28	U		19.7	65.6	1	01/22/2022 16:29	WG1806245
TPH C28 - C35	U		19.7	65.6	1	01/22/2022 16:29	WG1806245
TPH C6 - C35	U		19.7	65.6	1	01/22/2022 16:29	WG1806245
(S) o-Terphenyl	*86.2*			*70.0-130*		*01/22/2022 16:29*	WG1806245
(S) 1-chlorooctane	*107*			*70.0-130*		*01/22/2022 16:29*	WG1806245

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0155	0.0446	1	01/27/2022 18:39	WG1806716
PCB 1221	U		0.0155	0.0446	1	01/27/2022 18:39	WG1806716
PCB 1232	U		0.0155	0.0446	1	01/27/2022 18:39	WG1806716
PCB 1242	U		0.0155	0.0446	1	01/27/2022 18:39	WG1806716
PCB 1248	U		0.00969	0.0223	1	01/27/2022 18:39	WG1806716
PCB 1254	U		0.00969	0.0223	1	01/27/2022 18:39	WG1806716

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00969	0.0223	1	01/27/2022 18:39	WG1806716
(S) Decachlorobiphenyl	*48.3*			*10.0-135*		*01/27/2022 18:39*	WG1806716
(S) Tetrachloro-m-xylene	*62.8*			*10.0-139*		*01/27/2022 18:39*	WG1806716

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.0142	0.0874	2	01/25/2022 20:58	WG1806705
Acenaphthylene	U		0.0123	0.0874	2	01/25/2022 20:58	WG1806705
Anthracene	U		0.0156	0.0874	2	01/25/2022 20:58	WG1806705
Benzidine	U		0.164	4.38	2	01/25/2022 20:58	WG1806705
Benzo(a)anthracene	U		0.0154	0.0874	2	01/25/2022 20:58	WG1806705
Benzo(b)fluoranthene	U		0.0163	0.0874	2	01/25/2022 20:58	WG1806705
Benzo(k)fluoranthene	U		0.0155	0.0874	2	01/25/2022 20:58	WG1806705
Benzo(g,h,i)perylene	U		0.0160	0.0874	2	01/25/2022 20:58	WG1806705
Benzo(a)pyrene	U		0.0163	0.0874	2	01/25/2022 20:58	WG1806705
Bis(2-chlorethoxy)methane	U		0.0263	0.874	2	01/25/2022 20:58	WG1806705
Bis(2-chloroethyl)ether	U		0.0289	0.874	2	01/25/2022 20:58	WG1806705
2,2-Oxybis(1-Chloropropane)	U		0.0378	0.874	2	01/25/2022 20:58	WG1806705
4-Bromophenyl-phenylether	U		0.0307	0.874	2	01/25/2022 20:58	WG1806705
2-Chloronaphthalene	U		0.0154	0.0874	2	01/25/2022 20:58	WG1806705
4-Chlorophenyl-phenylether	U		0.0305	0.874	2	01/25/2022 20:58	WG1806705
Chrysene	U		0.0173	0.0874	2	01/25/2022 20:58	WG1806705
Dibenz(a,h)anthracene	U		0.0243	0.0874	2	01/25/2022 20:58	WG1806705
3,3-Dichlorobenzidine	U		0.0323	0.874	2	01/25/2022 20:58	WG1806705
2,4-Dinitrotoluene	U		0.0251	0.874	2	01/25/2022 20:58	WG1806705
2,6-Dinitrotoluene	U		0.0286	0.874	2	01/25/2022 20:58	WG1806705
Fluoranthene	U		0.0158	0.0874	2	01/25/2022 20:58	WG1806705
Fluorene	U		0.0142	0.0874	2	01/25/2022 20:58	WG1806705
Hexachlorobenzene	U		0.0310	0.874	2	01/25/2022 20:58	WG1806705
Hexachloro-1,3-butadiene	U		0.0294	0.874	2	01/25/2022 20:58	WG1806705
Hexachlorocyclopentadiene	U		0.0459	0.874	2	01/25/2022 20:58	WG1806705
Hexachloroethane	U		0.0344	0.874	2	01/25/2022 20:58	WG1806705
Indeno(1,2,3-cd)pyrene	U		0.0247	0.0874	2	01/25/2022 20:58	WG1806705
Isophorone	U		0.0268	0.874	2	01/25/2022 20:58	WG1806705
Naphthalene	U		0.0219	0.0874	2	01/25/2022 20:58	WG1806705
Nitrobenzene	U		0.0305	0.874	2	01/25/2022 20:58	WG1806705
n-Nitrosodimethylamine	U		0.130	0.874	2	01/25/2022 20:58	WG1806705
n-Nitrosodiphenylamine	U		0.0662	0.874	2	01/25/2022 20:58	WG1806705
n-Nitrosodi-n-propylamine	U		0.0291	0.874	2	01/25/2022 20:58	WG1806705
Phenanthrene	U		0.0173	0.0874	2	01/25/2022 20:58	WG1806705
Benzylbutyl phthalate	U		0.0273	0.874	2	01/25/2022 20:58	WG1806705
Bis(2-ethylhexyl)phthalate	U		0.111	0.874	2	01/25/2022 20:58	WG1806705
Di-n-butyl phthalate	U		0.0299	0.874	2	01/25/2022 20:58	WG1806705
Diethyl phthalate	U		0.0289	0.874	2	01/25/2022 20:58	WG1806705
Dimethyl phthalate	U		0.185	0.874	2	01/25/2022 20:58	WG1806705
Di-n-octyl phthalate	U		0.0591	0.874	2	01/25/2022 20:58	WG1806705
Pyrene	U		0.0171	0.0874	2	01/25/2022 20:58	WG1806705
1,2,4-Trichlorobenzene	U		0.0273	0.874	2	01/25/2022 20:58	WG1806705
4-Chloro-3-methylphenol	U		0.0284	0.874	2	01/25/2022 20:58	WG1806705
2-Chlorophenol	U		0.0289	0.874	2	01/25/2022 20:58	WG1806705
2,4-Dichlorophenol	U		0.0255	0.874	2	01/25/2022 20:58	WG1806705
2,4-Dimethylphenol	U		0.0228	0.874	2	01/25/2022 20:58	WG1806705
4,6-Dinitro-2-methylphenol	U		0.198	0.874	2	01/25/2022 20:58	WG1806705
2,4-Dinitrophenol	U		0.205	0.874	2	01/25/2022 20:58	WG1806705
2-Nitrophenol	U		0.0312	0.874	2	01/25/2022 20:58	WG1806705

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0273	0.874	2	01/25/2022 20:58	WG1806705
Pentachlorophenol	U		0.0235	0.874	2	01/25/2022 20:58	WG1806705
Phenol	U		0.0352	0.874	2	01/25/2022 20:58	WG1806705
2,4,6-Trichlorophenol	U		0.0281	0.874	2	01/25/2022 20:58	WG1806705
(S) 2-Fluorophenol	*60.6*			*12.0-120*		*01/25/2022 20:58*	WG1806705
(S) Phenol-d5	*56.1*			*10.0-120*		*01/25/2022 20:58*	WG1806705
(S) Nitrobenzene-d5	*48.4*			*10.0-122*		*01/25/2022 20:58*	WG1806705
(S) 2-Fluorobiphenyl	*52.8*			*15.0-120*		*01/25/2022 20:58*	WG1806705
(S) 2,4,6-Tribromophenol	*69.6*			*10.0-127*		*01/25/2022 20:58*	WG1806705
(S) p-Terphenyl-d14	*59.0*			*10.0-120*		*01/25/2022 20:58*	WG1806705

Sample Narrative:

L1453350-05 WG1806705: Dilution due to matrix impact during extract concentration procedure

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	80.7		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0223	0.0496	1	01/24/2022 09:07	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	U		0.642	2.48	1	01/29/2022 17:47	WG1807079
Barium	42.8		0.106	0.620	1	01/29/2022 17:47	WG1807079
Cadmium	0.308	J	0.0584	0.620	1	01/29/2022 17:47	WG1807079
Chromium	4.70		0.165	1.24	1	01/29/2022 17:47	WG1807079
Lead	2.44		0.258	0.620	1	01/29/2022 17:47	WG1807079
Selenium	U		0.947	2.48	1	01/29/2022 17:47	WG1807079
Silver	U		0.157	1.24	1	01/29/2022 17:47	WG1807079

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0549	0.0752	1	01/22/2022 18:23	WG1806515
Acrylonitrile	U		0.00543	0.0188	1	01/22/2022 18:23	WG1806515
Benzene	U		0.000702	0.00150	1	01/22/2022 18:23	WG1806515
Bromobenzene	U		0.00135	0.0188	1	01/22/2022 18:23	WG1806515
Bromodichloromethane	U		0.00109	0.00376	1	01/22/2022 18:23	WG1806515
Bromoform	U		0.00176	0.0376	1	01/22/2022 18:23	WG1806515
Bromomethane	U		0.00296	0.0188	1	01/22/2022 18:23	WG1806515
n-Butylbenzene	U		0.00790	0.0188	1	01/22/2022 18:23	WG1806515
sec-Butylbenzene	U		0.00433	0.0188	1	01/22/2022 18:23	WG1806515
tert-Butylbenzene	U		0.00293	0.00752	1	01/22/2022 18:23	WG1806515
Carbon tetrachloride	U		0.00135	0.00752	1	01/22/2022 18:23	WG1806515
Chlorobenzene	U		0.000316	0.00376	1	01/22/2022 18:23	WG1806515
Chlorodibromomethane	U		0.000921	0.00376	1	01/22/2022 18:23	WG1806515
Chloroethane	U		0.00256	0.00752	1	01/22/2022 18:23	WG1806515
Chloroform	U		0.00155	0.00376	1	01/22/2022 18:23	WG1806515
Chloromethane	U		0.00654	0.0188	1	01/22/2022 18:23	WG1806515
2-Chlorotoluene	U		0.00130	0.00376	1	01/22/2022 18:23	WG1806515
4-Chlorotoluene	U		0.000677	0.00752	1	01/22/2022 18:23	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00587	0.0376	1	01/22/2022 18:23	WG1806515
1,2-Dibromoethane	U		0.000975	0.00376	1	01/22/2022 18:23	WG1806515
Dibromomethane	U		0.00113	0.00752	1	01/22/2022 18:23	WG1806515
1,2-Dichlorobenzene	U		0.000639	0.00752	1	01/22/2022 18:23	WG1806515
1,3-Dichlorobenzene	U		0.000903	0.00752	1	01/22/2022 18:23	WG1806515
1,4-Dichlorobenzene	U		0.00105	0.00752	1	01/22/2022 18:23	WG1806515
Dichlorodifluoromethane	U		0.00242	0.00376	1	01/22/2022 18:23	WG1806515
1,1-Dichloroethane	U		0.000739	0.00376	1	01/22/2022 18:23	WG1806515
1,2-Dichloroethane	U		0.000976	0.00376	1	01/22/2022 18:23	WG1806515
1,1-Dichloroethene	U		0.000912	0.00376	1	01/22/2022 18:23	WG1806515
cis-1,2-Dichloroethene	U		0.00110	0.00376	1	01/22/2022 18:23	WG1806515
trans-1,2-Dichloroethene	U		0.00156	0.00752	1	01/22/2022 18:23	WG1806515
1,2-Dichloropropane	U		0.00214	0.00752	1	01/22/2022 18:23	WG1806515
1,1-Dichloropropene	U		0.00122	0.00376	1	01/22/2022 18:23	WG1806515
1,3-Dichloropropane	U		0.000754	0.00752	1	01/22/2022 18:23	WG1806515

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00114	0.00376	1	01/22/2022 18:23	WG1806515
trans-1,3-Dichloropropene	U		0.00171	0.00752	1	01/22/2022 18:23	WG1806515
2,2-Dichloropropane	U		0.00208	0.00376	1	01/22/2022 18:23	WG1806515
Di-isopropyl ether	U		0.000617	0.00150	1	01/22/2022 18:23	WG1806515
Ethylbenzene	U		0.00111	0.00376	1	01/22/2022 18:23	WG1806515
Hexachloro-1,3-Butadiene	U		0.00903	0.0376	1	01/22/2022 18:23	WG1806515
Isopropylbenzene	U		0.000639	0.00376	1	01/22/2022 18:23	WG1806515
p-Isopropyltoluene	U		0.00384	0.00752	1	01/22/2022 18:23	WG1806515
2-Butanone (MEK)	U		0.0955	0.150	1	01/22/2022 18:23	WG1806515
Methylene Chloride	U		0.00999	0.0376	1	01/22/2022 18:23	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00343	0.0376	1	01/22/2022 18:23	WG1806515
Methyl tert-butyl ether	U		0.000526	0.00150	1	01/22/2022 18:23	WG1806515
Naphthalene	U		0.00734	0.0188	1	01/22/2022 18:23	WG1806515
n-Propylbenzene	U		0.00143	0.00752	1	01/22/2022 18:23	WG1806515
Styrene	U		0.000344	0.0188	1	01/22/2022 18:23	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00143	0.00376	1	01/22/2022 18:23	WG1806515
1,1,2,2-Tetrachloroethane	U		0.00105	0.00376	1	01/22/2022 18:23	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00113	0.00376	1	01/22/2022 18:23	WG1806515
Tetrachloroethene	U		0.00135	0.00376	1	01/22/2022 18:23	WG1806515
Toluene	0.00338	J	0.00196	0.00752	1	01/22/2022 18:23	WG1806515
1,2,3-Trichlorobenzene	U		0.0110	0.0188	1	01/22/2022 18:23	WG1806515
1,2,4-Trichlorobenzene	U		0.00662	0.0188	1	01/22/2022 18:23	WG1806515
1,1,1-Trichloroethane	U		0.00139	0.00376	1	01/22/2022 18:23	WG1806515
1,1,2-Trichloroethane	U		0.000898	0.00376	1	01/22/2022 18:23	WG1806515
Trichloroethene	U		0.000878	0.00150	1	01/22/2022 18:23	WG1806515
Trichlorofluoromethane	U		0.00124	0.00376	1	01/22/2022 18:23	WG1806515
1,2,3-Trichloropropane	U		0.00244	0.0188	1	01/22/2022 18:23	WG1806515
1,2,4-Trimethylbenzene	U		0.00238	0.00752	1	01/22/2022 18:23	WG1806515
1,2,3-Trimethylbenzene	U		0.00238	0.00752	1	01/22/2022 18:23	WG1806515
1,3,5-Trimethylbenzene	U		0.00301	0.00752	1	01/22/2022 18:23	WG1806515
Vinyl chloride	U		0.00174	0.00376	1	01/22/2022 18:23	WG1806515
Xylenes, Total	U		0.00132	0.00978	1	01/22/2022 18:23	WG1806515
(S) Toluene-d8	*101*			*75.0-131*		*01/22/2022 18:23*	WG1806515
(S) 4-Bromofluorobenzene	*102*			*67.0-138*		*01/22/2022 18:23*	WG1806515
(S) 1,2-Dichloroethane-d4	*100*			*70.0-130*		*01/22/2022 18:23*	WG1806515

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		18.6	62.0	1	01/22/2022 16:45	WG1806245
TPH C12 - C28	U		18.6	62.0	1	01/22/2022 16:45	WG1806245
TPH C28 - C35	U		18.6	62.0	1	01/22/2022 16:45	WG1806245
TPH C6 - C35	U		18.6	62.0	1	01/22/2022 16:45	WG1806245
(S) o-Terphenyl	*95.2*			*70.0-130*		*01/22/2022 16:45*	WG1806245
(S) 1-chlorooctane	*115*			*70.0-130*		*01/22/2022 16:45*	WG1806245

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0146	0.0421	1	01/27/2022 18:47	WG1806716
PCB 1221	U		0.0146	0.0421	1	01/27/2022 18:47	WG1806716
PCB 1232	U		0.0146	0.0421	1	01/27/2022 18:47	WG1806716
PCB 1242	U		0.0146	0.0421	1	01/27/2022 18:47	WG1806716
PCB 1248	U		0.00915	0.0211	1	01/27/2022 18:47	WG1806716
PCB 1254	U		0.00915	0.0211	1	01/27/2022 18:47	WG1806716

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00915	0.0211	1	01/27/2022 18:47	WG1806716
(S) Decachlorobiphenyl	*86.5*			*10.0-135*		*01/27/2022 18:47*	WG1806716
(S) Tetrachloro-m-xylene	*69.7*			*10.0-139*		*01/27/2022 18:47*	WG1806716

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.0134	0.0826	2	01/25/2022 21:19	WG1806705
Acenaphthylene	U		0.0116	0.0826	2	01/25/2022 21:19	WG1806705
Anthracene	U		0.0148	0.0826	2	01/25/2022 21:19	WG1806705
Benzidine	U		0.155	4.14	2	01/25/2022 21:19	WG1806705
Benzo(a)anthracene	U		0.0145	0.0826	2	01/25/2022 21:19	WG1806705
Benzo(b)fluoranthene	U		0.0154	0.0826	2	01/25/2022 21:19	WG1806705
Benzo(k)fluoranthene	U		0.0146	0.0826	2	01/25/2022 21:19	WG1806705
Benzo(g,h,i)perylene	U		0.0151	0.0826	2	01/25/2022 21:19	WG1806705
Benzo(a)pyrene	U		0.0154	0.0826	2	01/25/2022 21:19	WG1806705
Bis(2-chlorethoxy)methane	U		0.0248	0.826	2	01/25/2022 21:19	WG1806705
Bis(2-chloroethyl)ether	U		0.0273	0.826	2	01/25/2022 21:19	WG1806705
2,2-Oxybis(1-Chloropropane)	U		0.0357	0.826	2	01/25/2022 21:19	WG1806705
4-Bromophenyl-phenylether	U		0.0290	0.826	2	01/25/2022 21:19	WG1806705
2-Chloronaphthalene	U		0.0145	0.0826	2	01/25/2022 21:19	WG1806705
4-Chlorophenyl-phenylether	U		0.0288	0.826	2	01/25/2022 21:19	WG1806705
Chrysene	U		0.0164	0.0826	2	01/25/2022 21:19	WG1806705
Dibenz(a,h)anthracene	U		0.0229	0.0826	2	01/25/2022 21:19	WG1806705
3,3-Dichlorobenzidine	U		0.0305	0.826	2	01/25/2022 21:19	WG1806705
2,4-Dinitrotoluene	U		0.0237	0.826	2	01/25/2022 21:19	WG1806705
2,6-Dinitrotoluene	U		0.0270	0.826	2	01/25/2022 21:19	WG1806705
Fluoranthene	U		0.0149	0.0826	2	01/25/2022 21:19	WG1806705
Fluorene	U		0.0134	0.0826	2	01/25/2022 21:19	WG1806705
Hexachlorobenzene	U		0.0293	0.826	2	01/25/2022 21:19	WG1806705
Hexachloro-1,3-butadiene	U		0.0278	0.826	2	01/25/2022 21:19	WG1806705
Hexachlorocyclopentadiene	U		0.0434	0.826	2	01/25/2022 21:19	WG1806705
Hexachloroethane	U		0.0325	0.826	2	01/25/2022 21:19	WG1806705
Indeno(1,2,3-cd)pyrene	U		0.0233	0.0826	2	01/25/2022 21:19	WG1806705
Isophorone	U		0.0253	0.826	2	01/25/2022 21:19	WG1806705
Naphthalene	U		0.0207	0.0826	2	01/25/2022 21:19	WG1806705
Nitrobenzene	U		0.0288	0.826	2	01/25/2022 21:19	WG1806705
n-Nitrosodimethylamine	U		0.122	0.826	2	01/25/2022 21:19	WG1806705
n-Nitrosodiphenylamine	U		0.0625	0.826	2	01/25/2022 21:19	WG1806705
n-Nitrosodi-n-propylamine	U		0.0275	0.826	2	01/25/2022 21:19	WG1806705
Phenanthrene	U		0.0164	0.0826	2	01/25/2022 21:19	WG1806705
Benzylbutyl phthalate	U		0.0258	0.826	2	01/25/2022 21:19	WG1806705
Bis(2-ethylhexyl)phthalate	U		0.105	0.826	2	01/25/2022 21:19	WG1806705
Di-n-butyl phthalate	U		0.0283	0.826	2	01/25/2022 21:19	WG1806705
Diethyl phthalate	U		0.0273	0.826	2	01/25/2022 21:19	WG1806705
Dimethyl phthalate	U		0.175	0.826	2	01/25/2022 21:19	WG1806705
Di-n-octyl phthalate	U		0.0558	0.826	2	01/25/2022 21:19	WG1806705
Pyrene	U		0.0161	0.0826	2	01/25/2022 21:19	WG1806705
1,2,4-Trichlorobenzene	U		0.0258	0.826	2	01/25/2022 21:19	WG1806705
4-Chloro-3-methylphenol	U		0.0268	0.826	2	01/25/2022 21:19	WG1806705
2-Chlorophenol	U		0.0273	0.826	2	01/25/2022 21:19	WG1806705
2,4-Dichlorophenol	U		0.0240	0.826	2	01/25/2022 21:19	WG1806705
2,4-Dimethylphenol	U		0.0216	0.826	2	01/25/2022 21:19	WG1806705
4,6-Dinitro-2-methylphenol	U		0.187	0.826	2	01/25/2022 21:19	WG1806705
2,4-Dinitrophenol	U		0.193	0.826	2	01/25/2022 21:19	WG1806705
2-Nitrophenol	U		0.0295	0.826	2	01/25/2022 21:19	WG1806705

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0258	0.826	2	01/25/2022 21:19	WG1806705
Pentachlorophenol	U		0.0222	0.826	2	01/25/2022 21:19	WG1806705
Phenol	U		0.0332	0.826	2	01/25/2022 21:19	WG1806705
2,4,6-Trichlorophenol	U		0.0265	0.826	2	01/25/2022 21:19	WG1806705
(S) 2-Fluorophenol	*66.7*			*12.0-120*		*01/25/2022 21:19*	WG1806705
(S) Phenol-d5	*59.2*			*10.0-120*		*01/25/2022 21:19*	WG1806705
(S) Nitrobenzene-d5	*57.7*			*10.0-122*		*01/25/2022 21:19*	WG1806705
(S) 2-Fluorobiphenyl	*55.2*			*15.0-120*		*01/25/2022 21:19*	WG1806705
(S) 2,4,6-Tribromophenol	*69.3*			*10.0-127*		*01/25/2022 21:19*	WG1806705
(S) p-Terphenyl-d14	*61.3*			*10.0-120*		*01/25/2022 21:19*	WG1806705

Sample Narrative:

L1453350-06 WG1806705: Dilution due to matrix impact during extract concentration procedure

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	78.3		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0230	0.0511	1	01/24/2022 09:13	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.05	J	0.662	2.55	1	01/29/2022 17:50	WG1807079
Barium	46.5		0.109	0.639	1	01/29/2022 17:50	WG1807079
Cadmium	0.0631	J	0.0602	0.639	1	01/29/2022 17:50	WG1807079
Chromium	5.06		0.170	1.28	1	01/29/2022 17:50	WG1807079
Lead	2.74		0.266	0.639	1	01/29/2022 17:50	WG1807079
Selenium	U		0.976	2.55	1	01/29/2022 17:50	WG1807079
Silver	U		0.162	1.28	1	01/29/2022 17:50	WG1807079

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0598	0.0820	1	01/22/2022 18:45	WG1806515
Acrylonitrile	U		0.00592	0.0205	1	01/22/2022 18:45	WG1806515
Benzene	U		0.000766	0.00164	1	01/22/2022 18:45	WG1806515
Bromobenzene	U		0.00148	0.0205	1	01/22/2022 18:45	WG1806515
Bromodichloromethane	U		0.00119	0.00410	1	01/22/2022 18:45	WG1806515
Bromoform	U		0.00192	0.0410	1	01/22/2022 18:45	WG1806515
Bromomethane	U		0.00323	0.0205	1	01/22/2022 18:45	WG1806515
n-Butylbenzene	U		0.00861	0.0205	1	01/22/2022 18:45	WG1806515
sec-Butylbenzene	U		0.00472	0.0205	1	01/22/2022 18:45	WG1806515
tert-Butylbenzene	U		0.00320	0.00820	1	01/22/2022 18:45	WG1806515
Carbon tetrachloride	U		0.00147	0.00820	1	01/22/2022 18:45	WG1806515
Chlorobenzene	U		0.000344	0.00410	1	01/22/2022 18:45	WG1806515
Chlorodibromomethane	U		0.00100	0.00410	1	01/22/2022 18:45	WG1806515
Chloroethane	U		0.00279	0.00820	1	01/22/2022 18:45	WG1806515
Chloroform	U		0.00169	0.00410	1	01/22/2022 18:45	WG1806515
Chloromethane	U		0.00713	0.0205	1	01/22/2022 18:45	WG1806515
2-Chlorotoluene	U		0.00142	0.00410	1	01/22/2022 18:45	WG1806515
4-Chlorotoluene	U		0.000738	0.00820	1	01/22/2022 18:45	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00639	0.0410	1	01/22/2022 18:45	WG1806515
1,2-Dibromoethane	U		0.00106	0.00410	1	01/22/2022 18:45	WG1806515
Dibromomethane	U		0.00123	0.00820	1	01/22/2022 18:45	WG1806515
1,2-Dichlorobenzene	U		0.000697	0.00820	1	01/22/2022 18:45	WG1806515
1,3-Dichlorobenzene	U		0.000984	0.00820	1	01/22/2022 18:45	WG1806515
1,4-Dichlorobenzene	U		0.00115	0.00820	1	01/22/2022 18:45	WG1806515
Dichlorodifluoromethane	U		0.00264	0.00410	1	01/22/2022 18:45	WG1806515
1,1-Dichloroethane	U		0.000805	0.00410	1	01/22/2022 18:45	WG1806515
1,2-Dichloroethane	U		0.00106	0.00410	1	01/22/2022 18:45	WG1806515
1,1-Dichloroethene	U		0.000993	0.00410	1	01/22/2022 18:45	WG1806515
cis-1,2-Dichloroethene	U		0.00120	0.00410	1	01/22/2022 18:45	WG1806515
trans-1,2-Dichloroethene	U		0.00170	0.00820	1	01/22/2022 18:45	WG1806515
1,2-Dichloropropane	U		0.00233	0.00820	1	01/22/2022 18:45	WG1806515
1,1-Dichloropropene	U		0.00133	0.00410	1	01/22/2022 18:45	WG1806515
1,3-Dichloropropane	U		0.000821	0.00820	1	01/22/2022 18:45	WG1806515

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00124	0.00410	1	01/22/2022 18:45	WG1806515
trans-1,3-Dichloropropene	U		0.00187	0.00820	1	01/22/2022 18:45	WG1806515
2,2-Dichloropropane	U		0.00226	0.00410	1	01/22/2022 18:45	WG1806515
Di-isopropyl ether	U		0.000672	0.00164	1	01/22/2022 18:45	WG1806515
Ethylbenzene	U		0.00121	0.00410	1	01/22/2022 18:45	WG1806515
Hexachloro-1,3-Butadiene	U		0.00984	0.0410	1	01/22/2022 18:45	WG1806515
Isopropylbenzene	U		0.000697	0.00410	1	01/22/2022 18:45	WG1806515
p-Isopropyltoluene	U		0.00418	0.00820	1	01/22/2022 18:45	WG1806515
2-Butanone (MEK)	U		0.104	0.164	1	01/22/2022 18:45	WG1806515
Methylene Chloride	U		0.0109	0.0410	1	01/22/2022 18:45	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00374	0.0410	1	01/22/2022 18:45	WG1806515
Methyl tert-butyl ether	U		0.000574	0.00164	1	01/22/2022 18:45	WG1806515
Naphthalene	U		0.00800	0.0205	1	01/22/2022 18:45	WG1806515
n-Propylbenzene	U		0.00156	0.00820	1	01/22/2022 18:45	WG1806515
Styrene	U		0.000375	0.0205	1	01/22/2022 18:45	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00155	0.00410	1	01/22/2022 18:45	WG1806515
1,1,2,2-Tetrachloroethane	U		0.00114	0.00410	1	01/22/2022 18:45	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00124	0.00410	1	01/22/2022 18:45	WG1806515
Tetrachloroethene	U		0.00147	0.00410	1	01/22/2022 18:45	WG1806515
Toluene	0.00451	J	0.00213	0.00820	1	01/22/2022 18:45	WG1806515
1,2,3-Trichlorobenzene	U		0.0120	0.0205	1	01/22/2022 18:45	WG1806515
1,2,4-Trichlorobenzene	U		0.00721	0.0205	1	01/22/2022 18:45	WG1806515
1,1,1-Trichloroethane	U		0.00151	0.00410	1	01/22/2022 18:45	WG1806515
1,1,2-Trichloroethane	U		0.000979	0.00410	1	01/22/2022 18:45	WG1806515
Trichloroethene	U		0.000957	0.00164	1	01/22/2022 18:45	WG1806515
Trichlorofluoromethane	U		0.00136	0.00410	1	01/22/2022 18:45	WG1806515
1,2,3-Trichloropropane	U		0.00266	0.0205	1	01/22/2022 18:45	WG1806515
1,2,4-Trimethylbenzene	U		0.00259	0.00820	1	01/22/2022 18:45	WG1806515
1,2,3-Trimethylbenzene	U		0.00259	0.00820	1	01/22/2022 18:45	WG1806515
1,3,5-Trimethylbenzene	U		0.00328	0.00820	1	01/22/2022 18:45	WG1806515
Vinyl chloride	U		0.00190	0.00410	1	01/22/2022 18:45	WG1806515
Xylenes, Total	U		0.00144	0.0107	1	01/22/2022 18:45	WG1806515
(S) Toluene-d8	*99.6*			*75.0-131*		*01/22/2022 18:45*	WG1806515
(S) 4-Bromofluorobenzene	*101*			*67.0-138*		*01/22/2022 18:45*	WG1806515
(S) 1,2-Dichloroethane-d4	*95.4*			*70.0-130*		*01/22/2022 18:45*	WG1806515

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		19.2	63.9	1	01/22/2022 17:31	WG1806245
TPH C12 - C28	U		19.2	63.9	1	01/22/2022 17:31	WG1806245
TPH C28 - C35	U		19.2	63.9	1	01/22/2022 17:31	WG1806245
TPH C6 - C35	U		19.2	63.9	1	01/22/2022 17:31	WG1806245
(S) o-Terphenyl	*98.8*			*70.0-130*		*01/22/2022 17:31*	WG1806245
(S) 1-chlorooctane	*116*			*70.0-130*		*01/22/2022 17:31*	WG1806245

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0151	0.0434	1	01/27/2022 18:56	WG1806716
PCB 1221	U		0.0151	0.0434	1	01/27/2022 18:56	WG1806716
PCB 1232	U		0.0151	0.0434	1	01/27/2022 18:56	WG1806716
PCB 1242	U		0.0151	0.0434	1	01/27/2022 18:56	WG1806716
PCB 1248	U		0.00943	0.0217	1	01/27/2022 18:56	WG1806716
PCB 1254	U		0.00943	0.0217	1	01/27/2022 18:56	WG1806716

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00943	0.0217	1	01/27/2022 18:56	WG1806716
(S) Decachlorobiphenyl	*67.1*			*10.0-135*		*01/27/2022 18:56*	WG1806716
(S) Tetrachloro-m-xylene	*60.2*			*10.0-139*		*01/27/2022 18:56*	WG1806716

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00689	0.0425	1	01/25/2022 19:15	WG1806705
Acenaphthylene	U		0.00599	0.0425	1	01/25/2022 19:15	WG1806705
Anthracene	U		0.00757	0.0425	1	01/25/2022 19:15	WG1806705
Benzidine	U		0.0800	2.13	1	01/25/2022 19:15	WG1806705
Benzo(a)anthracene	U		0.00750	0.0425	1	01/25/2022 19:15	WG1806705
Benzo(b)fluoranthene	U		0.00793	0.0425	1	01/25/2022 19:15	WG1806705
Benzo(k)fluoranthene	U		0.00756	0.0425	1	01/25/2022 19:15	WG1806705
Benzo(g,h,i)perylene	U		0.00778	0.0425	1	01/25/2022 19:15	WG1806705
Benzo(a)pyrene	U		0.00791	0.0425	1	01/25/2022 19:15	WG1806705
Bis(2-chlorethoxy)methane	U		0.0128	0.425	1	01/25/2022 19:15	WG1806705
Bis(2-chloroethyl)ether	U		0.0141	0.425	1	01/25/2022 19:15	WG1806705
2,2-Oxybis(1-Chloropropane)	U		0.0184	0.425	1	01/25/2022 19:15	WG1806705
4-Bromophenyl-phenylether	U		0.0149	0.425	1	01/25/2022 19:15	WG1806705
2-Chloronaphthalene	U		0.00747	0.0425	1	01/25/2022 19:15	WG1806705
4-Chlorophenyl-phenylether	U		0.0148	0.425	1	01/25/2022 19:15	WG1806705
Chrysene	U		0.00846	0.0425	1	01/25/2022 19:15	WG1806705
Dibenz(a,h)anthracene	U		0.0118	0.0425	1	01/25/2022 19:15	WG1806705
3,3-Dichlorobenzidine	U		0.0157	0.425	1	01/25/2022 19:15	WG1806705
2,4-Dinitrotoluene	U		0.0122	0.425	1	01/25/2022 19:15	WG1806705
2,6-Dinitrotoluene	U		0.0139	0.425	1	01/25/2022 19:15	WG1806705
Fluoranthene	U		0.00768	0.0425	1	01/25/2022 19:15	WG1806705
Fluorene	U		0.00692	0.0425	1	01/25/2022 19:15	WG1806705
Hexachlorobenzene	U		0.0151	0.425	1	01/25/2022 19:15	WG1806705
Hexachloro-1,3-butadiene	U		0.0143	0.425	1	01/25/2022 19:15	WG1806705
Hexachlorocyclopentadiene	U		0.0224	0.425	1	01/25/2022 19:15	WG1806705
Hexachloroethane	U		0.0167	0.425	1	01/25/2022 19:15	WG1806705
Indeno(1,2,3-cd)pyrene	U		0.0120	0.0425	1	01/25/2022 19:15	WG1806705
Isophorone	U		0.0130	0.425	1	01/25/2022 19:15	WG1806705
Naphthalene	U		0.0107	0.0425	1	01/25/2022 19:15	WG1806705
Nitrobenzene	U		0.0148	0.425	1	01/25/2022 19:15	WG1806705
n-Nitrosodimethylamine	U		0.0631	0.425	1	01/25/2022 19:15	WG1806705
n-Nitrosodiphenylamine	U		0.0322	0.425	1	01/25/2022 19:15	WG1806705
n-Nitrosodi-n-propylamine	U		0.0142	0.425	1	01/25/2022 19:15	WG1806705
Phenanthrene	U		0.00844	0.0425	1	01/25/2022 19:15	WG1806705
Benzylbutyl phthalate	U		0.0133	0.425	1	01/25/2022 19:15	WG1806705
Bis(2-ethylhexyl)phthalate	U		0.0539	0.425	1	01/25/2022 19:15	WG1806705
Di-n-butyl phthalate	U		0.0146	0.425	1	01/25/2022 19:15	WG1806705
Diethyl phthalate	U		0.0141	0.425	1	01/25/2022 19:15	WG1806705
Dimethyl phthalate	U		0.0902	0.425	1	01/25/2022 19:15	WG1806705
Di-n-octyl phthalate	U		0.0287	0.425	1	01/25/2022 19:15	WG1806705
Pyrene	U		0.00828	0.0425	1	01/25/2022 19:15	WG1806705
1,2,4-Trichlorobenzene	U		0.0133	0.425	1	01/25/2022 19:15	WG1806705
4-Chloro-3-methylphenol	U		0.0138	0.425	1	01/25/2022 19:15	WG1806705
2-Chlorophenol	U		0.0141	0.425	1	01/25/2022 19:15	WG1806705
2,4-Dichlorophenol	U		0.0124	0.425	1	01/25/2022 19:15	WG1806705
2,4-Dimethylphenol	U		0.0111	0.425	1	01/25/2022 19:15	WG1806705
4,6-Dinitro-2-methylphenol	U		0.0964	0.425	1	01/25/2022 19:15	WG1806705
2,4-Dinitrophenol	U		0.0995	0.425	1	01/25/2022 19:15	WG1806705
2-Nitrophenol	U		0.0152	0.425	1	01/25/2022 19:15	WG1806705

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0133	0.425	1	01/25/2022 19:15	WG1806705
Pentachlorophenol	U		0.0114	0.425	1	01/25/2022 19:15	WG1806705
Phenol	U		0.0171	0.425	1	01/25/2022 19:15	WG1806705
2,4,6-Trichlorophenol	U		0.0137	0.425	1	01/25/2022 19:15	WG1806705
(S) 2-Fluorophenol	*75.0*			*12.0-120*		*01/25/2022 19:15*	WG1806705
(S) Phenol-d5	*67.1*			*10.0-120*		*01/25/2022 19:15*	WG1806705
(S) Nitrobenzene-d5	*62.7*			*10.0-122*		*01/25/2022 19:15*	WG1806705
(S) 2-Fluorobiphenyl	*62.4*			*15.0-120*		*01/25/2022 19:15*	WG1806705
(S) 2,4,6-Tribromophenol	*77.7*			*10.0-127*		*01/25/2022 19:15*	WG1806705
(S) p-Terphenyl-d14	*71.2*			*10.0-120*		*01/25/2022 19:15*	WG1806705

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	74.0		1	01/24/2022 14:44	WG1806098

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0243	0.0540	1	01/24/2022 09:15	WG1806687

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.22	J	0.700	2.70	1	01/29/2022 17:52	WG1807079
Barium	87.5		0.115	0.675	1	01/29/2022 17:52	WG1807079
Cadmium	0.121	J	0.0636	0.675	1	01/29/2022 17:52	WG1807079
Chromium	10.9		0.180	1.35	1	01/29/2022 17:52	WG1807079
Lead	6.75		0.281	0.675	1	01/29/2022 17:52	WG1807079
Selenium	U		1.03	2.70	1	01/29/2022 17:52	WG1807079
Silver	U		0.172	1.35	1	01/29/2022 17:52	WG1807079

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	0.0685	J	0.0622	0.0852	1	01/22/2022 19:06	WG1806515
Acrylonitrile	U		0.00615	0.0213	1	01/22/2022 19:06	WG1806515
Benzene	U		0.000796	0.00170	1	01/22/2022 19:06	WG1806515
Bromobenzene	U		0.00153	0.0213	1	01/22/2022 19:06	WG1806515
Bromodichloromethane	U		0.00124	0.00426	1	01/22/2022 19:06	WG1806515
Bromoform	U		0.00199	0.0426	1	01/22/2022 19:06	WG1806515
Bromomethane	U		0.00336	0.0213	1	01/22/2022 19:06	WG1806515
n-Butylbenzene	U		0.00894	0.0213	1	01/22/2022 19:06	WG1806515
sec-Butylbenzene	U		0.00491	0.0213	1	01/22/2022 19:06	WG1806515
tert-Butylbenzene	U		0.00332	0.00852	1	01/22/2022 19:06	WG1806515
Carbon tetrachloride	U		0.00153	0.00852	1	01/22/2022 19:06	WG1806515
Chlorobenzene	U		0.000358	0.00426	1	01/22/2022 19:06	WG1806515
Chlorodibromomethane	U		0.00104	0.00426	1	01/22/2022 19:06	WG1806515
Chloroethane	U		0.00290	0.00852	1	01/22/2022 19:06	WG1806515
Chloroform	U		0.00175	0.00426	1	01/22/2022 19:06	WG1806515
Chloromethane	U		0.00741	0.0213	1	01/22/2022 19:06	WG1806515
2-Chlorotoluene	U		0.00147	0.00426	1	01/22/2022 19:06	WG1806515
4-Chlorotoluene	U		0.000767	0.00852	1	01/22/2022 19:06	WG1806515
1,2-Dibromo-3-Chloropropane	U		0.00664	0.0426	1	01/22/2022 19:06	WG1806515
1,2-Dibromoethane	U		0.00110	0.00426	1	01/22/2022 19:06	WG1806515
Dibromomethane	U		0.00128	0.00852	1	01/22/2022 19:06	WG1806515
1,2-Dichlorobenzene	U		0.000724	0.00852	1	01/22/2022 19:06	WG1806515
1,3-Dichlorobenzene	U		0.00102	0.00852	1	01/22/2022 19:06	WG1806515
1,4-Dichlorobenzene	U		0.00119	0.00852	1	01/22/2022 19:06	WG1806515
Dichlorodifluoromethane	U		0.00274	0.00426	1	01/22/2022 19:06	WG1806515
1,1-Dichloroethane	U		0.000836	0.00426	1	01/22/2022 19:06	WG1806515
1,2-Dichloroethane	U		0.00111	0.00426	1	01/22/2022 19:06	WG1806515
1,1-Dichloroethene	U		0.00103	0.00426	1	01/22/2022 19:06	WG1806515
cis-1,2-Dichloroethene	U		0.00125	0.00426	1	01/22/2022 19:06	WG1806515
trans-1,2-Dichloroethene	U		0.00177	0.00852	1	01/22/2022 19:06	WG1806515
1,2-Dichloropropane	U		0.00242	0.00852	1	01/22/2022 19:06	WG1806515
1,1-Dichloropropene	U		0.00138	0.00426	1	01/22/2022 19:06	WG1806515
1,3-Dichloropropane	U		0.000853	0.00852	1	01/22/2022 19:06	WG1806515

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00129	0.00426	1	01/22/2022 19:06	WG1806515
trans-1,3-Dichloropropene	U		0.00194	0.00852	1	01/22/2022 19:06	WG1806515
2,2-Dichloropropane	U		0.00235	0.00426	1	01/22/2022 19:06	WG1806515
Di-isopropyl ether	U		0.000698	0.00170	1	01/22/2022 19:06	WG1806515
Ethylbenzene	U		0.00126	0.00426	1	01/22/2022 19:06	WG1806515
Hexachloro-1,3-Butadiene	U		0.0102	0.0426	1	01/22/2022 19:06	WG1806515
Isopropylbenzene	U		0.000724	0.00426	1	01/22/2022 19:06	WG1806515
p-Isopropyltoluene	U		0.00434	0.00852	1	01/22/2022 19:06	WG1806515
2-Butanone (MEK)	U		0.108	0.170	1	01/22/2022 19:06	WG1806515
Methylene Chloride	U		0.0113	0.0426	1	01/22/2022 19:06	WG1806515
4-Methyl-2-pentanone (MIBK)	U		0.00388	0.0426	1	01/22/2022 19:06	WG1806515
Methyl tert-butyl ether	U		0.000596	0.00170	1	01/22/2022 19:06	WG1806515
Naphthalene	U		0.00831	0.0213	1	01/22/2022 19:06	WG1806515
n-Propylbenzene	U		0.00162	0.00852	1	01/22/2022 19:06	WG1806515
Styrene	U		0.000390	0.0213	1	01/22/2022 19:06	WG1806515
1,1,1,2-Tetrachloroethane	U		0.00161	0.00426	1	01/22/2022 19:06	WG1806515
1,1,2,2-Tetrachloroethane	U		0.00118	0.00426	1	01/22/2022 19:06	WG1806515
1,1,2-Trichlorotrifluoroethane	U		0.00128	0.00426	1	01/22/2022 19:06	WG1806515
Tetrachloroethene	U		0.00153	0.00426	1	01/22/2022 19:06	WG1806515
Toluene	0.00647	J	0.00221	0.00852	1	01/22/2022 19:06	WG1806515
1,2,3-Trichlorobenzene	U		0.0125	0.0213	1	01/22/2022 19:06	WG1806515
1,2,4-Trichlorobenzene	U		0.00750	0.0213	1	01/22/2022 19:06	WG1806515
1,1,1-Trichloroethane	U		0.00157	0.00426	1	01/22/2022 19:06	WG1806515
1,1,2-Trichloroethane	U		0.00102	0.00426	1	01/22/2022 19:06	WG1806515
Trichloroethene	U		0.000995	0.00170	1	01/22/2022 19:06	WG1806515
Trichlorofluoromethane	U		0.00141	0.00426	1	01/22/2022 19:06	WG1806515
1,2,3-Trichloropropane	U		0.00276	0.0213	1	01/22/2022 19:06	WG1806515
1,2,4-Trimethylbenzene	0.00286	J	0.00269	0.00852	1	01/22/2022 19:06	WG1806515
1,2,3-Trimethylbenzene	U		0.00269	0.00852	1	01/22/2022 19:06	WG1806515
1,3,5-Trimethylbenzene	U		0.00341	0.00852	1	01/22/2022 19:06	WG1806515
Vinyl chloride	U		0.00198	0.00426	1	01/22/2022 19:06	WG1806515
Xylenes, Total	U		0.00150	0.0111	1	01/22/2022 19:06	WG1806515
(S) Toluene-d8	*99.7*			*75.0-131*		*01/22/2022 19:06*	WG1806515
(S) 4-Bromofluorobenzene	*99.8*			*67.0-138*		*01/22/2022 19:06*	WG1806515
(S) 1,2-Dichloroethane-d4	*98.2*			*70.0-130*		*01/22/2022 19:06*	WG1806515

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		20.3	67.5	1	01/26/2022 04:11	WG1807686
TPH C12 - C28	U		20.3	67.5	1	01/26/2022 04:11	WG1807686
TPH C28 - C35	U		20.3	67.5	1	01/26/2022 04:11	WG1807686
TPH C6 - C35	U		20.3	67.5	1	01/26/2022 04:11	WG1807686
(S) o-Terphenyl	*109*			*70.0-130*		*01/26/2022 04:11*	WG1807686
(S) 1-chlorooctane	*118*			*70.0-130*		*01/26/2022 04:11*	WG1807686

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0159	0.0459	1	01/27/2022 19:05	WG1806716
PCB 1221	U		0.0159	0.0459	1	01/27/2022 19:05	WG1806716
PCB 1232	U		0.0159	0.0459	1	01/27/2022 19:05	WG1806716
PCB 1242	U		0.0159	0.0459	1	01/27/2022 19:05	WG1806716
PCB 1248	U		0.00997	0.0230	1	01/27/2022 19:05	WG1806716
PCB 1254	U		0.00997	0.0230	1	01/27/2022 19:05	WG1806716

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00997	0.0230	1	01/27/2022 19:05	WG1806716
(S) Decachlorobiphenyl	*65.7*			*10.0-135*		*01/27/2022 19:05*	WG1806716
(S) Tetrachloro-m-xylene	*54.4*			*10.0-139*		*01/27/2022 19:05*	WG1806716

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00728	0.0450	1	01/25/2022 04:22	WG1807167
Acenaphthylene	U		0.00634	0.0450	1	01/25/2022 04:22	WG1807167
Anthracene	U		0.00801	0.0450	1	01/25/2022 04:22	WG1807167
Benzidine	U		0.0846	2.26	1	01/25/2022 04:22	WG1807167
Benzo(a)anthracene	U		0.00793	0.0450	1	01/25/2022 04:22	WG1807167
Benzo(b)fluoranthene	U		0.00839	0.0450	1	01/25/2022 04:22	WG1807167
Benzo(k)fluoranthene	U		0.00800	0.0450	1	01/25/2022 04:22	WG1807167
Benzo(g,h,i)perylene	U		0.00823	0.0450	1	01/25/2022 04:22	WG1807167
Benzo(a)pyrene	U		0.00836	0.0450	1	01/25/2022 04:22	WG1807167
Bis(2-chlorethoxy)methane	U		0.0135	0.450	1	01/25/2022 04:22	WG1807167
Bis(2-chloroethyl)ether	U		0.0149	0.450	1	01/25/2022 04:22	WG1807167
2,2-Oxybis(1-Chloropropane)	U		0.0195	0.450	1	01/25/2022 04:22	WG1807167
4-Bromophenyl-phenylether	U		0.0158	0.450	1	01/25/2022 04:22	WG1807167
2-Chloronaphthalene	U		0.00790	0.0450	1	01/25/2022 04:22	WG1807167
4-Chlorophenyl-phenylether	U		0.0157	0.450	1	01/25/2022 04:22	WG1807167
Chrysene	U		0.00894	0.0450	1	01/25/2022 04:22	WG1807167
Dibenz(a,h)anthracene	U		0.0125	0.0450	1	01/25/2022 04:22	WG1807167
3,3-Dichlorobenzidine	U		0.0166	0.450	1	01/25/2022 04:22	WG1807167
2,4-Dinitrotoluene	U		0.0129	0.450	1	01/25/2022 04:22	WG1807167
2,6-Dinitrotoluene	U		0.0147	0.450	1	01/25/2022 04:22	WG1807167
Fluoranthene	U		0.00812	0.0450	1	01/25/2022 04:22	WG1807167
Fluorene	U		0.00732	0.0450	1	01/25/2022 04:22	WG1807167
Hexachlorobenzene	U		0.0159	0.450	1	01/25/2022 04:22	WG1807167
Hexachloro-1,3-butadiene	U		0.0151	0.450	1	01/25/2022 04:22	WG1807167
Hexachlorocyclopentadiene	U		0.0236	0.450	1	01/25/2022 04:22	WG1807167
Hexachloroethane	U		0.0177	0.450	1	01/25/2022 04:22	WG1807167
Indeno(1,2,3-cd)pyrene	U		0.0127	0.0450	1	01/25/2022 04:22	WG1807167
Isophorone	U		0.0138	0.450	1	01/25/2022 04:22	WG1807167
Naphthalene	U		0.0113	0.0450	1	01/25/2022 04:22	WG1807167
Nitrobenzene	U		0.0157	0.450	1	01/25/2022 04:22	WG1807167
n-Nitrosodimethylamine	U		0.0667	0.450	1	01/25/2022 04:22	WG1807167
n-Nitrosodiphenylamine	U		0.0340	0.450	1	01/25/2022 04:22	WG1807167
n-Nitrosodi-n-propylamine	U		0.0150	0.450	1	01/25/2022 04:22	WG1807167
Phenanthrene	U		0.00893	0.0450	1	01/25/2022 04:22	WG1807167
Benzylbutyl phthalate	U		0.0140	0.450	1	01/25/2022 04:22	WG1807167
Bis(2-ethylhexyl)phthalate	U		0.0570	0.450	1	01/25/2022 04:22	WG1807167
Di-n-butyl phthalate	U		0.0154	0.450	1	01/25/2022 04:22	WG1807167
Diethyl phthalate	U		0.0149	0.450	1	01/25/2022 04:22	WG1807167
Dimethyl phthalate	U		0.0954	0.450	1	01/25/2022 04:22	WG1807167
Di-n-octyl phthalate	U		0.0304	0.450	1	01/25/2022 04:22	WG1807167
Pyrene	U		0.00875	0.0450	1	01/25/2022 04:22	WG1807167
1,2,4-Trichlorobenzene	U		0.0140	0.450	1	01/25/2022 04:22	WG1807167
4-Chloro-3-methylphenol	U		0.0146	0.450	1	01/25/2022 04:22	WG1807167
2-Chlorophenol	U		0.0149	0.450	1	01/25/2022 04:22	WG1807167
2,4-Dichlorophenol	U		0.0131	0.450	1	01/25/2022 04:22	WG1807167
2,4-Dimethylphenol	U		0.0118	0.450	1	01/25/2022 04:22	WG1807167
4,6-Dinitro-2-methylphenol	U		0.102	0.450	1	01/25/2022 04:22	WG1807167
2,4-Dinitrophenol	U		0.105	0.450	1	01/25/2022 04:22	WG1807167
2-Nitrophenol	U		0.0161	0.450	1	01/25/2022 04:22	WG1807167

