APPENDIX S

ADDITIONAL EXPERT ANALYIS BY RAMBOLL

Prepared for

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EVALUATION OF OIL FIELD RELATED CONSTITUENTS FOR THE CASTEX DEVELOPMENT, LLC PROPERTY, JEFFERSON DAVIS PARISH, LOUISIANA

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1. INTRODUCTION

1.1 Overview of the Castex Development, LLC Property

At the request of BP America Production Company ("bp"), as the successor to Midwest Oil Corporation and Amoco Production Company, through their counsel Liskow & Lewis APLC, and separately by Jones Walker, LLP, on behalf of Anadarko Petroleum Corporation and Anadarko US Offshore, LLC (collectively referred to as "Anadarko")[1], Ramboll Americas Engineering Solutions, Inc. (Ramboll) conducted an evaluation of potential human health risks from constituents present on the Castex Development, LLC property (referred to henceforth as the Castex property)[2] (30° 11′ 59" N latitude by 92° 37′ 11" W longitude)[3]. The Castex property is located in Jefferson Davis Parish, approximately 3.3 miles southeast of Jennings, Louisiana, 35 miles west of Lafayette, Louisiana, and just west of the town of Mermentau, Louisiana. The property location is identified in Figures 1 and 2.

As described in the petition, the subject property covers approximately 1,130 acres and is surrounded by wooded, agricultural, and undeveloped areas. Rural residential properties are situated along the southeastern corner of the property, which also borders the Mermentau River. The land features agricultural fields, grasslands, and densely vegetated and forested regions, as well as areas of standing water. Recreational hunting and rice/crawfish agricultural production take place on the property. The U.S. Fish and Wildlife Service has designated portions of the southern half of the property as freshwater forested/shrub wetland, and a small section of a pipeline right-of-way is classified as freshwater emergent wetland.

Historical oilfield exploration and production activities took place on the property, and it also previously contained a nonhazardous oilfield waste disposal facility. The investigation of the Castex property focused on areas where oil and gas activities occurred. More specifically, the investigation by Ramboll conducted on behalf of bp focused on the limited areas in the central portion of the Castex property (in the vicinity of wells with Louisiana Department of Energy and Natural Resource (LDNR) serial numbers 76164, 82022, 82706, and 139607; see Figure 3) where historic oil and gas activities of bp's predecessors, Midwest and Amoco, occurred. Also included in the evaluation were areas around LDNR wells 28396 and 34959 where historic oil and gas activities of Anadarko occurred (Figure 4).

1.2 Purpose and Approach to the Human Health Evaluation

This evaluation's purpose was to evaluate the potential human health risks from constituents presently found at the site and determine whether levels of constituents found in the soil and groundwater pose any risks of adverse human health effects.

To evaluate potential human health effects, screening methods were applied to identify constituents of potential interest (COPI), as described in Section 2.1, by comparing the constituent concentrations in each sample to health protective screening standards presented in the Louisiana Department of Environmental Quality's (LDEQ) Risk Evaluation/Corrective Action Program (RECAP) (LDEQ 2003).[4] Based on these comparisons, additional evaluations can be conducted, if necessary, to determine the potential human health risks, consistent with the tiered framework of management options outlined in RECAP. The

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[1] Plaintiff alleges that the Anadarko entities are the successors in interest to Delta Drilling Company. Although this report addresses areas allegedly operated by Delta Drilling Company, the opinions offered do not serve as a concession that the Anadarko entities are successors in interest to Delta Drilling Company.

[2] Castex Development LLL vs. Anadarko Petroleum Corporate et al; Docket Number C-050220; 31st Judicial District Court, Jefferson Davis Parish; Jennings, Louisiana.

[3] These coordinates represent the approximate center of the Castex property as indicated in Figure 1.

[4] LDEQ had been in the process of potentially revising the RECAP guidance; however, it has since been removed from their website. When present on the website, LDEQ stated: "It is important to note that NO portion of the draft RECAP revision can be used to evaluate or support current site management decisions (including the proposed screening standards and MO-1 standards). The current, promulgated version of the RECAP regulation, LDEQ 2003, must be used."

approaches and intent of LDEQ RECAP were applied to those constituents that had exceedances after comparison to the screening standards. The methods used and the results are presented in Section 2.

To form an opinion regarding the potential exposures and health risks alleged in this case, I followed established toxicology and risk assessment principles and guidelines with consideration of relevant site-specific data and current scientific literature.

2. HUMAN HEALTH RISK ASSESSMENT

The purpose of a Human Health Risk Assessment (HHRA) is to provide a quantitative analysis, in a conservative and health-protective manner, of the likelihood that adverse effects could be associated with potential exposures to constituents in environmental media (e.g., soil) found at the Castex property. As several steps are involved in the completion of an HHRA, this section provides an overview of the logical flow of how this assessment was performed. Although the steps are presented in a sequential order, it is important to note that none of the steps are performed completely independently; instead, a decision made in one step may necessitate changes in a previous or future step. The HHRA was conducted using the following steps:

Hazard Identification is an evaluation of the constituents that could potentially be encountered in environmental media in the area based on the results of current sampling, and the selection of COPIs based on comparison of sampling results to screening values.

Toxicity Assessment is the identification of an exposure (dose) that is considered to be safe based on the toxicity of a constituent.

Exposure Assessment is the quantification of the extent, frequency, and duration of potential current exposure of individuals to constituents by relevant pathways.

Risk Characterization is an evaluation of the likelihood that an adverse health impact may occur as a result of exposure to constituents in the amount and by the pathways identified. The Risk Characterization compares estimates of exposure by relevant pathways to the established target levels as defined by the United States Environmental Protection Agency (USEPA) and LDEQ.

The conduct of the HHRA aims to focus the assessment on the constituents and exposure pathways that pose the greatest potential risk to human health. It also seeks to provide the necessary analyses for informed risk management decisions regarding further site investigations or future remedial actions.

2.1 Hazard Identification

The initial step in the HHRA was to identify constituents present on the subject property, potentially resulting from site-related activities noted during various sampling efforts. Sampling activities at the site were carried out by ICON Environmental Services, Inc. (ICON) of Port Allen, Louisiana, Environmental Resources Management (ERM) Southwest, Inc. of Houston, Texas, and Hydro-Environmental Technology (HET) of Lafayette, Louisiana.

Both ICON and/or ERM collected samples on the Castex property between June 2021 and August 2024, with sampling results presented in ICON (2024) and ERM (2022), respectively. Additional locations were sampled by HET in April and May 2025 to further delineate and assess soil and groundwater conditions at the Castex property. For analysis, samples collected by ICON were sent to Pace Analytical Services, Inc. in Greensburg, Pennsylvania (for radiochemistry analyses) or Element Material Technology in Lafayette, Louisiana. Samples collected by ERM were sent to four labs: Waypoint Analytical in Marrero, Louisiana; Pace Analytical Gulf Coast in Baton Rouge, Louisiana; Eberline Analytical/Oak Ridge Laboratory, Oak Ridge, Tennessee (for radio chemistry analyses); and ALS Environmental, Houston, Texas, for analysis. Soil samples collected by HET were sent to Waypoint Analytical in Marrero, Louisiana.

Figures 5 (bp focused area) and 6 (Anadarko focused area) present the locations of the soil and groundwater samples collected and analyzed by ICON (2024), ERM (2022), and HET (2025).

The analytes applicable to the HHRA that were present in the soil samples were identified by the testing laboratories using the following USEPA-approved analytical methods; however, not all samples were evaluated using every method:

- Resource Conservation and Recovery Act (RCRA) Metals (i.e., arsenic, barium, cadmium, chromium, lead, selenium, silver, strontium, and zinc) (EPA 6010B/6010D/6020B),
- Mercury (SW7471A/B),
- Polycyclic Aromatic Hydrocarbons (PAHs), i.e., acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene (SW846/8270D),
- Total Petroleum Hydrocarbon (TPH)-Diesel Range Organics (TPH-DRO), and TPH-Oil Range Organics (TPH-ORO) (SW8015B), and
- TPH Aliphatic and Aromatic Fractions (Massachusetts Department of Environmental [MADEP] Method EPH/VPH Revision 1.1).

It should be noted that the analytical results for some analytes (i.e., metals) from soil samples taken by ICON (2024) were reported on a dry-weight basis, whereas those taken by ERM and HET were reported on a wet-weight basis. As indicated in LDEQ (2012), "exposure concentrations and hence, risk-based RS [RECAP Standards] are based on wet-weight."

The analytes relevant to the HHRA present in the groundwater samples were identified by the testing laboratories using the following USEPA-approved methods:

- RCRA Metals (i.e., arsenic, barium, cadmium, chromium, lead, manganese, strontium, and zinc) (SW6010D/6020A/6020B),
- Mercury (SW7471A/7470A),
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) (Method 8021B/8260B/C),
- Chloride (9056A),
- Total Dissolved Solids (TDS) (SM2540C),
- TPH-Gasoline Range Organics (TPH-GRO), TPH-DRO, and TPH-ORO (SW8015B/C), and
- TPH-Aliphatic and Aromatic Fractions (MADEP Method EPH/VPH Revision 1.1).

Section 2.1.1 describes the soil sampling data considered in this evaluation. A discussion of groundwater sampling data is presented in Section 2.1.2. Using the sample data for each media, COPIs were identified by applying methods reported under RECAP (LDEQ 2003) and USEPA (1989). By initially identifying COPIs, an HHRA can focus on constituents expected to significantly contribute to risk estimates, rather than on those with little or no contribution to risk that would provide minimal information for risk management decisions.

The decision points used to identify the COPIs for the property are outlined below. Where relevant, the differences between the decision points concerning soil and water are explained. For the analysis of TPH, the total petroleum hydrocarbons (i.e., TPH-DRO and TPH-ORO) are evaluated at each decision point. If TPH-DRO or TPH-ORO is identified as a COPI in Decision Point 6, then an evaluation of TPH fractions is conducted.

As RECAP (2003) recommends using wet-weight concentrations, they will be compared to applicable RECAP standards. As proposed by USEPA (2024a), dry-weight concentrations will be used to compare to USEPA standards for special case considerations (e.g., lead) (see Decision Point 5).

Decision Point 1 – Was the constituent detected?

Constituents must be detected in at least one sample of the evaluated media to be considered a COPI.

Decision Point 2 – Was the constituent frequently detected?

Constituents that are infrequently detected may be artifacts of the sampling or analytical processes and, therefore, may not actually be present in the media under evaluation as a result of activities at the site. The general "rule of thumb" for frequency of detection, as described in USEPA (1989), is that if 20 or more samples were collected in the area under evaluation and a constituent was detected in fewer than or equal to 5% of the samples (one out of every 20 samples), then the constituent can be considered for exclusion from further evaluation in the risk assessment.

For this decision point, when a sample was collected and split for evaluation between ICON (2024), ERM (2022), and HET (2025), each split sample was regarded as an individual sample. Therefore, even if only 10 samples were collected, resulting in 20 split samples, they would be considered as 20 samples, and the frequency of the detection rule would be applied.

Decision Point 3 – Is the constituent a typical laboratory contaminant?

Certain constituents are typically used in laboratories as cleansers or during sample preparation. Consequently, the presence of these constituents may be an artifact of the cleaning processes for laboratory equipment or the preparation method and may not actually be present in the sample. Common laboratory contaminants include acetone, 2-butanone (methyl ethyl ketone), cyclohexane, methylene chloride, toluene, and phthalate esters (USEPA 2005, 1999a, 1999b). When these common laboratory contaminants are detected in analytical samples, the field blank, equipment blank, laboratory blank, and trip blank samples are reviewed to determine whether contamination occurred during field processing or laboratory analysis. If these blanks indicate the presence of these constituents, they can be excluded from consideration; otherwise, they should be retained for evaluation at other decision points.

Decision Point 4 – Does the concentration exceed an established background from an applicable regulatory body?

The only constituent analyzed in the soil at the Castex property for which LDEQ has established a background concentration level is for arsenic (12 milligrams per kilogram [mg/kg]) (LDEQ 2003).[5] No background levels for risk-based assessment purposes have been established by the LDEQ for constituents in water; therefore, this decision point is not applicable for groundwater.

The detected soil concentrations for arsenic were initially screened against the LDEQ-established background concentration. If the individual concentration exceeded the LDEQ-established background, the mean and the upper bound on the average concentration (e.g., the 95% UCL) were estimated. The 95% UCL can be used to represent a conservative estimate of the average concentration for an area of concern (LDEQ 2003). The use of this UCL provides confidence that the concentration used for the analysis will not underestimate the true average.