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0140	0.450	1	01/25/2022 04:22	WG1807167
Pentachlorophenol	U		0.0121	0.450	1	01/25/2022 04:22	WG1807167
Phenol	U		0.0181	0.450	1	01/25/2022 04:22	WG1807167
2,4,6-Trichlorophenol	U		0.0145	0.450	1	01/25/2022 04:22	WG1807167
(S) 2-Fluorophenol	*75.3*			*12.0-120*		*01/25/2022 04:22*	WG1807167
(S) Phenol-d5	*67.1*			*10.0-120*		*01/25/2022 04:22*	WG1807167
(S) Nitrobenzene-d5	*58.3*			*10.0-122*		*01/25/2022 04:22*	WG1807167
(S) 2-Fluorobiphenyl	*64.5*			*15.0-120*		*01/25/2022 04:22*	WG1807167
(S) 2,4,6-Tribromophenol	*86.3*			*10.0-127*		*01/25/2022 04:22*	WG1807167
(S) p-Terphenyl-d14	*75.9*			*10.0-120*		*01/25/2022 04:22*	WG1807167

Method Blank (MB)

(MB) R3753225-1 01/24/22 14:44

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1453350-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1453350-04 01/24/22 14:44 • (DUP) R3753225-3 01/24/22 14:44

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	66.0	67.5	1	2.18		10

Laboratory Control Sample (LCS)

(LCS) R3753225-2 01/24/22 14:44

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3752892-1 01/24/22 08:26

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3752892-2 01/24/22 08:28

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.518	104	80.0-120	

L1453350-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453350-03 01/24/22 08:30 • (MS) R3752892-3 01/24/22 08:32 • (MSD) R3752892-4 01/24/22 08:34

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.692	U	0.744	0.841	107	122	1	75.0-125			12.3	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Cp Tc Ss Cn Sr Qc Gl Al Sc

Method Blank (MB)

(MB) R3755094-1 01/29/22 15:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Lead	U		0.208	0.500
Selenium	U		0.764	2.00
Silver	U		0.127	1.00

Laboratory Control Sample (LCS)

(LCS) R3755094-2 01/29/22 15:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	93.1	93.1	80.0-120	
Barium	100	96.3	96.3	80.0-120	
Cadmium	100	104	104	80.0-120	
Chromium	100	100	100	80.0-120	
Lead	100	95.6	95.6	80.0-120	
Selenium	100	102	102	80.0-120	
Silver	20.0	19.9	99.6	80.0-120	

L1453350-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453350-03 01/29/22 15:44 • (MS) R3755094-5 01/29/22 15:52 • (MSD) R3755094-6 01/29/22 15:55

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	138	2.98	123	121	86.8	85.6	1	75.0-125			1.30	20
Barium	138	119	253	229	97.0	79.9	1	75.0-125			9.85	20
Cadmium	138	0.197	135	133	97.2	95.9	1	75.0-125			1.38	20
Chromium	138	14.8	146	141	94.6	91.5	1	75.0-125			3.05	20
Lead	138	10.5	137	135	91.4	89.8	1	75.0-125			1.64	20
Selenium	138	U	129	128	93.4	92.2	1	75.0-125			1.34	20
Silver	27.7	U	25.9	25.6	93.4	92.6	1	75.0-125			0.838	20

Method Blank (MB)

(MB) R3755126-1 01/30/22 13:26

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Lead	U		0.208	0.500
Selenium	U		0.764	2.00
Silver	U		0.127	1.00

Laboratory Control Sample (LCS)

(LCS) R3755126-2 01/30/22 13:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	92.2	92.2	80.0-120	
Barium	100	98.6	98.6	80.0-120	
Cadmium	100	90.9	90.9	80.0-120	
Chromium	100	93.0	93.0	80.0-120	
Lead	100	90.3	90.3	80.0-120	
Selenium	100	90.8	90.8	80.0-120	
Silver	20.0	17.2	85.8	80.0-120	

L1453441-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453441-05 01/30/22 13:32 • (MS) R3755126-5 01/30/22 13:39 • (MSD) R3755126-6 01/30/22 13:42

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.78	99.0	89.8	96.2	87.0	1	75.0-125			9.75	20
Barium	100	84.2	187	175	103	90.7	1	75.0-125			6.71	20
Cadmium	100	0.126	95.3	86.6	95.1	86.4	1	75.0-125			9.59	20
Chromium	100	8.67	103	93.8	94.3	85.1	1	75.0-125			9.36	20
Lead	100	6.86	102	92.8	94.7	86.0	1	75.0-125			8.96	20
Selenium	100	0.810	94.6	85.4	93.8	84.6	1	75.0-125			10.3	20
Silver	20.0	U	18.2	16.7	91.0	83.3	1	75.0-125			8.91	20

Method Blank (MB)

(MB) R3752873-2 01/22/22 11:24

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromobenzene	U		0.000900	0.0125
Bromodichloromethane	U		0.000725	0.00250
Bromoform	U		0.00117	0.0250
Bromomethane	U		0.00197	0.0125
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloroform	U		0.00103	0.00250
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	U		0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
Dibromomethane	U		0.000750	0.00500
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,1-Dichloroethane	U		0.000491	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,2-Dichloropropane	U		0.00142	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
1,3-Dichloropropane	U		0.000501	0.00500
cis-1,3-Dichloropropene	U		0.000757	0.00250
trans-1,3-Dichloropropene	U		0.00114	0.00500
2,2-Dichloropropane	U		0.00138	0.00250
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	U		0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250

Method Blank (MB)

(MB) R3752873-2 01/22/22 11:24

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	U		0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
Tetrachloroethene	U		0.000896	0.00250
Toluene	U		0.00130	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125
1,1,1-Trichloroethane	U		0.000923	0.00250
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	*99.2*			*75.0-131*
(S) 4-Bromofluorobenzene	*99.2*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3752873-1 01/22/22 09:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetone	0.625	0.779	125	10.0-160	
Acrylonitrile	0.625	0.624	99.8	45.0-153	
Benzene	0.125	0.117	93.6	70.0-123	
Bromobenzene	0.125	0.125	100	73.0-121	
Bromodichloromethane	0.125	0.115	92.0	73.0-121	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Laboratory Control Sample (LCS)

(LCS) R3752873-1 01/22/22 09:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromoform	0.125	0.102	81.6	64.0-132	
Bromomethane	0.125	0.104	83.2	56.0-147	
n-Butylbenzene	0.125	0.139	111	68.0-135	
sec-Butylbenzene	0.125	0.134	107	74.0-130	
tert-Butylbenzene	0.125	0.131	105	75.0-127	
Carbon tetrachloride	0.125	0.128	102	66.0-128	
Chlorobenzene	0.125	0.111	88.8	76.0-128	
Chlorodibromomethane	0.125	0.115	92.0	74.0-127	
Chloroethane	0.125	0.119	95.2	61.0-134	
Chloroform	0.125	0.115	92.0	72.0-123	
Chloromethane	0.125	0.119	95.2	51.0-138	
2-Chlorotoluene	0.125	0.124	99.2	75.0-124	
4-Chlorotoluene	0.125	0.117	93.6	75.0-124	
1,2-Dibromo-3-Chloropropane	0.125	0.120	96.0	59.0-130	
1,2-Dibromoethane	0.125	0.115	92.0	74.0-128	
Dibromomethane	0.125	0.116	92.8	75.0-122	
1,2-Dichlorobenzene	0.125	0.122	97.6	76.0-124	
1,3-Dichlorobenzene	0.125	0.120	96.0	76.0-125	
1,4-Dichlorobenzene	0.125	0.123	98.4	77.0-121	
Dichlorodifluoromethane	0.125	0.140	112	43.0-156	
1,1-Dichloroethane	0.125	0.117	93.6	70.0-127	
1,2-Dichloroethane	0.125	0.118	94.4	65.0-131	
1,1-Dichloroethene	0.125	0.125	100	65.0-131	
cis-1,2-Dichloroethene	0.125	0.113	90.4	73.0-125	
trans-1,2-Dichloroethene	0.125	0.111	88.8	71.0-125	
1,2-Dichloropropane	0.125	0.120	96.0	74.0-125	
1,1-Dichloropropene	0.125	0.127	102	73.0-125	
1,3-Dichloropropane	0.125	0.119	95.2	80.0-125	
cis-1,3-Dichloropropene	0.125	0.118	94.4	76.0-127	
trans-1,3-Dichloropropene	0.125	0.126	101	73.0-127	
2,2-Dichloropropane	0.125	0.141	113	59.0-135	
Di-isopropyl ether	0.125	0.126	101	60.0-136	
Ethylbenzene	0.125	0.117	93.6	74.0-126	
Hexachloro-1,3-butadiene	0.125	0.125	100	57.0-150	
Isopropylbenzene	0.125	0.128	102	72.0-127	
p-Isopropyltoluene	0.125	0.138	110	72.0-133	
2-Butanone (MEK)	0.625	0.730	117	30.0-160	
Methylene Chloride	0.125	0.108	86.4	68.0-123	
4-Methyl-2-pentanone (MIBK)	0.625	0.623	99.7	56.0-143	
Methyl tert-butyl ether	0.125	0.117	93.6	66.0-132	

Laboratory Control Sample (LCS)

(LCS) R3752873-1 01/22/22 09:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Naphthalene	0.125	0.132	106	59.0-130	
n-Propylbenzene	0.125	0.131	105	74.0-126	
Styrene	0.125	0.126	101	72.0-127	
1,1,1,2-Tetrachloroethane	0.125	0.112	89.6	74.0-129	
1,1,2,2-Tetrachloroethane	0.125	0.123	98.4	68.0-128	
Tetrachloroethene	0.125	0.122	97.6	70.0-136	
Toluene	0.125	0.112	89.6	75.0-121	
1,1,2-Trichlorotrifluoroethane	0.125	0.0885	70.8	61.0-139	
1,2,3-Trichlorobenzene	0.125	0.122	97.6	59.0-139	
1,2,4-Trichlorobenzene	0.125	0.129	103	62.0-137	
1,1,1-Trichloroethane	0.125	0.124	99.2	69.0-126	
1,1,2-Trichloroethane	0.125	0.114	91.2	78.0-123	
Trichloroethene	0.125	0.123	98.4	76.0-126	
Trichlorofluoromethane	0.125	0.105	84.0	61.0-142	
1,2,3-Trichloropropane	0.125	0.125	100	67.0-129	
1,2,3-Trimethylbenzene	0.125	0.130	104	74.0-124	
1,2,4-Trimethylbenzene	0.125	0.131	105	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.134	107	73.0-127	
Vinyl chloride	0.125	0.116	92.8	63.0-134	
Xylenes, Total	0.375	0.372	99.2	72.0-127	
(S) Toluene-d8			*98.2*	*75.0-131*	
(S) 4-Bromofluorobenzene			*103*	*67.0-138*	
(S) 1,2-Dichloroethane-d4			*102*	*70.0-130*	

1 Cp 2 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

Method Blank (MB)

(MB) R3753512-3 01/25/22 10:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Methyl tert-butyl ether	U		0.000350	0.00100
Toluene	U		0.00130	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	*101*			*75.0-131*
(S) 4-Bromofluorobenzene	*98.6*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*107*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3753512-1 01/25/22 09:01 • (LCSD) R3753512-2 01/25/22 09:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.113	0.109	90.4	87.2	70.0-123			3.60	20
Methyl tert-butyl ether	0.125	0.120	0.121	96.0	96.8	66.0-132			0.830	20
Toluene	0.125	0.107	0.105	85.6	84.0	75.0-121			1.89	20
1,2,4-Trimethylbenzene	0.125	0.108	0.105	86.4	84.0	70.0-126			2.82	20
Xylenes, Total	0.375	0.332	0.321	88.5	85.6	72.0-127			3.37	20
(S) Toluene-d8				*95.3*	*95.0*	*75.0-131*				
(S) 4-Bromofluorobenzene				*102*	*101*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*108*	*108*	*70.0-130*				

Method Blank (MB)

(MB) R3752620-1 01/22/22 11:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*89.2*			*70.0-130*
(S) 1-chlorooctane	*108*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3752620-2 01/22/22 11:20 • (LCSD) R3752620-3 01/22/22 11:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	271	278	108	111	75.0-125			2.55	20
TPH C12 - C28	250	241	254	96.4	102	75.0-125			5.25	20
TPH C6 - C35	500	512	532	102	106	75.0-125			3.83	20
(S) o-Terphenyl				*88.4*	*94.8*	*70.0-130*				
(S) 1-chlorooctane				*124*	*128*	*70.0-130*				

L1453350-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453350-01 01/22/22 14:57 • (MS) R3752620-4 01/22/22 15:12 • (MSD) R3752620-5 01/22/22 15:28

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	301	U	332	325	110	109	1	75.0-125			1.86	20
TPH C12 - C28	301	U	308	305	102	102	1	75.0-125			1.20	20
TPH C6 - C35	603	U	640	630	106	105	1	75.0-125			1.54	20
(S) o-Terphenyl					*91.5*	*89.8*		*70.0-130*				
(S) 1-chlorooctane					*129*	*125*		*70.0-130*				

Method Blank (MB)

(MB) R3754030-1 01/26/22 02:26

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*103*			*70.0-130*
(S) 1-chlorooctane	*116*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3754030-2 01/26/22 02:39 • (LCSD) R3754030-3 01/26/22 02:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	242	244	96.8	97.6	75.0-125			0.823	20
TPH C12 - C28	250	239	233	95.6	93.2	75.0-125			2.54	20
TPH C6 - C35	500	481	477	96.2	95.4	75.0-125			0.835	20
(S) o-Terphenyl				*101*	*100*	*70.0-130*				
(S) 1-chlorooctane				*125*	*124*	*70.0-130*				

L1453200-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453200-03 01/26/22 03:05 • (MS) R3754030-4 01/26/22 03:32 • (MSD) R3754030-5 01/26/22 03:45

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	297	U	293	287	98.8	96.8	1	75.0-125			2.04	20
TPH C12 - C28	297	50.5	329	322	93.8	91.4	1	75.0-125			2.19	20
TPH C6 - C35	594	87.6	622	609	90.0	87.8	1	75.0-125			2.12	20
(S) o-Terphenyl					*103*	*102*		*70.0-130*				
(S) 1-chlorooctane					*127*	*124*		*70.0-130*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3752693-1 01/22/22 20:35

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0118	0.0340
PCB 1221	U		0.0118	0.0340
PCB 1232	U		0.0118	0.0340
PCB 1242	U		0.0118	0.0340
PCB 1248	U		0.00738	0.0170
PCB 1254	U		0.00738	0.0170
PCB 1260	U		0.00738	0.0170
(S) Decachlorobiphenyl	*91.6*			*10.0-135*
(S) Tetrachloro-m-xylene	*91.6*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3752693-2 01/22/22 20:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	0.167	0.151	90.4	37.0-145	
PCB 1016	0.167	0.159	95.2	36.0-141	
(S) Decachlorobiphenyl			*82.1*	*10.0-135*	
(S) Tetrachloro-m-xylene			*87.5*	*10.0-139*	

L1453350-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453350-02 01/22/22 23:31 • (MS) R3752693-3 01/23/22 00:02 • (MSD) R3752693-4 01/23/22 00:12

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.195	U	0.213	0.179	109	91.6	1	10.0-160	P	P	17.3	38
PCB 1016	0.195	U	0.237	0.190	122	97.6	1	10.0-160	P	P	21.9	37
(S) Decachlorobiphenyl					*101*	*89.3*		*10.0-135*				
(S) Tetrachloro-m-xylene					*108*	*94.4*		*10.0-139*				

QUALITY CONTROL SUMMARY

L1453350-05,06,07,08

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3754300-1 01/27/22 15:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0118	0.0340
PCB 1221	U		0.0118	0.0340
PCB 1232	U		0.0118	0.0340
PCB 1242	U		0.0118	0.0340
PCB 1248	U		0.00738	0.0170
PCB 1254	U		0.00738	0.0170
PCB 1260	U		0.00738	0.0170
(S) Decachlorobiphenyl	*42.8*			*10.0-135*
(S) Tetrachloro-m-xylene	*43.1*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3754300-2 01/27/22 16:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	0.167	0.122	73.1	37.0-145	
PCB 1016	0.167	0.116	69.5	36.0-141	
(S) Decachlorobiphenyl			*64.3*	*10.0-135*	
(S) Tetrachloro-m-xylene			*66.7*	*10.0-139*	

L1453119-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453119-11 01/27/22 17:20 • (MS) R3754300-3 01/27/22 17:29 • (MSD) R3754300-4 01/27/22 17:37

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.166	U	0.0752	0.0542	45.3	32.6	1	10.0-160			32.4	38
PCB 1016	0.166	U	0.0658	0.0440	39.6	26.5	1	10.0-160		J3	39.7	37
(S) Decachlorobiphenyl					*31.7*	*11.9*		*10.0-135*				
(S) Tetrachloro-m-xylene					*30.5*	*11.4*		*10.0-139*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3753608-2 01/25/22 17:18

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	0.00644	J	0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

Method Blank (MB)

(MB) R3753608-2 01/25/22 17:18

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*61.6*			*10.0-122*
(S) 2-Fluorobiphenyl	*69.1*			*15.0-120*
(S) p-Terphenyl-d14	*83.2*			*10.0-120*
(S) Phenol-d5	*71.3*			*10.0-120*
(S) 2-Fluorophenol	*73.7*			*12.0-120*
(S) 2,4,6-Tribromophenol	*63.1*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3753608-1 01/25/22 16:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.471	70.7	38.0-120	
Acenaphthylene	0.666	0.491	73.7	40.0-120	
Anthracene	0.666	0.503	75.5	42.0-120	
Benzidine	1.33	0.383	28.8	10.0-120	
Benzo(a)anthracene	0.666	0.518	77.8	44.0-120	
Benzo(b)fluoranthene	0.666	0.511	76.7	43.0-120	
Benzo(k)fluoranthene	0.666	0.508	76.3	44.0-120	
Benzo(g,h,i)perylene	0.666	0.491	73.7	43.0-120	
Benzo(a)pyrene	0.666	0.515	77.3	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.408	61.3	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.414	62.2	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.456	68.5	23.0-120	
4-Bromophenyl-phenylether	0.666	0.481	72.2	40.0-120	
2-Chloronaphthalene	0.666	0.466	70.0	35.0-120	

Laboratory Control Sample (LCS)

(LCS) R3753608-1 01/25/22 16:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.471	70.7	40.0-120	
Chrysene	0.666	0.521	78.2	43.0-120	
Dibenz(a,h)anthracene	0.666	0.523	78.5	44.0-120	
3,3-Dichlorobenzidine	1.33	0.833	62.6	28.0-120	
2,4-Dinitrotoluene	0.666	0.546	82.0	45.0-120	
2,6-Dinitrotoluene	0.666	0.519	77.9	42.0-120	
Fluoranthene	0.666	0.502	75.4	44.0-120	
Fluorene	0.666	0.486	73.0	41.0-120	
Hexachlorobenzene	0.666	0.465	69.8	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.376	56.5	15.0-120	
Hexachlorocyclopentadiene	0.666	0.425	63.8	15.0-120	
Hexachloroethane	0.666	0.432	64.9	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.535	80.3	45.0-120	
Isophorone	0.666	0.405	60.8	23.0-120	
Naphthalene	0.666	0.380	57.1	18.0-120	
Nitrobenzene	0.666	0.391	58.7	17.0-120	
n-Nitrosodimethylamine	0.666	0.359	53.9	10.0-125	
n-Nitrosodiphenylamine	0.666	0.484	72.7	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.470	70.6	26.0-120	
Phenanthrene	0.666	0.489	73.4	42.0-120	
Benzylbutyl phthalate	0.666	0.543	81.5	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.539	80.9	41.0-120	
Di-n-butyl phthalate	0.666	0.522	78.4	43.0-120	
Diethyl phthalate	0.666	0.495	74.3	43.0-120	
Dimethyl phthalate	0.666	0.495	74.3	43.0-120	
Di-n-octyl phthalate	0.666	0.541	81.2	40.0-120	
Pyrene	0.666	0.512	76.9	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.383	57.5	17.0-120	
4-Chloro-3-methylphenol	0.666	0.407	61.1	28.0-120	
2-Chlorophenol	0.666	0.467	70.1	28.0-120	
2,4-Dichlorophenol	0.666	0.411	61.7	25.0-120	
2,4-Dimethylphenol	0.666	0.410	61.6	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.505	75.8	16.0-120	
2,4-Dinitrophenol	0.666	0.365	54.8	10.0-120	
2-Nitrophenol	0.666	0.404	60.7	20.0-120	
4-Nitrophenol	0.666	0.565	84.8	27.0-120	
Pentachlorophenol	0.666	0.551	82.7	29.0-120	
Phenol	0.666	0.469	70.4	28.0-120	
2,4,6-Trichlorophenol	0.666	0.464	69.7	37.0-120	
(S) Nitrobenzene-d5			*65.2*	*10.0-122*	

Laboratory Control Sample (LCS)

(LCS) R3753608-1 01/25/22 16:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*72.7*	*15.0-120*	
(S) p-Terphenyl-d14			*82.3*	*10.0-120*	
(S) Phenol-d5			*71.3*	*10.0-120*	
(S) 2-Fluorophenol			*75.4*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*77.2*	*10.0-127*	

L1453160-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453160-04 01/25/22 19:00 • (MS) R3753608-3 01/25/22 19:20 • (MSD) R3753608-4 01/25/22 19:40

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.781	U	0.462	0.392	59.1	49.8	2	18.0-120			16.5	32
Acenaphthylene	0.781	U	0.474	0.402	60.7	51.1	2	25.0-120			16.6	32
Anthracene	0.781	U	0.478	0.407	61.2	51.7	2	22.0-120			16.2	29
Benzidine	1.56	U	U	U	0.000	0.000	2	10.0-120	J6	J6	0.000	40
Benzo(a)anthracene	0.781	U	0.500	0.431	64.0	54.9	2	25.0-120			14.8	29
Benzo(b)fluoranthene	0.781	U	0.490	0.432	62.8	55.0	2	19.0-122			12.6	31
Benzo(k)fluoranthene	0.781	U	0.467	0.420	59.8	53.4	2	23.0-120			10.6	30
Benzo(g,h,i)perylene	0.781	U	0.419	0.383	53.6	48.7	2	10.0-120			8.91	33
Benzo(a)pyrene	0.781	U	0.473	0.427	60.6	54.4	2	24.0-120			10.1	30
Bis(2-chlorethoxy)methane	0.781	U	0.464	0.389	59.5	49.5	2	10.0-120			17.6	34
Bis(2-chloroethyl)ether	0.781	U	0.468	0.394	59.9	50.2	2	10.0-120			17.1	40
2,2-Oxybis(1-Chloropropane)	0.781	U	0.468	0.391	59.9	49.7	2	10.0-120			18.1	40
4-Bromophenyl-phenylether	0.781	U	0.446	0.382	57.1	48.6	2	27.0-120			15.5	30
2-Chloronaphthalene	0.781	U	0.456	0.389	58.4	49.5	2	20.0-120			15.7	32
4-Chlorophenyl-phenylether	0.781	U	0.453	0.395	58.0	50.3	2	24.0-120			13.6	29
Chrysene	0.781	U	0.489	0.440	62.6	56.0	2	21.0-120			10.6	29
Dibenz(a,h)anthracene	0.781	U	0.435	0.397	55.7	50.5	2	10.0-120			9.19	32
3,3-Dichlorobenzidine	1.56	U	0.100	0.140	6.42	8.91	2	10.0-120	J6	J6	33.2	34
2,4-Dinitrotoluene	0.781	U	0.520	0.440	66.6	56.0	2	30.0-120			16.7	31
2,6-Dinitrotoluene	0.781	U	0.503	0.407	64.4	51.7	2	25.0-120			21.1	31
Fluoranthene	0.781	U	0.485	0.426	62.1	54.2	2	18.0-126			13.0	32
Fluorene	0.781	U	0.479	0.400	61.4	50.9	2	25.0-120			17.9	30
Hexachlorobenzene	0.781	U	0.434	0.376	55.5	47.8	2	27.0-120			14.3	28
Hexachloro-1,3-butadiene	0.781	U	0.393	0.331	50.3	42.2	2	10.0-120			17.0	38
Hexachlorocyclopentadiene	0.781	U	0.159	0.111	20.3	14.1	2	10.0-120			35.6	40
Hexachloroethane	0.781	U	0.393	0.319	50.3	40.6	2	10.0-120			20.8	40
Indeno(1,2,3-cd)pyrene	0.781	U	0.471	0.431	60.3	54.9	2	10.0-120			8.74	32
Isophorone	0.781	U	0.450	0.391	57.6	49.7	2	13.0-120			14.1	34

L1453160-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453160-04 01/25/22 19:00 • (MS) R3753608-3 01/25/22 19:20 • (MSD) R3753608-4 01/25/22 19:40

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Naphthalene	0.781	U	0.413	0.361	52.8	45.9	2	10.0-120			13.4	35
Nitrobenzene	0.781	U	0.459	0.384	58.8	48.9	2	10.0-120			17.8	36
n-Nitrosodimethylamine	0.781	U	0.398	0.308	50.9	39.2	2	10.0-127			25.5	40
n-Nitrosodiphenylamine	0.781	U	0.466	0.400	59.6	50.9	2	17.0-120			15.1	29
n-Nitrosodi-n-propylamine	0.781	U	0.519	0.448	66.4	57.1	2	10.0-120			14.5	37
Phenanthrene	0.781	U	0.480	0.418	61.5	53.1	2	17.0-120			14.0	31
Benzylbutyl phthalate	0.781	U	0.605	0.520	77.4	66.1	2	23.0-120			15.1	30
Bis(2-ethylhexyl)phthalate	0.781	U	0.607	0.528	77.8	67.2	2	17.0-126			13.9	30
Di-n-butyl phthalate	0.781	U	0.526	0.448	67.4	57.1	2	30.0-120			15.9	29
Diethyl phthalate	0.781	U	0.493	0.419	63.1	53.3	2	26.0-120			16.2	28
Dimethyl phthalate	0.781	U	0.479	0.402	61.4	51.1	2	25.0-120			17.6	29
Di-n-octyl phthalate	0.781	U	0.618	0.558	79.2	71.0	2	21.0-123			10.3	29
Pyrene	0.781	U	0.492	0.436	62.9	55.5	2	16.0-121			12.0	32
1,2,4-Trichlorobenzene	0.781	U	0.411	0.350	52.7	44.5	2	12.0-120			16.2	37
4-Chloro-3-methylphenol	0.781	U	0.442	0.391	56.6	49.7	2	15.0-120			12.4	30
2-Chlorophenol	0.781	U	0.482	0.408	61.7	51.9	2	15.0-120			16.6	37
2,4-Dichlorophenol	0.781	U	0.435	0.383	55.7	48.7	2	20.0-120			12.7	31
2,4-Dimethylphenol	0.781	U	0.446	0.389	57.1	49.5	2	10.0-120			13.6	33
4,6-Dinitro-2-methylphenol	0.781	U	0.461	0.384	59.0	48.9	2	10.0-120			18.1	39
2,4-Dinitrophenol	0.781	U	0.391	0.344	50.0	43.7	2	10.0-121			12.8	40
2-Nitrophenol	0.781	U	0.451	0.398	57.7	50.6	2	12.0-120			12.5	39
4-Nitrophenol	0.781	U	0.623	0.516	79.8	65.7	2	10.0-137			18.8	32
Pentachlorophenol	0.781	U	0.586	0.498	75.1	63.3	2	10.0-160			16.4	31
Phenol	0.781	U	0.494	0.421	63.2	53.6	2	12.0-120			15.9	38
2,4,6-Trichlorophenol	0.781	U	0.477	0.397	61.0	50.5	2	19.0-120			18.3	32
(S) Nitrobenzene-d5					*64.4*	*54.2*		*10.0-122*				
(S) 2-Fluorobiphenyl					*62.1*	*53.9*		*15.0-120*				
(S) p-Terphenyl-d14					*67.8*	*59.6*		*10.0-120*				
(S) Phenol-d5					*66.4*	*56.6*		*10.0-120*				
(S) 2-Fluorophenol					*70.0*	*60.8*		*12.0-120*				
(S) 2,4,6-Tribromophenol					*66.5*	*54.2*		*10.0-127*				

Sample Narrative:

OS: Dilution due to matrix impact during extract concentration procedure

Method Blank (MB)

(MB) R3753180-2 01/25/22 00:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	U		0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3753180-2 01/25/22 00:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*62.5*			*10.0-122*
(S) 2-Fluorobiphenyl	*72.4*			*15.0-120*
(S) p-Terphenyl-d14	*85.3*			*10.0-120*
(S) Phenol-d5	*70.7*			*10.0-120*
(S) 2-Fluorophenol	*79.4*			*12.0-120*
(S) 2,4,6-Tribromophenol	*84.2*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3753180-1 01/24/22 23:49

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.499	74.9	38.0-120	
Acenaphthylene	0.666	0.514	77.2	40.0-120	
Anthracene	0.666	0.514	77.2	42.0-120	
Benzidine	1.33	0.266	20.0	10.0-120	
Benzo(a)anthracene	0.666	0.570	85.6	44.0-120	
Benzo(b)fluoranthene	0.666	0.558	83.8	43.0-120	
Benzo(k)fluoranthene	0.666	0.534	80.2	44.0-120	
Benzo(g,h,i)perylene	0.666	0.560	84.1	43.0-120	
Benzo(a)pyrene	0.666	0.562	84.4	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.386	58.0	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.555	83.3	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.464	69.7	23.0-120	
4-Bromophenyl-phenylether	0.666	0.518	77.8	40.0-120	
2-Chloronaphthalene	0.666	0.479	71.9	35.0-120	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Laboratory Control Sample (LCS)

(LCS) R3753180-1 01/24/22 23:49

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.491	73.7	40.0-120	
Chrysene	0.666	0.513	77.0	43.0-120	
Dibenz(a,h)anthracene	0.666	0.580	87.1	44.0-120	
3,3-Dichlorobenzidine	1.33	1.06	79.7	28.0-120	
2,4-Dinitrotoluene	0.666	0.591	88.7	45.0-120	
2,6-Dinitrotoluene	0.666	0.557	83.6	42.0-120	
Fluoranthene	0.666	0.498	74.8	44.0-120	
Fluorene	0.666	0.510	76.6	41.0-120	
Hexachlorobenzene	0.666	0.534	80.2	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.403	60.5	15.0-120	
Hexachlorocyclopentadiene	0.666	0.434	65.2	15.0-120	
Hexachloroethane	0.666	0.480	72.1	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.589	88.4	45.0-120	
Isophorone	0.666	0.381	57.2	23.0-120	
Naphthalene	0.666	0.366	55.0	18.0-120	
Nitrobenzene	0.666	0.377	56.6	17.0-120	
n-Nitrosodimethylamine	0.666	0.473	71.0	10.0-125	
n-Nitrosodiphenylamine	0.666	0.479	71.9	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.455	68.3	26.0-120	
Phenanthrene	0.666	0.478	71.8	42.0-120	
Benzylbutyl phthalate	0.666	0.584	87.7	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.564	84.7	41.0-120	
Di-n-butyl phthalate	0.666	0.507	76.1	43.0-120	
Diethyl phthalate	0.666	0.523	78.5	43.0-120	
Dimethyl phthalate	0.666	0.506	76.0	43.0-120	
Di-n-octyl phthalate	0.666	0.588	88.3	40.0-120	
Pyrene	0.666	0.513	77.0	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.399	59.9	17.0-120	
4-Chloro-3-methylphenol	0.666	0.404	60.7	28.0-120	
2-Chlorophenol	0.666	0.508	76.3	28.0-120	
2,4-Dichlorophenol	0.666	0.420	63.1	25.0-120	
2,4-Dimethylphenol	0.666	0.401	60.2	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.577	86.6	16.0-120	
2,4-Dinitrophenol	0.666	0.402	60.4	10.0-120	
2-Nitrophenol	0.666	0.456	68.5	20.0-120	
4-Nitrophenol	0.666	0.566	85.0	27.0-120	
Pentachlorophenol	0.666	0.503	75.5	29.0-120	
Phenol	0.666	0.488	73.3	28.0-120	
2,4,6-Trichlorophenol	0.666	0.507	76.1	37.0-120	
(S) Nitrobenzene-d5			*52.3*	*10.0-122*	

Cp Tc Ss Cn Sr Qc Gl Al Sc

Laboratory Control Sample (LCS)

(LCS) R3753180-1 01/24/22 23:49

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*72.1*	*15.0-120*	
(S) p-Terphenyl-d14			*79.0*	*10.0-120*	
(S) Phenol-d5			*71.9*	*10.0-120*	
(S) 2-Fluorophenol			*79.6*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*92.6*	*10.0-127*	

L1453980-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453980-02 01/25/22 05:04 • (MS) R3753180-3 01/25/22 05:25 • (MSD) R3753180-4 01/25/22 05:46

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.652	U	0.404	0.338	62.0	52.3	1	18.0-120			17.8	32
Acenaphthylene	0.652	U	0.418	0.354	64.1	54.8	1	25.0-120			16.6	32
Anthracene	0.652	U	0.437	0.391	67.0	60.5	1	22.0-120			11.1	29
Benzidine	1.30	U	U	U	0.000	0.000	1	10.0-120	J6	J6	0.000	40
Benzo(a)anthracene	0.652	0.00926	0.499	0.437	75.1	66.2	1	25.0-120			13.2	29
Benzo(b)fluoranthene	0.652	0.0203	0.473	0.406	69.4	59.7	1	19.0-122			15.2	31
Benzo(k)fluoranthene	0.652	0.00710	0.443	0.391	66.9	59.4	1	23.0-120			12.5	30
Benzo(g,h,i)perylene	0.652	0.0113	0.448	0.374	67.0	56.1	1	10.0-120			18.0	33
Benzo(a)pyrene	0.652	0.0119	0.479	0.415	71.6	62.4	1	24.0-120			14.3	30
Bis(2-chlorethoxy)methane	0.652	U	0.333	0.270	51.1	41.8	1	10.0-120			20.9	34
Bis(2-chloroethyl)ether	0.652	U	0.478	0.376	73.3	58.2	1	10.0-120			23.9	40
2,2-Oxybis(1-Chloropropane)	0.652	U	0.402	0.317	61.7	49.1	1	10.0-120			23.6	40
4-Bromophenyl-phenylether	0.652	U	0.452	0.403	69.3	62.4	1	27.0-120			11.5	30
2-Chloronaphthalene	0.652	U	0.397	0.327	60.9	50.6	1	20.0-120			19.3	32
4-Chlorophenyl-phenylether	0.652	U	0.402	0.348	61.7	53.9	1	24.0-120			14.4	29
Chrysene	0.652	0.0132	0.451	0.400	67.1	59.9	1	21.0-120			12.0	29
Dibenz(a,h)anthracene	0.652	U	0.472	0.400	72.4	61.9	1	10.0-120			16.5	32
3,3-Dichlorobenzidine	1.30	U	0.369	0.186	28.4	14.4	1	10.0-120		J3	65.9	34
2,4-Dinitrotoluene	0.652	U	0.503	0.454	77.1	70.3	1	30.0-120			10.2	31
2,6-Dinitrotoluene	0.652	U	0.460	0.413	70.6	63.9	1	25.0-120			10.8	31
Fluoranthene	0.652	0.0160	0.448	0.402	66.3	59.8	1	18.0-126			10.8	32
Fluorene	0.652	U	0.415	0.362	63.7	56.0	1	25.0-120			13.6	30
Hexachlorobenzene	0.652	U	0.443	0.398	67.9	61.6	1	27.0-120			10.7	28
Hexachloro-1,3-butadiene	0.652	U	0.348	0.280	53.4	43.3	1	10.0-120			21.7	38
Hexachlorocyclopentadiene	0.652	U	0.147	0.118	22.5	18.3	1	10.0-120			21.9	40
Hexachloroethane	0.652	U	0.377	0.296	57.8	45.8	1	10.0-120			24.1	40
Indeno(1,2,3-cd)pyrene	0.652	0.0119	0.494	0.424	73.9	63.8	1	10.0-120			15.3	32
Isophorone	0.652	U	0.338	0.272	51.8	42.1	1	13.0-120			21.6	34

L1453980-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453980-02 01/25/22 05:04 • (MS) R3753180-3 01/25/22 05:25 • (MSD) R3753180-4 01/25/22 05:46

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.652	U	0.312	0.253	47.9	39.2	1	10.0-120			20.9	35
Nitrobenzene	0.652	U	0.325	0.259	49.8	40.1	1	10.0-120			22.6	36
n-Nitrosodimethylamine	0.652	U	0.421	0.341	64.6	52.8	1	10.0-127			21.0	40
n-Nitrosodiphenylamine	0.652	U	0.344	0.290	52.8	44.9	1	17.0-120			17.0	29
n-Nitrosodi-n-propylamine	0.652	U	0.395	0.324	60.6	50.2	1	10.0-120			19.7	37
Phenanthrene	0.652	U	0.415	0.375	63.7	58.0	1	17.0-120			10.1	31
Benzylbutyl phthalate	0.652	U	0.531	0.471	81.4	72.9	1	23.0-120			12.0	30
Bis(2-ethylhexyl)phthalate	0.652	U	0.520	0.452	79.8	70.0	1	17.0-126			14.0	30
Di-n-butyl phthalate	0.652	U	0.451	0.400	69.2	61.9	1	30.0-120			12.0	29
Diethyl phthalate	0.652	U	0.436	0.384	66.9	59.4	1	26.0-120			12.7	28
Dimethyl phthalate	0.652	U	0.425	0.365	65.2	56.5	1	25.0-120			15.2	29
Di-n-octyl phthalate	0.652	U	0.567	0.499	87.0	77.2	1	21.0-123			12.8	29
Pyrene	0.652	0.0146	0.445	0.391	66.0	58.3	1	16.0-121			12.9	32
1,2,4-Trichlorobenzene	0.652	U	0.347	0.274	53.2	42.4	1	12.0-120			23.5	37
4-Chloro-3-methylphenol	0.652	U	0.347	0.301	53.2	46.6	1	15.0-120			14.2	30
2-Chlorophenol	0.652	U	0.418	0.336	64.1	52.0	1	15.0-120			21.8	37
2,4-Dichlorophenol	0.652	U	0.359	0.300	55.1	46.4	1	20.0-120			17.9	31
2,4-Dimethylphenol	0.652	U	0.281	0.206	43.1	31.9	1	10.0-120			30.8	33
4,6-Dinitro-2-methylphenol	0.652	U	0.567	0.471	87.0	72.9	1	10.0-120			18.5	39
2,4-Dinitrophenol	0.652	U	0.525	0.453	80.5	70.1	1	10.0-121			14.7	40
2-Nitrophenol	0.652	U	0.409	0.331	62.7	51.2	1	12.0-120			21.1	39
4-Nitrophenol	0.652	U	0.521	0.468	79.9	72.4	1	10.0-137			10.7	32
Pentachlorophenol	0.652	U	0.504	0.471	77.3	72.9	1	10.0-160			6.77	31
Phenol	0.652	U	0.413	0.337	63.3	52.2	1	12.0-120			20.3	38
2,4,6-Trichlorophenol	0.652	U	0.421	0.363	64.6	56.2	1	19.0-120			14.8	32
(S) Nitrobenzene-d5					*46.3*	*39.9*		*10.0-122*				
(S) 2-Fluorobiphenyl					*60.7*	*52.6*		*15.0-120*				
(S) p-Terphenyl-d14					*71.2*	*65.9*		*10.0-120*				
(S) Phenol-d5					*61.5*	*54.5*		*10.0-120*				
(S) 2-Fluorophenol					*67.8*	*60.7*		*12.0-120*				
(S) 2,4,6-Tribromophenol					*85.3*	*82.0*		*10.0-127*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Enercon - Oklahoma City, OK

1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: **Rusty Lynch**

Email To: **rlynch@enercon.com**

Project Description: MKARNS Moorings

City/State Collected: Muskogee, OK

Please Circle: PT MT CT ET

Phone: **405-722-7693**

Client Project # **CONSOR-00001**

Lab Project # **ENERCOOK-CONSOR00001**

SDG # L1453350
A089

Collected by (print): Rusty Lynch

Site/Facility ID #

P.O. #

Acctnum: **ENERCOOK**
Template: **T198286**
Prelogin: **P899874**
PM: **104 - Jason Romer**
PB:

Collected by (signature): [signature]

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr					Remarks	Sample # (lab only)
SB-18	G	SCM	N/A	1/14/22	15:05	5	X	X	X	X	X						-01
SB-24		SCM		1/14/22	16:00	5	X	X	X	X	X						-02
SB-25		SCM		1/16/22	14:00	5	X	X	X	X	X						-03
SB-22		SCM		1/16/22	15:45	5	X	X	X	X	X						-04
SB-19		SCM		1/17/22	11:00	5	X	X	X	X	X						-05
SB-21		SCM		1/17/22	13:00	~~5~~ 4	X	X	X	X	X						-06
SB-20		SCM		1/17/22	15:00	~~5~~ 4	X	X	X	X	X						-07
SB-26		SCM		1/18/22	09:20	~~5~~ 4	X	X	X	X	X						-08
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Soil collected in NP containers may not match up w/ what is noted on COC. All containers are labeled w/ the correct SB-# though

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No (HCL / MeoH, TBR)
[signature]	1/19/22	13:00	E. Davis	

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NA T °C 5.9+0=5.9	Bottles Received: 37	If preservation required by Login: Date/Time
E. Davis	1/19/22	17:00				

Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:	Hold:	Condition: NCF / OK
			[signature]	1/20/22	1300		

ANALYTICAL REPORT

February 08, 2022

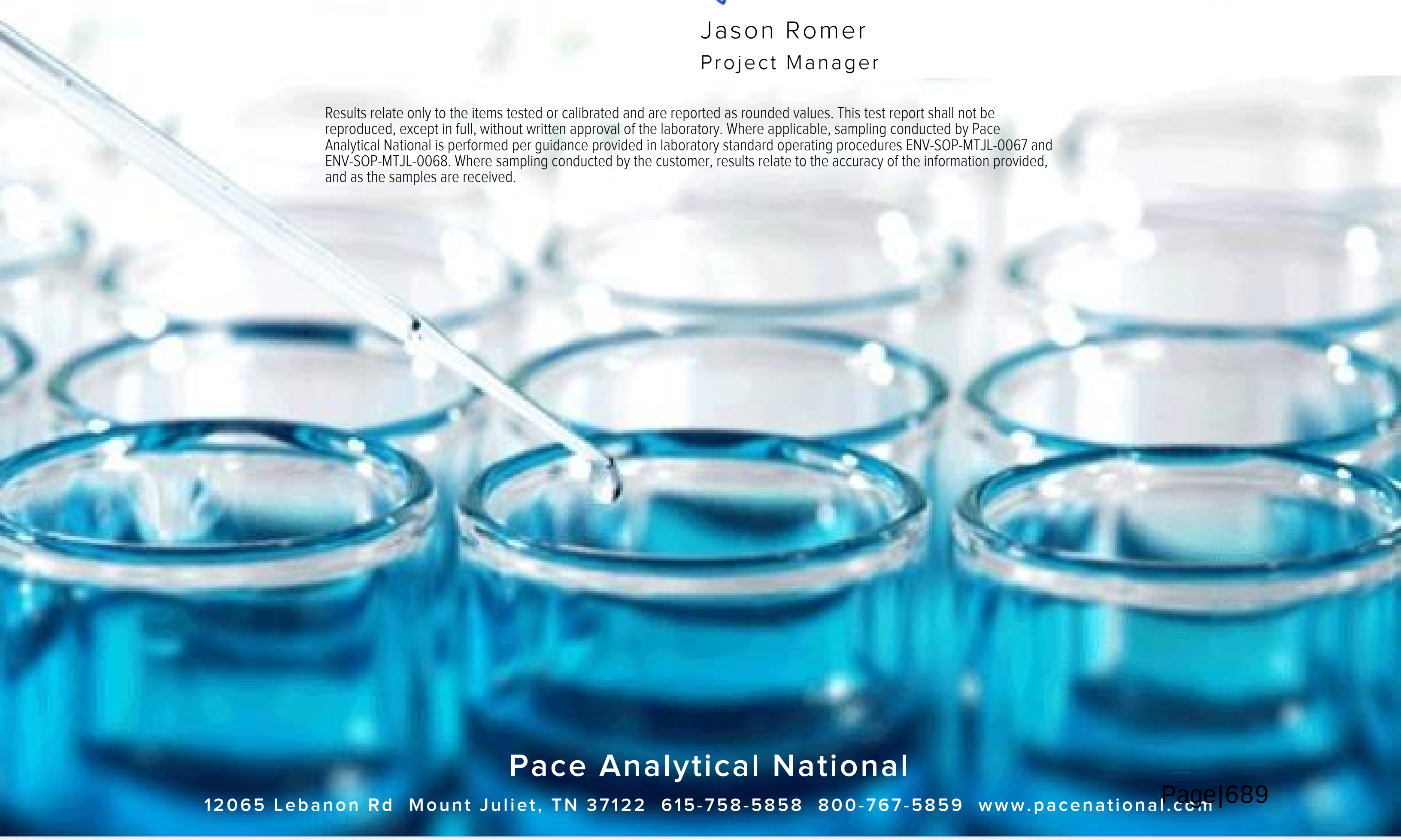
1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1455712
Samples Received:	01/28/2022
Project Number:	CONSOR-00001
Description:	MKARNS Moorings
Report To:	Rusty Lynch 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager



Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

	Collected by	Collected date/time	Received date/time
SB-23 L1455712-01 Solid	Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1809896	1	01/29/22 11:47	01/29/22 12:57	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:26	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:01	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1	01/21/22 12:00	01/30/22 18:41	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 03:31	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1810725	1	01/31/22 17:37	02/01/22 04:06	HMH	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 14:57	BJP	Mt. Juliet, TN

	Collected by	Collected date/time	Received date/time
SB-8 L1455712-02 Solid	Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1809896	1	01/29/22 11:47	01/29/22 12:57	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:29	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:04	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1	01/21/22 12:00	01/30/22 19:00	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 04:18	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/07/22 23:27	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 14:15	BJP	Mt. Juliet, TN

	Collected by	Collected date/time	Received date/time
SB-7 L1455712-03 Solid	Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1809896	1	01/29/22 11:47	01/29/22 12:57	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:08	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:12	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1.04	01/21/22 12:00	01/30/22 19:20	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 16:25	ALA	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/07/22 23:37	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 10:57	AGW	Mt. Juliet, TN

	Collected by	Collected date/time	Received date/time
SB-4 L1455712-04 Solid	Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1810042	1	01/29/22 09:19	01/29/22 09:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:31	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:15	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1.56	01/21/22 12:00	01/30/22 19:40	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 04:50	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/07/22 23:46	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 15:17	BJP	Mt. Juliet, TN

	Collected by	Collected date/time	Received date/time
SB-3 L1455712-05 Solid	Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1810042	1	01/29/22 09:19	01/29/22 09:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:39	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:17	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1.53	01/21/22 12:00	01/30/22 20:00	ACG	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

SB-3 L1455712-05 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 05:06	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/07/22 23:56	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 13:34	BJP	Mt. Juliet, TN

SB-2 L1455712-06 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1810042	1	01/29/22 09:19	01/29/22 09:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:41	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:20	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1	01/21/22 12:00	01/30/22 20:19	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 05:22	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/08/22 00:05	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 14:36	BJP	Mt. Juliet, TN

SB-1 L1455712-07 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1810042	1	01/29/22 09:19	01/29/22 09:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:44	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:22	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1	01/21/22 12:00	01/30/22 20:39	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 05:38	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/08/22 00:15	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 11:18	AGW	Mt. Juliet, TN

SB-5 L1455712-08 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1810042	1	01/29/22 09:19	01/29/22 09:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:46	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811148	1	02/01/22 13:17	02/02/22 09:25	KMG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1	01/21/22 12:00	01/30/22 20:59	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 05:54	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/08/22 00:24	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811358	1	02/02/22 22:28	02/03/22 13:54	BJP	Mt. Juliet, TN

SB-6 L1455712-09 Solid

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/21/22 12:00	01/28/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1810042	1	01/29/22 09:19	01/29/22 09:44	CMK	Mt. Juliet, TN
Mercury by Method 7471A	WG1810356	1	01/31/22 08:35	01/31/22 16:49	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1811226	1	02/01/22 18:19	02/02/22 20:24	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1810459	1	01/21/22 12:00	01/30/22 21:19	ACG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1812033	1	02/03/22 15:43	02/04/22 06:10	JDG	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1811393	1	02/07/22 15:51	02/08/22 00:34	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1811397	1	02/03/22 17:23	02/04/22 07:54	JNJ	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	84.5		1	01/29/2022 12:57	WG1809896

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0213	0.0474	1	01/31/2022 16:26	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.30	J	0.613	2.37	1	02/02/2022 09:01	WG1811148
Barium	35.6		0.101	0.592	1	02/02/2022 09:01	WG1811148
Cadmium	U		0.0558	0.592	1	02/02/2022 09:01	WG1811148
Chromium	5.42		0.157	1.18	1	02/02/2022 09:01	WG1811148
Lead	2.80		0.246	0.592	1	02/02/2022 09:01	WG1811148
Selenium	U		0.905	2.37	1	02/02/2022 09:01	WG1811148
Silver	U		0.150	1.18	1	02/02/2022 09:01	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0579	0.0793	1	01/30/2022 18:41	WG1810459
Acrylonitrile	U		0.00572	0.0198	1	01/30/2022 18:41	WG1810459
Benzene	U		0.000740	0.00159	1	01/30/2022 18:41	WG1810459
Bromobenzene	U		0.00143	0.0198	1	01/30/2022 18:41	WG1810459
Bromodichloromethane	U		0.00115	0.00396	1	01/30/2022 18:41	WG1810459
Bromoform	U		0.00185	0.0396	1	01/30/2022 18:41	WG1810459
Bromomethane	U		0.00312	0.0198	1	01/30/2022 18:41	WG1810459
n-Butylbenzene	U	J4	0.00832	0.0198	1	01/30/2022 18:41	WG1810459
sec-Butylbenzene	U		0.00457	0.0198	1	01/30/2022 18:41	WG1810459
tert-Butylbenzene	U		0.00309	0.00793	1	01/30/2022 18:41	WG1810459
Carbon tetrachloride	U		0.00142	0.00793	1	01/30/2022 18:41	WG1810459
Chlorobenzene	U		0.000333	0.00396	1	01/30/2022 18:41	WG1810459
Chlorodibromomethane	U		0.000970	0.00396	1	01/30/2022 18:41	WG1810459
Chloroethane	U		0.00269	0.00793	1	01/30/2022 18:41	WG1810459
Chloroform	U		0.00163	0.00396	1	01/30/2022 18:41	WG1810459
Chloromethane	U		0.00690	0.0198	1	01/30/2022 18:41	WG1810459
2-Chlorotoluene	U		0.00137	0.00396	1	01/30/2022 18:41	WG1810459
4-Chlorotoluene	U		0.000713	0.00793	1	01/30/2022 18:41	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00618	0.0396	1	01/30/2022 18:41	WG1810459
1,2-Dibromoethane	U		0.00103	0.00396	1	01/30/2022 18:41	WG1810459
Dibromomethane	U		0.00119	0.00793	1	01/30/2022 18:41	WG1810459
1,2-Dichlorobenzene	U		0.000674	0.00793	1	01/30/2022 18:41	WG1810459
1,3-Dichlorobenzene	U		0.000951	0.00793	1	01/30/2022 18:41	WG1810459
1,4-Dichlorobenzene	U		0.00111	0.00793	1	01/30/2022 18:41	WG1810459
Dichlorodifluoromethane	U		0.00255	0.00396	1	01/30/2022 18:41	WG1810459
1,1-Dichloroethane	U		0.000778	0.00396	1	01/30/2022 18:41	WG1810459
1,2-Dichloroethane	U		0.00103	0.00396	1	01/30/2022 18:41	WG1810459
1,1-Dichloroethene	U		0.000961	0.00396	1	01/30/2022 18:41	WG1810459
cis-1,2-Dichloroethene	U		0.00116	0.00396	1	01/30/2022 18:41	WG1810459
trans-1,2-Dichloroethene	U		0.00165	0.00793	1	01/30/2022 18:41	WG1810459
1,2-Dichloropropane	U		0.00225	0.00793	1	01/30/2022 18:41	WG1810459
1,1-Dichloropropene	U		0.00128	0.00396	1	01/30/2022 18:41	WG1810459
1,3-Dichloropropane	U		0.000794	0.00793	1	01/30/2022 18:41	WG1810459

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00120	0.00396	1	01/30/2022 18:41	WG1810459
trans-1,3-Dichloropropene	U		0.00181	0.00793	1	01/30/2022 18:41	WG1810459
2,2-Dichloropropane	U		0.00219	0.00396	1	01/30/2022 18:41	WG1810459
Di-isopropyl ether	U		0.000650	0.00159	1	01/30/2022 18:41	WG1810459
Ethylbenzene	0.00157	J	0.00117	0.00396	1	01/30/2022 18:41	WG1810459
Hexachloro-1,3-Butadiene	U		0.00951	0.0396	1	01/30/2022 18:41	WG1810459
Isopropylbenzene	U		0.000674	0.00396	1	01/30/2022 18:41	WG1810459
p-Isopropyltoluene	U		0.00404	0.00793	1	01/30/2022 18:41	WG1810459
2-Butanone (MEK)	U		0.101	0.159	1	01/30/2022 18:41	WG1810459
Methylene Chloride	U		0.0105	0.0396	1	01/30/2022 18:41	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00361	0.0396	1	01/30/2022 18:41	WG1810459
Methyl tert-butyl ether	U		0.000555	0.00159	1	01/30/2022 18:41	WG1810459
Naphthalene	U	J4	0.00774	0.0198	1	01/30/2022 18:41	WG1810459
n-Propylbenzene	U		0.00151	0.00793	1	01/30/2022 18:41	WG1810459
Styrene	U		0.000363	0.0198	1	01/30/2022 18:41	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00150	0.00396	1	01/30/2022 18:41	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00110	0.00396	1	01/30/2022 18:41	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00120	0.00396	1	01/30/2022 18:41	WG1810459
Tetrachloroethene	U		0.00142	0.00396	1	01/30/2022 18:41	WG1810459
Toluene	0.00908		0.00206	0.00793	1	01/30/2022 18:41	WG1810459
1,2,3-Trichlorobenzene	U		0.0116	0.0198	1	01/30/2022 18:41	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00698	0.0198	1	01/30/2022 18:41	WG1810459
1,1,1-Trichloroethane	U		0.00146	0.00396	1	01/30/2022 18:41	WG1810459
1,1,2-Trichloroethane	U		0.000946	0.00396	1	01/30/2022 18:41	WG1810459
Trichloroethene	U		0.000926	0.00159	1	01/30/2022 18:41	WG1810459
Trichlorofluoromethane	U		0.00131	0.00396	1	01/30/2022 18:41	WG1810459
1,2,3-Trichloropropane	U		0.00257	0.0198	1	01/30/2022 18:41	WG1810459
1,2,4-Trimethylbenzene	U		0.00250	0.00793	1	01/30/2022 18:41	WG1810459
1,2,3-Trimethylbenzene	U		0.00250	0.00793	1	01/30/2022 18:41	WG1810459
1,3,5-Trimethylbenzene	U		0.00317	0.00793	1	01/30/2022 18:41	WG1810459
Vinyl chloride	U		0.00184	0.00396	1	01/30/2022 18:41	WG1810459
Xylenes, Total	0.00821	J	0.00140	0.0103	1	01/30/2022 18:41	WG1810459
(S) Toluene-d8	*112*			*75.0-131*		*01/30/2022 18:41*	WG1810459
(S) 4-Bromofluorobenzene	*94.7*			*67.0-138*		*01/30/2022 18:41*	WG1810459
(S) 1,2-Dichloroethane-d4	*86.5*			*70.0-130*		*01/30/2022 18:41*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		17.8	59.2	1	02/04/2022 03:31	WG1812033
TPH C12 - C28	U		17.8	59.2	1	02/04/2022 03:31	WG1812033
TPH C28 - C35	U		17.8	59.2	1	02/04/2022 03:31	WG1812033
TPH C6 - C35	U		17.8	59.2	1	02/04/2022 03:31	WG1812033
(S) o-Terphenyl	*81.2*			*70.0-130*		*02/04/2022 03:31*	WG1812033
(S) 1-chlorooctane	*101*			*70.0-130*		*02/04/2022 03:31*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0140	0.0403	1	02/01/2022 04:06	WG1810725
PCB 1221	U		0.0140	0.0403	1	02/01/2022 04:06	WG1810725
PCB 1232	U		0.0140	0.0403	1	02/01/2022 04:06	WG1810725
PCB 1242	U		0.0140	0.0403	1	02/01/2022 04:06	WG1810725
PCB 1248	U		0.00874	0.0201	1	02/01/2022 04:06	WG1810725
PCB 1254	U		0.00874	0.0201	1	02/01/2022 04:06	WG1810725

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00874	0.0201	1	02/01/2022 04:06	WG1810725
(S) Decachlorobiphenyl	*65.2*			*10.0-135*		*02/01/2022 04:06*	WG1810725
(S) Tetrachloro-m-xylene	*60.5*			*10.0-139*		*02/01/2022 04:06*	WG1810725

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00638	0.0394	1	02/03/2022 14:57	WG1811358
Acenaphthylene	U		0.00555	0.0394	1	02/03/2022 14:57	WG1811358
Anthracene	U		0.00702	0.0394	1	02/03/2022 14:57	WG1811358
Benzidine	U		0.0741	1.98	1	02/03/2022 14:57	WG1811358
Benzo(a)anthracene	U		0.00695	0.0394	1	02/03/2022 14:57	WG1811358
Benzo(b)fluoranthene	U		0.00735	0.0394	1	02/03/2022 14:57	WG1811358
Benzo(k)fluoranthene	U		0.00701	0.0394	1	02/03/2022 14:57	WG1811358
Benzo(g,h,i)perylene	U		0.00721	0.0394	1	02/03/2022 14:57	WG1811358
Benzo(a)pyrene	U		0.00733	0.0394	1	02/03/2022 14:57	WG1811358
Bis(2-chlorethoxy)methane	U		0.0118	0.394	1	02/03/2022 14:57	WG1811358
Bis(2-chloroethyl)ether	U		0.0130	0.394	1	02/03/2022 14:57	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0170	0.394	1	02/03/2022 14:57	WG1811358
4-Bromophenyl-phenylether	U		0.0139	0.394	1	02/03/2022 14:57	WG1811358
2-Chloronaphthalene	U		0.00693	0.0394	1	02/03/2022 14:57	WG1811358
4-Chlorophenyl-phenylether	U		0.0137	0.394	1	02/03/2022 14:57	WG1811358
Chrysene	U		0.00784	0.0394	1	02/03/2022 14:57	WG1811358
Dibenz(a,h)anthracene	U		0.0109	0.0394	1	02/03/2022 14:57	WG1811358
3,3-Dichlorobenzidine	U		0.0146	0.394	1	02/03/2022 14:57	WG1811358
2,4-Dinitrotoluene	U		0.0113	0.394	1	02/03/2022 14:57	WG1811358
2,6-Dinitrotoluene	U		0.0129	0.394	1	02/03/2022 14:57	WG1811358
Fluoranthene	U		0.00712	0.0394	1	02/03/2022 14:57	WG1811358
Fluorene	U		0.00642	0.0394	1	02/03/2022 14:57	WG1811358
Hexachlorobenzene	U		0.0140	0.394	1	02/03/2022 14:57	WG1811358
Hexachloro-1,3-butadiene	U		0.0133	0.394	1	02/03/2022 14:57	WG1811358
Hexachlorocyclopentadiene	U		0.0207	0.394	1	02/03/2022 14:57	WG1811358
Hexachloroethane	U		0.0155	0.394	1	02/03/2022 14:57	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0111	0.0394	1	02/03/2022 14:57	WG1811358
Isophorone	U		0.0121	0.394	1	02/03/2022 14:57	WG1811358
Naphthalene	U		0.00990	0.0394	1	02/03/2022 14:57	WG1811358
Nitrobenzene	U		0.0137	0.394	1	02/03/2022 14:57	WG1811358
n-Nitrosodimethylamine	U		0.0585	0.394	1	02/03/2022 14:57	WG1811358
n-Nitrosodiphenylamine	U		0.0298	0.394	1	02/03/2022 14:57	WG1811358
n-Nitrosodi-n-propylamine	U		0.0131	0.394	1	02/03/2022 14:57	WG1811358
Phenanthrene	U		0.00783	0.0394	1	02/03/2022 14:57	WG1811358
Benzylbutyl phthalate	U		0.0123	0.394	1	02/03/2022 14:57	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0500	0.394	1	02/03/2022 14:57	WG1811358
Di-n-butyl phthalate	U		0.0135	0.394	1	02/03/2022 14:57	WG1811358
Diethyl phthalate	U		0.0130	0.394	1	02/03/2022 14:57	WG1811358
Dimethyl phthalate	U		0.0836	0.394	1	02/03/2022 14:57	WG1811358
Di-n-octyl phthalate	U		0.0266	0.394	1	02/03/2022 14:57	WG1811358
Pyrene	U		0.00767	0.0394	1	02/03/2022 14:57	WG1811358
1,2,4-Trichlorobenzene	U		0.0123	0.394	1	02/03/2022 14:57	WG1811358
4-Chloro-3-methylphenol	U		0.0128	0.394	1	02/03/2022 14:57	WG1811358
2-Chlorophenol	U		0.0130	0.394	1	02/03/2022 14:57	WG1811358
2,4-Dichlorophenol	U		0.0115	0.394	1	02/03/2022 14:57	WG1811358
2,4-Dimethylphenol	U		0.0103	0.394	1	02/03/2022 14:57	WG1811358
4,6-Dinitro-2-methylphenol	U		0.0894	0.394	1	02/03/2022 14:57	WG1811358
2,4-Dinitrophenol	U		0.0922	0.394	1	02/03/2022 14:57	WG1811358
2-Nitrophenol	U		0.0141	0.394	1	02/03/2022 14:57	WG1811358

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0123	0.394	1	02/03/2022 14:57	WG1811358
Pentachlorophenol	U		0.0106	0.394	1	02/03/2022 14:57	WG1811358
Phenol	U		0.0159	0.394	1	02/03/2022 14:57	WG1811358
2,4,6-Trichlorophenol	U		0.0127	0.394	1	02/03/2022 14:57	WG1811358
(S) 2-Fluorophenol	*55.4*			*12.0-120*		*02/03/2022 14:57*	WG1811358
(S) Phenol-d5	*51.1*			*10.0-120*		*02/03/2022 14:57*	WG1811358
(S) Nitrobenzene-d5	*41.4*			*10.0-122*		*02/03/2022 14:57*	WG1811358
(S) 2-Fluorobiphenyl	*55.0*			*15.0-120*		*02/03/2022 14:57*	WG1811358
(S) 2,4,6-Tribromophenol	*65.3*			*10.0-127*		*02/03/2022 14:57*	WG1811358
(S) p-Terphenyl-d14	*75.8*			*10.0-120*		*02/03/2022 14:57*	WG1811358

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	85.0		1	01/29/2022 12:57	WG1809896

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0212	0.0470	1	01/31/2022 16:29	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	0.995	J	0.609	2.35	1	02/02/2022 09:04	WG1811148
Barium	20.5		0.100	0.588	1	02/02/2022 09:04	WG1811148
Cadmium	U		0.0554	0.588	1	02/02/2022 09:04	WG1811148
Chromium	2.39		0.156	1.18	1	02/02/2022 09:04	WG1811148
Lead	1.08		0.245	0.588	1	02/02/2022 09:04	WG1811148
Selenium	U		0.898	2.35	1	02/02/2022 09:04	WG1811148
Silver	U		0.149	1.18	1	02/02/2022 09:04	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0544	0.0746	1	01/30/2022 19:00	WG1810459
Acrylonitrile	U		0.00538	0.0186	1	01/30/2022 19:00	WG1810459
Benzene	U		0.000696	0.00149	1	01/30/2022 19:00	WG1810459
Bromobenzene	U		0.00134	0.0186	1	01/30/2022 19:00	WG1810459
Bromodichloromethane	U		0.00108	0.00373	1	01/30/2022 19:00	WG1810459
Bromoform	U		0.00174	0.0373	1	01/30/2022 19:00	WG1810459
Bromomethane	U		0.00294	0.0186	1	01/30/2022 19:00	WG1810459
n-Butylbenzene	U	J4	0.00783	0.0186	1	01/30/2022 19:00	WG1810459
sec-Butylbenzene	U		0.00429	0.0186	1	01/30/2022 19:00	WG1810459
tert-Butylbenzene	U		0.00291	0.00746	1	01/30/2022 19:00	WG1810459
Carbon tetrachloride	U		0.00134	0.00746	1	01/30/2022 19:00	WG1810459
Chlorobenzene	U		0.000313	0.00373	1	01/30/2022 19:00	WG1810459
Chlorodibromomethane	U		0.000913	0.00373	1	01/30/2022 19:00	WG1810459
Chloroethane	U		0.00254	0.00746	1	01/30/2022 19:00	WG1810459
Chloroform	U		0.00154	0.00373	1	01/30/2022 19:00	WG1810459
Chloromethane	U		0.00649	0.0186	1	01/30/2022 19:00	WG1810459
2-Chlorotoluene	U		0.00129	0.00373	1	01/30/2022 19:00	WG1810459
4-Chlorotoluene	U		0.000671	0.00746	1	01/30/2022 19:00	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00582	0.0373	1	01/30/2022 19:00	WG1810459
1,2-Dibromoethane	U		0.000966	0.00373	1	01/30/2022 19:00	WG1810459
Dibromomethane	U		0.00112	0.00746	1	01/30/2022 19:00	WG1810459
1,2-Dichlorobenzene	U		0.000634	0.00746	1	01/30/2022 19:00	WG1810459
1,3-Dichlorobenzene	U		0.000895	0.00746	1	01/30/2022 19:00	WG1810459
1,4-Dichlorobenzene	U		0.00104	0.00746	1	01/30/2022 19:00	WG1810459
Dichlorodifluoromethane	U		0.00240	0.00373	1	01/30/2022 19:00	WG1810459
1,1-Dichloroethane	U		0.000732	0.00373	1	01/30/2022 19:00	WG1810459
1,2-Dichloroethane	U		0.000968	0.00373	1	01/30/2022 19:00	WG1810459
1,1-Dichloroethene	U		0.000904	0.00373	1	01/30/2022 19:00	WG1810459
cis-1,2-Dichloroethene	U		0.00109	0.00373	1	01/30/2022 19:00	WG1810459
trans-1,2-Dichloroethene	U		0.00155	0.00746	1	01/30/2022 19:00	WG1810459
1,2-Dichloropropane	U		0.00212	0.00746	1	01/30/2022 19:00	WG1810459
1,1-Dichloropropene	U		0.00121	0.00373	1	01/30/2022 19:00	WG1810459
1,3-Dichloropropane	U		0.000747	0.00746	1	01/30/2022 19:00	WG1810459

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00113	0.00373	1	01/30/2022 19:00	WG1810459
trans-1,3-Dichloropropene	U		0.00170	0.00746	1	01/30/2022 19:00	WG1810459
2,2-Dichloropropane	U		0.00206	0.00373	1	01/30/2022 19:00	WG1810459
Di-isopropyl ether	U		0.000611	0.00149	1	01/30/2022 19:00	WG1810459
Ethylbenzene	U		0.00110	0.00373	1	01/30/2022 19:00	WG1810459
Hexachloro-1,3-Butadiene	U		0.00895	0.0373	1	01/30/2022 19:00	WG1810459
Isopropylbenzene	U		0.000634	0.00373	1	01/30/2022 19:00	WG1810459
p-Isopropyltoluene	U		0.00380	0.00746	1	01/30/2022 19:00	WG1810459
2-Butanone (MEK)	U		0.0947	0.149	1	01/30/2022 19:00	WG1810459
Methylene Chloride	U		0.00990	0.0373	1	01/30/2022 19:00	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00340	0.0373	1	01/30/2022 19:00	WG1810459
Methyl tert-butyl ether	U		0.000522	0.00149	1	01/30/2022 19:00	WG1810459
Naphthalene	U	J4	0.00728	0.0186	1	01/30/2022 19:00	WG1810459
n-Propylbenzene	U		0.00142	0.00746	1	01/30/2022 19:00	WG1810459
Styrene	U		0.000342	0.0186	1	01/30/2022 19:00	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00141	0.00373	1	01/30/2022 19:00	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00104	0.00373	1	01/30/2022 19:00	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00112	0.00373	1	01/30/2022 19:00	WG1810459
Tetrachloroethene	U		0.00134	0.00373	1	01/30/2022 19:00	WG1810459
Toluene	0.00353	J	0.00194	0.00746	1	01/30/2022 19:00	WG1810459
1,2,3-Trichlorobenzene	U		0.0109	0.0186	1	01/30/2022 19:00	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00656	0.0186	1	01/30/2022 19:00	WG1810459
1,1,1-Trichloroethane	U		0.00138	0.00373	1	01/30/2022 19:00	WG1810459
1,1,2-Trichloroethane	U		0.000890	0.00373	1	01/30/2022 19:00	WG1810459
Trichloroethene	U		0.000871	0.00149	1	01/30/2022 19:00	WG1810459
Trichlorofluoromethane	U	J3	0.00123	0.00373	1	01/30/2022 19:00	WG1810459
1,2,3-Trichloropropane	U	J3	0.00242	0.0186	1	01/30/2022 19:00	WG1810459
1,2,4-Trimethylbenzene	U		0.00236	0.00746	1	01/30/2022 19:00	WG1810459
1,2,3-Trimethylbenzene	U		0.00236	0.00746	1	01/30/2022 19:00	WG1810459
1,3,5-Trimethylbenzene	U		0.00298	0.00746	1	01/30/2022 19:00	WG1810459
Vinyl chloride	U		0.00173	0.00373	1	01/30/2022 19:00	WG1810459
Xylenes, Total	U		0.00131	0.00969	1	01/30/2022 19:00	WG1810459
(S) Toluene-d8	*115*			*75.0-131*		*01/30/2022 19:00*	WG1810459
(S) 4-Bromofluorobenzene	*89.8*			*67.0-138*		*01/30/2022 19:00*	WG1810459
(S) 1,2-Dichloroethane-d4	*94.3*			*70.0-130*		*01/30/2022 19:00*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		17.6	58.8	1	02/04/2022 04:18	WG1812033
TPH C12 - C28	U		17.6	58.8	1	02/04/2022 04:18	WG1812033
TPH C28 - C35	U		17.6	58.8	1	02/04/2022 04:18	WG1812033
TPH C6 - C35	U		17.6	58.8	1	02/04/2022 04:18	WG1812033
(S) o-Terphenyl	*81.6*			*70.0-130*		*02/04/2022 04:18*	WG1812033
(S) 1-chlorooctane	*101*			*70.0-130*		*02/04/2022 04:18*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0139	0.0400	1	02/07/2022 23:27	WG1811393
PCB 1221	U		0.0139	0.0400	1	02/07/2022 23:27	WG1811393
PCB 1232	U		0.0139	0.0400	1	02/07/2022 23:27	WG1811393
PCB 1242	U		0.0139	0.0400	1	02/07/2022 23:27	WG1811393
PCB 1248	U		0.00868	0.0200	1	02/07/2022 23:27	WG1811393
PCB 1254	U		0.00868	0.0200	1	02/07/2022 23:27	WG1811393

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00868	0.0200	1	02/07/2022 23:27	WG1811393
(S) Decachlorobiphenyl	*46.0*			*10.0-135*		*02/07/2022 23:27*	WG1811393
(S) Tetrachloro-m-xylene	*53.4*			*10.0-139*		*02/07/2022 23:27*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00634	0.0392	1	02/03/2022 14:15	WG1811358
Acenaphthylene	U		0.00551	0.0392	1	02/03/2022 14:15	WG1811358
Anthracene	U		0.00697	0.0392	1	02/03/2022 14:15	WG1811358
Benzidine	U		0.0736	1.96	1	02/03/2022 14:15	WG1811358
Benzo(a)anthracene	U		0.00690	0.0392	1	02/03/2022 14:15	WG1811358
Benzo(b)fluoranthene	U		0.00730	0.0392	1	02/03/2022 14:15	WG1811358
Benzo(k)fluoranthene	U		0.00696	0.0392	1	02/03/2022 14:15	WG1811358
Benzo(g,h,i)perylene	U		0.00716	0.0392	1	02/03/2022 14:15	WG1811358
Benzo(a)pyrene	U		0.00728	0.0392	1	02/03/2022 14:15	WG1811358
Bis(2-chlorethoxy)methane	U		0.0118	0.392	1	02/03/2022 14:15	WG1811358
Bis(2-chloroethyl)ether	U		0.0129	0.392	1	02/03/2022 14:15	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0169	0.392	1	02/03/2022 14:15	WG1811358
4-Bromophenyl-phenylether	U		0.0138	0.392	1	02/03/2022 14:15	WG1811358
2-Chloronaphthalene	U		0.00688	0.0392	1	02/03/2022 14:15	WG1811358
4-Chlorophenyl-phenylether	U		0.0136	0.392	1	02/03/2022 14:15	WG1811358
Chrysene	U		0.00778	0.0392	1	02/03/2022 14:15	WG1811358
Dibenz(a,h)anthracene	U		0.0109	0.0392	1	02/03/2022 14:15	WG1811358
3,3-Dichlorobenzidine	U		0.0145	0.392	1	02/03/2022 14:15	WG1811358
2,4-Dinitrotoluene	U		0.0112	0.392	1	02/03/2022 14:15	WG1811358
2,6-Dinitrotoluene	U		0.0128	0.392	1	02/03/2022 14:15	WG1811358
Fluoranthene	U		0.00707	0.0392	1	02/03/2022 14:15	WG1811358
Fluorene	U		0.00637	0.0392	1	02/03/2022 14:15	WG1811358
Hexachlorobenzene	U		0.0139	0.392	1	02/03/2022 14:15	WG1811358
Hexachloro-1,3-butadiene	U		0.0132	0.392	1	02/03/2022 14:15	WG1811358
Hexachlorocyclopentadiene	U		0.0206	0.392	1	02/03/2022 14:15	WG1811358
Hexachloroethane	U		0.0154	0.392	1	02/03/2022 14:15	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0111	0.0392	1	02/03/2022 14:15	WG1811358
Isophorone	U		0.0120	0.392	1	02/03/2022 14:15	WG1811358
Naphthalene	U		0.00983	0.0392	1	02/03/2022 14:15	WG1811358
Nitrobenzene	U		0.0136	0.392	1	02/03/2022 14:15	WG1811358
n-Nitrosodimethylamine	U		0.0581	0.392	1	02/03/2022 14:15	WG1811358
n-Nitrosodiphenylamine	U		0.0296	0.392	1	02/03/2022 14:15	WG1811358
n-Nitrosodi-n-propylamine	U		0.0131	0.392	1	02/03/2022 14:15	WG1811358
Phenanthrene	U		0.00777	0.0392	1	02/03/2022 14:15	WG1811358
Benzylbutyl phthalate	U		0.0122	0.392	1	02/03/2022 14:15	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0496	0.392	1	02/03/2022 14:15	WG1811358
Di-n-butyl phthalate	U		0.0134	0.392	1	02/03/2022 14:15	WG1811358
Diethyl phthalate	U		0.0129	0.392	1	02/03/2022 14:15	WG1811358
Dimethyl phthalate	U		0.0830	0.392	1	02/03/2022 14:15	WG1811358
Di-n-octyl phthalate	U		0.0265	0.392	1	02/03/2022 14:15	WG1811358
Pyrene	U		0.00762	0.0392	1	02/03/2022 14:15	WG1811358
1,2,4-Trichlorobenzene	U		0.0122	0.392	1	02/03/2022 14:15	WG1811358
4-Chloro-3-methylphenol	U		0.0127	0.392	1	02/03/2022 14:15	WG1811358
2-Chlorophenol	U		0.0129	0.392	1	02/03/2022 14:15	WG1811358
2,4-Dichlorophenol	U		0.0114	0.392	1	02/03/2022 14:15	WG1811358
2,4-Dimethylphenol	U		0.0102	0.392	1	02/03/2022 14:15	WG1811358
4,6-Dinitro-2-methylphenol	U		0.0888	0.392	1	02/03/2022 14:15	WG1811358
2,4-Dinitrophenol	U		0.0916	0.392	1	02/03/2022 14:15	WG1811358
2-Nitrophenol	U		0.0140	0.392	1	02/03/2022 14:15	WG1811358

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0122	0.392	1	02/03/2022 14:15	WG1811358
Pentachlorophenol	U		0.0105	0.392	1	02/03/2022 14:15	WG1811358
Phenol	0.0227	J	0.0158	0.392	1	02/03/2022 14:15	WG1811358
2,4,6-Trichlorophenol	U		0.0126	0.392	1	02/03/2022 14:15	WG1811358
(S) 2-Fluorophenol	*62.7*			*12.0-120*		*02/03/2022 14:15*	WG1811358
(S) Phenol-d5	*56.7*			*10.0-120*		*02/03/2022 14:15*	WG1811358
(S) Nitrobenzene-d5	*46.0*			*10.0-122*		*02/03/2022 14:15*	WG1811358
(S) 2-Fluorobiphenyl	*59.6*			*15.0-120*		*02/03/2022 14:15*	WG1811358
(S) 2,4,6-Tribromophenol	*64.6*			*10.0-127*		*02/03/2022 14:15*	WG1811358
(S) p-Terphenyl-d14	*75.5*			*10.0-120*		*02/03/2022 14:15*	WG1811358

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	89.1		1	01/29/2022 12:57	WG1809896

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0202	0.0449	1	01/31/2022 16:08	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.46	J	0.581	2.24	1	02/02/2022 09:12	WG1811148
Barium	19.8		0.0956	0.561	1	02/02/2022 09:12	WG1811148
Cadmium	U		0.0529	0.561	1	02/02/2022 09:12	WG1811148
Chromium	2.93		0.149	1.12	1	02/02/2022 09:12	WG1811148
Lead	1.26		0.233	0.561	1	02/02/2022 09:12	WG1811148
Selenium	U		0.857	2.24	1	02/02/2022 09:12	WG1811148
Silver	U		0.143	1.12	1	02/02/2022 09:12	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0471	0.0645	1.04	01/30/2022 19:20	WG1810459
Acrylonitrile	U		0.00465	0.0161	1.04	01/30/2022 19:20	WG1810459
Benzene	U		0.000603	0.00129	1.04	01/30/2022 19:20	WG1810459
Bromobenzene	U		0.00116	0.0161	1.04	01/30/2022 19:20	WG1810459
Bromodichloromethane	U		0.000935	0.00322	1.04	01/30/2022 19:20	WG1810459
Bromoform	U		0.00151	0.0322	1.04	01/30/2022 19:20	WG1810459
Bromomethane	U		0.00254	0.0161	1.04	01/30/2022 19:20	WG1810459
n-Butylbenzene	U	J4	0.00677	0.0161	1.04	01/30/2022 19:20	WG1810459
sec-Butylbenzene	U		0.00372	0.0161	1.04	01/30/2022 19:20	WG1810459
tert-Butylbenzene	U		0.00252	0.00645	1.04	01/30/2022 19:20	WG1810459
Carbon tetrachloride	U		0.00116	0.00645	1.04	01/30/2022 19:20	WG1810459
Chlorobenzene	U		0.000270	0.00322	1.04	01/30/2022 19:20	WG1810459
Chlorodibromomethane	U		0.000789	0.00322	1.04	01/30/2022 19:20	WG1810459
Chloroethane	U		0.00219	0.00645	1.04	01/30/2022 19:20	WG1810459
Chloroform	U		0.00133	0.00322	1.04	01/30/2022 19:20	WG1810459
Chloromethane	U		0.00560	0.0161	1.04	01/30/2022 19:20	WG1810459
2-Chlorotoluene	U		0.00112	0.00322	1.04	01/30/2022 19:20	WG1810459
4-Chlorotoluene	U		0.000580	0.00645	1.04	01/30/2022 19:20	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00503	0.0322	1.04	01/30/2022 19:20	WG1810459
1,2-Dibromoethane	U		0.000836	0.00322	1.04	01/30/2022 19:20	WG1810459
Dibromomethane	U		0.000967	0.00645	1.04	01/30/2022 19:20	WG1810459
1,2-Dichlorobenzene	U		0.000548	0.00645	1.04	01/30/2022 19:20	WG1810459
1,3-Dichlorobenzene	U		0.000774	0.00645	1.04	01/30/2022 19:20	WG1810459
1,4-Dichlorobenzene	U		0.000903	0.00645	1.04	01/30/2022 19:20	WG1810459
Dichlorodifluoromethane	U		0.00207	0.00322	1.04	01/30/2022 19:20	WG1810459
1,1-Dichloroethane	U		0.000634	0.00322	1.04	01/30/2022 19:20	WG1810459
1,2-Dichloroethane	U		0.000837	0.00322	1.04	01/30/2022 19:20	WG1810459
1,1-Dichloroethene	U		0.000781	0.00322	1.04	01/30/2022 19:20	WG1810459
cis-1,2-Dichloroethene	U		0.000946	0.00322	1.04	01/30/2022 19:20	WG1810459
trans-1,2-Dichloroethene	U		0.00134	0.00645	1.04	01/30/2022 19:20	WG1810459
1,2-Dichloropropane	U		0.00184	0.00645	1.04	01/30/2022 19:20	WG1810459
1,1-Dichloropropene	U		0.00104	0.00322	1.04	01/30/2022 19:20	WG1810459
1,3-Dichloropropane	U		0.000646	0.00645	1.04	01/30/2022 19:20	WG1810459

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.000976	0.00322	1.04	01/30/2022 19:20	WG1810459
trans-1,3-Dichloropropene	U		0.00148	0.00645	1.04	01/30/2022 19:20	WG1810459
2,2-Dichloropropane	U		0.00179	0.00322	1.04	01/30/2022 19:20	WG1810459
Di-isopropyl ether	U		0.000528	0.00129	1.04	01/30/2022 19:20	WG1810459
Ethylbenzene	U		0.000950	0.00322	1.04	01/30/2022 19:20	WG1810459
Hexachloro-1,3-Butadiene	U		0.00774	0.0322	1.04	01/30/2022 19:20	WG1810459
Isopropylbenzene	U		0.000548	0.00322	1.04	01/30/2022 19:20	WG1810459
p-Isopropyltoluene	U		0.00329	0.00645	1.04	01/30/2022 19:20	WG1810459
2-Butanone (MEK)	U		0.0818	0.129	1.04	01/30/2022 19:20	WG1810459
Methylene Chloride	U		0.00857	0.0322	1.04	01/30/2022 19:20	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00294	0.0322	1.04	01/30/2022 19:20	WG1810459
Methyl tert-butyl ether	U		0.000451	0.00129	1.04	01/30/2022 19:20	WG1810459
Naphthalene	U	J4	0.00630	0.0161	1.04	01/30/2022 19:20	WG1810459
n-Propylbenzene	U		0.00123	0.00645	1.04	01/30/2022 19:20	WG1810459
Styrene	U		0.000295	0.0161	1.04	01/30/2022 19:20	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00122	0.00322	1.04	01/30/2022 19:20	WG1810459
1,1,2,2-Tetrachloroethane	U		0.000896	0.00322	1.04	01/30/2022 19:20	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.000972	0.00322	1.04	01/30/2022 19:20	WG1810459
Tetrachloroethene	U		0.00116	0.00322	1.04	01/30/2022 19:20	WG1810459
Toluene	0.00361	J	0.00167	0.00645	1.04	01/30/2022 19:20	WG1810459
1,2,3-Trichlorobenzene	U		0.00945	0.0161	1.04	01/30/2022 19:20	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00568	0.0161	1.04	01/30/2022 19:20	WG1810459
1,1,1-Trichloroethane	U		0.00119	0.00322	1.04	01/30/2022 19:20	WG1810459
1,1,2-Trichloroethane	U		0.000770	0.00322	1.04	01/30/2022 19:20	WG1810459
Trichloroethene	U		0.000753	0.00129	1.04	01/30/2022 19:20	WG1810459
Trichlorofluoromethane	U	J3	0.00107	0.00322	1.04	01/30/2022 19:20	WG1810459
1,2,3-Trichloropropane	U	J3	0.00208	0.0161	1.04	01/30/2022 19:20	WG1810459
1,2,4-Trimethylbenzene	U		0.00203	0.00645	1.04	01/30/2022 19:20	WG1810459
1,2,3-Trimethylbenzene	U		0.00203	0.00645	1.04	01/30/2022 19:20	WG1810459
1,3,5-Trimethylbenzene	U		0.00258	0.00645	1.04	01/30/2022 19:20	WG1810459
Vinyl chloride	U		0.00150	0.00322	1.04	01/30/2022 19:20	WG1810459
Xylenes, Total	U		0.00113	0.00838	1.04	01/30/2022 19:20	WG1810459
(S) Toluene-d8	*115*			*75.0-131*		*01/30/2022 19:20*	WG1810459
(S) 4-Bromofluorobenzene	*88.7*			*67.0-138*		*01/30/2022 19:20*	WG1810459
(S) 1,2-Dichloroethane-d4	*90.6*			*70.0-130*		*01/30/2022 19:20*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		16.8	56.1	1	02/04/2022 16:25	WG1812033
TPH C12 - C28	U		16.8	56.1	1	02/04/2022 16:25	WG1812033
TPH C28 - C35	U		16.8	56.1	1	02/04/2022 16:25	WG1812033
TPH C6 - C35	U		16.8	56.1	1	02/04/2022 16:25	WG1812033
(S) o-Terphenyl	*63.2*	J2		*70.0-130*		*02/04/2022 16:25*	WG1812033
(S) 1-chlorooctane	*75.2*			*70.0-130*		*02/04/2022 16:25*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0132	0.0382	1	02/07/2022 23:37	WG1811393
PCB 1221	U		0.0132	0.0382	1	02/07/2022 23:37	WG1811393
PCB 1232	U		0.0132	0.0382	1	02/07/2022 23:37	WG1811393
PCB 1242	U		0.0132	0.0382	1	02/07/2022 23:37	WG1811393
PCB 1248	U		0.00828	0.0191	1	02/07/2022 23:37	WG1811393
PCB 1254	U		0.00828	0.0191	1	02/07/2022 23:37	WG1811393

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00828	0.0191	1	02/07/2022 23:37	WG1811393
(S) Decachlorobiphenyl	*64.2*			*10.0-135*		*02/07/2022 23:37*	WG1811393
(S) Tetrachloro-m-xylene	*74.3*			*10.0-139*		*02/07/2022 23:37*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00605	0.0374	1	02/03/2022 10:57	WG1811358
Acenaphthylene	U		0.00526	0.0374	1	02/03/2022 10:57	WG1811358
Anthracene	U		0.00666	0.0374	1	02/03/2022 10:57	WG1811358
Benzidine	U		0.0703	1.87	1	02/03/2022 10:57	WG1811358
Benzo(a)anthracene	U		0.00659	0.0374	1	02/03/2022 10:57	WG1811358
Benzo(b)fluoranthene	U		0.00697	0.0374	1	02/03/2022 10:57	WG1811358
Benzo(k)fluoranthene	U		0.00664	0.0374	1	02/03/2022 10:57	WG1811358
Benzo(g,h,i)perylene	U		0.00683	0.0374	1	02/03/2022 10:57	WG1811358
Benzo(a)pyrene	U		0.00695	0.0374	1	02/03/2022 10:57	WG1811358
Bis(2-chlorethoxy)methane	U		0.0112	0.374	1	02/03/2022 10:57	WG1811358
Bis(2-chloroethyl)ether	U		0.0123	0.374	1	02/03/2022 10:57	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0162	0.374	1	02/03/2022 10:57	WG1811358
4-Bromophenyl-phenylether	U		0.0131	0.374	1	02/03/2022 10:57	WG1811358
2-Chloronaphthalene	U		0.00657	0.0374	1	02/03/2022 10:57	WG1811358
4-Chlorophenyl-phenylether	U		0.0130	0.374	1	02/03/2022 10:57	WG1811358
Chrysene	U		0.00743	0.0374	1	02/03/2022 10:57	WG1811358
Dibenz(a,h)anthracene	U		0.0104	0.0374	1	02/03/2022 10:57	WG1811358
3,3-Dichlorobenzidine	U		0.0138	0.374	1	02/03/2022 10:57	WG1811358
2,4-Dinitrotoluene	U		0.0107	0.374	1	02/03/2022 10:57	WG1811358
2,6-Dinitrotoluene	U		0.0122	0.374	1	02/03/2022 10:57	WG1811358
Fluoranthene	U		0.00675	0.0374	1	02/03/2022 10:57	WG1811358
Fluorene	U		0.00608	0.0374	1	02/03/2022 10:57	WG1811358
Hexachlorobenzene	U		0.0132	0.374	1	02/03/2022 10:57	WG1811358
Hexachloro-1,3-butadiene	U		0.0126	0.374	1	02/03/2022 10:57	WG1811358
Hexachlorocyclopentadiene	U		0.0196	0.374	1	02/03/2022 10:57	WG1811358
Hexachloroethane	U		0.0147	0.374	1	02/03/2022 10:57	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0106	0.0374	1	02/03/2022 10:57	WG1811358
Isophorone	U		0.0114	0.374	1	02/03/2022 10:57	WG1811358
Naphthalene	U		0.00938	0.0374	1	02/03/2022 10:57	WG1811358
Nitrobenzene	U		0.0130	0.374	1	02/03/2022 10:57	WG1811358
n-Nitrosodimethylamine	U		0.0554	0.374	1	02/03/2022 10:57	WG1811358
n-Nitrosodiphenylamine	U		0.0283	0.374	1	02/03/2022 10:57	WG1811358
n-Nitrosodi-n-propylamine	U		0.0125	0.374	1	02/03/2022 10:57	WG1811358
Phenanthrene	U		0.00742	0.0374	1	02/03/2022 10:57	WG1811358
Benzylbutyl phthalate	U		0.0117	0.374	1	02/03/2022 10:57	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0474	0.374	1	02/03/2022 10:57	WG1811358
Di-n-butyl phthalate	U		0.0128	0.374	1	02/03/2022 10:57	WG1811358
Diethyl phthalate	U		0.0123	0.374	1	02/03/2022 10:57	WG1811358
Dimethyl phthalate	U		0.0792	0.374	1	02/03/2022 10:57	WG1811358
Di-n-octyl phthalate	U		0.0253	0.374	1	02/03/2022 10:57	WG1811358
Pyrene	U		0.00727	0.0374	1	02/03/2022 10:57	WG1811358
1,2,4-Trichlorobenzene	U		0.0117	0.374	1	02/03/2022 10:57	WG1811358
4-Chloro-3-methylphenol	U		0.0121	0.374	1	02/03/2022 10:57	WG1811358
2-Chlorophenol	U		0.0123	0.374	1	02/03/2022 10:57	WG1811358
2,4-Dichlorophenol	U		0.0109	0.374	1	02/03/2022 10:57	WG1811358
2,4-Dimethylphenol	U		0.00976	0.374	1	02/03/2022 10:57	WG1811358
4,6-Dinitro-2-methylphenol	U		0.0847	0.374	1	02/03/2022 10:57	WG1811358
2,4-Dinitrophenol	U		0.0874	0.374	1	02/03/2022 10:57	WG1811358
2-Nitrophenol	U		0.0134	0.374	1	02/03/2022 10:57	WG1811358

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0117	0.374	1	02/03/2022 10:57	WG1811358
Pentachlorophenol	U		0.0101	0.374	1	02/03/2022 10:57	WG1811358
Phenol	0.0255	J	0.0150	0.374	1	02/03/2022 10:57	WG1811358
2,4,6-Trichlorophenol	U		0.0120	0.374	1	02/03/2022 10:57	WG1811358
(S) 2-Fluorophenol	*72.7*			*12.0-120*		*02/03/2022 10:57*	WG1811358
(S) Phenol-d5	*64.9*			*10.0-120*		*02/03/2022 10:57*	WG1811358
(S) Nitrobenzene-d5	*54.3*			*10.0-122*		*02/03/2022 10:57*	WG1811358
(S) 2-Fluorobiphenyl	*71.8*			*15.0-120*		*02/03/2022 10:57*	WG1811358
(S) 2,4,6-Tribromophenol	*73.0*			*10.0-127*		*02/03/2022 10:57*	WG1811358
(S) p-Terphenyl-d14	*83.1*			*10.0-120*		*02/03/2022 10:57*	WG1811358

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	82.6		1	01/29/2022 09:44	WG1810042

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0244	J	0.0218	0.0485	1	01/31/2022 16:31	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.21	J	0.627	2.42	1	02/02/2022 09:15	WG1811148
Barium	107		0.103	0.606	1	02/02/2022 09:15	WG1811148
Cadmium	2.51		0.0571	0.606	1	02/02/2022 09:15	WG1811148
Chromium	8.10		0.161	1.21	1	02/02/2022 09:15	WG1811148
Lead	21.9		0.252	0.606	1	02/02/2022 09:15	WG1811148
Selenium	U		0.925	2.42	1	02/02/2022 09:15	WG1811148
Silver	U		0.154	1.21	1	02/02/2022 09:15	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	0.199		0.0766	0.105	1.56	01/30/2022 19:40	WG1810459
Acrylonitrile	U		0.00758	0.0263	1.56	01/30/2022 19:40	WG1810459
Benzene	U		0.000982	0.00210	1.56	01/30/2022 19:40	WG1810459
Bromobenzene	U		0.00188	0.0263	1.56	01/30/2022 19:40	WG1810459
Bromodichloromethane	U		0.00152	0.00525	1.56	01/30/2022 19:40	WG1810459
Bromoform	U		0.00246	0.0525	1.56	01/30/2022 19:40	WG1810459
Bromomethane	U		0.00413	0.0263	1.56	01/30/2022 19:40	WG1810459
n-Butylbenzene	U	J4	0.0110	0.0263	1.56	01/30/2022 19:40	WG1810459
sec-Butylbenzene	U		0.00605	0.0263	1.56	01/30/2022 19:40	WG1810459
tert-Butylbenzene	U		0.00409	0.0105	1.56	01/30/2022 19:40	WG1810459
Carbon tetrachloride	U		0.00188	0.0105	1.56	01/30/2022 19:40	WG1810459
Chlorobenzene	U		0.000442	0.00525	1.56	01/30/2022 19:40	WG1810459
Chlorodibromomethane	U		0.00129	0.00525	1.56	01/30/2022 19:40	WG1810459
Chloroethane	U		0.00357	0.0105	1.56	01/30/2022 19:40	WG1810459
Chloroform	U		0.00217	0.00525	1.56	01/30/2022 19:40	WG1810459
Chloromethane	U		0.00914	0.0263	1.56	01/30/2022 19:40	WG1810459
2-Chlorotoluene	U		0.00182	0.00525	1.56	01/30/2022 19:40	WG1810459
4-Chlorotoluene	U		0.000945	0.0105	1.56	01/30/2022 19:40	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00819	0.0525	1.56	01/30/2022 19:40	WG1810459
1,2-Dibromoethane	U		0.00136	0.00525	1.56	01/30/2022 19:40	WG1810459
Dibromomethane	U		0.00158	0.0105	1.56	01/30/2022 19:40	WG1810459
1,2-Dichlorobenzene	U		0.000893	0.0105	1.56	01/30/2022 19:40	WG1810459
1,3-Dichlorobenzene	U		0.00126	0.0105	1.56	01/30/2022 19:40	WG1810459
1,4-Dichlorobenzene	U		0.00147	0.0105	1.56	01/30/2022 19:40	WG1810459
Dichlorodifluoromethane	U		0.00338	0.00525	1.56	01/30/2022 19:40	WG1810459
1,1-Dichloroethane	U		0.00103	0.00525	1.56	01/30/2022 19:40	WG1810459
1,2-Dichloroethane	U		0.00136	0.00525	1.56	01/30/2022 19:40	WG1810459
1,1-Dichloroethene	U		0.00127	0.00525	1.56	01/30/2022 19:40	WG1810459
cis-1,2-Dichloroethene	U		0.00155	0.00525	1.56	01/30/2022 19:40	WG1810459
trans-1,2-Dichloroethene	U		0.00218	0.0105	1.56	01/30/2022 19:40	WG1810459
1,2-Dichloropropane	U		0.00299	0.0105	1.56	01/30/2022 19:40	WG1810459
1,1-Dichloropropene	U		0.00170	0.00525	1.56	01/30/2022 19:40	WG1810459
1,3-Dichloropropane	U		0.00105	0.0105	1.56	01/30/2022 19:40	WG1810459

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00159	0.00525	1.56	01/30/2022 19:40	WG1810459
trans-1,3-Dichloropropene	U		0.00240	0.0105	1.56	01/30/2022 19:40	WG1810459
2,2-Dichloropropane	U		0.00289	0.00525	1.56	01/30/2022 19:40	WG1810459
Di-isopropyl ether	U		0.000862	0.00210	1.56	01/30/2022 19:40	WG1810459
Ethylbenzene	0.00284	J	0.00155	0.00525	1.56	01/30/2022 19:40	WG1810459
Hexachloro-1,3-Butadiene	U		0.0126	0.0525	1.56	01/30/2022 19:40	WG1810459
Isopropylbenzene	U		0.000893	0.00525	1.56	01/30/2022 19:40	WG1810459
p-Isopropyltoluene	U		0.00536	0.0105	1.56	01/30/2022 19:40	WG1810459
2-Butanone (MEK)	U		0.133	0.210	1.56	01/30/2022 19:40	WG1810459
Methylene Chloride	U		0.0140	0.0525	1.56	01/30/2022 19:40	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00479	0.0525	1.56	01/30/2022 19:40	WG1810459
Methyl tert-butyl ether	U		0.000735	0.00210	1.56	01/30/2022 19:40	WG1810459
Naphthalene	0.0167	J J4	0.0102	0.0263	1.56	01/30/2022 19:40	WG1810459
n-Propylbenzene	U		0.00199	0.0105	1.56	01/30/2022 19:40	WG1810459
Styrene	U		0.000481	0.0263	1.56	01/30/2022 19:40	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00199	0.00525	1.56	01/30/2022 19:40	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00145	0.00525	1.56	01/30/2022 19:40	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00159	0.00525	1.56	01/30/2022 19:40	WG1810459
Tetrachloroethene	U		0.00188	0.00525	1.56	01/30/2022 19:40	WG1810459
Toluene	0.0155		0.00273	0.0105	1.56	01/30/2022 19:40	WG1810459
1,2,3-Trichlorobenzene	U		0.0153	0.0263	1.56	01/30/2022 19:40	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00924	0.0263	1.56	01/30/2022 19:40	WG1810459
1,1,1-Trichloroethane	U		0.00194	0.00525	1.56	01/30/2022 19:40	WG1810459
1,1,2-Trichloroethane	U		0.00125	0.00525	1.56	01/30/2022 19:40	WG1810459
Trichloroethene	U		0.00123	0.00210	1.56	01/30/2022 19:40	WG1810459
Trichlorofluoromethane	U	J3	0.00174	0.00525	1.56	01/30/2022 19:40	WG1810459
1,2,3-Trichloropropane	U	J3	0.00341	0.0263	1.56	01/30/2022 19:40	WG1810459
1,2,4-Trimethylbenzene	0.00924	J	0.00331	0.0105	1.56	01/30/2022 19:40	WG1810459
1,2,3-Trimethylbenzene	U		0.00331	0.0105	1.56	01/30/2022 19:40	WG1810459
1,3,5-Trimethylbenzene	U		0.00420	0.0105	1.56	01/30/2022 19:40	WG1810459
Vinyl chloride	U		0.00244	0.00525	1.56	01/30/2022 19:40	WG1810459
Xylenes, Total	0.0215		0.00184	0.0136	1.56	01/30/2022 19:40	WG1810459
(S) Toluene-d8	*114*			*75.0-131*		*01/30/2022 19:40*	WG1810459
(S) 4-Bromofluorobenzene	*86.1*			*67.0-138*		*01/30/2022 19:40*	WG1810459
(S) 1,2-Dichloroethane-d4	*91.2*			*70.0-130*		*01/30/2022 19:40*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		18.2	60.6	1	02/04/2022 04:50	WG1812033
TPH C12 - C28	U		18.2	60.6	1	02/04/2022 04:50	WG1812033
TPH C28 - C35	U		18.2	60.6	1	02/04/2022 04:50	WG1812033
TPH C6 - C35	U		18.2	60.6	1	02/04/2022 04:50	WG1812033
(S) o-Terphenyl	*87.2*			*70.0-130*		*02/04/2022 04:50*	WG1812033
(S) 1-chlorooctane	*108*			*70.0-130*		*02/04/2022 04:50*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0143	0.0412	1	02/07/2022 23:46	WG1811393
PCB 1221	U		0.0143	0.0412	1	02/07/2022 23:46	WG1811393
PCB 1232	U		0.0143	0.0412	1	02/07/2022 23:46	WG1811393
PCB 1242	U		0.0143	0.0412	1	02/07/2022 23:46	WG1811393
PCB 1248	U		0.00894	0.0206	1	02/07/2022 23:46	WG1811393
PCB 1254	U		0.00894	0.0206	1	02/07/2022 23:46	WG1811393