The mean and 95% UCL are estimated using the USEPA-approved program ProUCL (USEPA 2022). Split and duplicate samples will be combined using the following methodology: 1) if one of the split samples produced a detected concentration while the other was non-detect then the detected concentration was used; 2) if both of the split samples were non-detects then the smallest reported detection limit was used; and 3) if both split samples produced detected concentrations then the average of the detects was used

[5] Defined in RECAP (2003) as the LDEQ-established background level plus one standard deviation.

unless the relative percent difference (RPD) between the two samples was greater than 50 percent in which case the maximum detected concentration was used as the representative concentration. The RPD, as shown in equation Eq 1, is defined as the absolute difference between the concentrations of the two samples (e.g., S1 and S2), divided by the average of the two sample concentrations.

$$RPD = \left|S_1 - S_2\right| \Big/ \frac{(S_1 + S_2)}{2} \qquad \text{Eq 1}$$

Decision Point 5 – Consideration of special case constituents.

Lead is considered to be a special case constituent because the USEPA has deemed it inappropriate to develop either a reference dose (RfD) or a cancer slope factor (CSF) for inorganic lead. Instead, potential hazards associated with lead exposure are assessed based on the estimated average blood lead levels that would result from a given exposure.

Management Option 1 standards (RECAP−SSni and RECAP−MO1) are considered generally safe for residential use (USEPA 1994a).

The values used by LDEQ for the RECAP non-industrial[6] Soil Screening and Management Option 1 standards (RECAP−SSni and RECAP−MO1) are based on a USEPA directive (USEPA 1994a), which recommended that a soil lead concentration less than 400 mg/kg is considered generally safe for residential exposure. This standard was established considering an acceptable blood lead level for children less than eight years of age of 10 micrograms per deciliter (µg/dL) for both short- and long-term exposures. The 400 mg/kg level was derived using the Integrated Exposure-Uptake Biokinetic Model (IEUBK) (USEPA 2007, USEPA 2010a).

As presented in the USEPA's January 17, 2024, memorandum on residential soil lead guidance (USEPA 2024b), the USEPA Office of Land and Emergency Management recommends using a residential soil lead screening level of 200 mg/kg. This screening level is based upon an updated acceptable blood lead level for children less than eight years of age of 5 µg/dL.

For a drinking water source (groundwater or surface water), RECAP uses the USEPA (2009a) proposed action level of 0.015 milligram per liter (mg/L) for lead. This action level is based on the treatment technique for controlling the water's corrosiveness rather than on human health risk. On October 30, 2024, the USEPA issued a final Lead and Copper Rule (USEPA 2024c) that reduced the action level for lead to 0.01 mg/L.

If either of the media has a value that exceeds its applicable standard (i.e., 200 mg/kg for soil or 0.01 mg/L for groundwater), then a mean and 95% UCL were estimated, as described in Decision Point 4. If either the mean or 95% UCL exceeds the applicable standard for lead, then lead in that media will be evaluated using the IEUBK model to determine if current exposures would result in a blood lead level of 10 µg/dL or greater.

Decision Point 6 – Does the concentration of the constituent and its 95% UCL exceed the applicable media-specific RECAP comparison standards?

Soil

The detected concentrations of each of the remaining constituents in each sample (e.g., those constituents still under consideration as COPIs following Decision Points 1 through 5) in soil are then compared to their respective RECAP−SSni standard. The concentrations of the constituents identified in each individual sample as exceeding their appropriate RECAP−SSni standard are then compared to their appropriate

[6] The RECAP−SSni and RECAP−MO1 residential standards used in the COPI selection process are representative of the evaluation of direct contact (e.g., ingestion and dermal contact) with soil on a continuous basis. Conservative exposure parameter values, such as an exposure frequency of 350 days per year and exposure duration of 30 years, are used which may not represent current activities for the property under evaluation.

RECAP−MO1 screening standard. For those constituents in individual samples exceeding the RECAP−MO1 standard, the mean and 95% UCL are estimated for comparison to the RECAP−MO1 standard when there are a sufficient number of samples (generally 10 or more [USEPA 2022]). If the 95% UCL for the constituent exceeds the RECAP−MO1 standard, this constituent will be considered a COPI. If no 95% UCL can be estimated and the maximum concentration of the constituent is in excess of the RECAP−MO1 standard, then the constituent will be considered a COPI.

When TPH-DRO and/or TPH-ORO concentrations for individual samples are in excess of the RECAP−MO1 standards, the concentrations of the major fractions for each of the TPH-mixtures in those samples (when available) are compared to the toxicity values derived for the major fractions (LDEQ 2003, TPHCWG 1997). However, RECAP, Appendix D, requires the use of hydrocarbon fraction analysis and expressly notes that hydrocarbon fraction analysis supersedes the results of TPH analyses. Accordingly, for this analysis, if fractionated data were available for any individual sample, those data were compared to the applicable RECAP−SSni and RECAP−MO1 standards. When a sufficient number of samples are available, a 95% UCL for each of the fractions exceeding the RECAP−MO1 standard were estimated.

When required to estimate the 95% UCL, samples with corresponding ICON (2024) and ERM (2022) split samples will be combined using the methodology and RPD equation presented above in Decision Point 4.

Groundwater

As a first step, the potential of each water-bearing zone to serve as a source of drinking water must be determined. Depending upon the most defensible classification based on the available data and if it indicates that the groundwater could be used as a drinking water source, the detected concentrations of the constituents in individual groundwater samples remaining for consideration as COPIs after the previous decision points are compared to the corresponding RECAP groundwater screening standard (RECAP−GW_{SS}[7]). If the concentration in any sample was greater than its RECAP−GW_{SS}, that constituent would be retained for further evaluation. The concentrations of the constituents identified as exceeding their appropriate RECAP−GW_{SS} are then compared to the RECAP standard for the groundwater classification determined for the water-bearing unit under consideration (Section 2.1.2.1). As with soil, when total TPH concentrations (i.e., TPH-GRO, TPH-DRO, and/or TPH-ORO) for individual samples are in excess of the RECAP standards, the concentrations of the major fractions for each of the TPH-mixtures, in those samples (when available), are compared to the toxicity values derived for the major fractions (LDEQ 2003, TPHCWG 1997).