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00894	0.0206	1	02/07/2022 23:46	WG1811393
(S) Decachlorobiphenyl	*61.8*			*10.0-135*		*02/07/2022 23:46*	WG1811393
(S) Tetrachloro-m-xylene	*74.7*			*10.0-139*		*02/07/2022 23:46*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00653	0.0403	1	02/03/2022 15:17	WG1811358
Acenaphthylene	U		0.00568	0.0403	1	02/03/2022 15:17	WG1811358
Anthracene	U		0.00718	0.0403	1	02/03/2022 15:17	WG1811358
Benzidine	U		0.0758	2.02	1	02/03/2022 15:17	WG1811358
Benzo(a)anthracene	U		0.00711	0.0403	1	02/03/2022 15:17	WG1811358
Benzo(b)fluoranthene	U		0.00752	0.0403	1	02/03/2022 15:17	WG1811358
Benzo(k)fluoranthene	U		0.00717	0.0403	1	02/03/2022 15:17	WG1811358
Benzo(g,h,i)perylene	U		0.00738	0.0403	1	02/03/2022 15:17	WG1811358
Benzo(a)pyrene	U		0.00750	0.0403	1	02/03/2022 15:17	WG1811358
Bis(2-chlorethoxy)methane	U		0.0121	0.403	1	02/03/2022 15:17	WG1811358
Bis(2-chloroethyl)ether	U		0.0133	0.403	1	02/03/2022 15:17	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0174	0.403	1	02/03/2022 15:17	WG1811358
4-Bromophenyl-phenylether	U		0.0142	0.403	1	02/03/2022 15:17	WG1811358
2-Chloronaphthalene	U		0.00709	0.0403	1	02/03/2022 15:17	WG1811358
4-Chlorophenyl-phenylether	U		0.0141	0.403	1	02/03/2022 15:17	WG1811358
Chrysene	U		0.00802	0.0403	1	02/03/2022 15:17	WG1811358
Dibenz(a,h)anthracene	U		0.0112	0.0403	1	02/03/2022 15:17	WG1811358
3,3-Dichlorobenzidine	U		0.0149	0.403	1	02/03/2022 15:17	WG1811358
2,4-Dinitrotoluene	U		0.0116	0.403	1	02/03/2022 15:17	WG1811358
2,6-Dinitrotoluene	U		0.0132	0.403	1	02/03/2022 15:17	WG1811358
Fluoranthene	U		0.00728	0.0403	1	02/03/2022 15:17	WG1811358
Fluorene	U		0.00657	0.0403	1	02/03/2022 15:17	WG1811358
Hexachlorobenzene	U		0.0143	0.403	1	02/03/2022 15:17	WG1811358
Hexachloro-1,3-butadiene	U		0.0136	0.403	1	02/03/2022 15:17	WG1811358
Hexachlorocyclopentadiene	U		0.0212	0.403	1	02/03/2022 15:17	WG1811358
Hexachloroethane	U		0.0159	0.403	1	02/03/2022 15:17	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0114	0.0403	1	02/03/2022 15:17	WG1811358
Isophorone	U		0.0124	0.403	1	02/03/2022 15:17	WG1811358
Naphthalene	U		0.0101	0.0403	1	02/03/2022 15:17	WG1811358
Nitrobenzene	U		0.0141	0.403	1	02/03/2022 15:17	WG1811358
n-Nitrosodimethylamine	U		0.0598	0.403	1	02/03/2022 15:17	WG1811358
n-Nitrosodiphenylamine	U		0.0305	0.403	1	02/03/2022 15:17	WG1811358
n-Nitrosodi-n-propylamine	U		0.0134	0.403	1	02/03/2022 15:17	WG1811358
Phenanthrene	U		0.00801	0.0403	1	02/03/2022 15:17	WG1811358
Benzylbutyl phthalate	U		0.0126	0.403	1	02/03/2022 15:17	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0511	0.403	1	02/03/2022 15:17	WG1811358
Di-n-butyl phthalate	U		0.0138	0.403	1	02/03/2022 15:17	WG1811358
Diethyl phthalate	U		0.0133	0.403	1	02/03/2022 15:17	WG1811358
Dimethyl phthalate	U		0.0855	0.403	1	02/03/2022 15:17	WG1811358
Di-n-octyl phthalate	U		0.0273	0.403	1	02/03/2022 15:17	WG1811358
Pyrene	U		0.00785	0.0403	1	02/03/2022 15:17	WG1811358
1,2,4-Trichlorobenzene	U		0.0126	0.403	1	02/03/2022 15:17	WG1811358
4-Chloro-3-methylphenol	U		0.0131	0.403	1	02/03/2022 15:17	WG1811358
2-Chlorophenol	U		0.0133	0.403	1	02/03/2022 15:17	WG1811358
2,4-Dichlorophenol	U		0.0117	0.403	1	02/03/2022 15:17	WG1811358
2,4-Dimethylphenol	U		0.0105	0.403	1	02/03/2022 15:17	WG1811358
4,6-Dinitro-2-methylphenol	U		0.0915	0.403	1	02/03/2022 15:17	WG1811358
2,4-Dinitrophenol	U		0.0944	0.403	1	02/03/2022 15:17	WG1811358
2-Nitrophenol	U		0.0144	0.403	1	02/03/2022 15:17	WG1811358

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0126	0.403	1	02/03/2022 15:17	WG1811358
Pentachlorophenol	U		0.0109	0.403	1	02/03/2022 15:17	WG1811358
Phenol	0.0573	J	0.0162	0.403	1	02/03/2022 15:17	WG1811358
2,4,6-Trichlorophenol	U		0.0130	0.403	1	02/03/2022 15:17	WG1811358
(S) 2-Fluorophenol	*66.0*			*12.0-120*		*02/03/2022 15:17*	WG1811358
(S) Phenol-d5	*60.2*			*10.0-120*		*02/03/2022 15:17*	WG1811358
(S) Nitrobenzene-d5	*47.0*			*10.0-122*		*02/03/2022 15:17*	WG1811358
(S) 2-Fluorobiphenyl	*64.9*			*15.0-120*		*02/03/2022 15:17*	WG1811358
(S) 2,4,6-Tribromophenol	*72.3*			*10.0-127*		*02/03/2022 15:17*	WG1811358
(S) p-Terphenyl-d14	*76.5*			*10.0-120*		*02/03/2022 15:17*	WG1811358

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	73.0		1	01/29/2022 09:44	WG1810042

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0332	J	0.0247	0.0548	1	01/31/2022 16:39	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.51		0.710	2.74	1	02/02/2022 09:17	WG1811148
Barium	183		0.117	0.685	1	02/02/2022 09:17	WG1811148
Cadmium	2.82		0.0645	0.685	1	02/02/2022 09:17	WG1811148
Chromium	25.1		0.182	1.37	1	02/02/2022 09:17	WG1811148
Lead	23.4		0.285	0.685	1	02/02/2022 09:17	WG1811148
Selenium	U		1.05	2.74	1	02/02/2022 09:17	WG1811148
Silver	U		0.174	1.37	1	02/02/2022 09:17	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	0.133		0.0900	0.123	1.53	01/30/2022 20:00	WG1810459
Acrylonitrile	U		0.00890	0.0308	1.53	01/30/2022 20:00	WG1810459
Benzene	U		0.00115	0.00247	1.53	01/30/2022 20:00	WG1810459
Bromobenzene	U		0.00223	0.0308	1.53	01/30/2022 20:00	WG1810459
Bromodichloromethane	U		0.00179	0.00618	1.53	01/30/2022 20:00	WG1810459
Bromoform	U		0.00289	0.0618	1.53	01/30/2022 20:00	WG1810459
Bromomethane	U		0.00485	0.0308	1.53	01/30/2022 20:00	WG1810459
n-Butylbenzene	0.0200	J J4	0.0130	0.0308	1.53	01/30/2022 20:00	WG1810459
sec-Butylbenzene	U		0.00711	0.0308	1.53	01/30/2022 20:00	WG1810459
tert-Butylbenzene	U		0.00481	0.0123	1.53	01/30/2022 20:00	WG1810459
Carbon tetrachloride	U		0.00221	0.0123	1.53	01/30/2022 20:00	WG1810459
Chlorobenzene	U		0.000518	0.00618	1.53	01/30/2022 20:00	WG1810459
Chlorodibromomethane	U		0.00151	0.00618	1.53	01/30/2022 20:00	WG1810459
Chloroethane	U		0.00419	0.0123	1.53	01/30/2022 20:00	WG1810459
Chloroform	U		0.00255	0.00618	1.53	01/30/2022 20:00	WG1810459
Chloromethane	U		0.0107	0.0308	1.53	01/30/2022 20:00	WG1810459
2-Chlorotoluene	U		0.00213	0.00618	1.53	01/30/2022 20:00	WG1810459
4-Chlorotoluene	U		0.00111	0.0123	1.53	01/30/2022 20:00	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00963	0.0618	1.53	01/30/2022 20:00	WG1810459
1,2-Dibromoethane	U		0.00160	0.00618	1.53	01/30/2022 20:00	WG1810459
Dibromomethane	U		0.00185	0.0123	1.53	01/30/2022 20:00	WG1810459
1,2-Dichlorobenzene	U		0.00105	0.0123	1.53	01/30/2022 20:00	WG1810459
1,3-Dichlorobenzene	U		0.00148	0.0123	1.53	01/30/2022 20:00	WG1810459
1,4-Dichlorobenzene	U		0.00173	0.0123	1.53	01/30/2022 20:00	WG1810459
Dichlorodifluoromethane	U		0.00397	0.00618	1.53	01/30/2022 20:00	WG1810459
1,1-Dichloroethane	U		0.00121	0.00618	1.53	01/30/2022 20:00	WG1810459
1,2-Dichloroethane	U		0.00160	0.00618	1.53	01/30/2022 20:00	WG1810459
1,1-Dichloroethene	U		0.00150	0.00618	1.53	01/30/2022 20:00	WG1810459
cis-1,2-Dichloroethene	U		0.00181	0.00618	1.53	01/30/2022 20:00	WG1810459
trans-1,2-Dichloroethene	U		0.00256	0.0123	1.53	01/30/2022 20:00	WG1810459
1,2-Dichloropropane	U		0.00350	0.0123	1.53	01/30/2022 20:00	WG1810459
1,1-Dichloropropene	U		0.00200	0.00618	1.53	01/30/2022 20:00	WG1810459
1,3-Dichloropropane	U		0.00124	0.0123	1.53	01/30/2022 20:00	WG1810459

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00187	0.00618	1.53	01/30/2022 20:00	WG1810459
trans-1,3-Dichloropropene	U		0.00281	0.0123	1.53	01/30/2022 20:00	WG1810459
2,2-Dichloropropane	U		0.00340	0.00618	1.53	01/30/2022 20:00	WG1810459
Di-isopropyl ether	U		0.00101	0.00247	1.53	01/30/2022 20:00	WG1810459
Ethylbenzene	U		0.00182	0.00618	1.53	01/30/2022 20:00	WG1810459
Hexachloro-1,3-Butadiene	U		0.0148	0.0618	1.53	01/30/2022 20:00	WG1810459
Isopropylbenzene	U		0.00105	0.00618	1.53	01/30/2022 20:00	WG1810459
p-Isopropyltoluene	U		0.00629	0.0123	1.53	01/30/2022 20:00	WG1810459
2-Butanone (MEK)	U		0.157	0.247	1.53	01/30/2022 20:00	WG1810459
Methylene Chloride	U		0.0165	0.0618	1.53	01/30/2022 20:00	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00563	0.0618	1.53	01/30/2022 20:00	WG1810459
Methyl tert-butyl ether	U		0.000863	0.00247	1.53	01/30/2022 20:00	WG1810459
Naphthalene	U	J4	0.0120	0.0308	1.53	01/30/2022 20:00	WG1810459
n-Propylbenzene	U		0.00234	0.0123	1.53	01/30/2022 20:00	WG1810459
Styrene	U		0.000565	0.0308	1.53	01/30/2022 20:00	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00234	0.00618	1.53	01/30/2022 20:00	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00171	0.00618	1.53	01/30/2022 20:00	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00185	0.00618	1.53	01/30/2022 20:00	WG1810459
Tetrachloroethene	U		0.00221	0.00618	1.53	01/30/2022 20:00	WG1810459
Toluene	0.00544	J	0.00321	0.0123	1.53	01/30/2022 20:00	WG1810459
1,2,3-Trichlorobenzene	U		0.0181	0.0308	1.53	01/30/2022 20:00	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.0109	0.0308	1.53	01/30/2022 20:00	WG1810459
1,1,1-Trichloroethane	U		0.00227	0.00618	1.53	01/30/2022 20:00	WG1810459
1,1,2-Trichloroethane	U		0.00147	0.00618	1.53	01/30/2022 20:00	WG1810459
Trichloroethene	U		0.00144	0.00247	1.53	01/30/2022 20:00	WG1810459
Trichlorofluoromethane	U	J3	0.00205	0.00618	1.53	01/30/2022 20:00	WG1810459
1,2,3-Trichloropropane	U	J3	0.00400	0.0308	1.53	01/30/2022 20:00	WG1810459
1,2,4-Trimethylbenzene	U		0.00390	0.0123	1.53	01/30/2022 20:00	WG1810459
1,2,3-Trimethylbenzene	U		0.00390	0.0123	1.53	01/30/2022 20:00	WG1810459
1,3,5-Trimethylbenzene	U		0.00494	0.0123	1.53	01/30/2022 20:00	WG1810459
Vinyl chloride	U		0.00285	0.00618	1.53	01/30/2022 20:00	WG1810459
Xylenes, Total	U		0.00218	0.0160	1.53	01/30/2022 20:00	WG1810459
(S) Toluene-d8	*116*			*75.0-131*		*01/30/2022 20:00*	WG1810459
(S) 4-Bromofluorobenzene	*92.6*			*67.0-138*		*01/30/2022 20:00*	WG1810459
(S) 1,2-Dichloroethane-d4	*86.4*			*70.0-130*		*01/30/2022 20:00*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		20.6	68.5	1	02/04/2022 05:06	WG1812033
TPH C12 - C28	U		20.6	68.5	1	02/04/2022 05:06	WG1812033
TPH C28 - C35	U		20.6	68.5	1	02/04/2022 05:06	WG1812033
TPH C6 - C35	U		20.6	68.5	1	02/04/2022 05:06	WG1812033
(S) o-Terphenyl	*86.0*			*70.0-130*		*02/04/2022 05:06*	WG1812033
(S) 1-chlorooctane	*107*			*70.0-130*		*02/04/2022 05:06*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0162	0.0466	1	02/07/2022 23:56	WG1811393
PCB 1221	U		0.0162	0.0466	1	02/07/2022 23:56	WG1811393
PCB 1232	U		0.0162	0.0466	1	02/07/2022 23:56	WG1811393
PCB 1242	U		0.0162	0.0466	1	02/07/2022 23:56	WG1811393
PCB 1248	U		0.0101	0.0233	1	02/07/2022 23:56	WG1811393
PCB 1254	U		0.0101	0.0233	1	02/07/2022 23:56	WG1811393

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.0101	0.0233	1	02/07/2022 23:56	WG1811393
(S) Decachlorobiphenyl	*45.4*			*10.0-135*		*02/07/2022 23:56*	WG1811393
(S) Tetrachloro-m-xylene	*56.3*			*10.0-139*		*02/07/2022 23:56*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00739	0.0456	1	02/03/2022 13:34	WG1811358
Acenaphthylene	U		0.00643	0.0456	1	02/03/2022 13:34	WG1811358
Anthracene	U		0.00813	0.0456	1	02/03/2022 13:34	WG1811358
Benzidine	U		0.0858	2.29	1	02/03/2022 13:34	WG1811358
Benzo(a)anthracene	U		0.00804	0.0456	1	02/03/2022 13:34	WG1811358
Benzo(b)fluoranthene	U		0.00851	0.0456	1	02/03/2022 13:34	WG1811358
Benzo(k)fluoranthene	U		0.00811	0.0456	1	02/03/2022 13:34	WG1811358
Benzo(g,h,i)perylene	U		0.00835	0.0456	1	02/03/2022 13:34	WG1811358
Benzo(a)pyrene	U		0.00848	0.0456	1	02/03/2022 13:34	WG1811358
Bis(2-chlorethoxy)methane	U		0.0137	0.456	1	02/03/2022 13:34	WG1811358
Bis(2-chloroethyl)ether	U		0.0151	0.456	1	02/03/2022 13:34	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0197	0.456	1	02/03/2022 13:34	WG1811358
4-Bromophenyl-phenylether	U		0.0160	0.456	1	02/03/2022 13:34	WG1811358
2-Chloronaphthalene	U		0.00802	0.0456	1	02/03/2022 13:34	WG1811358
4-Chlorophenyl-phenylether	U		0.0159	0.456	1	02/03/2022 13:34	WG1811358
Chrysene	U		0.00907	0.0456	1	02/03/2022 13:34	WG1811358
Dibenz(a,h)anthracene	U		0.0126	0.0456	1	02/03/2022 13:34	WG1811358
3,3-Dichlorobenzidine	U		0.0169	0.456	1	02/03/2022 13:34	WG1811358
2,4-Dinitrotoluene	U		0.0131	0.456	1	02/03/2022 13:34	WG1811358
2,6-Dinitrotoluene	U		0.0149	0.456	1	02/03/2022 13:34	WG1811358
Fluoranthene	U		0.00824	0.0456	1	02/03/2022 13:34	WG1811358
Fluorene	U		0.00743	0.0456	1	02/03/2022 13:34	WG1811358
Hexachlorobenzene	U		0.0162	0.456	1	02/03/2022 13:34	WG1811358
Hexachloro-1,3-butadiene	U		0.0153	0.456	1	02/03/2022 13:34	WG1811358
Hexachlorocyclopentadiene	U		0.0240	0.456	1	02/03/2022 13:34	WG1811358
Hexachloroethane	U		0.0180	0.456	1	02/03/2022 13:34	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0129	0.0456	1	02/03/2022 13:34	WG1811358
Isophorone	U		0.0140	0.456	1	02/03/2022 13:34	WG1811358
Naphthalene	U		0.0115	0.0456	1	02/03/2022 13:34	WG1811358
Nitrobenzene	U		0.0159	0.456	1	02/03/2022 13:34	WG1811358
n-Nitrosodimethylamine	U		0.0677	0.456	1	02/03/2022 13:34	WG1811358
n-Nitrosodiphenylamine	U		0.0345	0.456	1	02/03/2022 13:34	WG1811358
n-Nitrosodi-n-propylamine	U		0.0152	0.456	1	02/03/2022 13:34	WG1811358
Phenanthrene	U		0.00906	0.0456	1	02/03/2022 13:34	WG1811358
Benzylbutyl phthalate	U		0.0143	0.456	1	02/03/2022 13:34	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0578	0.456	1	02/03/2022 13:34	WG1811358
Di-n-butyl phthalate	U		0.0156	0.456	1	02/03/2022 13:34	WG1811358
Diethyl phthalate	U		0.0151	0.456	1	02/03/2022 13:34	WG1811358
Dimethyl phthalate	U		0.0967	0.456	1	02/03/2022 13:34	WG1811358
Di-n-octyl phthalate	U		0.0308	0.456	1	02/03/2022 13:34	WG1811358
Pyrene	U		0.00888	0.0456	1	02/03/2022 13:34	WG1811358
1,2,4-Trichlorobenzene	U		0.0143	0.456	1	02/03/2022 13:34	WG1811358
4-Chloro-3-methylphenol	U		0.0148	0.456	1	02/03/2022 13:34	WG1811358
2-Chlorophenol	U		0.0151	0.456	1	02/03/2022 13:34	WG1811358
2,4-Dichlorophenol	U		0.0133	0.456	1	02/03/2022 13:34	WG1811358
2,4-Dimethylphenol	U		0.0119	0.456	1	02/03/2022 13:34	WG1811358
4,6-Dinitro-2-methylphenol	U		0.103	0.456	1	02/03/2022 13:34	WG1811358
2,4-Dinitrophenol	U		0.107	0.456	1	02/03/2022 13:34	WG1811358
2-Nitrophenol	U		0.0163	0.456	1	02/03/2022 13:34	WG1811358

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0143	0.456	1	02/03/2022 13:34	WG1811358
Pentachlorophenol	U		0.0123	0.456	1	02/03/2022 13:34	WG1811358
Phenol	0.0351	J	0.0184	0.456	1	02/03/2022 13:34	WG1811358
2,4,6-Trichlorophenol	U		0.0147	0.456	1	02/03/2022 13:34	WG1811358
(S) 2-Fluorophenol	*64.7*			*12.0-120*		*02/03/2022 13:34*	WG1811358
(S) Phenol-d5	*59.1*			*10.0-120*		*02/03/2022 13:34*	WG1811358
(S) Nitrobenzene-d5	*48.3*			*10.0-122*		*02/03/2022 13:34*	WG1811358
(S) 2-Fluorobiphenyl	*60.6*			*15.0-120*		*02/03/2022 13:34*	WG1811358
(S) 2,4,6-Tribromophenol	*66.6*			*10.0-127*		*02/03/2022 13:34*	WG1811358
(S) p-Terphenyl-d14	*76.7*			*10.0-120*		*02/03/2022 13:34*	WG1811358

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	66.0		1	01/29/2022 09:44	WG1810042

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0438	J	0.0273	0.0606	1	01/31/2022 16:41	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.72		0.785	3.03	1	02/02/2022 09:20	WG1811148
Barium	225		0.129	0.758	1	02/02/2022 09:20	WG1811148
Cadmium	4.69		0.0714	0.758	1	02/02/2022 09:20	WG1811148
Chromium	28.5		0.202	1.52	1	02/02/2022 09:20	WG1811148
Lead	60.2		0.315	0.758	1	02/02/2022 09:20	WG1811148
Selenium	U		1.16	3.03	1	02/02/2022 09:20	WG1811148
Silver	U		0.192	1.52	1	02/02/2022 09:20	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0822	0.113	1	01/30/2022 20:19	WG1810459
Acrylonitrile	U		0.00813	0.0282	1	01/30/2022 20:19	WG1810459
Benzene	U		0.00105	0.00225	1	01/30/2022 20:19	WG1810459
Bromobenzene	U		0.00203	0.0282	1	01/30/2022 20:19	WG1810459
Bromodichloromethane	U		0.00163	0.00563	1	01/30/2022 20:19	WG1810459
Bromoform	U		0.00264	0.0563	1	01/30/2022 20:19	WG1810459
Bromomethane	U		0.00444	0.0282	1	01/30/2022 20:19	WG1810459
n-Butylbenzene	U	J4	0.0118	0.0282	1	01/30/2022 20:19	WG1810459
sec-Butylbenzene	U		0.00649	0.0282	1	01/30/2022 20:19	WG1810459
tert-Butylbenzene	U		0.00439	0.0113	1	01/30/2022 20:19	WG1810459
Carbon tetrachloride	U		0.00202	0.0113	1	01/30/2022 20:19	WG1810459
Chlorobenzene	U		0.000473	0.00563	1	01/30/2022 20:19	WG1810459
Chlorodibromomethane	U		0.00138	0.00563	1	01/30/2022 20:19	WG1810459
Chloroethane	U		0.00383	0.0113	1	01/30/2022 20:19	WG1810459
Chloroform	U		0.00232	0.00563	1	01/30/2022 20:19	WG1810459
Chloromethane	U		0.00980	0.0282	1	01/30/2022 20:19	WG1810459
2-Chlorotoluene	U		0.00195	0.00563	1	01/30/2022 20:19	WG1810459
4-Chlorotoluene	U		0.00101	0.0113	1	01/30/2022 20:19	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00878	0.0563	1	01/30/2022 20:19	WG1810459
1,2-Dibromoethane	U		0.00146	0.00563	1	01/30/2022 20:19	WG1810459
Dibromomethane	U		0.00169	0.0113	1	01/30/2022 20:19	WG1810459
1,2-Dichlorobenzene	U		0.000957	0.0113	1	01/30/2022 20:19	WG1810459
1,3-Dichlorobenzene	U		0.00135	0.0113	1	01/30/2022 20:19	WG1810459
1,4-Dichlorobenzene	U		0.00158	0.0113	1	01/30/2022 20:19	WG1810459
Dichlorodifluoromethane	U		0.00363	0.00563	1	01/30/2022 20:19	WG1810459
1,1-Dichloroethane	U		0.00111	0.00563	1	01/30/2022 20:19	WG1810459
1,2-Dichloroethane	U		0.00146	0.00563	1	01/30/2022 20:19	WG1810459
1,1-Dichloroethene	U		0.00136	0.00563	1	01/30/2022 20:19	WG1810459
cis-1,2-Dichloroethene	U		0.00165	0.00563	1	01/30/2022 20:19	WG1810459
trans-1,2-Dichloroethene	U		0.00234	0.0113	1	01/30/2022 20:19	WG1810459
1,2-Dichloropropane	U		0.00320	0.0113	1	01/30/2022 20:19	WG1810459
1,1-Dichloropropene	U		0.00182	0.00563	1	01/30/2022 20:19	WG1810459
1,3-Dichloropropane	U		0.00113	0.0113	1	01/30/2022 20:19	WG1810459

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00170	0.00563	1	01/30/2022 20:19	WG1810459
trans-1,3-Dichloropropene	U		0.00257	0.0113	1	01/30/2022 20:19	WG1810459
2,2-Dichloropropane	U		0.00311	0.00563	1	01/30/2022 20:19	WG1810459
Di-isopropyl ether	U		0.000923	0.00225	1	01/30/2022 20:19	WG1810459
Ethylbenzene	U		0.00166	0.00563	1	01/30/2022 20:19	WG1810459
Hexachloro-1,3-Butadiene	U		0.0135	0.0563	1	01/30/2022 20:19	WG1810459
Isopropylbenzene	U		0.000957	0.00563	1	01/30/2022 20:19	WG1810459
p-Isopropyltoluene	U		0.00574	0.0113	1	01/30/2022 20:19	WG1810459
2-Butanone (MEK)	U		0.143	0.225	1	01/30/2022 20:19	WG1810459
Methylene Chloride	U		0.0150	0.0563	1	01/30/2022 20:19	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00513	0.0563	1	01/30/2022 20:19	WG1810459
Methyl tert-butyl ether	U		0.000788	0.00225	1	01/30/2022 20:19	WG1810459
Naphthalene	U	J4	0.0110	0.0282	1	01/30/2022 20:19	WG1810459
n-Propylbenzene	U		0.00214	0.0113	1	01/30/2022 20:19	WG1810459
Styrene	U		0.000516	0.0282	1	01/30/2022 20:19	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00214	0.00563	1	01/30/2022 20:19	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00157	0.00563	1	01/30/2022 20:19	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00170	0.00563	1	01/30/2022 20:19	WG1810459
Tetrachloroethene	U		0.00202	0.00563	1	01/30/2022 20:19	WG1810459
Toluene	U		0.00293	0.0113	1	01/30/2022 20:19	WG1810459
1,2,3-Trichlorobenzene	U		0.0165	0.0282	1	01/30/2022 20:19	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00991	0.0282	1	01/30/2022 20:19	WG1810459
1,1,1-Trichloroethane	U		0.00208	0.00563	1	01/30/2022 20:19	WG1810459
1,1,2-Trichloroethane	U		0.00134	0.00563	1	01/30/2022 20:19	WG1810459
Trichloroethene	U		0.00132	0.00225	1	01/30/2022 20:19	WG1810459
Trichlorofluoromethane	U	J3	0.00186	0.00563	1	01/30/2022 20:19	WG1810459
1,2,3-Trichloropropane	U	J3	0.00365	0.0282	1	01/30/2022 20:19	WG1810459
1,2,4-Trimethylbenzene	U		0.00356	0.0113	1	01/30/2022 20:19	WG1810459
1,2,3-Trimethylbenzene	U		0.00356	0.0113	1	01/30/2022 20:19	WG1810459
1,3,5-Trimethylbenzene	U		0.00450	0.0113	1	01/30/2022 20:19	WG1810459
Vinyl chloride	U		0.00261	0.00563	1	01/30/2022 20:19	WG1810459
Xylenes, Total	U		0.00198	0.0146	1	01/30/2022 20:19	WG1810459
(S) Toluene-d8	*112*			*75.0-131*		*01/30/2022 20:19*	WG1810459
(S) 4-Bromofluorobenzene	*92.3*			*67.0-138*		*01/30/2022 20:19*	WG1810459
(S) 1,2-Dichloroethane-d4	*87.1*			*70.0-130*		*01/30/2022 20:19*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		22.7	75.8	1	02/04/2022 05:22	WG1812033
TPH C12 - C28	U		22.7	75.8	1	02/04/2022 05:22	WG1812033
TPH C28 - C35	U		22.7	75.8	1	02/04/2022 05:22	WG1812033
TPH C6 - C35	U		22.7	75.8	1	02/04/2022 05:22	WG1812033
(S) o-Terphenyl	*82.8*			*70.0-130*		*02/04/2022 05:22*	WG1812033
(S) 1-chlorooctane	*103*			*70.0-130*		*02/04/2022 05:22*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0179	0.0515	1	02/08/2022 00:05	WG1811393
PCB 1221	U		0.0179	0.0515	1	02/08/2022 00:05	WG1811393
PCB 1232	U		0.0179	0.0515	1	02/08/2022 00:05	WG1811393
PCB 1242	U		0.0179	0.0515	1	02/08/2022 00:05	WG1811393
PCB 1248	U		0.0112	0.0258	1	02/08/2022 00:05	WG1811393
PCB 1254	U		0.0112	0.0258	1	02/08/2022 00:05	WG1811393

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.0112	0.0258	1	02/08/2022 00:05	WG1811393
(S) Decachlorobiphenyl	*54.5*			*10.0-135*		*02/08/2022 00:05*	WG1811393
(S) Tetrachloro-m-xylene	*64.9*			*10.0-139*		*02/08/2022 00:05*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00817	0.0505	1	02/03/2022 14:36	WG1811358
Acenaphthylene	U		0.00711	0.0505	1	02/03/2022 14:36	WG1811358
Anthracene	U		0.00899	0.0505	1	02/03/2022 14:36	WG1811358
Benzidine	U		0.0949	2.53	1	02/03/2022 14:36	WG1811358
Benzo(a)anthracene	U		0.00889	0.0505	1	02/03/2022 14:36	WG1811358
Benzo(b)fluoranthene	U		0.00941	0.0505	1	02/03/2022 14:36	WG1811358
Benzo(k)fluoranthene	U		0.00897	0.0505	1	02/03/2022 14:36	WG1811358
Benzo(g,h,i)perylene	U		0.00923	0.0505	1	02/03/2022 14:36	WG1811358
Benzo(a)pyrene	U		0.00938	0.0505	1	02/03/2022 14:36	WG1811358
Bis(2-chlorethoxy)methane	U		0.0152	0.505	1	02/03/2022 14:36	WG1811358
Bis(2-chloroethyl)ether	U		0.0167	0.505	1	02/03/2022 14:36	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0218	0.505	1	02/03/2022 14:36	WG1811358
4-Bromophenyl-phenylether	U		0.0177	0.505	1	02/03/2022 14:36	WG1811358
2-Chloronaphthalene	U		0.00886	0.0505	1	02/03/2022 14:36	WG1811358
4-Chlorophenyl-phenylether	U		0.0176	0.505	1	02/03/2022 14:36	WG1811358
Chrysene	U		0.0100	0.0505	1	02/03/2022 14:36	WG1811358
Dibenz(a,h)anthracene	U		0.0140	0.0505	1	02/03/2022 14:36	WG1811358
3,3-Dichlorobenzidine	U		0.0186	0.505	1	02/03/2022 14:36	WG1811358
2,4-Dinitrotoluene	U		0.0145	0.505	1	02/03/2022 14:36	WG1811358
2,6-Dinitrotoluene	U		0.0165	0.505	1	02/03/2022 14:36	WG1811358
Fluoranthene	U		0.00911	0.0505	1	02/03/2022 14:36	WG1811358
Fluorene	U		0.00821	0.0505	1	02/03/2022 14:36	WG1811358
Hexachlorobenzene	U		0.0179	0.505	1	02/03/2022 14:36	WG1811358
Hexachloro-1,3-butadiene	U		0.0170	0.505	1	02/03/2022 14:36	WG1811358
Hexachlorocyclopentadiene	U		0.0265	0.505	1	02/03/2022 14:36	WG1811358
Hexachloroethane	U		0.0199	0.505	1	02/03/2022 14:36	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0143	0.0505	1	02/03/2022 14:36	WG1811358
Isophorone	U		0.0155	0.505	1	02/03/2022 14:36	WG1811358
Naphthalene	U		0.0127	0.0505	1	02/03/2022 14:36	WG1811358
Nitrobenzene	U		0.0176	0.505	1	02/03/2022 14:36	WG1811358
n-Nitrosodimethylamine	U		0.0749	0.505	1	02/03/2022 14:36	WG1811358
n-Nitrosodiphenylamine	U		0.0382	0.505	1	02/03/2022 14:36	WG1811358
n-Nitrosodi-n-propylamine	U		0.0168	0.505	1	02/03/2022 14:36	WG1811358
Phenanthrene	U		0.0100	0.0505	1	02/03/2022 14:36	WG1811358
Benzylbutyl phthalate	U		0.0158	0.505	1	02/03/2022 14:36	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0639	0.505	1	02/03/2022 14:36	WG1811358
Di-n-butyl phthalate	U		0.0173	0.505	1	02/03/2022 14:36	WG1811358
Diethyl phthalate	U		0.0167	0.505	1	02/03/2022 14:36	WG1811358
Dimethyl phthalate	U		0.107	0.505	1	02/03/2022 14:36	WG1811358
Di-n-octyl phthalate	U		0.0341	0.505	1	02/03/2022 14:36	WG1811358
Pyrene	U		0.00982	0.0505	1	02/03/2022 14:36	WG1811358
1,2,4-Trichlorobenzene	U		0.0158	0.505	1	02/03/2022 14:36	WG1811358
4-Chloro-3-methylphenol	U		0.0164	0.505	1	02/03/2022 14:36	WG1811358
2-Chlorophenol	U		0.0167	0.505	1	02/03/2022 14:36	WG1811358
2,4-Dichlorophenol	U		0.0147	0.505	1	02/03/2022 14:36	WG1811358
2,4-Dimethylphenol	U		0.0132	0.505	1	02/03/2022 14:36	WG1811358
4,6-Dinitro-2-methylphenol	U		0.114	0.505	1	02/03/2022 14:36	WG1811358
2,4-Dinitrophenol	U		0.118	0.505	1	02/03/2022 14:36	WG1811358
2-Nitrophenol	U		0.0180	0.505	1	02/03/2022 14:36	WG1811358

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0158	0.505	1	02/03/2022 14:36	WG1811358
Pentachlorophenol	U		0.0136	0.505	1	02/03/2022 14:36	WG1811358
Phenol	0.0783	J	0.0203	0.505	1	02/03/2022 14:36	WG1811358
2,4,6-Trichlorophenol	U		0.0162	0.505	1	02/03/2022 14:36	WG1811358
(S) 2-Fluorophenol	*63.5*			*12.0-120*		*02/03/2022 14:36*	WG1811358
(S) Phenol-d5	*58.2*			*10.0-120*		*02/03/2022 14:36*	WG1811358
(S) Nitrobenzene-d5	*46.4*			*10.0-122*		*02/03/2022 14:36*	WG1811358
(S) 2-Fluorobiphenyl	*61.3*			*15.0-120*		*02/03/2022 14:36*	WG1811358
(S) 2,4,6-Tribromophenol	*66.7*			*10.0-127*		*02/03/2022 14:36*	WG1811358
(S) p-Terphenyl-d14	*73.1*			*10.0-120*		*02/03/2022 14:36*	WG1811358

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	74.6		1	01/29/2022 09:44	WG1810042

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0293	J	0.0241	0.0536	1	01/31/2022 16:44	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	9.07		0.694	2.68	1	02/02/2022 09:22	WG1811148
Barium	145		0.114	0.670	1	02/02/2022 09:22	WG1811148
Cadmium	3.89		0.0631	0.670	1	02/02/2022 09:22	WG1811148
Chromium	19.7		0.178	1.34	1	02/02/2022 09:22	WG1811148
Lead	23.9		0.279	0.670	1	02/02/2022 09:22	WG1811148
Selenium	U		1.02	2.68	1	02/02/2022 09:22	WG1811148
Silver	U		0.170	1.34	1	02/02/2022 09:22	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0632	0.0866	1	01/30/2022 20:39	WG1810459
Acrylonitrile	U		0.00625	0.0216	1	01/30/2022 20:39	WG1810459
Benzene	U		0.000808	0.00173	1	01/30/2022 20:39	WG1810459
Bromobenzene	U		0.00156	0.0216	1	01/30/2022 20:39	WG1810459
Bromodichloromethane	U		0.00126	0.00433	1	01/30/2022 20:39	WG1810459
Bromoform	U		0.00203	0.0433	1	01/30/2022 20:39	WG1810459
Bromomethane	U		0.00341	0.0216	1	01/30/2022 20:39	WG1810459
n-Butylbenzene	U	J4	0.00909	0.0216	1	01/30/2022 20:39	WG1810459
sec-Butylbenzene	U		0.00499	0.0216	1	01/30/2022 20:39	WG1810459
tert-Butylbenzene	U		0.00338	0.00866	1	01/30/2022 20:39	WG1810459
Carbon tetrachloride	U		0.00155	0.00866	1	01/30/2022 20:39	WG1810459
Chlorobenzene	U		0.000364	0.00433	1	01/30/2022 20:39	WG1810459
Chlorodibromomethane	U		0.00106	0.00433	1	01/30/2022 20:39	WG1810459
Chloroethane	U		0.00294	0.00866	1	01/30/2022 20:39	WG1810459
Chloroform	U		0.00178	0.00433	1	01/30/2022 20:39	WG1810459
Chloromethane	U		0.00753	0.0216	1	01/30/2022 20:39	WG1810459
2-Chlorotoluene	U		0.00150	0.00433	1	01/30/2022 20:39	WG1810459
4-Chlorotoluene	U		0.000779	0.00866	1	01/30/2022 20:39	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00675	0.0433	1	01/30/2022 20:39	WG1810459
1,2-Dibromoethane	U		0.00112	0.00433	1	01/30/2022 20:39	WG1810459
Dibromomethane	U		0.00130	0.00866	1	01/30/2022 20:39	WG1810459
1,2-Dichlorobenzene	U		0.000736	0.00866	1	01/30/2022 20:39	WG1810459
1,3-Dichlorobenzene	U		0.00104	0.00866	1	01/30/2022 20:39	WG1810459
1,4-Dichlorobenzene	U		0.00121	0.00866	1	01/30/2022 20:39	WG1810459
Dichlorodifluoromethane	U		0.00279	0.00433	1	01/30/2022 20:39	WG1810459
1,1-Dichloroethane	U		0.000850	0.00433	1	01/30/2022 20:39	WG1810459
1,2-Dichloroethane	U		0.00112	0.00433	1	01/30/2022 20:39	WG1810459
1,1-Dichloroethene	U		0.00105	0.00433	1	01/30/2022 20:39	WG1810459
cis-1,2-Dichloroethene	U		0.00127	0.00433	1	01/30/2022 20:39	WG1810459
trans-1,2-Dichloroethene	U		0.00180	0.00866	1	01/30/2022 20:39	WG1810459
1,2-Dichloropropane	U		0.00246	0.00866	1	01/30/2022 20:39	WG1810459
1,1-Dichloropropene	U		0.00140	0.00433	1	01/30/2022 20:39	WG1810459
1,3-Dichloropropane	U		0.000867	0.00866	1	01/30/2022 20:39	WG1810459

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00131	0.00433	1	01/30/2022 20:39	WG1810459
trans-1,3-Dichloropropene	U		0.00197	0.00866	1	01/30/2022 20:39	WG1810459
2,2-Dichloropropane	U		0.00239	0.00433	1	01/30/2022 20:39	WG1810459
Di-isopropyl ether	U		0.000710	0.00173	1	01/30/2022 20:39	WG1810459
Ethylbenzene	U		0.00128	0.00433	1	01/30/2022 20:39	WG1810459
Hexachloro-1,3-Butadiene	U		0.0104	0.0433	1	01/30/2022 20:39	WG1810459
Isopropylbenzene	U		0.000736	0.00433	1	01/30/2022 20:39	WG1810459
p-Isopropyltoluene	U		0.00441	0.00866	1	01/30/2022 20:39	WG1810459
2-Butanone (MEK)	U		0.110	0.173	1	01/30/2022 20:39	WG1810459
Methylene Chloride	U		0.0115	0.0433	1	01/30/2022 20:39	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00395	0.0433	1	01/30/2022 20:39	WG1810459
Methyl tert-butyl ether	U		0.000606	0.00173	1	01/30/2022 20:39	WG1810459
Naphthalene	U	J4	0.00845	0.0216	1	01/30/2022 20:39	WG1810459
n-Propylbenzene	U		0.00164	0.00866	1	01/30/2022 20:39	WG1810459
Styrene	U		0.000396	0.0216	1	01/30/2022 20:39	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00164	0.00433	1	01/30/2022 20:39	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00120	0.00433	1	01/30/2022 20:39	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00131	0.00433	1	01/30/2022 20:39	WG1810459
Tetrachloroethene	U		0.00155	0.00433	1	01/30/2022 20:39	WG1810459
Toluene	U		0.00225	0.00866	1	01/30/2022 20:39	WG1810459
1,2,3-Trichlorobenzene	U		0.0127	0.0216	1	01/30/2022 20:39	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00762	0.0216	1	01/30/2022 20:39	WG1810459
1,1,1-Trichloroethane	U		0.00160	0.00433	1	01/30/2022 20:39	WG1810459
1,1,2-Trichloroethane	U		0.00103	0.00433	1	01/30/2022 20:39	WG1810459
Trichloroethene	U		0.00101	0.00173	1	01/30/2022 20:39	WG1810459
Trichlorofluoromethane	U	J3	0.00143	0.00433	1	01/30/2022 20:39	WG1810459
1,2,3-Trichloropropane	U	J3	0.00280	0.0216	1	01/30/2022 20:39	WG1810459
1,2,4-Trimethylbenzene	U		0.00274	0.00866	1	01/30/2022 20:39	WG1810459
1,2,3-Trimethylbenzene	U		0.00274	0.00866	1	01/30/2022 20:39	WG1810459
1,3,5-Trimethylbenzene	U		0.00346	0.00866	1	01/30/2022 20:39	WG1810459
Vinyl chloride	U		0.00201	0.00433	1	01/30/2022 20:39	WG1810459
Xylenes, Total	U		0.00152	0.0113	1	01/30/2022 20:39	WG1810459
(S) Toluene-d8	*112*			*75.0-131*		*01/30/2022 20:39*	WG1810459
(S) 4-Bromofluorobenzene	*89.6*			*67.0-138*		*01/30/2022 20:39*	WG1810459
(S) 1,2-Dichloroethane-d4	*86.2*			*70.0-130*		*01/30/2022 20:39*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		20.1	67.0	1	02/04/2022 05:38	WG1812033
TPH C12 - C28	U		20.1	67.0	1	02/04/2022 05:38	WG1812033
TPH C28 - C35	U		20.1	67.0	1	02/04/2022 05:38	WG1812033
TPH C6 - C35	U		20.1	67.0	1	02/04/2022 05:38	WG1812033
(S) o-Terphenyl	*85.2*			*70.0-130*		*02/04/2022 05:38*	WG1812033
(S) 1-chlorooctane	*106*			*70.0-130*		*02/04/2022 05:38*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0158	0.0456	1	02/08/2022 00:15	WG1811393
PCB 1221	U		0.0158	0.0456	1	02/08/2022 00:15	WG1811393
PCB 1232	U		0.0158	0.0456	1	02/08/2022 00:15	WG1811393
PCB 1242	U		0.0158	0.0456	1	02/08/2022 00:15	WG1811393
PCB 1248	U		0.00989	0.0228	1	02/08/2022 00:15	WG1811393
PCB 1254	U		0.00989	0.0228	1	02/08/2022 00:15	WG1811393

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00989	0.0228	1	02/08/2022 00:15	WG1811393
(S) Decachlorobiphenyl	*54.9*			*10.0-135*		*02/08/2022 00:15*	WG1811393
(S) Tetrachloro-m-xylene	*65.6*			*10.0-139*		*02/08/2022 00:15*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00722	0.0446	1	02/03/2022 11:18	WG1811358
Acenaphthylene	U		0.00629	0.0446	1	02/03/2022 11:18	WG1811358
Anthracene	U		0.00795	0.0446	1	02/03/2022 11:18	WG1811358
Benzidine	U		0.0839	2.24	1	02/03/2022 11:18	WG1811358
Benzo(a)anthracene	U		0.00787	0.0446	1	02/03/2022 11:18	WG1811358
Benzo(b)fluoranthene	U		0.00832	0.0446	1	02/03/2022 11:18	WG1811358
Benzo(k)fluoranthene	U		0.00794	0.0446	1	02/03/2022 11:18	WG1811358
Benzo(g,h,i)perylene	U		0.00816	0.0446	1	02/03/2022 11:18	WG1811358
Benzo(a)pyrene	U		0.00830	0.0446	1	02/03/2022 11:18	WG1811358
Bis(2-chlorethoxy)methane	U		0.0134	0.446	1	02/03/2022 11:18	WG1811358
Bis(2-chloroethyl)ether	U		0.0147	0.446	1	02/03/2022 11:18	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0193	0.446	1	02/03/2022 11:18	WG1811358
4-Bromophenyl-phenylether	U		0.0157	0.446	1	02/03/2022 11:18	WG1811358
2-Chloronaphthalene	U		0.00784	0.0446	1	02/03/2022 11:18	WG1811358
4-Chlorophenyl-phenylether	U		0.0155	0.446	1	02/03/2022 11:18	WG1811358
Chrysene	U		0.00887	0.0446	1	02/03/2022 11:18	WG1811358
Dibenz(a,h)anthracene	U		0.0124	0.0446	1	02/03/2022 11:18	WG1811358
3,3-Dichlorobenzidine	U		0.0165	0.446	1	02/03/2022 11:18	WG1811358
2,4-Dinitrotoluene	U		0.0128	0.446	1	02/03/2022 11:18	WG1811358
2,6-Dinitrotoluene	U		0.0146	0.446	1	02/03/2022 11:18	WG1811358
Fluoranthene	U		0.00806	0.0446	1	02/03/2022 11:18	WG1811358
Fluorene	U		0.00727	0.0446	1	02/03/2022 11:18	WG1811358
Hexachlorobenzene	U		0.0158	0.446	1	02/03/2022 11:18	WG1811358
Hexachloro-1,3-butadiene	U		0.0150	0.446	1	02/03/2022 11:18	WG1811358
Hexachlorocyclopentadiene	U		0.0235	0.446	1	02/03/2022 11:18	WG1811358
Hexachloroethane	U		0.0176	0.446	1	02/03/2022 11:18	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0126	0.0446	1	02/03/2022 11:18	WG1811358
Isophorone	U		0.0137	0.446	1	02/03/2022 11:18	WG1811358
Naphthalene	U		0.0112	0.0446	1	02/03/2022 11:18	WG1811358
Nitrobenzene	U		0.0155	0.446	1	02/03/2022 11:18	WG1811358
n-Nitrosodimethylamine	U		0.0662	0.446	1	02/03/2022 11:18	WG1811358
n-Nitrosodiphenylamine	U		0.0338	0.446	1	02/03/2022 11:18	WG1811358
n-Nitrosodi-n-propylamine	U		0.0149	0.446	1	02/03/2022 11:18	WG1811358
Phenanthrene	U		0.00886	0.0446	1	02/03/2022 11:18	WG1811358
Benzylbutyl phthalate	U		0.0139	0.446	1	02/03/2022 11:18	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0566	0.446	1	02/03/2022 11:18	WG1811358
Di-n-butyl phthalate	U		0.0153	0.446	1	02/03/2022 11:18	WG1811358
Diethyl phthalate	U		0.0147	0.446	1	02/03/2022 11:18	WG1811358
Dimethyl phthalate	U		0.0946	0.446	1	02/03/2022 11:18	WG1811358
Di-n-octyl phthalate	U		0.0302	0.446	1	02/03/2022 11:18	WG1811358
Pyrene	U		0.00869	0.0446	1	02/03/2022 11:18	WG1811358
1,2,4-Trichlorobenzene	U		0.0139	0.446	1	02/03/2022 11:18	WG1811358
4-Chloro-3-methylphenol	U		0.0145	0.446	1	02/03/2022 11:18	WG1811358
2-Chlorophenol	U		0.0147	0.446	1	02/03/2022 11:18	WG1811358
2,4-Dichlorophenol	U		0.0130	0.446	1	02/03/2022 11:18	WG1811358
2,4-Dimethylphenol	U		0.0117	0.446	1	02/03/2022 11:18	WG1811358
4,6-Dinitro-2-methylphenol	U		0.101	0.446	1	02/03/2022 11:18	WG1811358
2,4-Dinitrophenol	U		0.104	0.446	1	02/03/2022 11:18	WG1811358
2-Nitrophenol	U		0.0160	0.446	1	02/03/2022 11:18	WG1811358