For any constituent identified as exceeding its applicable groundwater classification RECAP standard, a 95% UCL will be calculated if a sufficient number of samples are available. As is conducted for soil, this UCL for groundwater will be estimated using the USEPA and LDEQ approved program, ProUCL (USEPA 2022). This 95% UCL will then be compared to its applicable groundwater classification RECAP standard and if exceeded, the constituent will be considered a COPI. If no 95% UCL can be estimated and the maximum concentration is in excess of the applicable groundwater classification RECAP standard, then the constituent will be considered a COPI.

2.1.1 Selection of Constituents of Potential Interest in Surface Soil

LDEQ (2003) indicates that the soil interval to which an individual might be exposed should be defined from the ground surface to a depth of 15 feet (ft) below ground surface (bgs) or the depth of impact, whichever is less. As permitted in LDEQ (2003), surface soil can be divided into two intervals: 1) from the ground surface to 3 ft bgs and 2) from 3 ft bgs to 15 ft bgs.[8] This division is often made because contact

[7] As defined in LDEQ (2003) the RECAP-GWss "is applicable to groundwater meeting the definitions of Groundwater Classifications 1, 2, and 3." Therefore, the RECAP-GW_{SS} standards should represent the most conservative value possible and would be applicable to both a non-industrial (residential) and industrial receptor.

[8] For this assessment, the soil horizons considered were from 0 to 3 feet and from 0 to 15 feet. Zero was used as the starting depth because exposure was anticipated to occur within the first three feet, given that access to soil deeper than three feet was obtained.

with soil from the ground surface to 3 ft is expected to be more readily accessible to an individual during normal activities (e.g., walking in the yard, cooking out, playing), whereas soil beneath 3 ft would be less accessible. While samples were collected from multiple depths within the soil borings, only those borings containing samples collected within 0 to 15 ft bgs are considered in this assessment and are listed in the provided tables. The COPI selection focused on all soil samples collected from 0 to 3-foot bgs and 0 to 15-foot bgs soil horizons for the Castex property.[9]

Tables 1a through 1c present the results for metals, Tables 2a through 2c provide the TPH data, and Table 3 summarizes the PAH concentrations for samples collected from the Castex property, based on comparisons to RECAP standards. Comparisons to USEPA standards using dry-weight concentrations are provided for special case considerations (e.g., lead) in Tables 4a and 4b. Figures 5 and 6 depict the locations of the soil samples collected by ICON (2024), ERM (2022), and HET (2025).

The identification of the COPIs for soil, based on comparisons to RECAP screening standards (using wet-weight concentrations for metals) and, for special case consideration, USEPA's (2024b) recommended standard for lead using dry-weight concentrations, is presented in the following Decision Points. For the initial screening, all sample data, regardless of location, were evaluated. This allowed for the exclusion of any constituents that do not exceed a comparison standard over the property under consideration.

Decision Point 1 – Was the constituent detected?

Table 1a presents the analytical results of the soil metal analysis conducted for each sample, along with a comparison to the RECAP screening and MO-1 standards, while Table 1b and Table 1c provide the summary statistics for the soil sampling data in the 0 to 3-foot and 0 to 15-foot soil horizons, with additional comparisons to the RECAP screening standards. As shown in Table 1b and Table 1c, all evaluated metals—arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, strontium, and zinc—were detected in at least one soil sample. Therefore, all evaluated metals—arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, strontium, and zinc—were retained as potential COPIs based on this decision point.

TPH-DRO and TPH-ORO were detected in at least one soil sample (see Table 2a for the individual sample analytical results and Tables 2b and 2c for summary results in the 0 to 3-foot and 0 to 15-foot soil horizons) and were thus considered COPIs.

Table 3 presents the analytical results for individual PAHs with a comparison to RECAP screening standards. Only three samples were analyzed for PAHs, with acenaphthylene, benzo(k)fluoranthene, and dibenz(a,h)anthracene not detected. Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluorene, fluoranthene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene were detected in at least one sample and retained as COPIs.

No other analyses were conducted on these samples.

Decision Point 2 – Was the constituent frequently detected?

As indicated in Tables 1b and 1c, all metals were detected in greater than 5% of the available soil samples. As reported in Tables 2b and 2c TPH-DRO and TPH-ORO were detected in greater than 5% of the available soil samples. As analysis for PAHs was performed only on three samples, no comparison for the frequency of detection could be performed, and all the detected constituents were retained. Therefore, TPH-DRO, TPH-ORO, and all of the metals, and the PAHs, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluorene, fluoranthene, indeno(1,2,3-cd)pyrene, 2-

[9] For this type of evaluation, if the sample depth interval included 15 feet bgs, it was retained. For example, a sample collected from a depth interval of 14 to 16 feet (e.g., a portion of the sample is less than 15 feet bgs) would be retained in the analysis but a sample collected from a depth interval of 15 to 17 feet (no portion of the sample is less than 15 feet bgs) would not be retained. One soil sample was identified as spanning the 15 feet bgs. Similarly, samples collected in the 2-4 feet bgs range were included in the 0 to 3-foot soil horizon analysis.

methylnaphthalene, naphthalene, phenanthrene, and pyrene, that remained following Decision Point 1, were retained for evaluation in Decision Points 3 through 6.

Decision Point 3 – Is the constituent a typical laboratory contaminant?

None of the constituents detected in the soil samples collected at the Castex property were considered common laboratory contaminants; therefore, this decision point was not evaluated.

Decision Point 4 – Does the concentration exceed an established background?

As indicated previously, the only constituent for which LDEQ has established a background concentration level in soil is arsenic, at a concentration in soil of 12 mg/kg (LDEQ 2003), which is used for both the RECAP−SSni and RECAP−MO1 standards. The range of arsenic concentrations detected in samples taken from the 0 to 3-foot soil horizon is 1.52 to 9.98 mg/kg, and in the 0 to 15-foot soil horizon is 0.265 mg/kg to 15.6 mg/kg (Tables 1b and 1c). None of the 46 samples in the 0 to 3-foot soil horizon had an arsenic concentration that exceeded the LDEQ established background. For the 0 to 15-foot soil horizon, only one of the 105 samples evaluated had a measured arsenic concentration that exceeded the LDEQ-established background concentration.

As an individual sample soil concentration exceeded the LDEQ-established background concentration for arsenic, the mean and 95% UCL were calculated. The first step involved combining split samples into one representative sample according to the methodology presented in Section 2.1, Decision Point 4. If the RPD between the two samples was less than 50%, the samples were averaged; otherwise, the maximum value from the two samples was used to represent that sample. ProUCL was used to calculate the mean and 95% UCL for arsenic, with the data and results provided in Appendix A.

The only exceedance of the LDEQ-established background for arsenic was in a sample taken at 10-12’ bgs (CD-18 10-12’); therefore, the mean and UCL were estimated over the 0 to 15-foot soil horizon. Combining the split samples is presented in Table A-1a, with the results of the ProUCL run presented in Table A-1b. The UCL estimated by ProUCL was 5.2 mg/kg based on the results of the student’s-t distribution and the modified-t distribution tests, while the mean was estimated to be 4.7 mg/kg (see Table A-1b).

It is worth noting that the ERM sample (CD-18 10-12’) had an arsenic concentration of 15.6 mg/kg, while the corresponding ICON split sample had a concentration of 8.01 mg/kg.

Based on this analysis, arsenic was detected above the LDEQ-established background in a single ERM sample. However, the corresponding ICON split concentration was below the LDEQ background threshold concentrations of 12 mg/kg. Additionally, the estimated 95% UCLs and mean concentrations in the 0 to 15-foot soil horizon were below the LDEQ-established background levels. Therefore, based on this decision point, arsenic was not retained as a COPI in the soil.

Decision Point 5 – Consideration of special case constituents.

As noted previously, lead is the only special case constituent considered in soil samples from the Castex property. When compared to the lead RECAP−SSni standard of 400 mg/kg, no samples (Tables 1b and 1c for wet-weight) were found to have lead concentrations exceeding this standard. The range of detected lead wet-weight concentrations on the Castex property was 5.8 to 200 mg/kg in the 0 to 3-foot soil horizon and 0.671 to 200 mg/kg in the 0 to 15-ft soil horizon.

The USEPA has recently updated their soil standard for lead to 200 mg/kg (USEPA, 2024c). Comparison of the measured soil lead dry-weight concentrations to this value revealed a single exceedance. The concentration of this exceedance was 262 mg/kg in sample HA-2 from the 2-4 ft bgs interval (Table 4a). As the 2-4 ft bgs samples fall within both soil horizon ranges, 0 to 3-foot and 0 to 15-foot, means and UCLs were estimated for both.

The combination of split samples is presented in Table A-2a for the 0 to 3-foot soil horizon and Table A-3a for the 0 to 15-foot soil horizon. The estimated mean and 95% UCLs for the 0 to 3-foot soil horizon were 22.7 and 43.4 mg/kg (based on the 95% Chebyshev distribution), respectively (see Table A-2b). For the 0 to 15-foot soil horizon, the estimated mean and 95% UCLs were 21.4 and 39.1 mg/kg (based on the 95% Chebyshev distribution), respectively (see Table A-3b).

Since no exceedances of the RECAP−SSni standard for lead in soil were noted, only a single dry-weight concentration exceeded the new USEPA (2024b) lead standard of 200 mg/kg, and both the mean and 95% UCL for the dry-weight concentrations were less than the 200 mg/kg standard, lead would not be considered a COPI in soil.

Decision Point 6 – Does the soil concentration of the constituent and its 95% UCL exceed both the RECAP−SSni and RECAP−MO1 non-industrial standards?

Prior to comparing the constituents to their RECAP−SSni and RECAP−MO1 values, those constituents for which LDEQ has not developed standards were reviewed and, where possible, standards were calculated. Strontium was the only constituent identified as a COPI in the soil for which no defined RECAP standard is available. The derivation of a soil value for strontium using methods consistent with those used to estimate RECAP standards is provided in Appendix B.

The detected individual sample concentrations of each of the remaining constituents (i.e., those constituents remaining for consideration following Decision Points 1 through 5) were compared to their respective RECAP−SSni and RECAP−MO1 screening standards (Tables 1a through 1c, Table 2, Table 3). The COPIs identified prior to Decision Point 6 that were compared to RECAP screening standards included barium, chromium, mercury, selenium, silver, strontium, zinc, TPH-DRO, and TPH-GRO and the PAHs, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluorene, fluoranthene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. If the concentration in any individual sample was greater than its RECAP−SSni and RECAP−MO1, that constituent would be retained for further evaluation.

The metals identified as having at least one sample with a concentration (Tables 1b and 1c) that exceeded their respective RECAP−SSni were barium (both 0 to 3-foot and 0 to 15-foot soil horizons) and chromium (both 0 to 3-foot and 0 to 15-foot soil horizons). None of the concentrations of the other metals (mercury, selenium, silver, strontium, or zinc) were greater than their respective RECAP-SSni; therefore, they are not considered to be COPIs. As indicated in Tables 2b and 2c, TPH-DRO and TPH-ORO had concentrations that exceeded their respective RECAP−SSni in both the 0 to 3-foot and 0 to 15-foot soil horizons and will be considered further. None of the detected PAH concentrations were greater than their respective RECAP-SSni; therefore, they are not considered to be COPIs.

The concentrations of the constituents exceeding the RECAP−SSni (barium, chromium, TPH-DRO, and TPH-ORO) were then compared to their appropriate RECAP−MO1 screening standard. Of these remaining constituents, barium, chromium, and TPH-ORO were identified as not having exceedances of the RECAP−MO1 screening standard and, therefore, are not considered COPIs. Two samples in the 0 to 3-foot soil horizon (Table 2b) and three samples in the 0 to 15-foot soil horizon (Table 2c) had TPH-DRO concentrations that exceeded the RECAP−MO1 screening standard of 650 mg/kg. Therefore, TPH-DRO was retained for further consideration as a COPI.