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0139	0.446	1	02/03/2022 11:18	WG1811358
Pentachlorophenol	U		0.0120	0.446	1	02/03/2022 11:18	WG1811358
Phenol	0.0985	J	0.0180	0.446	1	02/03/2022 11:18	WG1811358
2,4,6-Trichlorophenol	U		0.0143	0.446	1	02/03/2022 11:18	WG1811358
(S) 2-Fluorophenol	*63.4*			*12.0-120*		*02/03/2022 11:18*	WG1811358
(S) Phenol-d5	*57.5*			*10.0-120*		*02/03/2022 11:18*	WG1811358
(S) Nitrobenzene-d5	*46.6*			*10.0-122*		*02/03/2022 11:18*	WG1811358
(S) 2-Fluorobiphenyl	*60.1*			*15.0-120*		*02/03/2022 11:18*	WG1811358
(S) 2,4,6-Tribromophenol	*63.1*			*10.0-127*		*02/03/2022 11:18*	WG1811358
(S) p-Terphenyl-d14	*68.7*			*10.0-120*		*02/03/2022 11:18*	WG1811358

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	74.1		1	01/29/2022 09:44	WG1810042

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0243	0.0540	1	01/31/2022 16:46	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.31		0.700	2.70	1	02/02/2022 09:25	WG1811148
Barium	97.0		0.115	0.675	1	02/02/2022 09:25	WG1811148
Cadmium	1.73		0.0636	0.675	1	02/02/2022 09:25	WG1811148
Chromium	23.1		0.180	1.35	1	02/02/2022 09:25	WG1811148
Lead	22.7		0.281	0.675	1	02/02/2022 09:25	WG1811148
Selenium	U		1.03	2.70	1	02/02/2022 09:25	WG1811148
Silver	U		0.172	1.35	1	02/02/2022 09:25	WG1811148

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0677	0.0928	1	01/30/2022 20:59	WG1810459
Acrylonitrile	U		0.00670	0.0232	1	01/30/2022 20:59	WG1810459
Benzene	U		0.000866	0.00186	1	01/30/2022 20:59	WG1810459
Bromobenzene	U		0.00167	0.0232	1	01/30/2022 20:59	WG1810459
Bromodichloromethane	U		0.00135	0.00464	1	01/30/2022 20:59	WG1810459
Bromoform	U		0.00217	0.0464	1	01/30/2022 20:59	WG1810459
Bromomethane	U		0.00366	0.0232	1	01/30/2022 20:59	WG1810459
n-Butylbenzene	U	J4	0.00974	0.0232	1	01/30/2022 20:59	WG1810459
sec-Butylbenzene	U		0.00534	0.0232	1	01/30/2022 20:59	WG1810459
tert-Butylbenzene	U		0.00362	0.00928	1	01/30/2022 20:59	WG1810459
Carbon tetrachloride	U		0.00167	0.00928	1	01/30/2022 20:59	WG1810459
Chlorobenzene	U		0.000390	0.00464	1	01/30/2022 20:59	WG1810459
Chlorodibromomethane	U		0.00114	0.00464	1	01/30/2022 20:59	WG1810459
Chloroethane	U		0.00315	0.00928	1	01/30/2022 20:59	WG1810459
Chloroform	U		0.00191	0.00464	1	01/30/2022 20:59	WG1810459
Chloromethane	U		0.00807	0.0232	1	01/30/2022 20:59	WG1810459
2-Chlorotoluene	U		0.00160	0.00464	1	01/30/2022 20:59	WG1810459
4-Chlorotoluene	U		0.000835	0.00928	1	01/30/2022 20:59	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00724	0.0464	1	01/30/2022 20:59	WG1810459
1,2-Dibromoethane	U		0.00120	0.00464	1	01/30/2022 20:59	WG1810459
Dibromomethane	U		0.00139	0.00928	1	01/30/2022 20:59	WG1810459
1,2-Dichlorobenzene	U		0.000789	0.00928	1	01/30/2022 20:59	WG1810459
1,3-Dichlorobenzene	U		0.00111	0.00928	1	01/30/2022 20:59	WG1810459
1,4-Dichlorobenzene	U		0.00130	0.00928	1	01/30/2022 20:59	WG1810459
Dichlorodifluoromethane	U		0.00299	0.00464	1	01/30/2022 20:59	WG1810459
1,1-Dichloroethane	U		0.000911	0.00464	1	01/30/2022 20:59	WG1810459
1,2-Dichloroethane	U		0.00120	0.00464	1	01/30/2022 20:59	WG1810459
1,1-Dichloroethene	U		0.00112	0.00464	1	01/30/2022 20:59	WG1810459
cis-1,2-Dichloroethene	U		0.00136	0.00464	1	01/30/2022 20:59	WG1810459
trans-1,2-Dichloroethene	U		0.00193	0.00928	1	01/30/2022 20:59	WG1810459
1,2-Dichloropropane	U		0.00263	0.00928	1	01/30/2022 20:59	WG1810459
1,1-Dichloropropene	U		0.00150	0.00464	1	01/30/2022 20:59	WG1810459
1,3-Dichloropropane	U		0.000930	0.00928	1	01/30/2022 20:59	WG1810459

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Cp Tc Ss Cn Sr Qc Gl Al Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00140	0.00464	1	01/30/2022 20:59	WG1810459
trans-1,3-Dichloropropene	U		0.00212	0.00928	1	01/30/2022 20:59	WG1810459
2,2-Dichloropropane	U		0.00256	0.00464	1	01/30/2022 20:59	WG1810459
Di-isopropyl ether	U		0.000761	0.00186	1	01/30/2022 20:59	WG1810459
Ethylbenzene	U		0.00137	0.00464	1	01/30/2022 20:59	WG1810459
Hexachloro-1,3-Butadiene	U		0.0111	0.0464	1	01/30/2022 20:59	WG1810459
Isopropylbenzene	U		0.000789	0.00464	1	01/30/2022 20:59	WG1810459
p-Isopropyltoluene	U		0.00473	0.00928	1	01/30/2022 20:59	WG1810459
2-Butanone (MEK)	U		0.118	0.186	1	01/30/2022 20:59	WG1810459
Methylene Chloride	U		0.0123	0.0464	1	01/30/2022 20:59	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00423	0.0464	1	01/30/2022 20:59	WG1810459
Methyl tert-butyl ether	U		0.000649	0.00186	1	01/30/2022 20:59	WG1810459
Naphthalene	U	J4	0.00905	0.0232	1	01/30/2022 20:59	WG1810459
n-Propylbenzene	U		0.00176	0.00928	1	01/30/2022 20:59	WG1810459
Styrene	U		0.000425	0.0232	1	01/30/2022 20:59	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00176	0.00464	1	01/30/2022 20:59	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00129	0.00464	1	01/30/2022 20:59	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00140	0.00464	1	01/30/2022 20:59	WG1810459
Tetrachloroethene	U		0.00166	0.00464	1	01/30/2022 20:59	WG1810459
Toluene	U		0.00241	0.00928	1	01/30/2022 20:59	WG1810459
1,2,3-Trichlorobenzene	U		0.0136	0.0232	1	01/30/2022 20:59	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00816	0.0232	1	01/30/2022 20:59	WG1810459
1,1,1-Trichloroethane	U		0.00171	0.00464	1	01/30/2022 20:59	WG1810459
1,1,2-Trichloroethane	U		0.00111	0.00464	1	01/30/2022 20:59	WG1810459
Trichloroethene	U		0.00108	0.00186	1	01/30/2022 20:59	WG1810459
Trichlorofluoromethane	U	J3	0.00153	0.00464	1	01/30/2022 20:59	WG1810459
1,2,3-Trichloropropane	U	J3	0.00301	0.0232	1	01/30/2022 20:59	WG1810459
1,2,4-Trimethylbenzene	U		0.00293	0.00928	1	01/30/2022 20:59	WG1810459
1,2,3-Trimethylbenzene	U		0.00293	0.00928	1	01/30/2022 20:59	WG1810459
1,3,5-Trimethylbenzene	U		0.00371	0.00928	1	01/30/2022 20:59	WG1810459
Vinyl chloride	U		0.00215	0.00464	1	01/30/2022 20:59	WG1810459
Xylenes, Total	U		0.00163	0.0121	1	01/30/2022 20:59	WG1810459
(S) Toluene-d8	*104*			*75.0-131*		*01/30/2022 20:59*	WG1810459
(S) 4-Bromofluorobenzene	*109*			*67.0-138*		*01/30/2022 20:59*	WG1810459
(S) 1,2-Dichloroethane-d4	*92.0*			*70.0-130*		*01/30/2022 20:59*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		20.3	67.5	1	02/04/2022 05:54	WG1812033
TPH C12 - C28	U		20.3	67.5	1	02/04/2022 05:54	WG1812033
TPH C28 - C35	U		20.3	67.5	1	02/04/2022 05:54	WG1812033
TPH C6 - C35	U		20.3	67.5	1	02/04/2022 05:54	WG1812033
(S) o-Terphenyl	*81.2*			*70.0-130*		*02/04/2022 05:54*	WG1812033
(S) 1-chlorooctane	*101*			*70.0-130*		*02/04/2022 05:54*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0159	0.0459	1	02/08/2022 00:24	WG1811393
PCB 1221	U		0.0159	0.0459	1	02/08/2022 00:24	WG1811393
PCB 1232	U		0.0159	0.0459	1	02/08/2022 00:24	WG1811393
PCB 1242	U		0.0159	0.0459	1	02/08/2022 00:24	WG1811393
PCB 1248	U		0.00997	0.0230	1	02/08/2022 00:24	WG1811393
PCB 1254	U		0.00997	0.0230	1	02/08/2022 00:24	WG1811393

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.00997	0.0230	1	02/08/2022 00:24	WG1811393
(S) Decachlorobiphenyl	*53.1*			*10.0-135*		*02/08/2022 00:24*	WG1811393
(S) Tetrachloro-m-xylene	*59.8*			*10.0-139*		*02/08/2022 00:24*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00728	0.0450	1	02/03/2022 13:54	WG1811358
Acenaphthylene	U		0.00633	0.0450	1	02/03/2022 13:54	WG1811358
Anthracene	U		0.00801	0.0450	1	02/03/2022 13:54	WG1811358
Benzidine	U		0.0845	2.26	1	02/03/2022 13:54	WG1811358
Benzo(a)anthracene	U		0.00793	0.0450	1	02/03/2022 13:54	WG1811358
Benzo(b)fluoranthene	U		0.00839	0.0450	1	02/03/2022 13:54	WG1811358
Benzo(k)fluoranthene	U		0.00799	0.0450	1	02/03/2022 13:54	WG1811358
Benzo(g,h,i)perylene	U		0.00822	0.0450	1	02/03/2022 13:54	WG1811358
Benzo(a)pyrene	U		0.00836	0.0450	1	02/03/2022 13:54	WG1811358
Bis(2-chlorethoxy)methane	U		0.0135	0.450	1	02/03/2022 13:54	WG1811358
Bis(2-chloroethyl)ether	U		0.0149	0.450	1	02/03/2022 13:54	WG1811358
2,2-Oxybis(1-Chloropropane)	U		0.0194	0.450	1	02/03/2022 13:54	WG1811358
4-Bromophenyl-phenylether	U		0.0158	0.450	1	02/03/2022 13:54	WG1811358
2-Chloronaphthalene	U		0.00790	0.0450	1	02/03/2022 13:54	WG1811358
4-Chlorophenyl-phenylether	U		0.0157	0.450	1	02/03/2022 13:54	WG1811358
Chrysene	U		0.00894	0.0450	1	02/03/2022 13:54	WG1811358
Dibenz(a,h)anthracene	U		0.0125	0.0450	1	02/03/2022 13:54	WG1811358
3,3-Dichlorobenzidine	U		0.0166	0.450	1	02/03/2022 13:54	WG1811358
2,4-Dinitrotoluene	U		0.0129	0.450	1	02/03/2022 13:54	WG1811358
2,6-Dinitrotoluene	U		0.0147	0.450	1	02/03/2022 13:54	WG1811358
Fluoranthene	U		0.00812	0.0450	1	02/03/2022 13:54	WG1811358
Fluorene	U		0.00732	0.0450	1	02/03/2022 13:54	WG1811358
Hexachlorobenzene	U		0.0159	0.450	1	02/03/2022 13:54	WG1811358
Hexachloro-1,3-butadiene	U		0.0151	0.450	1	02/03/2022 13:54	WG1811358
Hexachlorocyclopentadiene	U		0.0236	0.450	1	02/03/2022 13:54	WG1811358
Hexachloroethane	U		0.0177	0.450	1	02/03/2022 13:54	WG1811358
Indeno(1,2,3-cd)pyrene	U		0.0127	0.0450	1	02/03/2022 13:54	WG1811358
Isophorone	U		0.0138	0.450	1	02/03/2022 13:54	WG1811358
Naphthalene	0.0114	J	0.0113	0.0450	1	02/03/2022 13:54	WG1811358
Nitrobenzene	U		0.0157	0.450	1	02/03/2022 13:54	WG1811358
n-Nitrosodimethylamine	U		0.0667	0.450	1	02/03/2022 13:54	WG1811358
n-Nitrosodiphenylamine	U		0.0340	0.450	1	02/03/2022 13:54	WG1811358
n-Nitrosodi-n-propylamine	U		0.0150	0.450	1	02/03/2022 13:54	WG1811358
Phenanthrene	U		0.00893	0.0450	1	02/03/2022 13:54	WG1811358
Benzylbutyl phthalate	U		0.0140	0.450	1	02/03/2022 13:54	WG1811358
Bis(2-ethylhexyl)phthalate	U		0.0570	0.450	1	02/03/2022 13:54	WG1811358
Di-n-butyl phthalate	U		0.0154	0.450	1	02/03/2022 13:54	WG1811358
Diethyl phthalate	U		0.0149	0.450	1	02/03/2022 13:54	WG1811358
Dimethyl phthalate	U		0.0953	0.450	1	02/03/2022 13:54	WG1811358
Di-n-octyl phthalate	U		0.0304	0.450	1	02/03/2022 13:54	WG1811358
Pyrene	U		0.00875	0.0450	1	02/03/2022 13:54	WG1811358
1,2,4-Trichlorobenzene	U		0.0140	0.450	1	02/03/2022 13:54	WG1811358
4-Chloro-3-methylphenol	U		0.0146	0.450	1	02/03/2022 13:54	WG1811358
2-Chlorophenol	U		0.0149	0.450	1	02/03/2022 13:54	WG1811358
2,4-Dichlorophenol	U		0.0131	0.450	1	02/03/2022 13:54	WG1811358
2,4-Dimethylphenol	U		0.0117	0.450	1	02/03/2022 13:54	WG1811358
4,6-Dinitro-2-methylphenol	U		0.102	0.450	1	02/03/2022 13:54	WG1811358
2,4-Dinitrophenol	U		0.105	0.450	1	02/03/2022 13:54	WG1811358
2-Nitrophenol	U		0.0161	0.450	1	02/03/2022 13:54	WG1811358

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0140	0.450	1	02/03/2022 13:54	WG1811358
Pentachlorophenol	U		0.0121	0.450	1	02/03/2022 13:54	WG1811358
Phenol	0.0702	J	0.0181	0.450	1	02/03/2022 13:54	WG1811358
2,4,6-Trichlorophenol	U		0.0144	0.450	1	02/03/2022 13:54	WG1811358
(S) 2-Fluorophenol	*65.9*			*12.0-120*		*02/03/2022 13:54*	WG1811358
(S) Phenol-d5	*60.0*			*10.0-120*		*02/03/2022 13:54*	WG1811358
(S) Nitrobenzene-d5	*47.5*			*10.0-122*		*02/03/2022 13:54*	WG1811358
(S) 2-Fluorobiphenyl	*60.5*			*15.0-120*		*02/03/2022 13:54*	WG1811358
(S) 2,4,6-Tribromophenol	*65.3*			*10.0-127*		*02/03/2022 13:54*	WG1811358
(S) p-Terphenyl-d14	*71.0*			*10.0-120*		*02/03/2022 13:54*	WG1811358

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	71.8		1	01/29/2022 09:44	WG1810042

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0416	J	0.0251	0.0557	1	01/31/2022 16:49	WG1810356

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	U		0.722	2.79	1	02/02/2022 20:24	WG1811226
Barium	122		0.119	0.697	1	02/02/2022 20:24	WG1811226
Cadmium	4.60		0.0656	0.697	1	02/02/2022 20:24	WG1811226
Chromium	22.3		0.185	1.39	1	02/02/2022 20:24	WG1811226
Lead	37.9		0.290	0.697	1	02/02/2022 20:24	WG1811226
Selenium	U		1.06	2.79	1	02/02/2022 20:24	WG1811226
Silver	U		0.177	1.39	1	02/02/2022 20:24	WG1811226

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	U		0.0654	0.0896	1	01/30/2022 21:19	WG1810459
Acrylonitrile	U		0.00647	0.0224	1	01/30/2022 21:19	WG1810459
Benzene	U		0.000837	0.00179	1	01/30/2022 21:19	WG1810459
Bromobenzene	U		0.00161	0.0224	1	01/30/2022 21:19	WG1810459
Bromodichloromethane	U		0.00130	0.00448	1	01/30/2022 21:19	WG1810459
Bromoform	U		0.00210	0.0448	1	01/30/2022 21:19	WG1810459
Bromomethane	U		0.00353	0.0224	1	01/30/2022 21:19	WG1810459
n-Butylbenzene	U	J4	0.00941	0.0224	1	01/30/2022 21:19	WG1810459
sec-Butylbenzene	U		0.00516	0.0224	1	01/30/2022 21:19	WG1810459
tert-Butylbenzene	U		0.00349	0.00896	1	01/30/2022 21:19	WG1810459
Carbon tetrachloride	U		0.00161	0.00896	1	01/30/2022 21:19	WG1810459
Chlorobenzene	U		0.000376	0.00448	1	01/30/2022 21:19	WG1810459
Chlorodibromomethane	U		0.00110	0.00448	1	01/30/2022 21:19	WG1810459
Chloroethane	U		0.00305	0.00896	1	01/30/2022 21:19	WG1810459
Chloroform	U		0.00185	0.00448	1	01/30/2022 21:19	WG1810459
Chloromethane	U		0.00780	0.0224	1	01/30/2022 21:19	WG1810459
2-Chlorotoluene	U		0.00155	0.00448	1	01/30/2022 21:19	WG1810459
4-Chlorotoluene	U		0.000806	0.00896	1	01/30/2022 21:19	WG1810459
1,2-Dibromo-3-Chloropropane	U		0.00699	0.0448	1	01/30/2022 21:19	WG1810459
1,2-Dibromoethane	U		0.00116	0.00448	1	01/30/2022 21:19	WG1810459
Dibromomethane	U		0.00134	0.00896	1	01/30/2022 21:19	WG1810459
1,2-Dichlorobenzene	U		0.000762	0.00896	1	01/30/2022 21:19	WG1810459
1,3-Dichlorobenzene	U		0.00108	0.00896	1	01/30/2022 21:19	WG1810459
1,4-Dichlorobenzene	U		0.00125	0.00896	1	01/30/2022 21:19	WG1810459
Dichlorodifluoromethane	U		0.00289	0.00448	1	01/30/2022 21:19	WG1810459
1,1-Dichloroethane	U		0.000880	0.00448	1	01/30/2022 21:19	WG1810459
1,2-Dichloroethane	U		0.00116	0.00448	1	01/30/2022 21:19	WG1810459
1,1-Dichloroethene	U		0.00109	0.00448	1	01/30/2022 21:19	WG1810459
cis-1,2-Dichloroethene	U		0.00132	0.00448	1	01/30/2022 21:19	WG1810459
trans-1,2-Dichloroethene	U		0.00186	0.00896	1	01/30/2022 21:19	WG1810459
1,2-Dichloropropane	U		0.00254	0.00896	1	01/30/2022 21:19	WG1810459
1,1-Dichloropropene	U		0.00145	0.00448	1	01/30/2022 21:19	WG1810459
1,3-Dichloropropane	U		0.000898	0.00896	1	01/30/2022 21:19	WG1810459

1 Cp 2 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.00136	0.00448	1	01/30/2022 21:19	WG1810459
trans-1,3-Dichloropropene	U		0.00204	0.00896	1	01/30/2022 21:19	WG1810459
2,2-Dichloropropane	U		0.00247	0.00448	1	01/30/2022 21:19	WG1810459
Di-isopropyl ether	U		0.000735	0.00179	1	01/30/2022 21:19	WG1810459
Ethylbenzene	U		0.00132	0.00448	1	01/30/2022 21:19	WG1810459
Hexachloro-1,3-Butadiene	U		0.0108	0.0448	1	01/30/2022 21:19	WG1810459
Isopropylbenzene	U		0.000762	0.00448	1	01/30/2022 21:19	WG1810459
p-Isopropyltoluene	U		0.00457	0.00896	1	01/30/2022 21:19	WG1810459
2-Butanone (MEK)	U		0.114	0.179	1	01/30/2022 21:19	WG1810459
Methylene Chloride	U		0.0119	0.0448	1	01/30/2022 21:19	WG1810459
4-Methyl-2-pentanone (MIBK)	U		0.00409	0.0448	1	01/30/2022 21:19	WG1810459
Methyl tert-butyl ether	U		0.000627	0.00179	1	01/30/2022 21:19	WG1810459
Naphthalene	U	J4	0.00875	0.0224	1	01/30/2022 21:19	WG1810459
n-Propylbenzene	U		0.00170	0.00896	1	01/30/2022 21:19	WG1810459
Styrene	U		0.000410	0.0224	1	01/30/2022 21:19	WG1810459
1,1,1,2-Tetrachloroethane	U		0.00170	0.00448	1	01/30/2022 21:19	WG1810459
1,1,2,2-Tetrachloroethane	U		0.00125	0.00448	1	01/30/2022 21:19	WG1810459
1,1,2-Trichlorotrifluoroethane	U		0.00135	0.00448	1	01/30/2022 21:19	WG1810459
Tetrachloroethene	U		0.00161	0.00448	1	01/30/2022 21:19	WG1810459
Toluene	U		0.00233	0.00896	1	01/30/2022 21:19	WG1810459
1,2,3-Trichlorobenzene	U		0.0131	0.0224	1	01/30/2022 21:19	WG1810459
1,2,4-Trichlorobenzene	U	J4	0.00788	0.0224	1	01/30/2022 21:19	WG1810459
1,1,1-Trichloroethane	U		0.00165	0.00448	1	01/30/2022 21:19	WG1810459
1,1,2-Trichloroethane	U		0.00107	0.00448	1	01/30/2022 21:19	WG1810459
Trichloroethene	U		0.00105	0.00179	1	01/30/2022 21:19	WG1810459
Trichlorofluoromethane	U	J3	0.00148	0.00448	1	01/30/2022 21:19	WG1810459
1,2,3-Trichloropropane	U	J3	0.00290	0.0224	1	01/30/2022 21:19	WG1810459
1,2,4-Trimethylbenzene	U		0.00283	0.00896	1	01/30/2022 21:19	WG1810459
1,2,3-Trimethylbenzene	U		0.00283	0.00896	1	01/30/2022 21:19	WG1810459
1,3,5-Trimethylbenzene	U		0.00358	0.00896	1	01/30/2022 21:19	WG1810459
Vinyl chloride	U		0.00208	0.00448	1	01/30/2022 21:19	WG1810459
Xylenes, Total	U		0.00158	0.0116	1	01/30/2022 21:19	WG1810459
(S) Toluene-d8	*116*			*75.0-131*		*01/30/2022 21:19*	WG1810459
(S) 4-Bromofluorobenzene	*89.3*			*67.0-138*		*01/30/2022 21:19*	WG1810459
(S) 1,2-Dichloroethane-d4	*88.3*			*70.0-130*		*01/30/2022 21:19*	WG1810459

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		20.9	69.7	1	02/04/2022 06:10	WG1812033
TPH C12 - C28	U		20.9	69.7	1	02/04/2022 06:10	WG1812033
TPH C28 - C35	U		20.9	69.7	1	02/04/2022 06:10	WG1812033
TPH C6 - C35	U		20.9	69.7	1	02/04/2022 06:10	WG1812033
(S) o-Terphenyl	*81.6*			*70.0-130*		*02/04/2022 06:10*	WG1812033
(S) 1-chlorooctane	*101*			*70.0-130*		*02/04/2022 06:10*	WG1812033

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.0164	0.0474	1	02/08/2022 00:34	WG1811393
PCB 1221	U		0.0164	0.0474	1	02/08/2022 00:34	WG1811393
PCB 1232	U		0.0164	0.0474	1	02/08/2022 00:34	WG1811393
PCB 1242	U		0.0164	0.0474	1	02/08/2022 00:34	WG1811393
PCB 1248	U		0.0103	0.0237	1	02/08/2022 00:34	WG1811393
PCB 1254	U		0.0103	0.0237	1	02/08/2022 00:34	WG1811393

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1260	U		0.0103	0.0237	1	02/08/2022 00:34	WG1811393
(S) Decachlorobiphenyl	*68.1*			*10.0-135*		*02/08/2022 00:34*	WG1811393
(S) Tetrachloro-m-xylene	*73.5*			*10.0-139*		*02/08/2022 00:34*	WG1811393

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00751	0.0464	1	02/04/2022 07:54	WG1811397
Acenaphthylene	U		0.00654	0.0464	1	02/04/2022 07:54	WG1811397
Anthracene	U		0.00826	0.0464	1	02/04/2022 07:54	WG1811397
Benzidine	U		0.0872	2.33	1	02/04/2022 07:54	WG1811397
Benzo(a)anthracene	U		0.00818	0.0464	1	02/04/2022 07:54	WG1811397
Benzo(b)fluoranthene	U		0.00865	0.0464	1	02/04/2022 07:54	WG1811397
Benzo(k)fluoranthene	U		0.00825	0.0464	1	02/04/2022 07:54	WG1811397
Benzo(g,h,i)perylene	U		0.00849	0.0464	1	02/04/2022 07:54	WG1811397
Benzo(a)pyrene	U		0.00863	0.0464	1	02/04/2022 07:54	WG1811397
Bis(2-chlorethoxy)methane	U		0.0139	0.464	1	02/04/2022 07:54	WG1811397
Bis(2-chloroethyl)ether	U		0.0153	0.464	1	02/04/2022 07:54	WG1811397
2,2-Oxybis(1-Chloropropane)	U		0.0201	0.464	1	02/04/2022 07:54	WG1811397
4-Bromophenyl-phenylether	U		0.0163	0.464	1	02/04/2022 07:54	WG1811397
2-Chloronaphthalene	U		0.00815	0.0464	1	02/04/2022 07:54	WG1811397
4-Chlorophenyl-phenylether	U		0.0162	0.464	1	02/04/2022 07:54	WG1811397
Chrysene	U		0.00923	0.0464	1	02/04/2022 07:54	WG1811397
Dibenz(a,h)anthracene	U		0.0129	0.0464	1	02/04/2022 07:54	WG1811397
3,3-Dichlorobenzidine	U		0.0171	0.464	1	02/04/2022 07:54	WG1811397
2,4-Dinitrotoluene	U		0.0133	0.464	1	02/04/2022 07:54	WG1811397
2,6-Dinitrotoluene	U		0.0152	0.464	1	02/04/2022 07:54	WG1811397
Fluoranthene	U		0.00838	0.0464	1	02/04/2022 07:54	WG1811397
Fluorene	U		0.00755	0.0464	1	02/04/2022 07:54	WG1811397
Hexachlorobenzene	U		0.0164	0.464	1	02/04/2022 07:54	WG1811397
Hexachloro-1,3-butadiene	U		0.0156	0.464	1	02/04/2022 07:54	WG1811397
Hexachlorocyclopentadiene	U		0.0244	0.464	1	02/04/2022 07:54	WG1811397
Hexachloroethane	U		0.0183	0.464	1	02/04/2022 07:54	WG1811397
Indeno(1,2,3-cd)pyrene	U		0.0131	0.0464	1	02/04/2022 07:54	WG1811397
Isophorone	U		0.0142	0.464	1	02/04/2022 07:54	WG1811397
Naphthalene	U		0.0117	0.0464	1	02/04/2022 07:54	WG1811397
Nitrobenzene	U		0.0162	0.464	1	02/04/2022 07:54	WG1811397
n-Nitrosodimethylamine	U		0.0688	0.464	1	02/04/2022 07:54	WG1811397
n-Nitrosodiphenylamine	U		0.0351	0.464	1	02/04/2022 07:54	WG1811397
n-Nitrosodi-n-propylamine	U		0.0155	0.464	1	02/04/2022 07:54	WG1811397
Phenanthrene	U		0.00921	0.0464	1	02/04/2022 07:54	WG1811397
Benzylbutyl phthalate	U		0.0145	0.464	1	02/04/2022 07:54	WG1811397
Bis(2-ethylhexyl)phthalate	U		0.0588	0.464	1	02/04/2022 07:54	WG1811397
Di-n-butyl phthalate	U		0.0159	0.464	1	02/04/2022 07:54	WG1811397
Diethyl phthalate	U		0.0153	0.464	1	02/04/2022 07:54	WG1811397
Dimethyl phthalate	U		0.0984	0.464	1	02/04/2022 07:54	WG1811397
Di-n-octyl phthalate	U		0.0314	0.464	1	02/04/2022 07:54	WG1811397
Pyrene	U		0.00903	0.0464	1	02/04/2022 07:54	WG1811397
1,2,4-Trichlorobenzene	U		0.0145	0.464	1	02/04/2022 07:54	WG1811397
4-Chloro-3-methylphenol	U		0.0151	0.464	1	02/04/2022 07:54	WG1811397
2-Chlorophenol	U		0.0153	0.464	1	02/04/2022 07:54	WG1811397
2,4-Dichlorophenol	U		0.0135	0.464	1	02/04/2022 07:54	WG1811397
2,4-Dimethylphenol	U		0.0121	0.464	1	02/04/2022 07:54	WG1811397
4,6-Dinitro-2-methylphenol	U		0.105	0.464	1	02/04/2022 07:54	WG1811397
2,4-Dinitrophenol	U		0.109	0.464	1	02/04/2022 07:54	WG1811397
2-Nitrophenol	U		0.0166	0.464	1	02/04/2022 07:54	WG1811397

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Nitrophenol	U		0.0145	0.464	1	02/04/2022 07:54	WG1811397
Pentachlorophenol	U		0.0125	0.464	1	02/04/2022 07:54	WG1811397
Phenol	U		0.0187	0.464	1	02/04/2022 07:54	WG1811397
2,4,6-Trichlorophenol	U		0.0149	0.464	1	02/04/2022 07:54	WG1811397
(S) 2-Fluorophenol	*52.9*			*12.0-120*		*02/04/2022 07:54*	WG1811397
(S) Phenol-d5	*47.7*			*10.0-120*		*02/04/2022 07:54*	WG1811397
(S) Nitrobenzene-d5	*41.2*			*10.0-122*		*02/04/2022 07:54*	WG1811397
(S) 2-Fluorobiphenyl	*47.7*			*15.0-120*		*02/04/2022 07:54*	WG1811397
(S) 2,4,6-Tribromophenol	*66.0*			*10.0-127*		*02/04/2022 07:54*	WG1811397
(S) p-Terphenyl-d14	*55.4*			*10.0-120*		*02/04/2022 07:54*	WG1811397

Method Blank (MB)

(MB) R3755294-1 01/29/22 12:57

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1455712-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1455712-01 01/29/22 12:57 • (DUP) R3755294-3 01/29/22 12:57

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	84.5	85.4	1	1.15		10

Laboratory Control Sample (LCS)

(LCS) R3755294-2 01/29/22 12:57

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3755281-1 01/29/22 09:44

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.00100			

L1455692-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1455692-01 01/29/22 09:44 • (DUP) R3755281-3 01/29/22 09:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	78.8	74.8	1	5.16		10

Laboratory Control Sample (LCS)

(LCS) R3755281-2 01/29/22 09:44

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3755513-1 01/31/22 15:58

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3755513-2 01/31/22 16:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.538	108	80.0-120	

L1455712-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455712-03 01/31/22 16:08 • (MS) R3755513-3 01/31/22 16:11 • (MSD) R3755513-4 01/31/22 16:13

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.561	U	0.600	0.561	107	100	1	75.0-125			6.71	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3756344-1 02/02/22 08:11

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Lead	U		0.208	0.500
Selenium	U		0.764	2.00
Silver	U		0.127	1.00

Laboratory Control Sample (LCS)

(LCS) R3756344-2 02/02/22 08:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	96.4	96.4	80.0-120	
Barium	100	101	101	80.0-120	
Cadmium	100	97.0	97.0	80.0-120	
Chromium	100	96.4	96.4	80.0-120	
Lead	100	98.4	98.4	80.0-120	
Selenium	100	98.1	98.1	80.0-120	
Silver	20.0	17.8	89.0	80.0-120	

L1455031-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455031-05 02/02/22 08:16 • (MS) R3756344-5 02/02/22 08:23 • (MSD) R3756344-6 02/02/22 08:26

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.28	85.6	90.1	83.4	87.9	1	75.0-125			5.12	20
Barium	100	60.3	171	149	110	88.8	1	75.0-125			13.5	20
Cadmium	100	0.168	84.5	88.4	84.4	88.2	1	75.0-125			4.40	20
Chromium	100	12.9	111	101	97.9	88.1	1	75.0-125			9.22	20
Lead	100	74.4	155	159	80.2	84.5	1	75.0-125			2.74	20
Selenium	100	U	84.9	90.5	84.9	90.5	1	75.0-125			6.38	20
Silver	20.0	U	15.9	16.5	79.3	82.4	1	75.0-125			3.92	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3756399-1 02/02/22 19:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Lead	0.891		0.208	0.500
Selenium	U		0.764	2.00
Silver	U		0.127	1.00

Laboratory Control Sample (LCS)

(LCS) R3756399-2 02/02/22 20:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	97.4	97.4	80.0-120	
Barium	100	104	104	80.0-120	
Cadmium	100	99.5	99.5	80.0-120	
Chromium	100	102	102	80.0-120	
Lead	100	102	102	80.0-120	
Selenium	100	99.5	99.5	80.0-120	
Silver	20.0	19.2	96.1	80.0-120	

L1455762-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455762-03 02/02/22 20:05 • (MS) R3756399-5 02/02/22 20:13 • (MSD) R3756399-6 02/02/22 20:16

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	5.82	107	104	101	98.1	1	75.0-125			2.66	20
Barium	100	125	262	148	137	23.2	1	75.0-125	J5	J3 J6	55.3	20
Cadmium	100	1.30	106	105	104	103	1	75.0-125			1.01	20
Chromium	100	28.1	122	105	93.6	77.3	1	75.0-125			14.4	20
Lead	100	13700	14000	4280	383	0.000	1	75.0-125	E V	J3 V	107	20
Selenium	100	U	103	101	103	101	1	75.0-125			1.74	20
Silver	20.0	0.738	21.9	20.9	106	101	1	75.0-125			4.26	20

Method Blank (MB)

(MB) R3756497-2 01/30/22 13:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromobenzene	U		0.000900	0.0125
Bromodichloromethane	U		0.000725	0.00250
Bromoform	U		0.00117	0.0250
Bromomethane	U		0.00197	0.0125
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloroform	U		0.00103	0.00250
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	U		0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
Dibromomethane	U		0.000750	0.00500
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,1-Dichloroethane	U		0.000491	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,2-Dichloropropane	U		0.00142	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
1,3-Dichloropropane	U		0.000501	0.00500
cis-1,3-Dichloropropene	U		0.000757	0.00250
trans-1,3-Dichloropropene	U		0.00114	0.00500
2,2-Dichloropropane	U		0.00138	0.00250
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	U		0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250

Method Blank (MB)

(MB) R3756497-2 01/30/22 13:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	U		0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
Tetrachloroethene	U		0.000896	0.00250
Toluene	U		0.00130	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125
1,1,1-Trichloroethane	U		0.000923	0.00250
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	*113*			*75.0-131*
(S) 4-Bromofluorobenzene	*95.5*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*88.4*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3756497-1 01/30/22 12:08 • (LCSD) R3756497-3 01/30/22 16:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.625	0.657	0.665	105	106	10.0-160			1.21	31
Acrylonitrile	0.625	0.595	0.633	95.2	101	45.0-153			6.19	22
Benzene	0.125	0.122	0.112	97.6	89.6	70.0-123			8.55	20
Bromobenzene	0.125	0.143	0.120	114	96.0	73.0-121			17.5	20
Bromodichloromethane	0.125	0.125	0.116	100	92.8	73.0-121			7.47	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3756497-1 01/30/22 12:08 • (LCSD) R3756497-3 01/30/22 16:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromoform	0.125	0.120	0.113	96.0	90.4	64.0-132			6.01	20
Bromomethane	0.125	0.131	0.116	105	92.8	56.0-147			12.1	20
n-Butylbenzene	0.125	0.0886	0.0848	70.9	67.8	68.0-135		J4	4.38	20
sec-Butylbenzene	0.125	0.127	0.107	102	85.6	74.0-130			17.1	20
tert-Butylbenzene	0.125	0.132	0.109	106	87.2	75.0-127			19.1	20
Carbon tetrachloride	0.125	0.144	0.130	115	104	66.0-128			10.2	20
Chlorobenzene	0.125	0.122	0.115	97.6	92.0	76.0-128			5.91	20
Chlorodibromomethane	0.125	0.156	0.139	125	111	74.0-127			11.5	20
Chloroethane	0.125	0.144	0.130	115	104	61.0-134			10.2	20
Chloroform	0.125	0.116	0.108	92.8	86.4	72.0-123			7.14	20
Chloromethane	0.125	0.112	0.106	89.6	84.8	51.0-138			5.50	20
2-Chlorotoluene	0.125	0.141	0.118	113	94.4	75.0-124			17.8	20
4-Chlorotoluene	0.125	0.136	0.116	109	92.8	75.0-124			15.9	20
1,2-Dibromo-3-Chloropropane	0.125	0.114	0.0991	91.2	79.3	59.0-130			14.0	20
1,2-Dibromoethane	0.125	0.133	0.124	106	99.2	74.0-128			7.00	20
Dibromomethane	0.125	0.120	0.112	96.0	89.6	75.0-122			6.90	20
1,2-Dichlorobenzene	0.125	0.108	0.101	86.4	80.8	76.0-124			6.70	20
1,3-Dichlorobenzene	0.125	0.117	0.108	93.6	86.4	76.0-125			8.00	20
1,4-Dichlorobenzene	0.125	0.118	0.105	94.4	84.0	77.0-121			11.7	20
Dichlorodifluoromethane	0.125	0.110	0.0990	88.0	79.2	43.0-156			10.5	20
1,1-Dichloroethane	0.125	0.111	0.0985	88.8	78.8	70.0-127			11.9	20
1,2-Dichloroethane	0.125	0.122	0.114	97.6	91.2	65.0-131			6.78	20
1,1-Dichloroethene	0.125	0.128	0.115	102	92.0	65.0-131			10.7	20
cis-1,2-Dichloroethene	0.125	0.121	0.110	96.8	88.0	73.0-125			9.52	20
trans-1,2-Dichloroethene	0.125	0.123	0.112	98.4	89.6	71.0-125			9.36	20
1,2-Dichloropropane	0.125	0.114	0.109	91.2	87.2	74.0-125			4.48	20
1,1-Dichloropropene	0.125	0.128	0.114	102	91.2	73.0-125			11.6	20
1,3-Dichloropropane	0.125	0.134	0.121	107	96.8	80.0-125			10.2	20
cis-1,3-Dichloropropene	0.125	0.145	0.129	116	103	76.0-127			11.7	20
trans-1,3-Dichloropropene	0.125	0.152	0.130	122	104	73.0-127			15.6	20
2,2-Dichloropropane	0.125	0.151	0.132	121	106	59.0-135			13.4	20
Di-isopropyl ether	0.125	0.109	0.101	87.2	80.8	60.0-136			7.62	20
Ethylbenzene	0.125	0.125	0.115	100	92.0	74.0-126			8.33	20
Hexachloro-1,3-butadiene	0.125	0.0933	0.0812	74.6	65.0	57.0-150			13.9	20
Isopropylbenzene	0.125	0.107	0.104	85.6	83.2	72.0-127			2.84	20
p-Isopropyltoluene	0.125	0.118	0.0991	94.4	79.3	72.0-133			17.4	20
2-Butanone (MEK)	0.625	0.692	0.805	111	129	30.0-160			15.1	24
Methylene Chloride	0.125	0.126	0.116	101	92.8	68.0-123			8.26	20
4-Methyl-2-pentanone (MIBK)	0.625	0.655	0.590	105	94.4	56.0-143			10.4	20
Methyl tert-butyl ether	0.125	0.126	0.120	101	96.0	66.0-132			4.88	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3756497-1 01/30/22 12:08 • (LCSD) R3756497-3 01/30/22 16:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.125	0.0758	0.0666	60.6	53.3	59.0-130		J4	12.9	20
n-Propylbenzene	0.125	0.136	0.113	109	90.4	74.0-126			18.5	20
Styrene	0.125	0.101	0.0939	80.8	75.1	72.0-127			7.29	20
1,1,1,2-Tetrachloroethane	0.125	0.127	0.116	102	92.8	74.0-129			9.05	20
1,1,2,2-Tetrachloroethane	0.125	0.149	0.123	119	98.4	68.0-128			19.1	20
Tetrachloroethene	0.125	0.150	0.140	120	112	70.0-136			6.90	20
Toluene	0.125	0.134	0.118	107	94.4	75.0-121			12.7	20
1,1,2-Trichlorotrifluoroethane	0.125	0.124	0.114	99.2	91.2	61.0-139			8.40	20
1,2,3-Trichlorobenzene	0.125	0.0848	0.0805	67.8	64.4	59.0-139			5.20	20
1,2,4-Trichlorobenzene	0.125	0.0754	0.0713	60.3	57.0	62.0-137	J4	J4	5.59	20
1,1,1-Trichloroethane	0.125	0.128	0.116	102	92.8	69.0-126			9.84	20
1,1,2-Trichloroethane	0.125	0.146	0.133	117	106	78.0-123			9.32	20
Trichloroethene	0.125	0.134	0.121	107	96.8	76.0-126			10.2	20
Trichlorofluoromethane	0.125	0.144	0.114	115	91.2	61.0-142		J3	23.3	20
1,2,3-Trichloropropane	0.125	0.149	0.120	119	96.0	67.0-129		J3	21.6	20
1,2,3-Trimethylbenzene	0.125	0.131	0.117	105	93.6	74.0-124			11.3	20
1,2,4-Trimethylbenzene	0.125	0.114	0.0962	91.2	77.0	70.0-126			16.9	20
1,3,5-Trimethylbenzene	0.125	0.114	0.0976	91.2	78.1	73.0-127			15.5	20
Vinyl chloride	0.125	0.124	0.106	99.2	84.8	63.0-134			15.7	20
Xylenes, Total	0.375	0.350	0.326	93.3	86.9	72.0-127			7.10	20
(S) Toluene-d8				*112*	*109*	*75.0-131*				
(S) 4-Bromofluorobenzene				*88.3*	*94.1*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*94.8*	*95.9*	*70.0-130*				

L1455712-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455712-01 01/30/22 18:41 • (MS) R3756497-4 01/30/22 22:56 • (MSD) R3756497-5 01/30/22 23:16

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.457	U	0.420	0.428	92.0	93.8	1	10.0-160			1.87	40
Acrylonitrile	0.457	U	0.406	0.480	88.9	105	1	10.0-160			16.8	40
Benzene	0.0912	U	0.0831	0.0783	91.1	85.9	1	10.0-149			5.89	37
Bromobenzene	0.0912	U	0.101	0.0972	111	107	1	10.0-156			4.00	38
Bromodichloromethane	0.0912	U	0.0858	0.0829	94.1	91.0	1	10.0-143			3.38	37
Bromoform	0.0912	U	0.0877	0.0848	96.2	93.0	1	10.0-146			3.31	36
Bromomethane	0.0912	U	0.0740	0.0655	81.2	71.8	1	10.0-149			12.3	38
n-Butylbenzene	0.0912	U	0.0598	0.0587	65.6	64.3	1	10.0-160			1.87	40
sec-Butylbenzene	0.0912	U	0.0853	0.0813	93.6	89.2	1	10.0-159			4.76	39
tert-Butylbenzene	0.0912	U	0.0894	0.0823	98.1	90.3	1	10.0-156			8.31	39

L1455712-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455712-01 01/30/22 18:41 • (MS) R3756497-4 01/30/22 22:56 • (MSD) R3756497-5 01/30/22 23:16

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Carbon tetrachloride	0.0912	U	0.0913	0.0802	100	88.0	1	10.0-145			12.9	37
Chlorobenzene	0.0912	U	0.0859	0.0783	94.3	85.9	1	10.0-152			9.27	39
Chlorodibromomethane	0.0912	U	0.108	0.101	119	111	1	10.0-146			6.35	37
Chloroethane	0.0912	U	0.0701	0.0702	76.9	77.0	1	10.0-146			0.226	40
Chloroform	0.0912	U	0.0815	0.0775	89.4	85.0	1	10.0-146			4.99	37
Chloromethane	0.0912	U	0.0724	0.0764	79.5	83.8	1	10.0-159			5.32	37
2-Chlorotoluene	0.0912	U	0.0940	0.0869	103	95.3	1	10.0-159			7.89	38
4-Chlorotoluene	0.0912	U	0.0861	0.0899	94.4	98.6	1	10.0-155			4.32	39
1,2-Dibromo-3-Chloropropane	0.0912	U	0.0999	0.101	110	110	1	10.0-151			0.791	39
1,2-Dibromoethane	0.0912	U	0.0950	0.0957	104	105	1	10.0-148			0.831	34
Dibromomethane	0.0912	U	0.0873	0.0824	95.8	90.4	1	10.0-147			5.79	35
1,2-Dichlorobenzene	0.0912	U	0.0861	0.0818	94.4	89.7	1	10.0-155			5.10	37
1,3-Dichlorobenzene	0.0912	U	0.0842	0.0796	92.3	87.3	1	10.0-153			5.61	38
1,4-Dichlorobenzene	0.0912	U	0.0835	0.0820	91.7	89.9	1	10.0-151			1.92	38
Dichlorodifluoromethane	0.0912	U	0.0663	0.0642	72.7	70.4	1	10.0-160			3.16	35
1,1-Dichloroethane	0.0912	U	0.0755	0.0723	82.8	79.3	1	10.0-147			4.29	37
1,2-Dichloroethane	0.0912	U	0.0916	0.0821	101	90.1	1	10.0-148			10.9	35
1,1-Dichloroethene	0.0912	U	0.0832	0.0769	91.3	84.3	1	10.0-155			7.92	37
cis-1,2-Dichloroethene	0.0912	U	0.0823	0.0812	90.3	89.0	1	10.0-149			1.36	37
trans-1,2-Dichloroethene	0.0912	U	0.0783	0.0740	85.9	81.2	1	10.0-150			5.62	37
1,2-Dichloropropane	0.0912	U	0.0861	0.0742	94.4	81.4	1	10.0-148			14.8	37
1,1-Dichloropropene	0.0912	U	0.0799	0.0789	87.7	86.6	1	10.0-153			1.20	35
1,3-Dichloropropane	0.0912	U	0.101	0.0977	111	107	1	10.0-154			3.82	35
cis-1,3-Dichloropropene	0.0912	U	0.101	0.0980	110	107	1	10.0-151			2.71	37
trans-1,3-Dichloropropene	0.0912	U	0.104	0.0978	114	107	1	10.0-148			5.67	37
2,2-Dichloropropane	0.0912	U	0.0807	0.0674	88.5	73.9	1	10.0-138			18.0	36
Di-isopropyl ether	0.0912	U	0.0808	0.0742	88.7	81.4	1	10.0-147			8.59	36
Ethylbenzene	0.0912	0.00157	0.0869	0.0808	93.6	87.0	1	10.0-160			7.18	38
Hexachloro-1,3-butadiene	0.0912	U	0.0664	0.0647	72.9	71.0	1	10.0-160			2.66	40
Isopropylbenzene	0.0912	U	0.0736	0.0675	80.7	74.1	1	10.0-155			8.54	38
p-Isopropyltoluene	0.0912	U	0.0791	0.0732	86.8	80.3	1	10.0-160			7.70	40
2-Butanone (MEK)	0.457	U	0.490	0.579	107	127	1	10.0-160			16.6	40
Methylene Chloride	0.0912	U	0.0880	0.0810	96.5	88.9	1	10.0-141			8.26	37
4-Methyl-2-pentanone (MIBK)	0.457	U	0.491	0.491	108	108	1	10.0-160			0.000	35
Methyl tert-butyl ether	0.0912	U	0.0932	0.0821	102	90.1	1	11.0-147			12.7	35
Naphthalene	0.0912	U	0.0820	0.0820	89.9	89.9	1	10.0-160			0.000	36
n-Propylbenzene	0.0912	U	0.0873	0.0839	95.8	92.0	1	10.0-158			4.07	38
Styrene	0.0912	U	0.0701	0.0674	76.9	73.9	1	10.0-160			3.92	40
1,1,1,2-Tetrachloroethane	0.0912	U	0.0878	0.0813	96.3	89.2	1	10.0-149			7.69	39

L1455712-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455712-01 01/30/22 18:41 • (MS) R3756497-4 01/30/22 22:56 • (MSD) R3756497-5 01/30/22 23:16

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
1,1,2,2-Tetrachloroethane	0.0912	U	0.117	0.116	129	127	1	10.0-160			0.815	35
Tetrachloroethene	0.0912	U	0.0953	0.0886	105	97.2	1	10.0-156			7.24	39
Toluene	0.0912	0.00908	0.0965	0.0899	95.9	88.6	1	10.0-156			7.14	38
1,1,2-Trichlorotrifluoroethane	0.0912	U	0.0862	0.0829	94.6	91.0	1	10.0-160			3.94	36
1,2,3-Trichlorobenzene	0.0912	U	0.0940	0.0869	103	95.3	1	10.0-160			7.89	40
1,2,4-Trichlorobenzene	0.0912	U	0.0672	0.0640	73.7	70.3	1	10.0-160			4.83	40
1,1,1-Trichloroethane	0.0912	U	0.0785	0.0698	86.1	76.5	1	10.0-144			11.8	35
1,1,2-Trichloroethane	0.0912	U	0.113	0.108	124	118	1	10.0-160			4.60	35
Trichloroethene	0.0912	U	0.0850	0.0812	93.2	89.0	1	10.0-156			4.58	38
Trichlorofluoromethane	0.0912	U	0.0783	0.0690	85.9	75.7	1	10.0-160			12.7	40
1,2,3-Trichloropropane	0.0912	U	0.111	0.113	122	123	1	10.0-156			1.56	35
1,2,3-Trimethylbenzene	0.0912	U	0.0969	0.0918	106	101	1	10.0-160			5.38	36
1,2,4-Trimethylbenzene	0.0912	U	0.0763	0.0718	83.7	78.8	1	10.0-160			6.00	36
1,3,5-Trimethylbenzene	0.0912	U	0.0799	0.0728	87.7	79.8	1	10.0-160			9.35	38
Vinyl chloride	0.0912	U	0.0780	0.0740	85.6	81.2	1	10.0-160			5.21	37
Xylenes, Total	0.274	0.00821	0.239	0.222	84.3	77.9	1	10.0-160			7.56	38
(S) Toluene-d8					*110*	*109*		*75.0-131*				
(S) 4-Bromofluorobenzene					*92.0*	*86.5*		*67.0-138*				
(S) 1,2-Dichloroethane-d4					*90.7*	*91.4*		*70.0-130*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3757048-1 02/04/22 01:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*85.6*			*70.0-130*
(S) 1-chlorooctane	*108*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3757048-2 02/04/22 02:14 • (LCSD) R3757048-3 02/04/22 02:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	267	262	107	105	75.0-125			1.89	20
TPH C12 - C28	250	236	231	94.4	92.4	75.0-125			2.14	20
TPH C6 - C35	500	503	493	101	98.6	75.0-125			2.01	20
(S) o-Terphenyl				*84.8*	*83.6*	*70.0-130*				
(S) 1-chlorooctane				*122*	*122*	*70.0-130*				

L1455712-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455712-01 02/04/22 03:31 • (MS) R3757048-4 02/04/22 03:47 • (MSD) R3757048-5 02/04/22 04:02

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	296	U	303	308	102	104	1	75.0-125			1.55	20
TPH C12 - C28	296	U	270	275	91.2	92.8	1	75.0-125			1.74	20
TPH C6 - C35	592	U	573	582	96.8	98.4	1	75.0-125			1.64	20
(S) o-Terphenyl					*81.6*	*82.8*		*70.0-130*				
(S) 1-chlorooctane					*116*	*116*		*70.0-130*				

Method Blank (MB)

(MB) R3755597-1 02/01/22 00:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0118	0.0340
PCB 1221	U		0.0118	0.0340
PCB 1232	U		0.0118	0.0340
PCB 1242	U		0.0118	0.0340
PCB 1248	U		0.00738	0.0170
PCB 1254	U		0.00738	0.0170
PCB 1260	U		0.00738	0.0170
(S) Decachlorobiphenyl	*81.5*			*10.0-135*
(S) Tetrachloro-m-xylene	*81.5*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3755597-2 02/01/22 00:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	0.167	0.172	103	37.0-145	
PCB 1016	0.167	0.150	89.8	36.0-141	
(S) Decachlorobiphenyl			*91.7*	*10.0-135*	
(S) Tetrachloro-m-xylene			*85.9*	*10.0-139*	

L1452734-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1452734-08 02/01/22 01:04 • (MS) R3755597-3 02/01/22 01:17 • (MSD) R3755597-4 02/01/22 01:30

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.167	U	0.0467	0.0345	28.0	20.7	1	10.0-160			30.0	38
PCB 1016	0.167	U	0.0326	0.0214	19.5	12.8	1	10.0-160		J3	41.5	37
(S) Decachlorobiphenyl					*25.8*	*19.5*		*10.0-135*				
(S) Tetrachloro-m-xylene					*13.2*	*6.80*		*10.0-139*		J2		

Cp Tc Ss Cn Sr Qc Gl Al Sc

Method Blank (MB)

(MB) R3757905-1 02/07/22 23:08

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0118	0.0340
PCB 1221	U		0.0118	0.0340
PCB 1232	U		0.0118	0.0340
PCB 1242	U		0.0118	0.0340
PCB 1248	U		0.00738	0.0170
PCB 1254	U		0.00738	0.0170
PCB 1260	U		0.00738	0.0170
(S) Decachlorobiphenyl	*92.5*			*10.0-135*
(S) Tetrachloro-m-xylene	*104*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3757905-2 02/07/22 23:18

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	0.167	0.165	98.8	37.0-145	
PCB 1016	0.167	0.189	113	36.0-141	
(S) Decachlorobiphenyl			*90.8*	*10.0-135*	
(S) Tetrachloro-m-xylene			*102*	*10.0-139*	

L1455983-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455983-04 02/08/22 01:22 • (MS) R3757905-3 02/08/22 01:31 • (MSD) R3757905-4 02/08/22 01:41

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.167	U	0.138	0.174	71.3	89.8	1	10.0-160	P	P	23.0	38
PCB 1016	0.167	U	125	95.9	64700	49600	1	10.0-160	J5 P	J5 P	26.4	37
(S) Decachlorobiphenyl					*58.9*	*65.5*		*10.0-135*				
(S) Tetrachloro-m-xylene					*83.6*	*90.8*		*10.0-139*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3756587-2 02/03/22 10:42

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	U		0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3756587-2 02/03/22 10:42

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*71.8*			*10.0-122*
(S) 2-Fluorobiphenyl	*77.5*			*15.0-120*
(S) p-Terphenyl-d14	*84.7*			*10.0-120*
(S) Phenol-d5	*77.3*			*10.0-120*
(S) 2-Fluorophenol	*80.2*			*12.0-120*
(S) 2,4,6-Tribromophenol	*105*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3756587-1 02/03/22 10:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.498	74.8	38.0-120	
Acenaphthylene	0.666	0.532	79.9	40.0-120	
Anthracene	0.666	0.526	79.0	42.0-120	
Benzidine	1.33	0.593	44.6	10.0-120	
Benzo(a)anthracene	0.666	0.543	81.5	44.0-120	
Benzo(b)fluoranthene	0.666	0.509	76.4	43.0-120	
Benzo(k)fluoranthene	0.666	0.509	76.4	44.0-120	
Benzo(g,h,i)perylene	0.666	0.526	79.0	43.0-120	
Benzo(a)pyrene	0.666	0.537	80.6	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.413	62.0	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.564	84.7	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.441	66.2	23.0-120	
4-Bromophenyl-phenylether	0.666	0.556	83.5	40.0-120	
2-Chloronaphthalene	0.666	0.501	75.2	35.0-120	

Laboratory Control Sample (LCS)

(LCS) R3756587-1 02/03/22 10:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.561	84.2	40.0-120	
Chrysene	0.666	0.496	74.5	43.0-120	
Dibenz(a,h)anthracene	0.666	0.546	82.0	44.0-120	
3,3-Dichlorobenzidine	1.33	1.03	77.4	28.0-120	
2,4-Dinitrotoluene	0.666	0.605	90.8	45.0-120	
2,6-Dinitrotoluene	0.666	0.551	82.7	42.0-120	
Fluoranthene	0.666	0.559	83.9	44.0-120	
Fluorene	0.666	0.521	78.2	41.0-120	
Hexachlorobenzene	0.666	0.562	84.4	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.480	72.1	15.0-120	
Hexachlorocyclopentadiene	0.666	0.445	66.8	15.0-120	
Hexachloroethane	0.666	0.497	74.6	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.574	86.2	45.0-120	
Isophorone	0.666	0.460	69.1	23.0-120	
Naphthalene	0.666	0.384	57.7	18.0-120	
Nitrobenzene	0.666	0.464	69.7	17.0-120	
n-Nitrosodimethylamine	0.666	0.480	72.1	10.0-125	
n-Nitrosodiphenylamine	0.666	0.486	73.0	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.567	85.1	26.0-120	
Phenanthrene	0.666	0.506	76.0	42.0-120	
Benzylbutyl phthalate	0.666	0.580	87.1	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.576	86.5	41.0-120	
Di-n-butyl phthalate	0.666	0.556	83.5	43.0-120	
Diethyl phthalate	0.666	0.569	85.4	43.0-120	
Dimethyl phthalate	0.666	0.528	79.3	43.0-120	
Di-n-octyl phthalate	0.666	0.548	82.3	40.0-120	
Pyrene	0.666	0.508	76.3	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.447	67.1	17.0-120	
4-Chloro-3-methylphenol	0.666	0.499	74.9	28.0-120	
2-Chlorophenol	0.666	0.524	78.7	28.0-120	
2,4-Dichlorophenol	0.666	0.479	71.9	25.0-120	
2,4-Dimethylphenol	0.666	0.462	69.4	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.474	71.2	16.0-120	
2,4-Dinitrophenol	0.666	0.349	52.4	10.0-120	
2-Nitrophenol	0.666	0.486	73.0	20.0-120	
4-Nitrophenol	0.666	0.548	82.3	27.0-120	
Pentachlorophenol	0.666	0.569	85.4	29.0-120	
Phenol	0.666	0.500	75.1	28.0-120	
2,4,6-Trichlorophenol	0.666	0.617	92.6	37.0-120	
(S) Nitrobenzene-d5			*60.4*	*10.0-122*	

Laboratory Control Sample (LCS)

(LCS) R3756587-1 02/03/22 10:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*77.2*	*15.0-120*	
(S) p-Terphenyl-d14			*77.5*	*10.0-120*	
(S) Phenol-d5			*74.5*	*10.0-120*	
(S) 2-Fluorophenol			*78.7*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*117*	*10.0-127*	

L1455308-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455308-01 02/03/22 12:08 • (MS) R3756587-3 02/03/22 12:29 • (MSD) R3756587-4 02/03/22 12:50

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.808	U	0.493	0.500	60.9	61.7	1	18.0-120			1.49	32
Acenaphthylene	0.808	U	0.517	0.528	64.0	65.2	1	25.0-120			2.12	32
Anthracene	0.808	U	0.571	0.532	70.7	65.6	1	22.0-120			7.13	29
Benzidine	1.62	U	U	U	0.000	0.000	1	10.0-120	J6	J6	0.000	40
Benzo(a)anthracene	0.808	U	0.625	0.598	77.4	73.8	1	25.0-120			4.42	29
Benzo(b)fluoranthene	0.808	U	0.576	0.549	71.3	67.7	1	19.0-122			4.80	31
Benzo(k)fluoranthene	0.808	U	0.550	0.532	68.1	65.6	1	23.0-120			3.41	30
Benzo(g,h,i)perylene	0.808	U	0.586	0.561	72.5	69.2	1	10.0-120			4.28	33
Benzo(a)pyrene	0.808	U	0.606	0.576	74.9	71.1	1	24.0-120			4.99	30
Bis(2-chlorethoxy)methane	0.808	U	0.418	0.414	51.7	51.1	1	10.0-120			0.886	34
Bis(2-chloroethyl)ether	0.808	U	0.533	0.525	66.0	64.7	1	10.0-120			1.63	40
2,2-Oxybis(1-Chloropropane)	0.808	U	0.431	0.415	53.3	51.2	1	10.0-120			3.77	40
4-Bromophenyl-phenylether	0.808	U	0.585	0.550	72.3	67.9	1	27.0-120			6.06	30
2-Chloronaphthalene	0.808	U	0.502	0.499	62.2	61.5	1	20.0-120			0.736	32
4-Chlorophenyl-phenylether	0.808	U	0.575	0.545	71.1	67.3	1	24.0-120			5.26	29
Chrysene	0.808	U	0.569	0.542	70.4	66.8	1	21.0-120			4.87	29
Dibenz(a,h)anthracene	0.808	U	0.596	0.576	73.7	71.1	1	10.0-120			3.35	32
3,3-Dichlorobenzidine	1.62	U	0.965	0.946	59.5	58.3	1	10.0-120			2.06	34
2,4-Dinitrotoluene	0.808	U	0.624	0.617	77.2	76.1	1	30.0-120			1.19	31
2,6-Dinitrotoluene	0.808	U	0.538	0.515	66.6	63.5	1	25.0-120			4.43	31
Fluoranthene	0.808	0.00790	0.650	0.628	79.4	76.4	1	18.0-126			3.46	32
Fluorene	0.808	U	0.531	0.527	65.7	65.0	1	25.0-120			0.697	30
Hexachlorobenzene	0.808	U	0.599	0.564	74.2	69.5	1	27.0-120			6.12	28
Hexachloro-1,3-butadiene	0.808	U	0.477	0.467	59.0	57.6	1	10.0-120			2.08	38
Hexachlorocyclopentadiene	0.808	U	0.155	0.128	19.1	15.8	1	10.0-120			19.1	40
Hexachloroethane	0.808	U	0.434	0.388	53.6	47.9	1	10.0-120			11.1	40
Indeno(1,2,3-cd)pyrene	0.808	U	0.641	0.624	79.3	77.0	1	10.0-120			2.72	32
Isophorone	0.808	U	0.446	0.432	55.2	53.3	1	13.0-120			3.08	34

L1455308-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455308-01 02/03/22 12:08 • (MS) R3756587-3 02/03/22 12:29 • (MSD) R3756587-4 02/03/22 12:50

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Naphthalene	0.808	U	0.387	0.382	47.9	47.1	1	10.0-120			1.28	35
Nitrobenzene	0.808	U	0.464	0.452	57.4	55.8	1	10.0-120			2.68	36
n-Nitrosodimethylamine	0.808	U	0.413	0.462	51.1	57.0	1	10.0-127			11.2	40
n-Nitrosodiphenylamine	0.808	U	0.507	0.489	62.8	60.3	1	17.0-120			3.70	29
n-Nitrosodi-n-propylamine	0.808	U	0.509	0.482	62.9	59.4	1	10.0-120			5.46	37
Phenanthrene	0.808	U	0.538	0.525	66.6	64.7	1	17.0-120			2.54	31
Benzylbutyl phthalate	0.808	U	0.700	0.676	86.6	83.3	1	23.0-120			3.57	30
Bis(2-ethylhexyl)phthalate	0.808	U	0.685	0.666	84.8	82.1	1	17.0-126			2.91	30
Di-n-butyl phthalate	0.808	U	0.647	0.612	80.1	75.5	1	30.0-120			5.66	29
Diethyl phthalate	0.808	U	0.598	0.591	74.0	72.9	1	26.0-120			1.24	28
Dimethyl phthalate	0.808	U	0.520	0.510	64.3	62.9	1	25.0-120			1.91	29
Di-n-octyl phthalate	0.808	U	0.688	0.665	85.1	82.0	1	21.0-123			3.45	29
Pyrene	0.808	U	0.574	0.558	71.0	68.8	1	16.0-121			2.82	32
1,2,4-Trichlorobenzene	0.808	U	0.445	0.436	55.0	53.8	1	12.0-120			1.95	37
4-Chloro-3-methylphenol	0.808	U	0.510	0.501	63.1	61.8	1	15.0-120			1.70	30
2-Chlorophenol	0.808	U	0.485	0.468	60.0	57.7	1	15.0-120			3.61	37
2,4-Dichlorophenol	0.808	U	0.495	0.486	61.2	60.0	1	20.0-120			1.75	31
2,4-Dimethylphenol	0.808	U	0.447	0.436	55.3	53.8	1	10.0-120			2.50	33
4,6-Dinitro-2-methylphenol	0.808	U	0.723	0.722	89.5	89.1	1	10.0-120			0.170	39
2,4-Dinitrophenol	0.808	U	0.791	0.770	97.9	95.0	1	10.0-121			2.68	40
2-Nitrophenol	0.808	U	0.525	0.515	64.9	63.5	1	12.0-120			1.89	39
4-Nitrophenol	0.808	U	0.689	0.651	85.3	80.3	1	10.0-137			5.68	32
Pentachlorophenol	0.808	U	0.759	0.786	93.9	97.0	1	10.0-160			3.50	31
Phenol	0.808	0.0271	0.373	0.346	42.8	39.4	1	12.0-120			7.51	38
2,4,6-Trichlorophenol	0.808	U	0.644	0.658	79.6	81.2	1	19.0-120			2.26	32
(S) Nitrobenzene-d5					*51.4*	*50.9*		*10.0-122*				
(S) 2-Fluorobiphenyl					*59.9*	*61.5*		*15.0-120*				
(S) p-Terphenyl-d14					*73.9*	*70.0*		*10.0-120*				
(S) Phenol-d5					*43.6*	*40.0*		*10.0-120*				
(S) 2-Fluorophenol					*62.6*	*61.7*		*12.0-120*				
(S) 2,4,6-Tribromophenol					*110*	*107*		*10.0-127*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3756810-2 02/04/22 02:06

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00539	0.0333
Acenaphthylene	U		0.00469	0.0333
Anthracene	U		0.00593	0.0333
Benzidine	U		0.0626	1.67
Benzo(a)anthracene	U		0.00587	0.0333
Benzo(b)fluoranthene	U		0.00621	0.0333
Benzo(k)fluoranthene	U		0.00592	0.0333
Benzo(g,h,i)perylene	U		0.00609	0.0333
Benzo(a)pyrene	U		0.00619	0.0333
Bis(2-chlorethoxy)methane	U		0.0100	0.333
Bis(2-chloroethyl)ether	U		0.0110	0.333
2,2-oxybis(1-chloropropane)	U		0.0144	0.333
4-Bromophenyl-phenylether	U		0.0117	0.333
2-Chloronaphthalene	U		0.00585	0.0333
4-Chlorophenyl-phenylether	U		0.0116	0.333
Chrysene	U		0.00662	0.0333
Dibenz(a,h)anthracene	U		0.00923	0.0333
3,3-Dichlorobenzidine	U		0.0123	0.333
2,4-Dinitrotoluene	U		0.00955	0.333
2,6-Dinitrotoluene	U		0.0109	0.333
Fluoranthene	U		0.00601	0.0333
Fluorene	U		0.00542	0.0333
Hexachlorobenzene	U		0.0118	0.333
Hexachloro-1,3-butadiene	U		0.0112	0.333
Hexachlorocyclopentadiene	U		0.0175	0.333
Hexachloroethane	U		0.0131	0.333
Indeno(1,2,3-cd)pyrene	U		0.00941	0.0333
Isophorone	U		0.0102	0.333
Naphthalene	U		0.00836	0.0333
Nitrobenzene	U		0.0116	0.333
n-Nitrosodimethylamine	U		0.0494	0.333
n-Nitrosodiphenylamine	U		0.0252	0.333
n-Nitrosodi-n-propylamine	U		0.0111	0.333
Phenanthrene	U		0.00661	0.0333
Benzylbutyl phthalate	U		0.0104	0.333
Bis(2-ethylhexyl)phthalate	U		0.0422	0.333
Di-n-butyl phthalate	U		0.0114	0.333
Diethyl phthalate	U		0.0110	0.333
Dimethyl phthalate	U		0.0706	0.333
Di-n-octyl phthalate	U		0.0225	0.333

Method Blank (MB)

(MB) R3756810-2 02/04/22 02:06

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.00648	0.0333
1,2,4-Trichlorobenzene	U		0.0104	0.333
4-Chloro-3-methylphenol	U		0.0108	0.333
2-Chlorophenol	U		0.0110	0.333
2,4-Dichlorophenol	U		0.00970	0.333
2,4-Dimethylphenol	U		0.00870	0.333
4,6-Dinitro-2-methylphenol	U		0.0755	0.333
2,4-Dinitrophenol	U		0.0779	0.333
2-Nitrophenol	U		0.0119	0.333
4-Nitrophenol	U		0.0104	0.333
Pentachlorophenol	U		0.00896	0.333
Phenol	U		0.0134	0.333
2,4,6-Trichlorophenol	U		0.0107	0.333
(S) Nitrobenzene-d5	*53.2*			*10.0-122*
(S) 2-Fluorobiphenyl	*58.3*			*15.0-120*
(S) p-Terphenyl-d14	*65.8*			*10.0-120*
(S) Phenol-d5	*57.2*			*10.0-120*
(S) 2-Fluorophenol	*62.0*			*12.0-120*
(S) 2,4,6-Tribromophenol	*48.6*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3756810-1 02/04/22 01:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.666	0.441	66.2	38.0-120	
Acenaphthylene	0.666	0.453	68.0	40.0-120	
Anthracene	0.666	0.478	71.8	42.0-120	
Benzidine	1.33	0.501	37.7	10.0-120	
Benzo(a)anthracene	0.666	0.484	72.7	44.0-120	
Benzo(b)fluoranthene	0.666	0.482	72.4	43.0-120	
Benzo(k)fluoranthene	0.666	0.495	74.3	44.0-120	
Benzo(g,h,i)perylene	0.666	0.515	77.3	43.0-120	
Benzo(a)pyrene	0.666	0.487	73.1	45.0-120	
Bis(2-chlorethoxy)methane	0.666	0.375	56.3	20.0-120	
Bis(2-chloroethyl)ether	0.666	0.453	68.0	16.0-120	
2,2-Oxybis(1-Chloropropane)	0.666	0.418	62.8	23.0-120	
4-Bromophenyl-phenylether	0.666	0.450	67.6	40.0-120	
2-Chloronaphthalene	0.666	0.451	67.7	35.0-120	

Laboratory Control Sample (LCS)

(LCS) R3756810-1 02/04/22 01:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
4-Chlorophenyl-phenylether	0.666	0.454	68.2	40.0-120	
Chrysene	0.666	0.490	73.6	43.0-120	
Dibenz(a,h)anthracene	0.666	0.498	74.8	44.0-120	
3,3-Dichlorobenzidine	1.33	0.770	57.9	28.0-120	
2,4-Dinitrotoluene	0.666	0.461	69.2	45.0-120	
2,6-Dinitrotoluene	0.666	0.453	68.0	42.0-120	
Fluoranthene	0.666	0.467	70.1	44.0-120	
Fluorene	0.666	0.459	68.9	41.0-120	
Hexachlorobenzene	0.666	0.428	64.3	39.0-120	
Hexachloro-1,3-butadiene	0.666	0.341	51.2	15.0-120	
Hexachlorocyclopentadiene	0.666	0.354	53.2	15.0-120	
Hexachloroethane	0.666	0.395	59.3	17.0-120	
Indeno(1,2,3-cd)pyrene	0.666	0.540	81.1	45.0-120	
Isophorone	0.666	0.363	54.5	23.0-120	
Naphthalene	0.666	0.358	53.8	18.0-120	
Nitrobenzene	0.666	0.377	56.6	17.0-120	
n-Nitrosodimethylamine	0.666	0.450	67.6	10.0-125	
n-Nitrosodiphenylamine	0.666	0.448	67.3	40.0-120	
n-Nitrosodi-n-propylamine	0.666	0.452	67.9	26.0-120	
Phenanthrene	0.666	0.465	69.8	42.0-120	
Benzylbutyl phthalate	0.666	0.520	78.1	40.0-120	
Bis(2-ethylhexyl)phthalate	0.666	0.517	77.6	41.0-120	
Di-n-butyl phthalate	0.666	0.484	72.7	43.0-120	
Diethyl phthalate	0.666	0.478	71.8	43.0-120	
Dimethyl phthalate	0.666	0.464	69.7	43.0-120	
Di-n-octyl phthalate	0.666	0.521	78.2	40.0-120	
Pyrene	0.666	0.496	74.5	41.0-120	
1,2,4-Trichlorobenzene	0.666	0.350	52.6	17.0-120	
4-Chloro-3-methylphenol	0.666	0.343	51.5	28.0-120	
2-Chlorophenol	0.666	0.437	65.6	28.0-120	
2,4-Dichlorophenol	0.666	0.363	54.5	25.0-120	
2,4-Dimethylphenol	0.666	0.378	56.8	15.0-120	
4,6-Dinitro-2-methylphenol	0.666	0.434	65.2	16.0-120	
2,4-Dinitrophenol	0.666	0.291	43.7	10.0-120	
2-Nitrophenol	0.666	0.357	53.6	20.0-120	
4-Nitrophenol	0.666	0.524	78.7	27.0-120	
Pentachlorophenol	0.666	0.414	62.2	29.0-120	
Phenol	0.666	0.439	65.9	28.0-120	
2,4,6-Trichlorophenol	0.666	0.410	61.6	37.0-120	
(S) Nitrobenzene-d5			*60.7*	*10.0-122*	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Laboratory Control Sample (LCS)

(LCS) R3756810-1 02/04/22 01:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*62.5*	*15.0-120*	
(S) p-Terphenyl-d14			*72.1*	*10.0-120*	
(S) Phenol-d5			*63.2*	*10.0-120*	
(S) 2-Fluorophenol			*67.4*	*12.0-120*	
(S) 2,4,6-Tribromophenol			*59.2*	*10.0-127*	

L1455751-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455751-08 02/04/22 02:53 • (MS) R3756810-3 02/04/22 03:16 • (MSD) R3756810-4 02/04/22 03:40

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.790	U	0.440	0.453	55.7	57.4	1	18.0-120			2.92	32
Acenaphthylene	0.790	U	0.446	0.461	56.5	58.4	1	25.0-120			3.40	32
Anthracene	0.790	U	0.458	0.487	58.0	61.7	1	22.0-120			6.27	29
Benzidine	1.58	U	0.122	0.119	7.74	7.52	1	10.0-120	J6	J6	2.96	40
Benzo(a)anthracene	0.790	U	0.455	0.480	57.7	60.8	1	25.0-120			5.32	29
Benzo(b)fluoranthene	0.790	U	0.446	0.465	56.5	58.9	1	19.0-122			4.17	31
Benzo(k)fluoranthene	0.790	U	0.455	0.477	57.7	60.4	1	23.0-120			4.58	30
Benzo(g,h,i)perylene	0.790	U	0.468	0.485	59.3	61.4	1	10.0-120			3.48	33
Benzo(a)pyrene	0.790	U	0.455	0.476	57.7	60.2	1	24.0-120			4.33	30
Bis(2-chlorethoxy)methane	0.790	U	0.379	0.394	48.0	49.8	1	10.0-120			3.68	34
Bis(2-chloroethyl)ether	0.790	U	0.460	0.478	58.3	60.5	1	10.0-120			3.79	40
2,2-Oxybis(1-Chloropropane)	0.790	U	0.389	0.426	49.2	53.9	1	10.0-120			9.02	40
4-Bromophenyl-phenylether	0.790	U	0.428	0.453	54.2	57.4	1	27.0-120			5.65	30
2-Chloronaphthalene	0.790	U	0.441	0.459	55.9	58.1	1	20.0-120			3.95	32
4-Chlorophenyl-phenylether	0.790	U	0.448	0.468	56.8	59.3	1	24.0-120			4.40	29
Chrysene	0.790	U	0.466	0.484	59.0	61.3	1	21.0-120			3.75	29
Dibenz(a,h)anthracene	0.790	U	0.464	0.490	58.7	62.0	1	10.0-120			5.47	32
3,3-Dichlorobenzidine	1.58	U	0.688	0.722	43.6	45.8	1	10.0-120			4.88	34
2,4-Dinitrotoluene	0.790	U	0.453	0.483	57.4	61.1	1	30.0-120			6.34	31
2,6-Dinitrotoluene	0.790	U	0.463	0.449	58.6	56.9	1	25.0-120			2.86	31
Fluoranthene	0.790	U	0.447	0.473	56.6	59.9	1	18.0-126			5.67	32
Fluorene	0.790	U	0.451	0.465	57.1	58.9	1	25.0-120			3.11	30
Hexachlorobenzene	0.790	U	0.393	0.430	49.7	54.5	1	27.0-120			9.22	28
Hexachloro-1,3-butadiene	0.790	U	0.339	0.352	42.9	44.6	1	10.0-120			3.77	38
Hexachlorocyclopentadiene	0.790	U	0.178	0.161	22.5	20.4	1	10.0-120			9.79	40
Hexachloroethane	0.790	U	0.374	0.383	47.3	48.5	1	10.0-120			2.51	40
Indeno(1,2,3-cd)pyrene	0.790	U	0.497	0.522	62.9	66.1	1	10.0-120			4.89	32
Isophorone	0.790	U	0.377	0.394	47.7	49.8	1	13.0-120			4.31	34

L1455751-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1455751-08 02/04/22 02:53 • (MS) R3756810-3 02/04/22 03:16 • (MSD) R3756810-4 02/04/22 03:40

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Naphthalene	0.790	U	0.370	0.375	46.8	47.4	1	10.0-120			1.27	35
Nitrobenzene	0.790	U	0.382	0.397	48.3	50.3	1	10.0-120			3.96	36
n-Nitrosodimethylamine	0.790	U	0.453	0.448	57.4	56.8	1	10.0-127			1.05	40
n-Nitrosodiphenylamine	0.790	U	0.417	0.440	52.9	55.7	1	17.0-120			5.26	29
n-Nitrosodi-n-propylamine	0.790	U	0.454	0.461	57.5	58.4	1	10.0-120			1.55	37
Phenanthrene	0.790	U	0.449	0.474	56.9	60.1	1	17.0-120			5.39	31
Benzylbutyl phthalate	0.790	U	0.500	0.523	63.4	66.2	1	23.0-120			4.40	30
Bis(2-ethylhexyl)phthalate	0.790	U	0.502	0.521	63.5	65.9	1	17.0-126			3.71	30
Di-n-butyl phthalate	0.790	U	0.460	0.483	58.3	61.1	1	30.0-120			4.78	29
Diethyl phthalate	0.790	U	0.468	0.480	59.3	60.8	1	26.0-120			2.50	28
Dimethyl phthalate	0.790	U	0.448	0.472	56.8	59.8	1	25.0-120			5.15	29
Di-n-octyl phthalate	0.790	U	0.506	0.532	64.1	67.4	1	21.0-123			5.02	29
Pyrene	0.790	U	0.470	0.491	59.5	62.2	1	16.0-121			4.44	32
1,2,4-Trichlorobenzene	0.790	U	0.359	0.370	45.5	46.8	1	12.0-120			2.93	37
4-Chloro-3-methylphenol	0.790	U	0.349	0.371	44.1	47.0	1	15.0-120			6.26	30
2-Chlorophenol	0.790	U	0.436	0.458	55.3	58.0	1	15.0-120			4.77	37
2,4-Dichlorophenol	0.790	U	0.370	0.387	46.8	48.9	1	20.0-120			4.39	31
2,4-Dimethylphenol	0.790	U	0.376	0.396	47.6	50.2	1	10.0-120			5.22	33
4,6-Dinitro-2-methylphenol	0.790	U	0.416	0.422	52.7	53.5	1	10.0-120			1.41	39
2,4-Dinitrophenol	0.790	U	0.352	0.340	44.6	43.1	1	10.0-121			3.42	40
2-Nitrophenol	0.790	U	0.377	0.406	47.7	51.4	1	12.0-120			7.27	39
4-Nitrophenol	0.790	U	0.563	0.588	71.3	74.5	1	10.0-137			4.33	32
Pentachlorophenol	0.790	U	0.458	0.489	58.0	61.9	1	10.0-160			6.52	31
Phenol	0.790	U	0.438	0.457	55.4	57.8	1	12.0-120			4.24	38
2,4,6-Trichlorophenol	0.790	U	0.422	0.435	53.5	55.1	1	19.0-120			3.04	32
(S) Nitrobenzene-d5					*56.2*	*56.2*		*10.0-122*				
(S) 2-Fluorobiphenyl					*56.2*	*56.2*		*15.0-120*				
(S) p-Terphenyl-d14					*59.8*	*61.3*		*10.0-120*				
(S) Phenol-d5					*56.3*	*59.0*		*10.0-120*				
(S) 2-Fluorophenol					*59.6*	*63.1*		*12.0-120*				
(S) 2,4,6-Tribromophenol					*54.7*	*56.9*		*10.0-127*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Company Name/Address:	Billing Information:	
Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118	Pres Chk
Report to: Rusty Lynch	Email To: rlynch@enercon.com	

Project Description: MKARNS Moorings
City/State Collected: Muskogee, OK
Please Circle: PT MT CT ET

Phone: 405-722-7693
Client Project # CONSOR-00001
Lab Project # ENERCOOK-CONSOR00001

Collected by (print): Rusty Lynch
Site/Facility ID #
P.O. #

Collected by (signature): Rusty [signature]
Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #
Date Results Needed

Chain of Custody Page ___ of ___

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1455712
A225
Table #
Acctnum: ENERCOOK
Template: T198286
Prelogin: P899874
PM: 104 - Jason Romer
PB:
Shipped Via: FedEx Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr	GAMMA Ray Isotopic EPA Method 901.1	Remarks	Sample # (lab only)
SB-23	G	SCM	N/A	1/21/22	12:00PM	5	X	X	X	X	X	X		-01
SB-8		SCM		1/21/22	2:00PM	5	X	X	X	X	X	X		-02
SB-7		SCM		1/21/22	3:00PM	5	X	X	X	X	X	X		-03
SB-4		SCM		1/23/22	10:30AM	5	X	X	X	X	X	X		-04
SB-3		SCM		1/23/22	12:30PM	5	X	X	X	X	X	X		-05
SB-2		SCM		1/23/22	3:15PM	5	X	X	X	X	X	X		-06
SB-1		SCM		1/24/22	9:20AM	5	X	X	X	X	X	X		-07
SB-5		SCM		1/25/22	12:30PM	5	X	X	X	X	X	X		-08
SB-6		SCM		1/25/22	1:45PM	5	X	X	X	X	X	X		-09
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Soil collected in NP containers may not match up w/ what is not on COC. All containers are labled w/ the correct SB # though

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP _Y _N
COC Signed/Accurate: Y _N
Bottles arrive intact: Y _N
Correct bottles used: Y _N
Sufficient volume sent: Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: Y _N
RAD Screen <0.5 mR/hr: Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Rusty [signature]	1/27/22	14:20	E. Davis	

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NS/NC 2.4±0=2.4	Bottles Received: 36	If preservation required by Login: Date/Time
E. Davis	1/27/22	17:00				

Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:	Hold:	Condition: NCF / OK
			[signature]	1/28/22	0800		OK

ANALYTICAL REPORT

February 25, 2022

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1456809
Samples Received:	01/20/2022
Project Number:	CONSOR-00001
Description:	MKARNS Moorings
Report To:	Rusty Lynch
	1601 Northwest Expressway
	Suite 1000
	Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SB-1,2,3 COMP L1456809-01 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816851	1	02/03/22 08:11	02/24/22 11:38	DME	Mt. Juliet, TN

SB-4,5,6 COMP L1456809-02 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816841	1	02/03/22 08:11	02/24/22 10:21	DME	Mt. Juliet, TN

SB-7,8,9 COMP L1456809-03 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816841	1	02/03/22 08:11	02/24/22 10:43	DME	Mt. Juliet, TN

SB-10,11,12 COMP L1456809-04 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816851	1	02/03/22 08:11	02/24/22 10:28	DME	Mt. Juliet, TN

SB-13,14,15 COMP L1456809-05 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816851	1	02/03/22 08:11	02/24/22 10:26	DME	Mt. Juliet, TN

SB-16,17,18 COMP L1456809-06 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816851	1	02/03/22 08:11	02/24/22 12:41	DME	Mt. Juliet, TN

SB-19,20,21,22 COMP L1456809-07 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816841	1	02/03/22 08:11	02/24/22 10:54	DME	Mt. Juliet, TN

SB-23,24,25,26 COMP L1456809-08 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
Rusty Lynch	01/14/22 15:05	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method DOE Ga-01-R/901.1	WG1816841	1	02/03/22 08:11	02/24/22 11:10	DME	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Project Narrative

Multiple samples were composited per customer instructions.
All samples were dried, ground and passed through a 12 mesh sieve prior to anlaysis.

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.33		0.310	0.440	02/24/2022 11:38	WG1816851
Bismuth-212	1.85	J	1.11	1.89	02/24/2022 11:38	WG1816851
Bismuth-214 (Ra-226)	1.76		0.268	0.228	02/24/2022 11:38	WG1816851
Lead-212	1.54		0.196	0.154	02/24/2022 11:38	WG1816851
Lead-214	1.53		0.213	0.237	02/24/2022 11:38	WG1816851
Potassium-40	11.2		1.98	1.32	02/24/2022 11:38	WG1816851
Thallium-208	0.385		0.102	0.128	02/24/2022 11:38	WG1816851
Uranium-235	0.153		0.0650	0.103	02/24/2022 11:38	WG1816851
Thorium-234 (U-238)	1.17	J	0.663	1.42	02/24/2022 11:38	WG1816851
Radium-226 (186 KeV)	1.75		0.666	1.01	02/24/2022 11:38	WG1816851

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.31		0.224	0.235	02/24/2022 10:21	WG1816841
Bismuth-212	1.81		0.701	1.02	02/24/2022 10:21	WG1816841
Bismuth-214 (Ra-226)	1.27		0.197	0.153	02/24/2022 10:21	WG1816841
Lead-212	1.20		0.177	0.120	02/24/2022 10:21	WG1816841
Lead-214	1.14		0.177	0.148	02/24/2022 10:21	WG1816841
Potassium-40	10.1		1.37	1.00	02/24/2022 10:21	WG1816841
Thallium-208	0.357		0.0719	0.0752	02/24/2022 10:21	WG1816841
Uranium-235	0.130		0.0554	0.0915	02/24/2022 10:21	WG1816841
Thorium-234 (U-238)	0.636	U	0.894	1.82	02/24/2022 10:21	WG1816841
Radium-226 (186 KeV)	1.34		0.564	0.910	02/24/2022 10:21	WG1816841

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	0.425		0.159	0.260	02/24/2022 10:43	WG1816841
Bismuth-212	0.520	U	0.650	1.22	02/24/2022 10:43	WG1816841
Bismuth-214 (Ra-226)	0.499		0.127	0.168	02/24/2022 10:43	WG1816841
Lead-212	0.353		0.0983	0.140	02/24/2022 10:43	WG1816841
Lead-214	0.387		0.0978	0.155	02/24/2022 10:43	WG1816841
Potassium-40	16.2		2.12	0.906	02/24/2022 10:43	WG1816841
Thallium-208	0.131		0.0525	0.0755	02/24/2022 10:43	WG1816841
Uranium-235	0.0587	U	0.0536	0.465	02/24/2022 10:43	WG1816841
Thorium-234 (U-238)	-0.110	U	0.703	1.56	02/24/2022 10:43	WG1816841
Radium-226 (186 KeV)	0.658	J	0.549	0.935	02/24/2022 10:43	WG1816841

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	0.451		0.239	0.387	02/24/2022 10:28	WG1816851
Bismuth-212	0.346	U	0.956	2.00	02/24/2022 10:28	WG1816851
Bismuth-214 (Ra-226)	0.623		0.188	0.246	02/24/2022 10:28	WG1816851
Lead-212	0.773		0.153	0.167	02/24/2022 10:28	WG1816851
Lead-214	0.672		0.149	0.217	02/24/2022 10:28	WG1816851
Potassium-40	16.0		2.71	1.67	02/24/2022 10:28	WG1816851
Thallium-208	0.226		0.0842	0.112	02/24/2022 10:28	WG1816851
Uranium-235	0.0378	U	0.0673	0.123	02/24/2022 10:28	WG1816851
Thorium-234 (U-238)	0.0868	U	0.594	1.44	02/24/2022 10:28	WG1816851
Radium-226 (186 KeV)	0.511	U	0.690	1.22	02/24/2022 10:28	WG1816851

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	1.09		0.305	0.471	02/24/2022 10:26	WG1816851
Bismuth-212	0.123	U	0.946	1.87	02/24/2022 10:26	WG1816851
Bismuth-214 (Ra-226)	0.995		0.200	0.206	02/24/2022 10:26	WG1816851
Lead-212	1.22		0.184	0.180	02/24/2022 10:26	WG1816851
Lead-214	0.924		0.170	0.227	02/24/2022 10:26	WG1816851
Potassium-40	19.0		2.77	2.00	02/24/2022 10:26	WG1816851
Thallium-208	0.393		0.0959	0.121	02/24/2022 10:26	WG1816851
Uranium-235	0.273	U	0.0824	0.665	02/24/2022 10:26	WG1816851
Thorium-234 (U-238)	1.29	J	0.851	1.68	02/24/2022 10:26	WG1816851
Radium-226 (186 KeV)	2.35		0.799	1.15	02/24/2022 10:26	WG1816851

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	0.545		0.281	0.512	02/24/2022 12:41	WG1816851
Bismuth-212	0.471	U	1.05	2.10	02/24/2022 12:41	WG1816851
Bismuth-214 (Ra-226)	0.806		0.231	0.290	02/24/2022 12:41	WG1816851
Lead-212	0.658		0.160	0.220	02/24/2022 12:41	WG1816851
Lead-214	0.662		0.176	0.285	02/24/2022 12:41	WG1816851
Potassium-40	9.98		2.25	1.75	02/24/2022 12:41	WG1816851
Thallium-208	0.265		0.0976	0.131	02/24/2022 12:41	WG1816851
Uranium-235	0.162		0.0697	0.107	02/24/2022 12:41	WG1816851
Thorium-234 (U-238)	0.321	U	0.572	1.63	02/24/2022 12:41	WG1816851
Radium-226 (186 KeV)	1.55		0.706	1.09	02/24/2022 12:41	WG1816851

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	0.393		0.122	0.242	02/24/2022 10:54	WG1816841
Bismuth-212	0.130	U	0.442	0.919	02/24/2022 10:54	WG1816841
Bismuth-214 (Ra-226)	0.344		0.0822	0.124	02/24/2022 10:54	WG1816841
Lead-212	0.313		0.0774	0.106	02/24/2022 10:54	WG1816841
Lead-214	0.355		0.0857	0.107	02/24/2022 10:54	WG1816841
Potassium-40	19.2		1.85	0.637	02/24/2022 10:54	WG1816841
Thallium-208	0.145		0.0413	0.0536	02/24/2022 10:54	WG1816841
Uranium-235	0.0501	U	0.0405	0.408	02/24/2022 10:54	WG1816841
Thorium-234 (U-238)	0.681	J	0.709	1.38	02/24/2022 10:54	WG1816841
Radium-226 (186 KeV)	0.582	J	0.412	0.719	02/24/2022 10:54	WG1816841

Radiochemistry by Method DOE Ga-01-R/901.1

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Actinium-228 (Ra-228)	0.452		0.131	0.228	02/24/2022 11:10	WG1816841
Bismuth-212	0.0797	U	0.441	0.872	02/24/2022 11:10	WG1816841
Bismuth-214 (Ra-226)	0.436		0.0996	0.111	02/24/2022 11:10	WG1816841
Lead-212	0.436		0.0875	0.102	02/24/2022 11:10	WG1816841
Lead-214	0.452		0.0868	0.101	02/24/2022 11:10	WG1816841
Potassium-40	14.8		1.62	0.893	02/24/2022 11:10	WG1816841
Thallium-208	0.171		0.0472	0.0633	02/24/2022 11:10	WG1816841
Uranium-235	0.0402	J	0.0366	0.0670	02/24/2022 11:10	WG1816841
Thorium-234 (U-238)	0.199	U	0.605	1.37	02/24/2022 11:10	WG1816841
Radium-226 (186 KeV)	0.458	J	0.374	0.662	02/24/2022 11:10	WG1816841

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

QUALITY CONTROL SUMMARY

L1456809-02,03,07,08

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3762634-1 02/21/22 09:53

Analyte	MB Result pCi/g	MB Qualifier	MB Uncertainty + / -	MB MDA pCi/g
Actinium-228 (Ra-228)	0.0192	U	0.122	0.550
Americium-241	-0.0538	U	0.0952	0.202
Bismuth-212	0.133	U	0.427	1.55
Bismuth-214 (Ra-226)	-0.0158	U	0.112	0.281
Cesium-137	-0.0576	U	0.0600	0.167
Cobalt-60	0.00731	U	0.0524	0.212
Lead-212	0.0294	U	0.0884	0.178
Lead-214	-0.00861	U	0.107	0.259
Potassium-40	-0.00343	U	0.552	2.01
Radium-226 (186 KeV)	0.332	U	0.591	1.09
Thallium-208	0.0166	U	0.0627	0.131
Thorium-234 (U-238)	0.461	U	0.503	1.24
Uranium-235	0.0199	U	0.0584	0.111

L1455291-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1455291-01 02/21/22 10:42 • (DUP) R3762634-4 02/22/22 13:09

Analyte	Original Result pCi/g	Original Uncertainty + / -	Original MDA pCi/g	DUP Result pCi/g	DUP Uncertainty + / -	DUP MDA pCi/g	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Actinium-228 (Ra-228)	0.536	0.130	0.203	0.681	0.211	0.203	1	23.9	0.587		20	3
Bismuth-212	0.718	0.454	0.816	0.975	0.658	0.816	1	30.4	0.322	J	20	3
Bismuth-214 (Ra-226)	0.713	0.113	0.125	0.718	0.155	0.125	1	0.699	0.0260		20	3
Lead-212	0.368	0.0922	0.131	0.550	0.116	0.131	1	39.7	1.23		20	3
Lead-214	0.708	0.122	0.108	0.627	0.134	0.108	1	12.2	0.448		20	3
Potassium-40	-0.187	0.328	0.750	-0.278	0.376	0.750	1	0.000	0.182	U	20	3
Radium-226 (186 KeV)	0.549	0.458	0.811	0.686	0.536	0.811	1	22.2	0.194	J	20	3
Thallium-208	0.192	0.0468	0.0567	0.209	0.0711	0.0567	1	8.13	0.192		20	3
Thorium-234 (U-238)	0.635	0.761	1.58	0.919	0.496	1.58	1	36.5	0.312	J	20	3
Uranium-235	0.0587	0.0451	0.402	0.0764	0.0529	0.402	1	26.3	0.255	J	20	3

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3762634-2 02/21/22 09:53 • (LCSD) R3762634-3 02/21/22 10:40

Analyte	Spike Amount pCi/g	LCS Result pCi/g	LCSD Result pCi/g	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Americium-241	47.3	53.8	54.3	114	115	60.0-140			0.944	20
Cesium-137	72.4	80.7	76.8	111	106	80.0-120			5.02	20
Cobalt-60	86.9	89.8	91.2	103	105	80.0-120			1.52	20

Method Blank (MB)

(MB) R3763581-3 02/24/22 13:45

Analyte	MB Result pCi/g	MB Qualifier	MB Uncertainty + / -	MB MDA pCi/g
Actinium-228 (Ra-228)	-0.0122	U	0.104	0.255
Americium-241	0.177	J	0.128	0.222
Bismuth-212	-0.102	U	0.476	1.05
Bismuth-214 (Ra-226)	0.0257	U	0.0562	0.117
Cesium-137	0.0418	J	0.0414	0.0737
Cobalt-60	-0.00788	U	0.0270	0.0913
Lead-212	0.0319	U	0.0613	0.113
Lead-214	0.0579	U	0.0617	0.130
Potassium-40	0.193	U	0.485	1.03
Radium-226 (186 KeV)	0.424	J	0.489	0.830
Thallium-208	-0.00788	U	0.0263	0.0632
Thorium-234 (U-238)	1.72		0.747	1.20
Uranium-235	0.0473	U	0.0491	0.493

L1456513-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1456513-01 02/24/22 12:38 • (DUP) R3763581-4 02/24/22 14:13

Analyte	Original Result pCi/g	Original Uncertainty + / -	Original MDA pCi/g	DUP Result pCi/g	DUP Uncertainty + / -	DUP MDA pCi/g	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Actinium-228 (Ra-228)	0.510	0.121	0.179	0.536	0.163	0.179	1	4.95	0.127		20	3
Bismuth-212	0.546	0.401	0.669	0.695	0.585	0.669	1	24.1	0.211	J	20	3
Bismuth-214 (Ra-226)	0.408	0.0789	0.0799	0.469	0.124	0.0799	1	14.0	0.419		20	3
Lead-212	0.640	0.0874	0.0736	0.636	0.110	0.0736	1	0.690	0.0314		20	3
Lead-214	0.369	0.0713	0.100	0.350	0.0950	0.100	1	5.48	0.166		20	3
Potassium-40	0.660	0.343	0.518	0.360	0.470	0.518	1	58.9	0.516	U	20	3
Radium-226 (186 KeV)	0.334	0.355	0.592	0.326	0.386	0.592	1	2.34	0.0147	J	20	3
Thallium-208	0.174	0.0417	0.0500	0.159	0.0590	0.0500	1	9.05	0.209		20	3
Thorium-234 (U-238)	0.625	0.421	0.918	0.285	0.355	0.918	1	74.6	0.617	U	20	3
Uranium-235	0.0376	0.0357	0.328	0.0220	0.0377	0.328	1	52.3	0.300	U	20	3

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3763581-1 02/23/22 14:51 • (LCSD) R3763581-2 02/24/22 10:35

Analyte	Spike Amount pCi/g	LCS Result pCi/g	LCSD Result pCi/g	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Americium-241	47.3	46.4	53.1	98.2	112	60.0-140			13.4	20
Cesium-137	72.4	80.4	81.7	111	113	80.0-120			1.60	20
Cobalt-60	86.9	91.5	93.0	105	107	80.0-120			1.55	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1 Cp 2 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

Company Name/Address:	Billing Information:	Pres Chk
Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118	
Report to: Rusty Lynch	Email To: rlynch@enercon.com	
Project Description: MKARNS Moorings	City/State Collected: Muskogee, OK	Please Circle: PT MT CT ET
Phone: 405-722-7693	Client Project # CONSOR-00001	Lab Project # ENERCOOK-CONSOR00001
Collected by (print): Rusty Lynch	Site/Facility ID #	P.O. #
Collected by (signature): [signature] Immediately Packed on Ice N___ Y X	Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
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SDG # L1455717 L1456809

Table # A225

Acctnum: ENERCOOK

Template: T198286

Prelogin: P899874

PM: 104 - Jason Romer

PB:

Shipped Via: FedEX Ground

N 2/2/22

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr	GAMMA Ray Isotopic EPA Method 901.1	Remarks	Sample # (lab only)
SB-23	G	SCM	N/A	1/21/22	12:00PM	5	X	X	X	X	X	X		~~01~~
SB-8		SCM		1/21/22	2:00PM	5	X	X	X	X	X	X		~~02~~
SB-7		SCM		1/21/22	3:00PM	5	X	X	X	X	X	X		~~03~~
SB-4		SCM		1/23/22	10:30AM	5	X	X	X	X	X	X		~~04~~
SB-3		SCM		1/23/22	12:30PM	5	X	X	X	X	X	X		~~05~~
SB-2		SCM		1/23/22	3:15PM	5	X	X	X	X	X	X		~~06~~
SB-1		SCM		1/24/22	9:20AM	5	X	X	X	X	X	X		~~07~~
SB-5		SCM		1/25/22	12:30PM	5	X	X	X	X	X	X		~~08~~
SB-6		SCM		1/25/22	1:45PM	5	X	X	X	X	X	X		~~09~~
		SCM				5	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Soil collected in NP containers may not match up w/ what is not on COC. All containers are labled w/ the correct SB # though <500 cpm

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP _Y _N
COC Signed/Accurate: _Y _N
Bottles arrive intact: _Y _N
Correct bottles used: _Y _N
Sufficient volume sent: _Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: _Y _N
RAD Screen <0.5 mR/hr: _Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
[signature]	1/27/22	14:20	E. Davis	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NS AC 2.4±0=2.4 Bottles Received: 36
E. Davis	1/27/22	17:00		
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 1/28/22 Time: 0800
			[signature]	

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Company Name/Address:
Enercon - Oklahoma City, OK
1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Report to: Rusty Lynch

Email To: rlynch@enercon.com

Project Description: MKARNS Moorings

City/State Collected: Muskogee, OK

Please Circle: PT MT CT ET

Phone: 405-722-7693

Client Project #: CONSOR-00001

Lab Project #: ENERCOOK-CONSOR00001

Collected by (print): Rusty Lynch

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N___ Y X

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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SDG # L1453362
A089
L1456809

Acctnum: ENERCOOK
Template: T198286
Prelogin: P899874
PM: 104 - Jason Romer
PB:
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr					Remarks	Sample # (lab only)
SB-18	G	SCM	N/A	1/14/22	15:05	5	X	X	X	X	X						~~-01~~
SB-24		SCM		1/14/22	16:00	5	X	X	X	X	X						~~-02~~
SB-25		SCM		1/16/22	14:00	5	X	X	X	X	X						~~-03~~
SB-22		SCM		1/16/22	15:45	5	X	X	X	X	X						~~-04~~
SB-19		SCM		1/17/22	11:00	5	X	X	X	X	X						~~-05~~
SB-21		SCM		1/17/22	13:00	~~5~~ 4	X	X	X	X	X						~~-06~~
SB-20		SCM		1/17/22	15:00	~~5~~ 4	X	X	X	X	X						~~-07~~
SB-26		SCM		1/18/22	09:20	~~5~~ 4	X	X	X	X	X						~~-08~~
~~	~~~~	~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
~~	~~~~	~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Soil collected in NP containers may not match up w/ what is noted on COC. All containers are labeled w/ the correct SB-# though

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y __N
COC Signed/Accurate: Y __N
Bottles arrive intact: Y __N
Correct bottles used: Y __N
Sufficient volume sent: Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)		
Rusty Lynch	1/19/22	13:00	E. Davis	Trip Blank Received: Yes / No (circled No) HCL / MeoH TBR	
Relinquished by : (Signature) E. Davis	Date: 1/19/22	Time: 17:00	Received by: (Signature)	Temp: 5.9 °C 5.9+0=5.9	Bottles Received: 37
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 1/20/22	Time: 1300

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Company Name/Address:
Enercon - Oklahoma City, OK
1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Report to: Rusty Lynch

Email To: rlynch@enercon.com

Project Description: MKARNS Moorings

City/State Collected: Muskogee, OK

Please Circle: PT MT CT ET

Phone: 405-722-7693

Client Project # CONSOR-00001

Lab Project # ENERCOOK-CONSOR00001

Collected by (print): Rusty Lynch

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Chain of Custody Page ___ of ___

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SDG # ~~L1455717~~

Table # A225 L1456809

Acctnum: ENERCOOK

Template: T198286

Prelogin: P899874

PM: 104 - Jason Romer

PB:

Shipped Via: FedEX Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr	GAMMA Ray isotopic EPA Method 901.1	Remarks	Sample # (lab only)
SB - 23	G	SCM	N/A	1/21/22	12:00PM	5	X	X	X	X	X	X		~~01~~
SB - 8		SCM		1/21/22	2:00PM	5	X	X	X	X	X	X		~~02~~
SB - 7		SCM		1/21/22	3:00PM	5	X	X	X	X	X	X		~~03~~
SB - 4		SCM		1/23/22	10:30AM	5	X	X	X	X	X	X		~~04~~
SB - 3		SCM		1/23/22	12:30PM	5	X	X	X	X	X	X		~~05~~
SB - 2		SCM		1/23/22	3:15PM	5	X	X	X	X	X	X		~~06~~
SB - 1		SCM		1/24/22	9:20AM	5	X	X	X	X	X	X		~~07~~
SB - 5		SCM		1/25/22	12:30PM	5	X	X	X	X	X	X		~~08~~
SB - 6		SCM		1/25/22	1:45PM	5	X	X	X	X	X	X		-09
		~~SCM~~				5	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks: Soil collected in NP containers may not match up w/ what is not on COC. All containers are labled w/ the correct SB # though

pH ____ Temp ____ <500 cpm

Flow ____ Other ____

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Rusty Lynch	1/27/22	14:20	E. Davis	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NS °C 2.4±0=2.4 / Bottles Received: 36
E. Davis	1/27/22	17:00		
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 1/28/22 Time: 0800

If preservation required by Login: Date/Time

Hold:

Condition: OK

Andy Vann

From:	Jason Romer
Sent:	Tuesday, February 1, 2022 5:01 PM
To:	MTJL Project Service
Cc:	MTJL Sample Storage; Donna Eidson
Subject:	ENERCOOK - relog request - containers should be in Rad Lab

KanBan Card also created, but I felt this relog was easier to read and follow in email format.