Since TPH-DRO concentrations exceeded the RECAP−MO1 standards, the concentrations of the major fractions for each of the TPH mixtures in those samples were compared to their respective RECAP screening standards. For the ERM and HET samples in which petroleum hydrocarbons were analyzed, the concentrations of the major fractions of each TPH mixture were identified and compared to the toxicity values derived for these major fractions as defined under RECAP (LDEQ 2003, TPHCWG 1997). This included the four samples identified as having exceedances of TPH-DRO. As indicated in Table 2a, ICON (2024) did not provide fractionated TPH data. Based on the ERM and HET samples, all the TPH fractions

were identified as having detected concentrations in at least one sample. Detected concentrations and detection limits for all TPH fractions, except C8-C10 aliphatics, C8-C10 aromatics, and C12-C16 aliphatics, were below their respective RECAP-SSni. However, none of these TPH fractions had concentrations that exceeded their respective RECAP−MO1 standards (Tables 2b and 2c). Therefore, based on a comparison of the available fractionated data, neither TPH fractions nor TPH-DRO would be identified as COPIs in soil.

Summary of COPI Selection for Soil

Using the above decision points, none of the soil constituents analyzed for the Castex property are identified as COPIs.

The RECAP−SSni and RECAP−MO1 residential standards used in the COPI selection process effectively represent the evaluation of direct contact (i.e., ingestion and dermal contact) with soil on a continuous basis. Indirect pathways through which an individual at the Castex property could be exposed to these constituents in soil are discussed in the Exposure Assessment section (see Section 2.3).

2.1.2 Selection of Constituents of Potential Interest in Groundwater

Groundwater sampling at the Castex property was taken at various screening intervals within each of the borings. The groundwater beneath the site was considered in two zones as designated by ICON (2024). Samples collected in wells screened at a depth of less than 50 feet bgs were labeled as "A-Zone", while those screened between 50 feet and 95 feet bgs were labeled as "B-Zone". One sample at CD-5D with a screened interval between 95-110 feet bgs was not placed in either zone and is considered to be within the transition zone of the surficial confining unit. Before comparing these results to any RECAP groundwater screening standard, it was necessary to evaluate the proposed classification for the groundwater developed by ICON and HET to understand its potential use and determine the appropriate RECAP comparison standards to be used, if any.

2.1.2.1 Classification of Groundwater

RECAP (LDEQ 2003) indicates that groundwater shall be classified as determined by current or potential use, maximum sustainable yield, and/or TDS concentration. The information required to classify the groundwater zone(s) of concern shall be collected during the site investigation and shall include:

- the current use of the aquifer, which is determined by identifying all existing water wells and their usage within a one-mile radius of the AOI[10] property boundaries;
- the maximum sustainable aquifer yield determined by well yield estimation methods or by direct measurements, which are outlined in Appendix F of RECAP (LDEQ 2003); and/or
- the TDS concentration of the aquifer of concern.

Although not mentioned in RECAP (LDEQ 2003), chloride concentrations can be assessed to evaluate the potential aesthetic quality of the water as a drinking water source. The classification of the water-bearing zones below the Castex property is discussed.

ICON did not classify the groundwater for either zone; instead, it compared the sample results to the proposed background levels.

Aquifer Yield

As described in Section 3.4 of HET (2025), slug tests were conducted in both the "A" and "B" shallow water bearing zones, either by ICON and/or HET. Using the geometric means of the hydraulic conductivity, confining head, and saturated thickness, HET estimated a yield of 164 gallons per day (gpd) for the "A-Zone" and 229 gpd for the "B-Zone". Potential well yields were also estimated in Kueper (2025), with reported geometric means of 150 gpd for the "A-Zone" and 75 gpd for the "B-Zone" based on a single well.

[10] Defined in RECAP (LDEQ 2003) as the Area of Investigation (AOI).

Based on these reported results, neither of these shallow water-bearing zones is capable of supporting a sustainable yield of more than 800 gpd, as defined in LDEQ (2003). Therefore, they would be classified as Groundwater Classification 3 [GW3], indicating that they are not suitable for use as a public or private source of drinking water.

USEPA (2024d) indicates that a yield of 150 gpd is sufficient to meet the needs of an average household. Although the yields reported above are slightly above 150 gpd, as noted in HET (2025), relying on such yields in shallow water-bearing zones is neither practical nor feasible. The yields in these zones are unsustainable, with some wells that were sampled by HET on the Castex property being dry or pumping dry during sampling, indicating that these water sources cannot reliably support household needs.

Site Hydrogeology

As reported in HET (2025), survey data were collected to determine the depths of nearby surface water bodies, including various ditches, an irrigation canal, and the Mermentau River. This information was used to evaluate whether there is a potential for the shallow water bearing zones (i.e. "A-Zone" and "B-Zone") to discharge to the nearest down-gradient surface water body. This information is required to calculate the dilution and attenuation factor (DAF) in accordance with RECAP (2003). Based on the results of the survey and water level measurements, the shallow water bearing zones are not in direct hydraulic communication with surface water bodies or usable portions of the underlying Chicot aquifer, and the shallow water bearing zones are incapable of discharge to the Mermentau River.

TDS Concentration

The TDS concentrations from the wells sampled on the Castex property are shown in Table 5. The average TDS concentration in groundwater samples collected from monitoring wells by both ICON (2024) and ERM (2022) for "A-Zone" and "B-Zone" was 3,475 mg/L and 2,588 mg/L, respectively. The minimum TDS concentration measured in "A-Zone" was 242 mg/L, while the minimum for "B-Zone" was 245 mg/L. The maximum TDS concentration in "A-Zone" was 38,500 mg/L; for "B-Zone", it was 26,500 mg/L.

The USEPA (2009a, 2010b) has established a secondary maximum contaminant level (MCL) for TDS of 500 mg/L based on aesthetics (e.g., hardness, deposits, colored water, staining, salty taste). While the USEPA does not enforce a secondary MCL, it aids public water systems in managing their drinking water based on aesthetic factors, such as taste, color, and odor. The average TDS concentrations in both the "A-Zone" and "B-Zone" exceed the secondary MCL.

Chloride

No health-based limits are available for chloride in drinking water. The USEPA (2009a, 2010b) has established a secondary MCL for chloride of 250 mg/L based on aesthetics. While the USEPA does not enforce a secondary MCL, it aids public water systems in managing their drinking water based on aesthetic factors, such as taste, color, and odor. If chlorides are present in drinking water above these standards, the contaminants may cause the water to appear cloudy or colored, or to taste or smell unpleasant. Drinking water with chloride levels above 250 mg/L may have a salty taste. Exceedances of the secondary MCL may lead many people to stop using water from their public water system, even though the water is actually safe to drink (USEPA 2013).