L1450959, L1453352, and L1455717:

Per client, please composite samples as follows. Use **ALL** volume from each container in order to provide lab with adequate volume to analyze.
Log to ONE NEW L#, and delete these three SDGs once complete.

L1455717-05, -06, -07 - (log as SB-1,2,3 COMP)
L1455717-04, -08, -09 - (log as SB-4,5,6 COMP)
L1455717-02, -03 and L1450959-01 - (log as SB-7,8,9 COMP)
L1450959-02, -03, -04 - (log as SB-10,11,12 COMP)
L1450959-05, -06, -07 - (log as SB-13,14,15 COMP)
L1450959-08, -09 and L1453352-01 - (log as SB-16,17,18 COMP)
L1453352-04, -05, -06, -07 - (log as SB-19,20,21,22 COMP)
L1453352-02, -03, -08 and L1455717-01 - (log as SB-23,24,25,26 COMP)

Log as R5 Standard TAT for Matrix 17: RADPREPSAMPLE and GSPEC-NORM

Additional soil jar volume if needed as follows, dash numbers will be the same.
L1450959 (also logged as L1450956)
L1453352 (also logged as L1453350)
L1455717 (also logged as L1455712)

Thanks,

Jason Romer
Project Manager II
Pace Analytical - National Center for Testing and Innovation
12065 Lebanon Road | Mt. Juliet, TN 37122
o.615.773.9713 | Jason.Romer@pacelabs.com

Pace Analytical®

ANALYTICAL REPORT

February 10, 2022

Enercon - Oklahoma City, OK

Sample Delivery Group:	L1453575
Samples Received:	01/20/2022
Project Number:	CONSOR-00001
Description:	MKARNS Moorings
Report To:	Rusty Lynch
	1601 Northwest Expressway
	Suite 1000
	Oklahoma City, OK 73118

Entire Report Reviewed By:

Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

	Collected by	Collected date/time	Received date/time
DRILLING MUD DISPOSAL L1453575-01 Solid	Rusty Lynch	01/18/22 08:20	01/20/22 13:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1806458	1	01/24/22 13:57	01/24/22 14:02	CMK	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1806412	1	01/22/22 09:40	01/22/22 12:00	GI	Mt. Juliet, TN
Mercury by Method 7471A	WG1814580	1	02/08/22 12:32	02/09/22 10:11	MRW	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1814439	1	02/08/22 11:21	02/09/22 10:41	KMG	Mt. Juliet, TN
TPH by TCEQ Method 1005	WG1809182	10	01/27/22 18:55	01/28/22 03:31	JDG	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	53.5		1	01/24/2022 14:02	WG1806458

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	9.78	T8	1	01/22/2022 12:00	WG1806412

Sample Narrative:

L1453575-01 WG1806412: 9.78 at 14.2C

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0336	0.0747	1	02/09/2022 10:11	WG1814580

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.98		0.967	3.74	1	02/09/2022 10:41	WG1814439
Barium	35.1		0.159	0.934	1	02/09/2022 10:41	WG1814439
Cadmium	U		0.0880	0.934	1	02/09/2022 10:41	WG1814439
Chromium	17.4		0.248	1.87	1	02/09/2022 10:41	WG1814439
Lead	4.81		0.388	0.934	1	02/09/2022 10:41	WG1814439
Selenium	U		1.43	3.74	1	02/09/2022 10:41	WG1814439
Silver	U		0.237	1.87	1	02/09/2022 10:41	WG1814439

TPH by TCEQ Method 1005

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH C6 - C12	U		280	934	10	01/28/2022 03:31	WG1809182
TPH C12 - C28	U		280	934	10	01/28/2022 03:31	WG1809182
TPH C28 - C35	U		280	934	10	01/28/2022 03:31	WG1809182
TPH C6 - C35	U		280	934	10	01/28/2022 03:31	WG1809182
(S) o-Terphenyl	*112*			*70.0-130*		*01/28/2022 03:31*	WG1809182
(S) 1-chlorooctane	*119*			*70.0-130*		*01/28/2022 03:31*	WG1809182

Sample Narrative:

L1453575-01 WG1809182: Dilution due to matrix impact during extraction procedure

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3753223-1 01/24/22 14:02

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00300			

L1453502-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1453502-02 01/24/22 14:02 • (DUP) R3753223-3 01/24/22 14:02

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	95.8	95.6	1	0.210		10

Laboratory Control Sample (LCS)

(LCS) R3753223-2 01/24/22 14:02

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Laboratory Control Sample (LCS)

(LCS) R3752560-1 01/22/22 12:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.07 at 13.2C

Method Blank (MB)

(MB) R3758412-1 02/09/22 09:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3758412-2 02/09/22 10:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.513	103	80.0-120	

L1454499-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1454499-12 02/09/22 10:04 • (MS) R3758412-3 02/09/22 10:06 • (MSD) R3758412-4 02/09/22 10:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.500	0.0189	0.593	0.551	115	106	1	75.0-125			7.37	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3758621-1 02/09/22 10:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Lead	U		0.208	0.500
Selenium	U		0.764	2.00
Silver	U		0.127	1.00

Laboratory Control Sample (LCS)

(LCS) R3758621-2 02/09/22 10:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	98.8	98.8	80.0-120	
Barium	100	104	104	80.0-120	
Cadmium	100	97.7	97.7	80.0-120	
Chromium	100	98.7	98.7	80.0-120	
Lead	100	102	102	80.0-120	
Selenium	100	100	100	80.0-120	
Silver	20.0	18.1	90.7	80.0-120	

L1453575-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453575-01 02/09/22 10:41 • (MS) R3758621-5 02/09/22 10:49 • (MSD) R3758621-6 02/09/22 10:51

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	187	3.98	179	179	93.6	93.8	1	75.0-125			0.282	20
Barium	187	35.1	217	218	97.4	97.9	1	75.0-125			0.388	20
Cadmium	187	U	173	173	92.7	92.6	1	75.0-125			0.0730	20
Chromium	187	17.4	196	196	95.6	95.6	1	75.0-125			0.000667	20
Lead	187	4.81	189	189	98.5	98.7	1	75.0-125			0.231	20
Selenium	187	U	179	180	95.6	96.2	1	75.0-125			0.614	20
Silver	37.4	U	32.4	32.7	86.8	87.6	1	75.0-125			0.863	20

Method Blank (MB)

(MB) R3754548-1 01/27/22 22:52

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH C6 - C12	U		15.0	50.0
TPH C12 - C28	U		15.0	50.0
TPH C28 - C35	U		15.0	50.0
TPH C6 - C35	U		15.0	50.0
(S) o-Terphenyl	*104*			*70.0-130*
(S) 1-chlorooctane	*113*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3754548-2 01/27/22 23:05 • (LCSD) R3754548-3 01/27/22 23:18

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	282	271	113	108	75.0-125			3.98	20
TPH C12 - C28	250	264	258	106	103	75.0-125			2.30	20
TPH C6 - C35	500	546	529	109	106	75.0-125			3.16	20
(S) o-Terphenyl				*108*	*107*	*70.0-130*				
(S) 1-chlorooctane				*132*	*135*	*70.0-130*	J1	J1		

L1453556-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1453556-11 01/28/22 01:05 • (MS) R3754548-4 01/28/22 01:18 • (MSD) R3754548-5 01/28/22 01:31

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH C6 - C12	250	U	315	316	108	108	1	75.0-125			0.371	20
TPH C12 - C28	250	U	302	312	103	107	1	75.0-125			3.43	20
TPH C6 - C35	500	U	616	628	105	107	1	75.0-125			1.88	20
(S) o-Terphenyl					*106*	*110*		*70.0-130*				
(S) 1-chlorooctane					*129*	*136*		*70.0-130*		J1		

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1 Cp 2 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

Company Name/Address: Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Billing Information: Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118	Pres Chk
Report to: Rusty Lynch	Email To: rlynch@enercon.com	
Project Description: MKARNS Moorings	City/State Collected: Muskogee, OK	Please Circle: PT MT CT ET
Phone: 405-722-7693	Client Project # CONSOR-00001	Lab Project # ENERCOOK-CONSOR00001
Collected by (print): Rusty Lynch	Site/Facility ID #	P.O. #
Collected by (signature): Rusty Lynch Immediately Packed on Ice N ___ Y X	Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr						Remarks	Sample # (lab only)
SB-18	G	SCM	N/A	1/14/22	15:05	5	X	X	X	X	X							-01
SB-24		SCM		1/14/22	16:00	5	X	X	X	X	X							-02
SB-25		SCM		1/16/22	14:00	5	X	X	X	X	X							-03
SB-22		SCM		1/16/22	15:45	5	X	X	X	X	X							-04
SB-19		SCM		1/17/22	11:00	5	X	X	X	X	X							-05
SB-21		SCM		1/17/22	13:00	~~5~~ 4	X	X	X	X	X							-06
SB-20		SCM		1/17/22	15:00	~~5~~ 4	X	X	X	X	X							-07
SB-26		SCM		1/18/22	09:20	~~5~~ 4	X	X	X	X	X							-08
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							

Chain of Custody Page ___ of ___

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12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG# ~~L1453350~~
A089
L1453575

Acctnum: ENERCOOK
Template: T198286
Prelogin: P899874
PM: 104 - Jason Romer
PB:
Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Soil collected in NP containers may not match up w/ what is noted on COC. All containers are labeled w/ the correct SB-# though

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Rusty Lynch	1/19/22	13:00	E. Davis	
Relinquished by : (Signature) E. Davis	Date: 1/19/22	Time: 17:00	Received by: (Signature)	Temp: NA ℃ 5.9+0=5.9 Bottles Received: 37
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 1/20/22 Time: 1300

If preservation required by Login: Date/Time

Hold:

Condition: OK

L1453575

1/21-NCF-~~L1453350~~ ENERCOOK

R5

Page|790

Time estimate: 0h **Time spent:** 0h

Members

HM Hailey Melson (responsible) Jason Romer

Due on *25 January 2022 8:00 AM* for target *Done*

- [ ] Login Clarification needed
- [ ] Chain of custody is incomplete
- [ ] Please specify Metals requested
- [ ] Please specify TCLP requested
- [x] Received additional samples not listed on COC
- [ ] Sample IDs on containers do not match IDs on COC
- [ ] Client did not "X" analysis
- [ ] Chain of Custody is missing
- [ ] If no COC: Received by:____________
- [ ] If no COC: Date/Time:____________
- [ ] If no COC: Temp./Cont.Rec./pH:____________
- [ ] If no COC: Carrier:____________
- [ ] If no COC: Tracking #:____________
- [ ] Client informed by call
- [ ] Client informed by Email
- [ ] Client informed by Voicemail
- [ ] Date/Time:____________
- [ ] PM initials:____________
- [ ] Client Contact:____________

Comments

Hailey Melson *21 January 2022 8:52 AM*

Received 1-8oz jar for ID: Drilling Mud Disposal not listed on COC.

Jason Romer *21 January 2022 12:05 PM*

Log to a separate SDG and run just TPHTX, PH, MRCRA8 and TS.

Scan this COC and NCF to the new SDG and I will generate a COC to scan later.

Hailey Melson *21 January 2022 1:44 PM*

Sample logged to L1453575

Company Name/Address:	Billing Information:	Pres Chk	Analysis / Container / Preservative	Chain of Custody Page ___ of ___
Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118			Pace PEOPLE ADVANCING SCIENCE MT JULIET, TN 12065 Lebanon Rd Mount Juliet, TN 37122 Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf
Report to: Rusty Lynch	Email To: rlynch@enercon.com			
Project Description: MKARNS Moorings	City/State Collected: Muskogee, OK	Please Circle: PT MT CT ET		
Phone: 405-722-7693	Client Project # CONSOR-00001	Lab Project # ENERCOOK-CONSOR00001		SDG # L1456717
Collected by (print): Rusty Lynch	Site/Facility ID #	P.O. #		Table # A225 L1456809
Collected by (signature): Rusty Lynch	Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # / Date Results Needed		Acctnum: ENERCOOK Template: T198286 Prelogin: P899874 PM: 104 - Jason Romer PB: Shipped Via: FedEX Ground
Immediately Packed on Ice N ___ Y X				

N 2/2/22

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr	GAMMA Ray Isotopic EPA Method 901.1					Remarks	Sample # (lab only)
SB-23	G	SCM	N/A	1/20/22	12:00PM	5	X	X	X	X	X	X						-01
SB-8		SCM		1/21/22	2:00PM	5	X	X	X	X	X	X						-02
SB-7		SCM		1/21/22	3:00PM	5	X	X	X	X	X	X						-03
SB-4		SCM		1/23/22	10:30AM	5	X	X	X	X	X	X						-04
SB-3		SCM		1/23/22	12:30PM	5	X	X	X	X	X	X						-05
SB-2		SCM		1/23/22	3:15PM	5	X	X	X	X	X	X						-06
SB-1		SCM		1/24/22	9:20AM	5	X	X	X	X	X	X						-07
SB-5		SCM		1/25/22	12:30PM	5	X	X	X	X	X	X						-08
SB-6		SCM		1/25/22	1:45PM	5	X	X	X	X	X	X						-09
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Soil collected in NP containers may not match up w/ what is not on COC. All containers are labled w/ the correct SB # though

pH ______ <600 cpm Temp ______
Flow ______ Other ______

Samples returned via: __ UPS __ FedEx __ Courier ______

Tracking #

Sample Receipt Checklist	
COC Seal Present/Intact:	NP Y N
COC Signed/Accurate:	Y N
Bottles arrive intact:	Y N
Correct bottles used:	Y N
Sufficient volume sent:	Y N
If Applicable	
VOA Zero Headspace:	Y N
Preservation Correct/Checked:	Y N
RAD Screen <0.5 mR/hr:	Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Rusty Lynch	1/27/22	14:20	E. Davis		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NS AC 2.4±0=2.4	Bottles Received: 36
E. Davis	1/27/22	17:00			If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 1/28/22	Time: 0800
				Hold:	Condition: NCF / OK

Company Name/Address:
Enercon - Oklahoma City, OK

1601 Northwest Expressway
Suite 1000
Oklahoma City, OK 73118

Billing Information:
Accounts Payable - Lisa Hedrick
1601 NW Expressway
Ste.1000
Oklahoma City, OK 73118

Pres Chk

Report to: Rusty Lynch

Email To: rlynch@enercon.com

Project Description: MKARNS Moorings

City/State Collected: Muskogee, OK

Please Circle: PT MT CT ET

Phone: 405-722-7693

Client Project # CONSOR-00001

Lab Project # ENERCOOK-CONSOR00001

Collected by (print): Rusty Lynch

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N___ Y X

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr					Remarks	Sample # (lab only)
SB-18	G	SCM	N/A	1/14/22	15:05	5	X	X	X	X	X						~~01~~
SB-24		SCM		1/14/22	16:00	5	X	X	X	X	X						~~02~~
SB-25		SCM		1/16/22	14:00	5	X	X	X	X	X						~~03~~
SB-22		SCM		1/16/22	15:45	5	X	X	X	X	X						~~04~~
SB-19		SCM		1/17/22	11:00	5	X	X	X	X	X						~~05~~
SB-21		SCM		1/17/22	13:00	4	X	X	X	X	X						~~06~~
SB-20		SCM		1/17/22	15:00	4	X	X	X	X	X						~~07~~
SB-26		SCM		1/18/22	09:20	4	X	X	X	X	X						~~08~~
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						

Chain of Custody Page ___ of ___

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MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
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SDG # L1453362
A089
L1456809

Acctnum: ENERCOOK
Template: T198286
Prelogin: P899874
PM: 104 - Jason Romer
PB:
Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Soil collected in NP containers may not match up w/ what is noted on COC. All containers are labeled w/ the correct SB-# though

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
___ UPS ___ FedEx ___ Courier

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y __N
COC Signed/Accurate: Y __N
Bottles arrive intact: Y __N
Correct bottles used: Y __N
Sufficient volume sent: Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Rusty Lynch	1/19/22	13:00	E. Davis	Yes (No)

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C	Bottles Received:
E. Davis	1/19/22	17:00		5.9+0=5.9	37

Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:
			[signature]	1/20/22	1300

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Company Name/Address:	Billing Information:	Pres Chk	Chain of Custody Page ___ of ___
Enercon - Oklahoma City, OK 1601 Northwest Expressway Suite 1000 Oklahoma City, OK 73118	Accounts Payable - Lisa Hedrick 1601 NW Expressway Ste.1000 Oklahoma City, OK 73118		Pace PEOPLE ADVANCING SCIENCE MT JULIET, TN 12065 Lebanon Rd Mount Juliet, TN 37122 Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf
Report to: Rusty Lynch	Email To: rlynch@enercon.com		
Project Description: MKARNS Moorings	City/State Collected: Muskogee, OK	Please Circle: PT MT CT ET	
Phone: 405-722-7693	Client Project # CONSOR-00001	Lab Project # ENERCOOK-CONSOR00001	SDG # ~~L1455717~~ A225
Collected by (print): Rusty Lynch	Site/Facility ID #	P.O. #	Table # L1456809 Acctnum: ENERCOOK Template: T198286 Prelogin: P899874 PM: 104 - Jason Romer PB:
Collected by (signature): [signature] Immediately Packed on Ice N ___ Y X	Rush? (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # Date Results Needed	Shipped Via: FedEX Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GSPEC-NORM 16ozHDPE-NoPres	RCAR8 Metals 2ozClr-NoPres	SV8082, SV8270, TS 4ozClr-NoPres	TPHTX 4ozClr-NoPres	V8260 40mlAmb/MeOH10ml/Syr	GAMMA Ray isotopic EPA Method 901.1	Remarks	Sample # (lab only)
SB-23	G	SCM	N/A	1/21/22	12:00PM	5	X	X	X	X	X	X		~~01~~
SB-8		SCM		1/21/22	2:00PM	5	X	X	X	X	X	X		~~02~~
SB-7		SCM		1/21/22	3:00PM	5	X	X	X	X	X	X		~~03~~
SB-4		SCM		1/23/22	10:30AM	5	X	X	X	X	X	X		~~04~~
SB-3		SCM		1/23/22	12:30PM	5	X	X	X	X	X	X		~~05~~
SB-2		SCM		1/23/22	3:15PM	5	X	X	X	X	X	X		~~06~~
SB-1		SCM		1/24/22	9:20AM	5	X	X	X	X	X	X		~~07~~
SB-5		SCM		1/25/22	12:30PM	5	X	X	X	X	X	X		~~08~~
SB-6		SCM		1/25/22	1:45PM	5	X	X	X	X	X	X		~~09~~
		~~SCM~~				~~5~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks: Soil collected in NP containers may not match up w/ what is not on COC. All containers are labled w/ the correct SB # though

<500 cpm

pH ______ Temp ______
Flow ______ Other ______

Samples returned via: __ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	NP _Y _N
COC Signed/Accurate:	_Y _N
Bottles arrive intact:	_Y _N
Correct bottles used:	_Y _N
Sufficient volume sent:	_Y _N
If Applicable	
VOA Zero Headspace:	_Y _N
Preservation Correct/Checked:	_Y _N
RAD Screen <0.5 mR/hr:	_Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
[signature]	1/27/22	14:20	E Davis		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NS°C 2.4=2.4	Bottles Received: 36
E Davis	1/27/22	17:00			If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 1/28/22	Time: 0800
			[signature]	Hold:	Condition: OK

Andy Vann

From:	Jason Romer
Sent:	Tuesday, February 1, 2022 5:01 PM
To:	MTJL Project Service
Cc:	MTJL Sample Storage; Donna Eidson
Subject:	ENERCOOK - relog request - containers should be in Rad Lab

KanBan Card also created, but I felt this relog was easier to read and follow in email format.

L1450959, L1453352, and L1455717:

Per client, please composite samples as follows. Use **ALL** volume from each container in order to provide lab with adequate volume to analyze.
Log to ONE NEW L#, and delete these three SDGs once complete.

L1455717-05, -06, -07 - (log as SB-1,2,3 COMP)
L1455717-04, -08, -09 - (log as SB-4,5,6 COMP)
L1455717-02, -03 and L1450959-01 - (log as SB-7,8,9 COMP)
L1450959-02, -03, -04 - (log as SB-10,11,12 COMP)
L1450959-05, -06, -07 - (log as SB-13,14,15 COMP)
L1450959-08, -09 and L1453352-01 - (log as SB-16,17,18 COMP)
L1453352-04, -05, -06, -07 - (log as SB-19,20,21,22 COMP)
L1453352-02, -03, -08 and L1455717-01 - (log as SB-23,24,25,26 COMP)

Log as R5 Standard TAT for Matrix 17: RADPREPSAMPLE and GSPEC-NORM

Additional soil jar volume if needed as follows, dash numbers will be the same.
L1450959 (also logged as L1450956)
L1453352 (also logged as L1453350)
L1455717 (also logged as L1455712)

Thanks,

Jason Romer
Project Manager II
Pace Analytical - National Center for Testing and Innovation
12065 Lebanon Road | Mt. Juliet, TN 37122
o.615.773.9713 | Jason.Romer@pacelabs.com

Pace Analytical®

Appendix B

Photographic Record

Photographic Record

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #1: Representative photograph of drill rig set-up on the barge.

Photo #2: Representative photo of SB-9 mudline (0-2 ft). Sample collected from mudline.

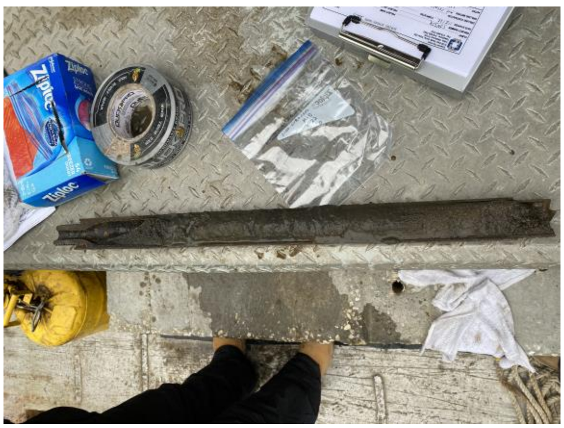

Photo #3: Representative photo of SB-9 (4-6 ft below mudline).

Photo #4: Representative photo of SB-9 top of bedrock.

Photo #5: Representative photo of SB-10 mudline (0-2 ft). Sample collected from mudline

Photo #6: Representative photo of SB-10 (2-4 ft below mudline).

PHOTOGRAPHIC RECORD

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #7: Representative photo of SB-10 top of bedrock.

Photo #8: Representative photo of SB-11 mudline (0-2 ft). Sample collected from mudline.

Photo #9: Representative photo of SB-11 (4-6 ft below mudline).

Photo #10: Representative photo of SB-11 top of bedrock.

Photo #11: Representative photo of SB-12 mudline (0-2 ft). Sample collected from mudline.

Photo #12: Representative photo of SB-12 (6-8 ft below mudline).

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #13: Representative photo of SB-12 top of bedrock.

Photo #14: Representative photo of SB-13 mudline (0-2 ft). Sample collected from mudline.

Photo #15: Representative photo of SB-13 (6-8 ft below mudline).

Photo #16: Representative photo of SB-13 top of bedrock.

Photo #17: Representative photo of SB-14 mudline (0-2 ft). Sample collected from mudline.

Photo #18: Representative photo of SB-14 (8-10 ft below mudline).

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #19: Representative photo of SB-14 top of bedrock.

Photo #20: Representative photo of SB-15 mudline (0-2 ft). Sample collected from mudline.

Photo #21: Representative photo of SB-15 (6-8 ft below mudline).

Photo #22: Representative photo of SB-15 top of bedrock.

Photo #23: Representative photo of SB-16 mudline (0-2 ft). Sample collected from mudline.

Photo #24: Representative photo of SB-16 (6-8 ft below mudline).

Project No.: CONSOR-00001 **Project Name: Moorings Update**

Photo #25: Representative photo of SB-16 top of bedrock.

Photo #26: Representative photo of SB-17 mudline (0-2 ft). Sample collected from mudline.

Photo #27: Representative photo of SB-17 (6-8 ft below mudline).

Photo #28: Representative photo of SB-17 bedrock.

Appendix C

Tables

Table 1
Soil Analytical Results Summary- Solids and Chemical Materials
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

Sample ID	Date Sampled	Actinium-228 (Ra-228)	Bismuth-212	Bismuth-214 (RA-226)	Lead-212	Lead-214	Potassium-40	Thallium-208	Uranium-235	Thorium-234 (U-238)	Radium-226 (186 KeV)
SB-1, 2, 3 COMP	1/24/2022	1.33	1.85[J]	1.76	1.54	1.53	11.2	0.385	0.153	1.17[J]	1.75
SB-4, 5, 6 COMP	1/23/2022	1.31	1.81	1.27	1.20	1.14	10.1	0.357	0.130	0.636	1.34
SB-7, 8, 9 COMP	1/21/2022	0.425	0.520	0.499	0.353	0.387	16.2	0.131	0.0587	-0.110	0.658[J]
SB-10, 11, 12 COMP	1/8/2022	0.451	0.346	0.623	0.773	0.672	16.0	0.226	0.0378	0.0868	0.511
SB-13, 14, 15 COMP	1/10/2022	1.09	0.123	0.995	1.22	0.924	19.0	0.393	0.273	1.29[J]	2.35
SB-16, 17, 18 COMP	1/11/2022	0.545	0.471	0.806	0.658	0.662	9.98	0.265	0.162	0.321	1.55
SB-19, 20, 21, 22 COMP	1/17/2022	0.393	0.130	0.344	0.313	0.355	19.2	0.145	0.0501	0.681[J]	0.582[J]
SB-23, 24, 25, 26 COMP	1/21/2022	0.452	0.0797	0.436	0.436	0.452	14.8	0.171	0.0402[J]	0.199	0.458[J]

*EPA does not provide Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1) for radioactive materials. All results are within expected levels.

Radiochemistry tested by Method DOE Ga-01-R/901.1
Soil concentrations are reported in picocuries per gram (pCi/g).
[J] = The identification of the analyte is acceptable; the reported value is an estimate.

Table 2
Soil Analytical Results Summary- Solids, Mercury, and Metals (ICP)
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

Sample ID	Date Sampled	Total Solids (Method 2450 G-2011)	Mercury (Method 7471A)	Arsenic (Method 6010B)	Barium (Method 6010B)	Cadmium (Method 6010B)	Chromium (Method 6010B)	Lead (Method 6010B)	Selenium (Method 6010B)	Silver (Method 6010B)
SB-1	1/24/2022	74.6	0.0293[J]	9.07	145	3.89	19.7	23.9	< 1.02	< 0.170
SB-2	1/23/2022	66.0	0.0438[J]	3.72	225	4.69	28.5	60.2	< 1.16	< 0.192
SB-3	1/23/2022	73.0	0.0332[J]	6.51	183	2.82	25.1	23.4	< 1.05	< 0.174
SB-4	1/23/2022	82.6	0.0244[J]	2.21[J]	107	2.51	8.1	21.9	< 0.925	< 0.154
SB-5	1/25/2022	74.1	< 0.0243	6.31	97.0	1.73	23.1	22.7	< 1.03	< 0.172
SB-6	1/25/2022	71.8	0.0416[J]	< 0.722	122	4.60	22.3	37.9	< 1.06	< 0.177
SB-7	1/21/2022	89.1	< 0.0202	1.46[J]	19.8	< 0.0529	2.93	1.26	< 0.857	< 0.143
SB-8	1/21/2022	85.0	< 0.0212	0.995[J]	20.5	< 0.0554	2.39	1.08	< 0.898	< 0.149
SB-9	1/8/2022	82.2	< 0.0219	2.01[J]	41.5	0.0959[J]	8.60	4.70	< 0.930	< 0.155
SB-10	1/8/2022	86.3	< 0.0209	0.840[J]	29.5	< 0.0546	3.30	2.52	< 0.886	< 0.147
SB-11	1/8/2022	87.0	< 0.0207	1.79[J]	26.2	< 0.0541	3.53	2.24	< 0.878	< 0.146
SB-12	1/10/2022	68.3	< 0.0264	2.97	107	0.390[J]	18.6	10.6	< 1.12	< 0.186
SB-13	1/10/2022	77.9	< 0.0231	1.87[J]	91.0	0.230[J]	10.5	7.62	1.16[J]	0.338[J]
SB-14	1/10/2022	75.2	< 0.0239	1.83[J]	105	0.194[J]	11.7	9.25	< 1.02	< 0.169
SB-15	1/10/2022	64.0	< 0.0281	3.07[J]	156	0.330[J]	20.6	14.8	1.38[J]	< 0.198
SB-16	1/11/2022	67.8	< 0.0265	2.64[J]	111	0.213[J]	14.8	9.86	1.82[J]	< 0.187
SB-17	1/11/2022	84.3	< 0.0213	2.11[J]	151	0.242[J]	9.0	223	< 0.906	< 0.151
SB-18	1/14/2022	81.7	< 0.0220	0.868[J]	36.8	0.190[J]	6.56	21.2	< 0.935	< 0.155
SB-19	1/17/2022	76.2	< 0.0236	1.06[J]	59.4	0.117[J]	6.81	4.6	< 1.00	< 0.167
SB-20	1/17/2022	78.3	< 0.0230	1.05[J]	46.5	0.0631[J]	5.06	2.74	< 0.976	< 0.162
SB-21	1/17/2022	80.7	< 0.0223	< 0.642	42.8	0.308[J]	4.70	2.44	< 0.947	< 0.157
SB-22	1/16/2022	66.0	< 0.0273	2.99[J]	103	0.215[J]	15.3	9.09	1.37[J]	< 0.192
SB-23	1/21/2022	84.5	< 0.0213	1.30[J]	35.6	< 0.0558	5.42	2.80	< 0.905	< 0.150
SB-24	1/14/2022	85.6	< 0.0210	0.889[J]	21.3	< 0.0550	1.96	1.72	< 0.893	< 0.148
SB-25	1/16/2022	72.3	< 0.0249	2.98	119.0	0.197[J]	14.8	10.5	< 1.06	< 0.176
SB-26	1/18/2022	74	< 0.0243	2.22[J]	88	0.121[J]	10.9	6.75	< 1.03	< 0.172
EPA RSL Industrial Soil [1]			4.6	3.0	22000.0	98.0	NC	800.0	580.0	580.0
EPA Inorganic Background [2]			0	1.1-16.7	430	0.01-1.0	38	10-18	0	.01-5

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)
2 - EPA Region 6 Human Health Medium-Specific Screening Levels, Naturally Occurring Inorganic Background Levels

Total Solids are reported in percentage.
Soil concentrations are reported in miligrams per kilogram (mg/kg).
[J] = The identification of the analyte is acceptable; the reported value is an estimate.

Sample ID	Date Sampled	Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon Tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	Dibromomethane
SB-1	1/24/2022	< 0.0632	< 0.00625	< 0.000808	< 0.00156	< 0.00126	< 0.00203	< 0.00341	< 0.00909[J]	< 0.00499	< 0.00338	< 0.00155	< 0.000364	< 0.00106	< 0.00294	< 0.00178	< 0.00753	< 0.00150	< 0.000779	< 0.00675	< 0.00112	< 0.00130
SB-2	1/23/2022	< 0.0822	< 0.00813	< 0.00105	< 0.00203	< 0.00163	< 0.00264	< 0.00444	< 0.0118[J]	< 0.00649	< 0.00439	< 0.00202	< 0.000473	< 0.00138	< 0.00383	< 0.00232	< 0.00980	< 0.00195	< 0.00101	< 0.00878	< 0.00146	< 0.00169
SB-3	1/23/2022	0.133	< 0.00890	< 0.00115	< 0.00223	< 0.00179	< 0.00289	< 0.00485	0.0200[J]	< 0.00711	< 0.00481	< 0.00221	< 0.000518	< 0.00151	< 0.00419	< 0.00255	< 0.0107	< 0.00213	< 0.00111	< 0.00963	< 0.00160	< 0.00185
SB-4	1/23/2022	0.199	< 0.00758	< 0.000982	< 0.00188	< 0.00152	< 0.00246	< 0.00413	< 0.0110[J]	< 0.00605	< 0.00409	< 0.00188	< 0.000442	< 0.00129	< 0.00357	< 0.00217	< 0.00914	< 0.00182	< 0.000945	< 0.00819	< 0.00136	< 0.00158
SB-5	1/25/2022	< 0.0677	< 0.00670	< 0.000866	< 0.00167	< 0.00135	< 0.00217	< 0.00366	< 0.00974[J]	< 0.00534	< 0.00362	< 0.00167	< 0.000390	< 0.00114	< 0.00315	< 0.00191	< 0.00807	< 0.00160	< 0.000835	< 0.00724	< 0.00120	< 0.00139
SB-6	1/25/2022	< 0.0654	< 0.00647	< 0.000837	< 0.00161	< 0.00130	< 0.00210	< 0.00353	< 0.00941[J]	< 0.00516	< 0.00349	< 0.00161	< 0.000376	< 0.00110	< 0.00305	< 0.00185	< 0.0780	< 0.00155	< 0.000806	< 0.00699	< 0.00116	< 0.00134
SB-7	1/21/2022	< 0.0471	< 0.00465	< 0.000603	< 0.00116	< 0.000935	< 0.00151	< 0.00254	< 0.00677[J]	< 0.00372	< 0.00252	< 0.00116	< 0.000270	< 0.000789	< 0.00219	< 0.00133	< 0.00560	< 0.00112	< 0.000580	< 0.00503	< 0.000836	< 0.000967
SB-8	1/21/2022	< 0.0544	< 0.00538	< 0.000696	< 0.00134	< 0.00108	< 0.00174	< 0.00294	< 0.00783[J]	< 0.00429	< 0.00291	< 0.00134	< 0.000313	< 0.000913	< 0.00254	< 0.00154	< 0.00649	< 0.00129	< 0.000671	< 0.00582	< 0.000966	< 0.00112
SB-9	1/8/2022	< 0.0606	< 0.00599	< 0.000775	< 0.00149	< 0.00120	< 0.00194	< 0.00327	< 0.00871	< 0.00478	< 0.00324	< 0.00149	< 0.000348	< 0.00102	< 0.00282	< 0.00171	< 0.00722	< 0.00144	< 0.000747	< 0.00647	< 0.00108	< 0.00124
SB-10	1/8/2022	< 00564	< 0.00557	< 0.000721	< 0.00139	< 0.00112	< 0.00181	< 0.00304	< 0.00811	< 0.00445	< 0.00301	< 0.00139	< 0.000324	< 0.000945	< 0.00262	< 0.00159	< 0.00672	< 0.00134	< 0.000695	< 0.00602	< 0.00100	< 0.00116
SB-11	1/8/2022	< 0.0572	< 0.00566	< 0.000732	< 0.00141	< 0.00114	< 0.00183	< 0.00309	< 0.00823	< 0.00451	< 0.00306	< 0.00141	< 0.000329	< 0.000959	< 0.00266	< 0.00161	< 0.00682	< 0.00136	< 0.000705	< 0.00611	< 0.00102	< 0.00118
SB-12	1/10/2022	< 0.0752	< 0.00744	< 0.000962	< 0.00185	< 0.00149	< 0.00241	< 0.00406	< 0.0108	< 0.00593	< 0.00402	< 0.00185	< 0.000433	< 0.00126	< 0.00350	< 0.00212	< 0.00896	< 0.00178	< 0.000927	< 0.00803	< 0.00133	< 0.00154
SB-13	1/10/2022	< 0.0654	< 0.00647	< 0.000836	< 0.00161	< 0.00130	< 0.00210	< 0.00353	< 0.00940	< 0.00516	< 0.00349	< 0.00161	< 0.000376	< 0.00110	< 0.00304	< 0.00184	< 0.00779	< 0.00155	< 0.000806	< 0.00699	< 0.00116	< 0.00134
SB-14	1/10/2022	< 0.0677	< 0.00670	< 0.000867	< 0.00167	< 0.00135	< 0.00217	< 0.00366	< 0.00974	< 0.00534	< 0.00362	< 0.00167	< 0.000390	< 0.00114	< 0.00315	< 0.00191	< 0.00807	< 0.00161	< 0.000835	< 0.00724	< 0.00120	< 0.00139
SB-15	1/10/2022	< 0.0864	< 0.00855	< 0.00111	< 0.00213	< 0.00172	< 0.00277	< 0.00466	< 0.0124	< 0.00682	< 0.00462	< 0.00213	< 0.000497	< 0.00145	< 0.00403	< 0.00244	< 0.0103	< 0.00205	< 0.00107	< 0.00923	< 0.00153	< 0.00178
SB-16	1/11/2022	< 0.0832	< 0.00823	< 0.00106	< 0.00205	< 0.00165	< 0.00267	< 0.00449	< 0.0120	< 0.00657	< 0.00445	< 0.00205	< 0.000479	< 0.00140	< 0.00388	< 0.00235	< 0.00992	< 0.00197	< 0.00103	< 0.00889	< 0.00148	< 0.00171
SB-17	1/11/2022	< 0.0603	< 0.00596	< 0.000771	< 0.00149	< 0.00120	< 0.00193	< 0.00325	< 0.00867	< 0.00475	< 0.00322	< 0.00148	< 0.000347	< 0.00101	< 0.00281	< 0.00170	< 0.00718	< 0.00143	< 0.000743	< 0.00644	< 0.00107	< 0.00124
SB-18	1/14/2022	< 0.0715	< 0.00708	< 0.000915	< 0.00177	< 0.00142	< 0.00229	< 0.00387	< 0.0103	< 0.00565	< 0.00382	< 0.00177	< 0.000411	< 0.00120	< 0.00333	< 0.00202	< 0.00853	< 0.00170	< 0.000882	< 0.00765	< 0.00127	< 0.00148
SB-19	1/17/2022	< 0.0647	< 0.00640	< 0.000828	< 0.00160	< 0.00129	< 0.00207	< 0.00349	< 0.00931	< 0.00511	< 0.00346	< 0.00159	< 0.000372	< 0.00109	< 0.00301	< 0.00183	< 0.00771	< 0.00153	< 0.000798	< 0.00691	< 0.00115	< 0.00133
SB-20	1/17/2022	< 0.0598	< 0.00592	< 0.000766	< 0.00148	< 0.00119	< 0.00192	< 0.00323	< 0.00861	< 0.00472	< 0.00320	< 0.00147	< 0.000344	< 0.00100	< 0.00279	< 0.00169	< 0.00713	< 0.00142	< 0.000738	< 0.00639	< 0.00106	< 0.00123
SB-21	1/17/2022	< 0.0549	< 0.00543	< 0.000702	< 0.00135	< 0.00109	< 0.00176	< 0.00296	< 0.00790	< 0.00433	< 0.00293	< 0.00135	< 0.000316	< 0.000921	< 0.00256	< 0.00155	< 0.00654	< 0.00130	< 0.000677	< 0.00587	< 0.000975	< 0.00113
SB-22	1/16/2022	< 0.0780	< 0.00771	< 0.000998	< 0.00192	< 0.00155	< 0.00250	< 0.00421	< 0.0112	< 0.00615	< 0.00417	< 0.00192	< 0.000449	< 0.00131	< 0.00363	< 0.00220	< 0.00929	< 0.00185	< 0.000961	< 0.00833	< 0.00138	< 0.00160
SB-23	1/21/2022	< 0.0579	< 0.00572	< 0.000740	< 0.00143	< 0.00115	< 0.00185	< 0.00312	< 0.00832[J]	< 0.00457	< 0.00309	< 0.00142	< 0.000333	< 0.000970	< 0.00269	< 0.00163	< 0.00690	< 0.00137	< 0.000713	< 0.00618	< 0.00103	< 0.00119
SB-24	1/14/2022	< 0.0495	< 0.00489	< 0.000633	< 0.00122	< 0.000983	< 0.00159	< 0.00267	< 0.00712	< 0.00390	< 0.00264	< 0.00122	< 0.000285	< 0.000830	< 0.00230	< 0.00140	< 0.00590	< 0.00117	< 0.000610	< 0.00529	< 0.000878	< 0.00102
SB-25	1/16/2022	0.0689[J]	< 0.00640	< 0.000828	< 0.00159	< 0.00128	< 0.00207	< 0.00349	< 0.00930	< 0.00510	< 0.00346	< 0.00159	< 0.000372	< 0.00108	< 0.00301	< 0.00183	< 0.00771	< 0.00153	< 0.000797	< 0.00691	< 0.00115	< 0.00133
SB-26	1/18/2022	0.0685[J]	< 0.00615	< 0.000796	< 0.00153	< 0.00124	< 0.00199	< 0.00336	< 0.00894	< 0.00491	< 0.00332	< 0.00153	< 0.000358	< 0.00104	< 0.00290	< 0.00175	< 0.00741	< 0.00147	< 0.000767	< 0.00664	< 0.00110	< 0.00128
EPA RSL Industrial Soil [1]		1,100,000	0.25	5.1	1800	1.3	86	30	58,000	120,000	120,000	2.9	1,300	39	5,700	1.4	460	23,000	2,300	0.064	0.16	9.9

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Volatile Organic Compounds tested by Method 8260B
Soil concentrations are reported in miligrams per kilogram (mg/kg).
[J] = The identification of the analyte is acceptable; the reported value is an estimate.
[B] = The same analyte is found in the associated blank.