Using the data presented in ICON (2024) and ERM (2022), chloride concentrations, as reported in Table 5, for samples obtained in "A-Zone" ranged between 11 and 22,000 mg/L and for "B-Zone", 20.1 and 12,900 mg/L. The average chloride concentration was 1,794 mg/L and 1,235 mg/L in "A-Zone" and "B-Zone", respectively. The average concentration in both the "A-Zone" and "B-Zone" exceeds the MCL of 250 mg/L. Therefore, using water from either zone as a potable source would not be recommended due to poor taste quality.

Current or Potential Use

RECAP (LDEQ 2003) indicates that a survey of the water wells located within one mile of the property boundary should be conducted. The LDNR water well database (see Appendix C) lists the water wells within a specific radius of a location defined by its latitude and longitude coordinates (LDNR 2025). Instead of evaluating various points along the property boundary, the following method was employed to identify the wells within a one-mile radius. The approximate center point of the property (30° 11' 59" N latitude by 92° 37' 11" W longitude) was determined, and the maximum distance from this point to the property boundary was estimated. The maximum distance from the center of the property to any boundary was approximately half a mile (2,100 ft). Therefore, a 7,920-foot radius (1.5 miles) from the center of the property was used as input for the LDNR water well database. A total of one hundred and fifty-six (156) registered groundwater wells were identified (Appendix C).

Ninety-seven (97) monitoring wells (70 active and 27 plugged and abandoned [P&A]), nine rig supply wells (two active and seven P&A), seven recovery wells (all P&A), one other well (active), and one test hole (P&A) were identified. Twenty-nine (29) domestic wells (25 active and four P&A), five industrial wells (all active), four public supply wells (all active), and three irrigation wells (all active) were also identified. Depths of the active domestic, industrial, public supply, and irrigation wells ranged from 124' to 258'.

None of the wells designated for irrigation or as potential drinking water sources were established in "A-Zone" or "B-Zone". Consequently, these zones are currently unused.

Summary

Based on the results presented above and summarized below, both the "A-Zone" and "B-Zone" shallow water-bearing zones would be classified as a RECAP Groundwater Classification 3 non-drinking water [RECAP−GW_{3NDW}] aquifer:

1. Both zones cannot sustain a yield exceeding 800 gpd that is needed to be a drinking water source. Furthermore, as reported in HET (2025), there were observations of the wells running dry during the sampling events.
2. Neither zone is currently utilized as a source of drinking water, and neither zone is in direct hydraulic communication with the deeper drinking water zones of the Chicot Aquifer.
3. Surface water bodies in the area are not used as sources of drinking water. As discussed above, the shallow water-bearing zones do not have direct hydraulic communication with regional surface water bodies, and cannot discharge into them.

Based on these results, the water-bearing zones identified as "A-Zone" and "B-Zone" are not expected to serve as a potable source of drinking water in the foreseeable future. Therefore, no exposure to an on-site receptor is anticipated, and no comparison of the sample groundwater concentrations to RECAP standards was conducted.

2.1.2.2 Constituents of Potential Interest in Groundwater

As described in Section 2.1.2.1, the water-bearing zones sampled by both ICON (2024), ERM (2022), and HET (2025) have been classified as a Class 3 groundwater non-drinking water aquifer. In contrast to the definitions for Groundwater Classifications 1 or 2, a Groundwater Classification of 3 indicates that the aquifer is not currently used as a public water source or for domestic or agricultural purposes within one mile of the AOI property boundary. Therefore, since no current exposure pathway to these constituents exists based on direct exposure to this groundwater strata as a drinking water source, the sample measurements provided by ICON (2024), ERM (2022), and HET (2025) do not represent exposure concentrations of concern for human health.

2.2 Toxicity Assessment

The objectives of the toxicity assessment are to evaluate the inherent toxicity of the substances under investigation and to identify the level of exposure below which these toxic effects are not expected to

occur, and/or a target risk level that is not expected to be exceeded. The RECAP screening standards developed by LDEQ are estimated using toxicity values from the following hierarchy of sources:

- USEPA's Integrated Risk Information System (IRIS) (USEPA 2025);
- National Center for Environmental Assessment (NCEA) provisional values available from the USEPA Regional Screening Level (RSL) Master Table (USEPA 2024e);
- USEPA's Health Effects Assessment Summary Tables (HEAST) (USEPA 1997a);
- Values withdrawn from IRIS or HEAST; and,
- Other USEPA or LDEQ recommended sources.

Non-carcinogenic toxicity refers to adverse health effects, other than cancer, that are due to adverse alterations in the structure or function of various organ systems (USEPA 1994b). Most constituents do not cause the same degree of toxicity in all parts of the body, but instead may elicit greater toxicity in one or a few organs or biological systems, termed a "target organ" effect (USEPA 1994b). The toxicity values termed Reference Dose (RfD in mg/kg/day) for oral exposures and Reference Concentration (RfC in mg/m^3) for inhalation exposures are used for estimating non-carcinogenic toxicity. Both are estimates (typically based on animal data, with an uncertainty spanning an order of magnitude) of a daily intake for human populations, including sensitive subpopulations, that is unlikely to result in adverse noncancer health effects (USEPA 1988, 1994b). Potential for the occurrence of adverse health effects from non-carcinogenic constituents is assessed by determining the ratio (referred to as the hazard quotient [HQ]) of the constituent's concentration in the media being evaluated to the constituent's RfD (or RfC, depending upon the route of exposure). If the HQ exceeds unity (i.e., a value of one when rounded to one significant digit) there may be concern for potential noncancer effects (USEPA 1989).

Extra lifetime cancer risks, defined as the probability of developing cancer after a lifetime of continuous exposure at a specified intake, are calculated using cancer slope factors (CSF) and unit risk factors (URF). For carcinogenic constituents, RECAP−SSni and RECAP−MO1 standards are estimated using a risk level of 1×10^{-6} (one in a million). As indicated in LDEQ (2003), "the total cumulative cancer risk estimate for an AOI shall not exceed the target risk level (1E-06 to 1E-04) approved by the Department . . .". Both USEPA (USEPA 1996) and LDEQ (LDEQ 2003) have established an acceptable cancer risk range to be between 1×10^{-4} and 1×10^{-6}.

As indicated in Section 2.1.1, no constituents in soil have been identified as COPIs. Since the groundwater within both identified zones was determined to be a non-potable aquifer (RECAP−GW_{3ndw} classification) no exposure to a residential receptor is expected, and, therefore, no COPIs were identified in groundwater. No COPIs were identified in soil or groundwater, so a toxicity assessment was not required.