Table 3
Soil Analytical Results Summary- Volatile Organic Compounds (GC/MS)
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropane	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	2,2-Dichloropropane	Di-isopropyl ether	Ethylbenzene	Hexachloro-1,3-Butadiene	Isopropylbenzene	p-Isopropyltoluene	2-Butanone (MEK)	Methyl Chloride	4-Methyl-2-pentanone (MIBK)
< 0.000736	< 0.00104	< 0.00121	< 0.00279	< 0.000850	< 0.00112	< 0.00105	< 0.00127	< 0.00180	< 0.00246	< 0.00140	< 0.000867	< 0.00131	< 0.00197	< 0.00239	< 0.000710	< 0.00128	< 0.0104	< 0.000736	< 0.00441	< 0.110	< 0.0115	< 0.00395
< 0.000957	< 0.00135	< 0.00158	< 0.00363	< 0.00111	< 0.00146	< 0.00136	< 0.00165	< 0.00234	< 0.00234	< 0.00182	< 0.00113	< 0.00170	< 0.00257	< 0.00311	< 0.000923	< 0.00166	< 0.0135	< 0.000957	< 0.00574	< 0.143	< 0.0150	< 0.00513
< 0.00105	< 0.00148	< 0.00173	< 0.00397	< 0.00121	< 0.00160	< 0.00150	< 0.00181	< 0.00256	< 0.00350	< 0.00200	< 0.00124	< 0.00187	< 0.00281	< 0.00340	< 0.00101	< 0.00182	< 0.0148	< 0.00105	< 0.00629	< 0.157	< 0.0165	< 0.00563
< 0.000893	< 0.00126	< 0.00147	< 0.00338	< 0.00103	< 0.00136	< 0.00127	< 0.00155	< 0.00218	< 0.00299	< 0.00170	< 0.00105	< 0.00159	< 0.00240	< 0.00289	< 0.000862	0.00284[J]	< 0.0126	< 0.000893	< 0.00536	< 0.133	< 0.0140	< 0.00479
< 0.000789	< 0.00111	< 0.00130	< 0.00299	< 0.000911	< 0.00120	< 0.00112	< 0.00136	< 0.00193	< 0.00263	< 0.00150	< 0.000930	< 0.00140	< 0.00212	< 0.00256	< 0.000761	< 0.00137	< 0.0111	< 0.000789	< 0.00473	< 0.118	< 0.0123	< 0.00423
< 0.000762	< 0.00108	< 0.00125	< 0.00289	< 0.000880	< 0.00116	< 0.00109	< 0.00132	< 0.00186	< 0.00254	< 0.00145	< 0.000898	< 0.00136	< 0.00204	< 0.00247	< 0.000735	< 0.00132	< 0.0108	< 0.000762	< 0.00457	< 0.114	< 0.0119	< 0.00409
< 0.000548	< 0.000774	< 0.000903	< 0.00207	< 0.000634	< 0.000837	< 0.000781	< 0.000946	< 0.00134	< 0.00184	< 0.00104	< 0.000646	< 0.000976	< 0.00148	< 0.00179	< 0.000528	< 0.000950	< 0.00774	< 0.000548	< 0.00329	< 0.0818	< 0.00857	< 0.00294
< 0.000634	< 0.000895	< 0.00104	< 0.00240	< 0.000732	< 0.000968	< 0.000904	< 0.00109	< 0.00155	< 0.00212	< 0.00121	< 0.000747	< 0.00113	< 0.00170	< 0.00206	< 0.000611	< 0.00110	< 0.00895	< 0.000634	< 0.00380	< 0.0947	< 0.00990	< 0.00340
< 0.000705	< 0.000996	< 0.00116	< 0.00267	< 0.000815	< 0.00108	< 0.00101	< 0.00122	< 0.00173	< 0.00236	< 0.00134	< 0.000831	< 0.00126	< 0.00189	< 0.00229	< 0.000680	< 0.00122	< 0.00996	< 0.000705	< 0.00423	< 0.105	< 0.0110	< 0.00378
< 0.000656	< 0.000926	< 0.00108	< 0.00249	< 0.000758	< 0.00100	< 0.000936	< 0.00113	< 0.00161	< 0.00219	< 0.00125	< 0.000774	< 0.00117	< 0.00176	< 0.00213	< 0.000633	< 0.00114	< 0.00926	< 0.000656	< 0.00394	< 0.0980	< 0.0103	< 0.00352
< 0.000666	< 0.000940	< 0.00110	< 0.00252	< 0.000769	< 0.00102	< 0.000949	< 0.00115	< 0.00163	< 0.00222	< 0.00127	< 0.000785	< 0.00119	< 0.00179	< 0.00216	< 0.000642	< 0.00115	< 0.00940	< 0.000666	< 0.00400	< 0.0995	< 0.0104	< 0.00357
< 0.000875	< 0.00124	< 0.00144	< 0.00332	< 0.00101	< 0.00134	< 0.00125	< 0.00151	< 0.00214	< 0.00293	< 0.00167	< 0.00103	< 0.00156	< 0.00235	< 0.00284	< 0.000845	< 0.00152	< 0.0124	< 0.000875	< 0.00525	< 0.131	< 0.0137	< 0.00470
< 0.000761	< 0.00107	< 0.00125	< 0.00288	< 0.000879	< 0.00116	< 0.00109	< 0.00131	< 0.00186	< 0.00254	< 0.00145	< 0.000897	< 0.00136	< 0.00204	< 0.00247	< 0.000734	< 0.00132	< 0.0107	< 0.000761	< 0.00457	< 0.114	< 0.0119	< 0.00408
< 0.000789	< 0.00111	< 0.00130	< 0.00299	< 0.000911	< 0.00120	< 0.00112	< 0.00136	< 0.00193	< 0.00246	< 0.00150	< 0.000930	< 0.00140	< 0.00212	< 0.00256	< 0.000761	< 0.00137	< 0.0111	< 0.000789	< 0.00473	< 0.118	< 0.0123	< 0.00423
< 0.00101	< 0.00142	< 0.00166	< 0.00381	< 0.00116	< 0.00154	< 0.00143	< 0.00174	< 0.00246	< 0.00336	< 0.00192	< 0.00119	< 0.00179	< 0.00270	< 0.00327	< 0.000971	< 0.00174	< 0.0142	< 0.00101	< 0.00604	< 0.150	< 0.0157	< 0.00540
< 0.000969	< 0.00137	< 0.00160	< 0.00367	< 0.00112	< 0.00148	< 0.00138	< 0.00167	< 0.00237	< 0.00324	< 0.00184	< 0.00114	< 0.00173	< 0.00260	< 0.00315	< 0.000935	< 0.00168	< 0.0137	< 0.000969	< 0.00581	< 0.145	< 0.0151	< 0.00520
< 0.000702	< 0.000991	< 0.00116	< 0.00266	< 0.000811	< 0.00107	< 0.00100	< 0.00121	< 0.00172	< 0.00234	< 0.00134	< 0.000827	< 0.00125	< 0.00188	< 0.00228	< 0.000677	< 0.00122	< 0.00991	< 0.000702	< 0.00421	< 0.105	< 0.0110	< 0.00376
< 0.000832	< 0.00118	< 0.00137	< 0.00316	< 0.000962	< 0.00127	< 0.00119	< 0.00144	< 0.00204	< 0.00279	< 0.00159	< 0.000982	< 0.00148	< 0.00224	< 0.00271	< 0.000803	< 0.00145	< 0.0118	< 0.000832	< 0.00500	< 0.125	< 0.0130	< 0.00447
< 0.000754	< 0.00106	< 0.00124	< 0.00285	< 0.000871	< 0.00115	< 0.00107	< 0.00130	< 0.00184	< 0.00252	< 0.00143	< 0.000888	< 0.00134	< 0.00202	< 0.00245	< 0.000727	< 0.00131	< 0.0106	< 0.000754	< 0.00452	< 0.113	< 0.0118	< 0.00404
< 0.000697	< 0.000984	< 0.00115	< 0.00264	< 0.000805	< 0.00106	< 0.000993	< 0.00120	< 0.00170	< 0.00233	< 0.00133	< 0.000821	< 0.00124	< 0.00187	< 0.00226	< 0.000672	< 0.00121	< 0.00984	< 0.000697	< 0.00418	< 0.104	< 0.0109	< 0.00374
< 0.000639	< 0.000903	< 0.00105	< 0.00242	< 0.000739	< 0.000976	< 0.000912	< 0.00110	< 0.00156	< 0.00214	< 0.00122	< 0.000754	< 0.00114	< 0.00171	< 0.00208	< 0.000617	< 0.00111	< 0.00903	< 0.000639	< 0.00384	< 0.0955	< 0.00999	< 0.00343
< 0.000908	< 0.00128	< 0.00150	< 0.00344	< 0.00105	< 0.00139	< 0.00129	< 0.00157	< 0.00222	< 0.00303	< 0.00173	< 0.00107	< 0.00162	< 0.00244	< 0.00295	< 0.000876	< 0.00157	< 0.0128	< 0.000908	< 0.00545	< 0.136	< 0.0142	< 0.00487
< 0.000674	< 0.000951	< 0.00111	< 0.00255	< 0.000778	< 0.00103	< 0.000961	< 0.00116	< 0.00165	< 0.00225	< 0.00128	< 0.000794	< 0.00120	< 0.00181	< 0.00219	< 0.000650	0.00157[J]	< 0.00951	< 0.000674	< 0.00404	< 0.101	< 0.0105	< 0.00361
< 0.000576	< 0.000813	< 0.000949	< 0.00218	< 0.000666	< 0.000880	< 0.000822	< 0.000995	< 0.00141	< 0.00193	< 0.00110	< 0.000679	< 0.00103	< 0.00155	< 0.00187	< 0.000556	< 0.000999	< 0.00813	< 0.000576	< 0.00346	< 0.0861	< 0.00900	< 0.00309
< 0.000753	< 0.00106	< 0.00124	< 0.00285	< 0.000870	< 0.00115	< 0.00107	< 0.00130	< 0.00184	< 0.00252	< 0.00143	< 0.000888	< 0.00134	< 0.00202	< 0.00245	< 0.000727	< 0.00131	< 0.0106	< 0.000753	< 0.00452	< 0.113	< 0.0118	< 0.00404
< 0.000724	< 0.00102	< 0.00119	< 0.00274	< 0.000836	< 0.00111	< 0.00103	< 0.00125	< 0.00177	< 0.00242	< 0.00138	< 0.000853	< 0.00129	< 0.00194	< 0.00235	< 0.000698	< 0.00126	< 0.0102	< 0.000724	< 0.00434	< 0.108	< 0.0113	< 0.00388
9,300	NC	11	370	16	2	16	2,300	300	11	8.2	23,000	8.2	8.2	NC	9,400	25	5.3	NC	NC	19,000	460	14,000

Methyl tert-butyl ether	Naphalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichlorotrifluoroethane	Tetrachloroethane	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,2,3-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl Chloride	Xylenes, Total
< 0.000606	< 0.00845[J]	0.00164	< 0.000396	< 0.00164	< 0.00120	< 0.00131	< 0.00155	< 0.00225	< 0.0127	< 0.00762[J]	< 0.00160	< 0.00103	< 0.00101	< 0.00143[J]	< 0.00280[J]	< 0.00274	< 0.00274	< 0.00346	< 0.00201	< 0.00152
< 0.000788	< 0.0110[J]	< 0.00214	< 0.000516	< 0.00214	< 0.00157	< 0.00170	< 0.00202	< 0.00293	< 0.0165	< 0.00991[J]	< 0.00208	< 0.00134	< 0.00132	< 0.00186[J]	< 0.00365[J]	< 0.00356	< 0.00356	< 0.00450	< 0.00261	< 0.00198
< 0.000863	< 0.0120[J]	< 0.00234	< 0.000565	< 0.00234	< 0.00171	< 0.00185	< 0.00221	0.00544[J]	< 0.0181	< 0.0109[J]	< 0.00227	< 0.00147	< 0.00144	< 0.00205[J]	< 0.00400[J]	< 0.00390	< 0.00390	< 0.00494	< 0.00285	< 0.00218
< 0.000735	0.0167[J]	< 0.00199	< 0.000481	< 0.00199	< 0.00145	< 0.00159	< 0.00188	0.0155	< 0.0153	< 0.00924[J]	< 0.00194	< 0.00125	< 0.00123	< 0.00174[J]	< 0.00341[J]	0.00924[J]	< 0.00331	< 0.00420	< 0.00244	0.02
< 0.000649	< 0.00905[J]	< 0.00176	< 0.000425	< 0.00176	< 0.00129	< 0.00140	< 0.00166	< 0.00241	< 0.0136	< 0.00816[J]	< 0.00171	< 0.00111	< 0.00108	< 0.00153[J]	< 0.00301[J]	< 0.00293	< 0.00293	< 0.00371	< 0.00215	< 0.00163
< 0.000627	< 0.00875[J]	< 0.00170	< 0.000410	< 0.00170	< 0.00125	< 0.00135	< 0.00161	< 0.00233	< 0.0131	< 0.00788[J]	< 0.00165	< 0.00107	< 0.00105	< 0.00148[J]	< 0.00290[J]	< 0.00283	< 0.00283	< 0.00358	< 0.00208	< 0.00158
< 0.000451	< 0.00630[J]	< 0.00123	< 0.000295	< 0.00122	< 0.000896	< 0.000972	< 0.00116	0.00361[J]	< 0.00945	< 0.00568[J]	< 0.00119	< 0.000770	< 0.000753	< 0.00107[J]	< 0.00208[J]	< 0.00203	< 0.00203	< 0.00258	< 0.00150	< 0.00113
< 0.000522	< 0.00728[J]	< 0.00142	< 0.000342	< 0.00141	< 0.00104	< 0.00112	< 0.00134	0.00353[J]	< 0.0109	< 0.00656[J]	< 0.00138	< 0.000890	< 0.000871	< 0.00123[J]	< 0.00242[J]	< 0.00236	< 0.00236	< 0.00298	< 0.00173	< 0.00131
< 0.000581	< 0.00810	< 0.00830	< 0.000380	< 0.00157	< 0.00115	< 0.00125	< 0.00149	< 0.00216	< 0.0122	< 0.00730	< 0.00153	< 0.000991	< 0.000969	< 0.00137	< 0.00269	< 0.00262	< 0.00262	< 0.00332	< 0.00332	< 0.00146
< 0.000540	< 0.00753	< 0.00147	< 0.000354	< 0.00146	< 0.00107	< 0.00116	< 0.00138	0.00687[J]	< 0.0113	< 0.00679	< 0.00143	< 0.000922	< 0.000902	< 0.00128	< 0.00250	< 0.00244	< 0.00244	< 0.00309	< 0.00179	< 0.00136
< 0.000548	< 0.00765	< 0.00149	< 0.000359	< 0.00149	< 0.00109	< 0.00118	< 0.00140	0.0143	< 0.0115	< 0.00689	< 0.00145	< 0.000935	< 0.000915	< 0.00130	< 0.00254	< 0.00248	< 0.00248	< 0.00313	< 0.00182	0.00526[J]
< 0.000721	< 0.0101	< 0.00196	< 0.000472	< 0.00195	< 0.00143	< 0.00155	< 0.00185	0.016	< 0.0151	< 0.00906	< 0.00190	< 0.00123	< 0.00120	< 0.00170	< 0.00334	< 0.00325	< 0.00325	< 0.00412	< 0.00239	< 0.00181
< 0.000627	< 0.00874	< 0.00170	< 0.000410	< 0.00170	< 0.00124	< 0.00135	< 0.00160	< 0.00233	< 0.0131	< 0.00788	< 0.00165	< 0.00107	< 0.00105	< 0.00148	< 0.00290	< 0.00283	< 0.00283	< 0.00358	< 0.00208	< 0.00158
< 0.000649	< 0.00906	< 0.00176	< 0.000425	< 0.00176	< 0.00129	< 0.00140	< 0.00166	0.00742[J]	< 0.0136	< 0.00817	< 0.00171	< 0.00111	< 0.00108	< 0.00153	< 0.00301	< 0.00293	< 0.00293	< 0.00371	< 0.00215	< 0.00163
< 0.000829	< 0.0116	< 0.00225	< 0.000542	< 0.00224	< 0.00165	< 0.00179	< 0.00212	< 0.00308	< 0.0174	< 0.0104	< 0.00219	< 0.00141	< 0.00138	< 0.00196	< 0.00384	< 0.00374	< 0.00374	< 0.00474	< 0.00275	< 0.00208
< 0.000798	< 0.0111	< 0.00217	< 0.000522	< 0.00216	< 0.00158	< 0.00172	< 0.00204	< 0.00296	< 0.0167	< 0.0100	< 0.00210	< 0.00136	< 0.00133	< 0.00189	< 0.00369	< 0.00360	< 0.00360	< 0.00456	< 0.00264	< 0.00201
< 0.000578	0.0215	0.00158[J]	< 0.000378	< 0.00157	< 0.00115	< 0.00124	< 0.00148	0.0114	< 0.0121	< 0.00726	< 0.00152	< 0.000986	< 0.000964	< 0.00137	< 0.00267	0.00730[J]	< 0.00261	< 0.00330	< 0.00192	< 0.00145
< 0.000686	< 0.00957	< 0.00186	< 0.000449	< 0.00186	< 0.00136	< 0.00148	< 0.00175	0.012	< 0.0144	< 0.00863	< 0.00181	< 0.00117	< 0.00114	< 0.00162	< 0.00318	< 0.00309	< 0.00309	< 0.00392	< 0.00228	0.00446[J]
< 0.000621	< 0.00865	< 0.00168	< 0.00406	< 0.00168	< 0.00123	< 0.00134	< 0.00159	0.00943	< 0.0130	< 0.00780	< 0.00164	< 0.00106	< 0.00104	< 0.00147	< 0.00287	< 0.00280	< 0.00280	< 0.00355	< 0.00206	< 0.00156
< 0.000574	< 0.00800	< 0.00156	< 0.000375	< 0.00155	< 0.00114	< 0.00124	< 0.00147	0.00451[J]	< 0.0120	< 0.00721	< 0.00151	< 0.000979	< 0.000957	< 0.00136	< 0.00266	< 0.00259	< 0.00259	< 0.00328	< 0.00190	< 0.00144
< 0.000526	< 0.00734	< 0.00143	< 0.000344	< 0.00143	< 0.00105	< 0.00113	< 0.00135	0.00338[J]	< 0.0110	< 0.00662	< 0.00139	< 0.000898	< 0.000878	< 0.00124	< 0.00244	< 0.00238	< 0.00238	< 0.00301	< 0.00174	< 0.00132
< 0.000748	< 0.0104	< 0.00203	< 0.000489	< 0.00202	< 0.00148	< 0.00161	< 0.00191	0.0172	< 0.0157	< 0.00940	< 0.00197	< 0.00128	< 0.00125	< 0.00177	< 0.00346	< 0.00337	< 0.00337	< 0.00427	< 0.00248	0.00252[J]
< 0.000555	< 0.00774[J]	< 0.00151	< 0.000363	< 0.00150	< 0.00110	< 0.00120	< 0.00142	0.00908	< 0.0116	< 0.00698[J]	< 0.00146	< 0.000946	< 0.000926	< 0.00131	< 0.00257	< 0.00250	< 0.00250	< 0.00317	< 0.00184	0.00821[J]
< 0.000474	< 0.00662	< 0.00129	< 0.000310	< 0.00129	< 0.000942	< 0.00102	< 0.00121	0.00588[J]	< 0.00994	< 0.00597	< 0.00125	< 0.000809	< 0.000792	< 0.00112	< 0.00220	< 000214	< 0.00214	< 0.00271	< 0.00157	0.00205[J]
< 0.000620	< 0.00865	< 0.00168	< 0.000406	< 0.00168	< 0.00123	< 0.00134	< 0.00159	0.0146	< 0.0130	< 0.00780	< 0.00164	< 0.00106	< 0.00103	< 0.00147	< 0.00287	0.00315[J]	0.00443[J]	< 0.00354	< 0.00206	0.00530[J]
< 0.000596	< 0.00831	< 0.00162	< 0.000390	< 0.00161	< 0.00118	< 0.00128	< 0.00153	0.00647[J]	< 0.0125	< 0.00750	< 0.00157	< 0.00102	< 0.000995	< 0.00141	< 0.00276	0.00286[J]	< 0.00269	< 0.00341	< 0.00198	< 0.00150
210	17	NC	35,000	8.8	2.7	28,000	100	47,000	930	110	36,000	5	6	350,000	0.11	1,800	2,000	1,500	1.7	2,500

Table 4
Soil Analytical Results Summary-
Total Petroleum Hydrocarbons (TPH)
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

Sample ID	Date Sampled	TPH C6-C12	TPH C12-C28	TPH C28-C35	TPH C6-C35
SB-1	1/24/2022	< 20.1	< 20.1	< 20.1	< 20.1
SB-2	1/23/2022	< 22.7	< 22.7	< 22.7	< 22.7
SB-3	1/23/2022	< 20.6	< 20.6	< 20.6	< 20.6
SB-4	1/23/2022	< 18.2	< 18.2	< 18.2	< 18.2
SB-5	1/25/2022	< 20.3	< 20.3	< 20.3	< 20.3
SB-6	1/25/2022	< 20.9	< 20.9	< 20.9	< 20.9
SB-7	1/21/2022	< 16.8	< 16.8	< 16.8	< 16.8
SB-8	1/21/2022	< 17.6	< 17.6	< 17.6	< 17.6
SB-9	1/8/2022	< 18.3	23.7[J]	< 18.3	23.7[J]
SB-10	1/8/2022	< 17.4	< 17.4	< 17.4	< 17.4
SB-11	1/8/2022	< 17.2	< 17.2	< 17.2	< 17.2
SB-12	1/10/2022	< 22.0	< 22.0	< 22.0	< 22.0
SB-13	1/10/2022	< 19.3	< 19.3	< 19.3	< 19.3
SB-14	1/10/2022	< 19.9	< 19.9	< 19.9	< 19.9
SB-15	1/10/2022	< 23.4	< 23.4	< 23.4	< 23.4
SB-16	1/11/2022	< 22.1	< 22.1	< 22.1	< 22.1
SB-17	1/11/2022	< 17.8	< 17.8	< 17.8	< 17.8
SB-18	1/14/2022	< 18.4	< 18.4	< 18.4	< 18.4
SB-19	1/17/2022	< 19.7	< 19.7	< 19.7	< 19.7
SB-20	1/17/2022	< 19.2	< 19.2	< 19.2	< 19.2
SB-21	1/17/2022	< 18.6	< 18.6	< 18.6	< 18.6
SB-22	1/16/2022	< 22.7	< 22.7	< 22.7	< 22.7
SB-23	1/21/2022	< 17.8	< 17.8	< 17.8	< 17.8
SB-24	1/14/2022	< 17.5	< 17.5	< 17.5	< 17.5
SB-25	1/16/2022	< 20.8	< 20.8	< 20.8	< 20.8
SB-26	1/18/2022	< 20.3	< 20.3	< 20.3	< 20.3
ODEQ - Industrial Soil (1)		500.00	500.00	500.00	500.00

Table 5
Soil Analytical Results Summary- Polychlorinated Biphenyls (GC)
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

Sample ID	Date Sampled	PCB 1016	PCB 1221	PCB 1232	PCB 1242	PCB 1248	PCB 1254	PCB 1260
SB-1	1/24/2022	< 0.0158	< 0.0158	< 0.0158	< 0.0158	< 0.00989	< 0.00989	< 0.00989
SB-2	1/23/2022	< 0.0179	< 0.0179	< 0.0179	< 0.0179	< 0.0112	< 0.0112	< 0.0112
SB-3	1/23/2022	< 0.0162	< 0.0162	< 0.0162	< 0.0162	< 0.0101	< 0.0101	< 0.0101
SB-4	1/23/2022	< 0.0143	< 0.0143	< 0.0143	< 0.0143	< 0.00894	< 0.00894	< 0.00894
SB-5	1/25/2022	< 0.0159	< 0.0159	< 0.0159	< 0.0159	< 0.00997	< 0.00997	< 0.00997
SB-6	1/25/2022	< 0.0164	< 0.0164	< 0.0164	< 0.0164	< 0.0103	< 0.0103	< 0.0103
SB-7	1/21/2022	< 0.0132	< 0.0132	< 0.0132	< 0.0132	< 0.00828	< 0.00828	< 0.00828
SB-8	1/21/2022	< 0.0139	< 0.0139	< 0.0139	< 0.0139	< 0.00868	< 0.00868	< 0.00868
SB-9	1/8/2022	< 0.0144	< 0.0144	< 0.0144	< 0.0144	< 0.00898	< 0.00898	< 0.00898
SB-10	1/8/2022	< 0.0137	< 0.0137	< 0.0137	< 0.0137	< 0.00855	< 0.00855	< 0.00855
SB-11	1/8/2022	< 0.0136	< 0.0136	< 0.0136	< 0.0136	< 0.00848	< 0.00848	< 0.00848
SB-12	1/10/2022	< 0.0173	< 0.0173	< 0.0173	< 0.0173	< 0.0108	< 0.0108	< 0.0108
SB-13	1/10/2022	< 0.0152	< 0.0152	< 0.0152	< 0.0152	< 0.00948	< 0.00948	< 0.00948
SB-14	1/10/2022	< 0.0157	< 0.0157	< 0.0157	< 0.0157	< 0.00981	< 0.00981	< 0.00981
SB-15	1/10/2022	< 0.0184	< 0.0184	< 0.0184	< 0.0184	< 0.0115	< 0.0115	< 0.0115
SB-16	1/11/2022	< 0.0174	< 0.0174	< 0.0174	< 0.0174	< 0.0109	< 0.0109	< 0.0109
SB-17	1/11/2022	< 0.0140	< 0.0140	< 0.0140	< 0.0140	< 0.00875	< 0.00875	< 0.00875
SB-18	1/14/2022	< 0.0144	< 0.0144	< 0.0144	< 0.0144	< 0.00903	< 0.00903	< 0.00903
SB-19	1/17/2022	< 0.0155	< 0.0155	< 0.0155	< 0.0155	< 0.00969	< 0.00969	< 0.00969
SB-20	1/17/2022	< 0.0151	< 0.0151	< 0.0151	< 0.0151	< 0.00943	< 0.00943	< 0.00943
SB-21	1/17/2022	< 0.0146	< 0.0146	< 0.0146	< 0.0146	< 0.00915	< 0.00915	< 0.00915
SB-22	1/16/2022	< 0.0179	< 0.0179	< 0.0179	< 0.0179	< 0.0112	< 0.0112	< 0.0112
SB-23	1/21/2022	< 0.0140	< 0.0140	< 0.0140	< 0.0140	<0.00874	<0.00874	<0.00874
SB-24	1/14/2022	< 0.0138	< 0.0138	< 0.0138	< 0.0138	< 0.00862	< 0.00862	< 0.00862
SB-25	1/16/2022	< 0.0163	< 0.0163	< 0.0163	< 0.0163	< 0.0102	< 0.0102	< 0.0102
SB-26	1/18/2022	< 0.0159	< 0.0159	< 0.0159	< 0.0159	< 0.00997	< 0.00997	< 0.00997
EPA RSL Industrial Soil [1]		5.1	1	1	1	1	1	1

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Polychlorinated Biphenyls (GC) tested by Method 8082
Soil concentrations are reported in miligrams per kilogram (mg/kg).

Sample ID	Date Sampled	Acenaphthene	Acenaphthylene	Anthracene	Benzidine	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzo(a)pyrene	Bis(2-chlorethoxy)methane	Bis(2-chloroethyl)ether	2,2-Oxybis(1-Chloropropane)	4-Bromophenyl-phenylether	2-Chloronaphthalene	4-Chlorophenyl-phenylether	Chrysene	Dibenz(a,h)anthracene	3,3-Dichlorobenzidine
SB-1	1/24/2022	< 0.00722	< 0.00629	< 0.00759	< 0.0839	< 0.00787	< 0.00832	< 0.00794	< 0.00816	< 0.00830	< 0.0134	< 0.0147	< 0.0193	< 0.0157	< 0.00784	< 0.0155	< 0.00887	< 0.0124	< 0.0165
SB-2	1/23/2022	< 0.00817	< 0.00711	< 0.00899	< 0.0949	<.00889	< 0.00941	< 0.00897	< 0.00923	< 0.00938	< 0.0152	< 0.0167	< 0.0218	< 0.0177	< 0.00886	< 0.0176	< 0.0100	< 0.0140	< 0.0186
SB-3	1/23/2022	< 0.00739	< 0.00643	< 0.00813	< 0.0858	< 0.00804	< 0.00851	< 0.00811	< 0.00835	< 0.00848	< 0.0137	< 0.0151	< 0.0197	< 0.0160	< 0.00802	< 0.0159	< 0.00907	< 0.0126	< 0.0169
SB-4	1/23/2022	< 0.00653	< 0.00568	< 0.00718	< 0.0758	< 0.00711	< 0.00752	< 0.00717	< 0.00738	< 0.00750	< 0.0121	< 0.0133	< 0.0174	< 0.0142	< 0.00709	< 0.0141	< 0.00802	< 0.0112	< 0.0149
SB-5	1/25/2022	< 0.00728	< 0.00633	< 0.00801	< 0.0845	< 0.00793	< 0.00839	< 0.00799	< 0.00822	< 0.00836	< 0.0135	< 0.0149	< 0.0194	< 0.0158	< 0.00790	< 0.0157	< 0.00894	< 0.0125	< 0.0166
SB-6	1/25/2022	< 0.00751	< 0.00654	< 0.00826	< 0.0872	< 0.00818	< 0.00865	< 0.00825	< 0.00849	< 0.00863	< 0.0139	< 0.0153	< 0.0201	< 0.0163	< 0.00815	< 0.0162	< 0.00923	< 0.0129	< 0.0171
SB-7	1/21/2022	< 0.00605	< 0.00526	< 0.00666	< 0.0703	< 0.00659	< 0.00697	< 0.00664	< 0.00683	< 0.00695	< 0.0112	< 0.0123	< 0.0162	< 0.0131	< 0.00657	< 0.0130	< 0.00743	< 0.0104	< 0.0138
SB-8	1/21/2022	< 0.00634	< 0.00551	< 0.00697	< 0.0736	< 0.00690	< 0.00730	< 0.00696	< 0.00716	< 0.00728	< 0.0118	< 0.0129	< 0.0169	< 0.0138	< 0.00688	< 0.0136	< 0.00778	< 0.0109	< 0.0145
SB-9	1/8/2022	< 0.00656	< 0.00571	< 0.00722	< 0.0762	< 0.00714	< 0.00756	< 0.00720	< 0.00741	< 0.00753	< 0.0122	< 0.0134	< 0.0175	< 0.0142	< 0.00712	< 0.0141	< 0.00805	< 0.0112	< 0.0150
SB-10	1/8/2022	< 0.00625	< 0.00544	< 0.00687	< 0.0726	< 0.00680	< 0.00720	< 0.00686	< 0.00706	< 0.00717	< 0.0116	< 0.0127	< 0.0167	< 0.0136	< 0.00678	< 0.0134	< 0.00767	< 0.0107	< 0.0143
SB-11	1/8/2022	< 0.00619	< 0.00539	< 0.00681	< 0.0719	< 0.00675	< 0.00714	< 0.00680	< 0.00700	< 0.00711	< 0.0115	< 0.0126	< 0.0165	< 0.0134	< 0.00672	< 0.0133	< 0.00761	< 0.0106	< 0.0141
SB-12	1/10/2022	< 0.00789	< 0.00687	< 0.00868	< 0.0917	< 0.00860	< 0.00909	< 0.00867	< 0.00892	< 0.00906	< 0.0146	< 0.0161	< 0.0211	< 0.0171	< 0.00857	< 0.0170	< 0.00969	< 0.0135	< 0.0180
SB-13	1/10/2022	< 0.00692	< 0.00602	< 0.00762	< 0.0804	< 0.00754	< 0.00798	< 0.00760	< 0.00782	< 0.00795	< 0.0128	< 0.0141	< 0.0185	< 0.0150	< 0.00751	< 0.0149	< 0.00850	< 0.0119	< 0.0158
SB-14	1/10/2022	< 0.00717	< 0.00624	< 0.00789	< 0.0833	< 0.00781	< 0.00826	< 0.00787	< 0.00810	< 0.00823	< 0.0133	< 0.0146	< 0.0192	< 0.0156	< 0.00778	< 0.0154	< 0.00880	< 0.0123	< 0.0164
SB-15	1/10/2022	< 0.00842	< 0.00733	< 0.00926	< 0.0978	< 0.00917	< 0.00970	< 0.00925	< 0.00951	< 0.00967	< 0.0156	< 0.0172	< 0.0225	< 0.0183	< 0.00914	< 0.0181	< 0.0103	< 0.0144	< 0.0192
SB-16	1/11/2022	< 0.00795	< 0.00691	< 0.00874	< 0.0923	< 0.00865	< 0.00916	< 0.00873	< 0.00898	< 0.00913	< 0.0147	< 0.0162	< 0.0212	< 0.0173	< 0.00863	< 0.0171	< 0.00976	< 0.0136	< 0.0181
SB-17	1/11/2022	< 0.00639	< 0.00556	< 0.00703	< 0.0742	< 0.00696	< 0.00736	< 0.00702	< 0.00722	< 0.00734	< 0.0119	< 0.0130	< 0.0171	< 0.0139	< 0.00694	< 0.0138	< 0.00785	< 0.0109	< 0.0146
SB-18	1/14/2022	< 0.0132	< 0.0115	< 0.0146	< 0.153	< 0.0143	< 0.0152	< 0.0144	< 0.0149	< 0.0152	< 0.0245	< 0.0269	< 0.0352	< 0.0286	< 0.0143	< 0.0284	< 0.0162	< 0.0226	< 0.0301
SB-19	1/17/2022	< 0.0142	< 0.0123	< 0.0156	< 0.164	< 0.0154	< 0.0163	< 0.0155	< 0.0160	< 0.0163	< 0.0263	< 0.0289	< 0.0378	< 0.0307	< 0.0154	< 0.0305	< 0.0173	< 0.0243	< 0.0323
SB-20	1/17/2022	< 0.00689	< 0.00599	< 0.00757	< 0.0800	< 0.00750	< 0.00793	< 0.00756	< 0.00778	< 0.00791	< 0.0128	< 0.0141	< 0.0184	< 0.0149	< 0.00747	< 0.0148	< 0.00846	< 0.0118	< 0.0157
SB-21	1/17/2022	< 0.0134	< 0.0116	< 0.0148	< 0.155	< 0.0145	< 0.0154	< 0.0146	< 0.0151	< 0.0154	< 0.0248	< 0.0273	< 0.0357	< 0.0290	< 0.0145	< 0.0288	< 0.0164	< 0.0229	< 0.0305
SB-22	1/16/2022	< 0.0164	< 0.0142	< 0.0180	< 0.189	< 0.0177	< 0.0188	< 0.0179	< 0.0185	< 0.0188	< 0.0303	< 0.0333	< 0.0436	< 0.0354	< 0.0177	< 0.0351	< 0.0200	< 0.0280	< 0.0373
SB-23	1/21/2022	< 0.00638	< 0.00555	< 0.00702	< 0.0741	< 0.00695	< 0.00735	< 0.00701	< 0.00721	< 0.00733	< 0.0118	< 0.0130	< 0.0170	< 0.0139	< 0.00693	< 0.0137	< 0.00784	< 0.0109	< 0.0146
SB-24	1/14/2022	< 0.00630	< 0.00548	< 0.00693	< 0.0731	< 0.00686	< 0.00725	< 0.00692	< 0.00711	< 0.00723	< 0.0117	< 0.0129	< 0.0168	< 0.0137	< 0.00683	< 0.0136	< 0.00773	< 0.0108	< 0.0144
SB-25	1/16/2022	< 0.0149	< 0.0130	< 0.0165	< 0.173	< 0.0162	< 0.0172	< 0.0163	< 0.0169	< 0.0172	< 0.0277	< 0.0304	< 0.0399	< 0.0324	< 0.0162	< 0.0321	< 0.0183	< 0.0256	< 0.0340
SB-26	1/18/2022	< 0.00728	< 0.00634	< 0.00801	< 0.0846	< 0.00793	< 0.00839	< 0.00800	< 0.00823	< 0.00836	< 0.0135	< 0.0149	< 0.0195	< 0.0158	< 0.00790	< 0.0157	< 0.00894	< 0.0125	< 0.0166
EPA RSL Industrial Soil [1]		4,500	4,500	23,000	0.01	2.9	2.9	29	NC	0.29	2,500	1	47,000	2,300	6,000	5,800	290	0.29	5.1

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

Semi Volatile Organic Compound(GC/MS) tested by Method 8270C

Soil concentrations are reported in miligrams per kilogram (mg/kg).

[J] = The identification of the analyte is acceptable; the reported value is an estimate.

Table 6
Soil Analytical Results Summary- Semi Volatile Organic Compounds (GC/MS)
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

2,4-Dinitrotoluene	2,6-Dinitrotoluene	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachloro-1,3-butadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	Naphthalene	Nitrobenzene	n-Nitrosodimethylamine	n-Nitrosodiphenylamine	n-Nitrosodi-n-propylamine	Phenanthrene	Benzylbutyl phthalate	Bis(2-ethylhexyl)phthalate	Di-n-butyl phthalate	Diethyl phthalate
< 0.0128	< 0.0146	< 0.00806	< 0.00727	< 0.0158	< 0.0150	< 0.0235	< 0.0176	< 0.0126	< 0.0137	< 0.0112	< 0.0155	< 0.0662	< 0.0338	< 0.0149	< 0.00886	< 0.0139	< 0.0566	< 0.0153	< 0.0147
< 0.0145	< 0.0165	< 0.00911	< 0.00821	< 0.0179	< 0.0170	< 0.0265	< 0.0199	< 0.0143	< 0.0155	< 0.0127	< 0.0176	< 0.0749	< 0.0382	< 0.0168	< 0.0100	< 0.0158	< 0.0639	< 0.0173	< 0.0167
< 0.0131	< 0.0149	< 0.00824	< 0.00743	< 0.0162	< 0.0153	< 0.0240	< 0.0180	< 0.0129	< 0.0140	< 0.0115	< 0.0159	< 0.0677	< 0.0345	< 0.0152	< 0.00906	< 0.0143	< 00578	< 0.0156	< 0.0151
< 0.0116	< 0.0132	< 0.00728	< 0.00657	< 0.0143	< 0.0136	< 0.0212	< 0.0159	< 0.0114	< 0.0124	< 0.0101	< 0.0141	< 0.0598	< 0.0305	< 0.0134	< 0.00801	< 0.0126	< 0.0511	< 0.0138	< 0.0133
< 0.0129	< 0.0147	< 0.00812	< 0.00732	< 0.0159	< 0.0151	< 0.0236	< 0.0177	< 0.0127	< 0.0138	0.0114[J]	< 0.0157	< 0.0667	< 0.0340	< 0.0150	< 0.00893	< 0.0140	< 0.0570	< 0.0154	< 0.0149
< 0.0133	< 0.0152	< 0.00838	< 0.00755	< 0.0164	< 0.0156	< 0.0244	< 0.0183	< 0.0131	< 0.0142	< 0.0117	< 0.0162	< 0.0688	< 0.0351	< 0.0155	< 0.00921	< 0.0145	< 0.0588	< 0.0159	< 0.0153
< 0.0107	< 0.0122	< 0.00675	< 0.00608	< 0.0132	< 0.0126	< 0.0196	< 0.0147	< 0.0106	< 0.0114	< 0.00938	< 0.0130	< 0.0554	< 0.0283	< 0.0125	< 0.00742	< 0.117	< 0.0474	< 0.0128	< 0.0123
< 0.0112	< 0.0128	< 0.00707	< 0.00637	< 0.0139	< 0.0132	< 0.0206	< 0.0154	< 0.0111	< 0.0120	< 0.00983	< 0.0136	< 0.0581	< 0.0296	< 0.0131	< 0.00777	< 0.0122	< 0.0496	< 0.0134	< 0.0129
< 0.0116	< 0.0133	< 0.00731	< 0.00659	< 0.0144	< 0.0136	< 0.0213	< 0.0159	< 0.0114	< 0.0124	< 0.0102	< 0.0141	< 0.0601	< 0.0307	< 0.0135	< 0.00804	< 0.0127	< 0.0513	< 0.0139	< 0.0134
< 0.0111	< 0.0126	< 0.00697	< 0.00628	< 0.0137	< 0.0130	< 0.0203	< 0.0152	< 0.0109	< 0.0118	< 0.00969	< 0.0134	< 0.0573	< 0.0292	< 0.0129	< 0.00766	< 0.0121	< 0.0489	< 0.0132	< 0.0127
< 0.0110	< 0.0125	< 0.00691	< 0.0623	< 0.0136	< 0.0129	< 0.0201	< 0.0151	< 0.0108	< 0.0117	< 0.00961	< 0.0133	< 0.0568	< 0.0290	< 0.0128	< 0.00760	< 0.0120	< 0.0485	< 0.0131	< 0.0126
< 0.0140	< 0.0160	< 0.00880	< 0.00794	< 0.0173	< 0.0164	< 0.0256	< 0.0192	< 0.0138	< 0.0149	< 0.0122	< 0.0170	< 0.0723	< 0.0369	< 0.0163	< 0.00968	< 0.0152	< 0.0618	< 0.0167	< 0.0161
< 0.0123	< 0.0140	< 0.00772	< 0.00696	< 0.0152	< 0.0144	< 0.0225	< 0.0168	< 0.0121	< 0.0131	< 0.0107	< 0.0149	< 0.0634	< 0.0324	< 0.0143	< 0.00849	< 0.0134	< 0.0542	< 0.0146	< 0.0141
< 0.0127	< 0.0145	< 0.00799	< 0.00721	< 0.0157	< 0.0149	< 0.0233	< 0.0174	< 0.0125	< 0.0136	< 0.0111	< 0.0154	< 0.0657	< 0.0335	< 0.0148	< 0.00879	< 0.0138	< 0.0561	< 0.0152	< 0.0146
< 0.0149	< 0.0170	< 0.00939	< 0.00847	< 0.0184	< 0.0175	< 0.0273	< 0.0205	< 0.0147	< 0.0159	< 0.0131	< 0.0181	< 0.0772	< 0.0394	< 0.0173	< 0.0103	< 0.0162	< 0.0659	< 0.0178	< 0.0172
< 0.0141	< 0.0161	< 0.00886	< 0.00799	< 0.0174	< 0.0165	< 0.0258	< 0.0193	< 0.0139	< 0.0150	< 0.0123	< 0.0171	< 0.0728	< 0.0372	< 0.0164	< 0.00975	< 0.0153	< 0.0622	< 0.0168	< 0.0162
< 0.0113	< 0.0129	< 0.00713	< 0.00643	< 0.0140	< 0.0133	< 0.0208	< 0.0155	< 0.0112	< 0.0121	< 0.00991	< 0.0138	< 0.0586	< 0.0299	< 0.0132	< 0.00784	< 0.0123	< 0.0500	< 0.0135	< 0.0130
< 0.0234	< 0.0267	0.0165[J]	< 0.0132	< 0.0289	< 0.0274	< 0.0428	< 0.0321	< 0.0230	< 0.0250	< 0.0204	< 0.0284	< 0.121	< 0.0617	< 0.0272	< 0.0162	< 0.0254	< 0.103	< 0.0279	< 0.0269
< 0.0251	< 0.0286	< 0.0158	< 0.0142	< 0.0310	< 0.0294	< 0.0459	< 0.0344	< 0.0247	< 0.0268	< 0.0219	< 0.0305	< 0.130	< 0.0662	< 0.0291	< 0.0173	< 0.0273	< 0.111	< 0.0299	< 0.0289
< 0.0122	< 0.0139	< 0.00768	< 0.00692	< 0.0151	< 0.0143	< 0.0224	< 0.0167	< 0.0120	< 0.0130	< 0.0107	< 0.0148	< 0.0631	< 0.0322	< 0.0142	< 0.00844	< 0.0133	< 0.0539	< 0.0146	< 0.0141
< 0.0237	< 0.0270	< 0.0149	< 0.0134	< 0.0293	< 0.0278	< 0.0434	< 0.0325	< 0.0233	< 0.0253	< 0.0207	< 0.0288	< 0.122	< 0.0625	< 0.0275	< 0.0164	< 0.0258	< 0.105	< 0.0283	< 0.0273
< 0.0289	< 0.0330	< 0.0182	< 0.0164	< 0.0357	< 0.0339	< 0.0530	< 0.0397	< 0.0285	< 0.0309	< 0.0253	< 0.0351	< 0.150	< 0.0763	< 0.0336	< 0.0200	< 0.0315	< 0.128	< 0.0345	< 0.0333
< 0.0113	< 0.0129	< 0.00712	< 0.00642	< 0.0140	< 0.0133	< 0.0207	< 0.0155	< 0.0111	< 0.0121	< 0.00990	< 0.0137	< 0.0585	< 0.0298	< 0.0131	< 0.00783	< 0.0123	< 0.0500	< 0.0135	< 0.0130
< 0.0112	< 0.0127	< 0.00702	< 0.00633	< 0.0138	< 0.0131	< 0.0204	< 0.0153	< 0.0110	< 0.0119	< 0.00977	< 0.0136	< 0.0577	< 0.0294	< 0.0130	< 0.00772	< 0.0121	< 0.0493	< 0.0133	< 0.0129
< 0.0264	< 0.0302	0.0241[J]	< 0.0149	< 0.0327	< 0.0310	< 0.0484	< 0.0363	< 0.0260	< 0.0282	< 0.0231	< 0.0321	< 0.137	< 0.0698	< 0.0307	< 0.0183	< 0.0288	< 0.117	< 0.0316	< 0.0304
< 0.0129	< 0.0147	< 0.00812	< 0.00732	< 0.0159	< 0.0151	< 0.0236	< 0.0177	< 0.0127	< 0.0138	< 0.0113	< 0.0157	< 0.0667	< 0.0340	< 0.0150	< 0.00893	< 0.0140	< 0.0570	< 0.0154	< 0.0149
7.4	1.5	3,000	3,000	0.96	5.3	7.5	8	2.9	2400	17	22	0.034	4,700	0.33	NC	1,200	160	82,000	660,000

Dimethyl pthalate	Di-n-octyl phthalate	Pyrene	1,2,4-Trichlorobenzene	4-Chloro-3-methylphenol	2-Chlorophenol	2,4-Dichlorophennol	2,4-Dimethylphenol	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	2-Nitrophenol	4-Nitrophenol	Pentachlorophenol	Phenol	2,4,6-Trichlorophenol
< 0.0946	< 0.0302	< 0.00869	< 0.0139	< 0.0145	< 0.0147	< 0.0130	< 0.0117	< 0.101	< 0.104	< 0.0160	< 0.0139	< 0.0120	0.0985[J]	< 0.0143
< 0.107	< 0.0341	< 0.00982	< 0.0158	< 0.0164	< 0.0167	< 0.0147	< 0.0132	< 0.114	< 0.118	< 0.0180	< 0.0158	< 0.0136	0.0783[J]	< 0.0162
< 0.0967	< 0.0308	< 0.00888	< 0.0143	< 0.0148	< 0.0151	< 0.0133	< 0.0119	< 0.103	< 0.107	< 0.0163	< 0.0143	< 0.0123	0.0351[J]	< 0.0147
< 0.0855	< 0.0273	< 0.00785	< 0.0126	< 0.0131	< 0.0133	< 0.0117	< 0.0105	< 0.0915	< 0.0944	< 0.0144	< 0.0126	< 0.0109	0.0573[J]	< 0.0130
< 0.0953	< 0.0304	< 0.00875	< 0.0140	< 0.0146	< 0.0149	< 0.0131	< 0.0117	< 0.102	< 0.105	< 0.0161	< 0.0140	< 0.0121	0.0702	< 0.0144
< 0.0984	< 0.0314	< 0.00903	< 0.0145	< 0.0151	< 0.0153	< 0.0135	< 0.0121	< 0.105	< 0.109	< 0.0166	< 0.0145	< 0.0125	< 0.0187	< 0.0149
< 0.0792	< 0.0253	< 0.00727	< 0.0117	< 0.0121	< 0.0123	< 0.0109	< 0.00976	< 0.0847	< 0.0874	< 0.0134	< 0.0117	< 0.0101	0.0255[J]	< 0.0120
< 0.0830	< 0.0265	< 0.00762	< 0.0122	< 0.0127	< 0.0129	< 0.0114	< 0.0102	< 0.0888	< 0.0916	< 0.0140	< 0.0122	< 0.0105	0.0227[J]	< 0.0126
< 0.0859	< 0.0274	< 0.00788	< 0.0127	< 0.0131	< 0.0134	< 0.0118	< 0.0106	< 0.0919	< 0.0948	< 0.0145	< 0.0127	< 0.0109	< 0.0163	< 0.0130
< 0.0818	< 0.0261	< 0.00751	< 0.0121	< 0.0125	< 0.0127	< 0.0112	< 0.0101	< 0.0875	< 0.0903	< 0.0138	< 0.0121	< 0.0104	< 0.0155	< 0.0124
< 0.0811	< 0.0259	< 0.00745	< 0.0120	< 0.0124	< 0.0126	< 0.0111	< 0.0100	< 0.0868	< 0.0895	< 0.0137	< 0.0120	< 0.0103	< 0.0154	< 0.0123
< 0.103	< 0.0329	< 0.00949	< 0.0152	< 0.0158	< 0.0161	< 0.0142	< 0.0127	< 0.111	< 0.114	< 0.0174	< 0.0152	< 0.0131	< 0.0196	< 0.0157
< 0.0907	< 0.0289	< 0.00832	< 0.0134	< 0.0139	< 0.0141	< 0.0125	< 0.0112	< 0.0970	< 0.100	< 0.0153	< 0.0134	< 0.0115	< 0.0172	< 0.0137
< 0.0939	< 0.0299	< 0.00862	< 0.0138	< 0.0144	< 0.0146	< 0.0129	< 0.0116	< 0.100	< 0.104	< 0.0158	< 0.0138	< 0.0119	< 0.0178	< 0.0142
< 0.110	< 0.0352	< 0.0101	< 0.0162	< 0.0169	< 0.0172	< 0.0152	< 0.0136	< 0.118	< 0.122	< 0.0186	< 0.0162	< 0.0140	< 0.0209	< 0.0167
< 0.104	< 0.0332	< 0.00955	< 0.0153	< 0.0159	< 0.0162	< 0.0143	< 0.0128	< 0.111	< 0.115	< 0.0175	< 0.0153	< 0.0132	< 0.0198	< 0.0158
< 0.0837	< 0.0267	< 0.00768	< 0.0123	< 0.0128	< 0.0130	< 0.0115	< 0.0103	< 0.0895	< 0.0924	< 0.0141	< 0.0123	< 0.0106	< 0.0159	< 0.0127
< 0.173	< 0.0551	0.0208[J]	< 0.0254	< 0.0264	< 0.0269	< 0.0237	< 0.0213	< 0.185	< 0.191	< 0.0291	< 0.0254	< 0.0219	< 0.0328	< 0.0262
< 0.185	< 0.0591	< 0.0171	< 0.0273	< 0.0284	< 0.0289	< 0.0255	< 0.0228	< 0.198	< 0.205	< 0.0312	< 0.0273	< 0.0235	< 0.0352	< 0.0281
< 0.0902	< 0.0287	< 0.00828	< 0.0133	< 0.0138	< 0.0141	< 0.0124	< 0.0111	< 0.0964	< 0.0995	< 0.0152	< 0.0133	< 0.0114	< 0.0171	< 0.0137
< 0.175	< 0.0558	< 0.0161	< 0.0258	< 0.0268	< 0.0273	< 0.0240	< 0.0216	< 0.187	< 0.193	< 0.0295	< 0.0258	< 0.0222	< 0.0332	< 0.0265
< 0.214	< 0.0682	< 0.0197	< 0.0315	< 0.0327	< 0.0333	< 0.0294	< 0.0264	< 0.229	< 0.236	< 0.0360	< 0.0315	< 0.0271	< 0.0406	< 0.0324
< 0.0836	< 0.0266	< 0.00767	< 0.0123	< 0.0128	< 0.0130	< 0.0115	< 0.0103	< 0.0894	< 0.0922	< 0.0141	< 0.0123	< 0.0106	< 0.0159	< 0.0127
< 0.0825	< 0.0263	< 0.00757	< 0.0121	< 0.0126	< 0.0129	< 0.0113	< 0.0102	< 0.0882	< 0.0910	< 0.0139	< 0.0121	< 0.0105	< 0.0157	< 0.0125
< 0.195	< 0.0623	0.0185[J]	< 0.0288	< 0.0299	< 0.0304	< 0.0268	< 0.0241	< 0.209	< 0.216	< 0.0329	< 0.0288	< 0.0248	< 0.0371	< 0.0296
< 0.0954	< 0.0304	< 0.00875	< 0.0140	< 0.0146	< 0.0149	< 0.0131	< 0.0118	< 0.102	< 0.105	< 0.0161	< 0.0140	< 0.0121	< 0.0181	< 0.0145
1,200,000	8,200	2,300	110	82,000	5,800	2,500	1,300	5.1	1,600	1,600	1,600	4	250,000	210

Table 7
Soil Analytical Results Summary- Drilling Mud Disposal:
Total Solids, pH, TPH
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

Sample ID	Date Sampled	Total Solids (Method 2540 G-2011)	pH (Method 9045D)	TPH C6-C12 (Method 1005)	TPH C12-C28 (Method 1005)	TPH C28-C35 (Method 1005)	TPH C6-C35 (Method 1005)
Drilling Mud Disposal	1/18/2022	53.5	9.78	< 280	< 280	< 280	< 280
ODEQ - Industrial Soil (1)				500.00	500.00	500.00	500.00

1 = Oklahoma Department of Environmental Quality (ODEQ) Risk-Based Levels for Total Petroleum Hydrocarbons (TPH) Tier 1 Generic Cleanup Levels (February 2020).

Total Solids are reported in percentage.
pH reported in su.
Soil concentrations are reported in miligrams per kilogram (mg/kg).
ND= Not Reported at the Reporting Limit.

Table 8
Soil Analytical Results Summary- Drilling Mud Disposal: Heavy Metals
CONSOR-00001
Port of Muskogee
Fort Gibson, Oklahoma

Sample ID	Date Sampled	Mercury (Method 7471A)	Arsenic (Method 6010B)	Barium (Method 6010B)	Cadmium (Method 6010B)	Chromium (Method 6010B)	Lead (Method 6010B)	Selenium (Method 6010B)	Silver (Method 6010B)
Drilling Mud Disposal	1/18/2022	< 0.0336	3.98	35.1	< 0.0880	17.4	4.81	< 1.43	< 0.237
EPA RSL Industrial Soil [1]		4.6	3.0	22,000	98	NC	800	580	580
EPA Inorganic Background [2]		0.1	1.1-16.7	430	0.01-1.0	38	10-18	0.2	.01-5

1 - EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=0.1)

2 - EPA Region 6 Human Health Medium-Specific Screening Levels, Naturally Occurring Inorganic Background Levels

Soil concentrations are reported in miligrams per kilogram (mg/kg).
ND = Not Reported at the Reporting Limit.