2.3 Exposure Assessment

As indicated in LDEQ (2003), Management Option 3 (MO-3) allows for the development of site-specific RECAP Standards for impacted media based on site-specific exposure and environmental fate and transport data. Any site-specific exposure assumptions should reflect a reasonable maximum exposure (RME) scenario for the identified receptor activity patterns at the site. Reasonable maximum exposure is defined as the highest exposure that could reasonably be expected to occur for a given exposure pathway and aims to account for both uncertainty in the constituent concentration and variability in the exposure parameters. The RME is estimated using protective assumptions about exposure (intake rate, exposure frequency, exposure duration, body weight, etc.). These values are considered representative of constituent concentrations in media that protect human health and the environment under the conditions specific to the site being evaluated.

The RECAP screening standards presented in Section 2.1.1 were developed using the same exposure and intake equations for direct contact that would be applied in a quantitative risk assessment. The RECAP−SSni and RECAP−MO1 residential screening standards are based on a conservative assumption

that direct human contact occurs 350 days a year for 30 years and take into account the direct contact pathways of incidental soil ingestion and dermal contact with the soil.

When evaluating exposure pathways under RECAP, the initial assessment considers exposures if the property was developed for residential use. Additionally, for thoroughness, indirect exposure pathways, which are not covered in the screening standards and present a way for individuals to be exposed to constituents found in the soil, sediment, and groundwater, may also be taken into account.

According to the National Academy of Science (NAS 1983), an exposure assessment should consider the magnitude (the concentration of constituents to which the individual is exposed), duration (the time period over which the exposure occurs), frequency (how often the exposure occurs), and route of exposure (the pathway by which the exposure occurs, e.g., dermal contact with soil or inhalation of volatile constituents). It should also take into account the characteristics of the exposed population, e.g., the manner in which they might be exposed.

This section of the HHRA describes the methods based on USEPA Guidance (USEPA 1989, 1996, 1997b, 2001, 2004, 2009b, 2011) used to characterize land use in the evaluation area, identify populations that could potentially be exposed, and determine the exposure pathways through which the identified population may be exposed. The Exposure Assessment, along with the Toxicity Assessment, supports the characterization of potential risks to human health discussed in the Risk Characterization section.

2.3.1 Land Use Evaluation

The Castex property primarily consists of wooded, agricultural, and undeveloped areas, along with areas of standing water. A small portion has been defined as a freshwater forested/shrub wetland and a freshwater emergent wetland. Historical oilfield exploration and production activities took place on the property, and limited areas where oil and gas exploration and production activities have recently taken place are also present. Recreational hunting and rice/crawfish agricultural production are the primary uses of the property.

The current landowner controls the future use of the property, which remains unknown at this time. However, given the uncertainty of future usage, assumptions about its potential use can be drawn based on its historical use. For the screening evaluation (Section 2.1) and the evaluation conducted in this section, it was assumed that the future land use could be unrestricted, non-industrial, and therefore considered residential. Historical use of the property suggests land use exposure patterns other than residential, and even less than those typical for industrial exposure (5 days/week, 8 hours/day).

2.3.2 Potential Exposure Pathways

Exposure is defined as contact with a constituent or physical agent. The course a constituent or physical agent takes from the source of release to the exposed individual is defined as the exposure pathway. An exposure pathway consists of four elements: 1) a source of constituent release; 2) a transport medium (e.g., soil, groundwater, surface water, or air); 3) human contact with the affected media; and 4) a route of exposure (e.g., inhalation, ingestion, or dermal absorption) at the point of contact, leading to the constituent entering the body, termed intake (USEPA 1989). The presence of a constituent in soil or groundwater by itself does not indicate that exposure will occur or that individuals in the area will be at risk. For exposure to occur, there must be a complete exposure pathway (i.e., all four elements discussed above must be complete). In this assessment, an exposure pathway analysis was conducted to identify the complete pathways through which individuals could currently be exposed.

2.3.2.1 Soil Exposure Pathway

No residences are located within the Castex Property, with the nearest residential properties at the southeastern corner of the property. However, the current assessment of the soil was conducted as if a resident were living on the site. Individuals who could potentially be exposed to constituents present in the soil due to previous oil field activities may include workers, site visitors, hunters, and occasional trespassers. Typical exposure pathways would involve incidental ingestion of and dermal contact with the

soil. Exposure for workers, visitors, or trespassers through these pathways is expected to occur less frequently than what is considered when evaluating potential health effects for a resident.

2.3.2.2 Groundwater Exposure Pathway

As discussed in Section 2.1.2.1, groundwater within both identified zones was determined to be a non-potable aquifer (RECAP–GW_{3ndw} classification) with no exposure to a residential receptor expected. Other potential applications of groundwater might include irrigating home gardens or other non-potable uses; however, human exposure would likely be limited, and the precise exposure scenarios remain unknown.

2.3.2.3 Other Exposure Pathways

The only other limited potential uses of the property could include hunting or raising rice and crawfish. Based upon the limited amount of impacted soil found in areas of the Castex property, it is unlikely that wildgame would be present in these specific areas of the property for any significant amount of time. Any wildgame present on the property would not be restricted to the Castex property boundaries but would forage over a much larger area. Therefore, any exposure from the consumption of wildgame obtained from the Castex property is anticipated to be minimal.

Direct contact with soil, as discussed in Sections 2.1.1, would be expected to result in higher estimates of intake than from the ingestion of wildlife or the potential use of the property to raise produce, such as rice or crawfish. Based upon the root zone analysis conducted by HET (2025), concentrations of constituents in the 0 to 6-inch soil horizon, which would be the depth of root penetration for rice crops on the Castex property, are expected to be minimal. Therefore, intake from these pathways on the Castex property is expected to be at exposures that are not of concern for human health.

2.3.2.4 Summary of Exposure Pathways Considered

The exposure pathways considered to be complete, resulting in potential human exposures, are limited to incidental ingestion of soil, dermal contact with soil, and inhalation of volatiles from soil. These pathways are all considered in the equations used to calculate the LDEQ RECAP–SSni and RECAP–MO1 screening standards for a non-industrial (residential) receptor. As discussed in Section 2.1.1, the comparison of the constituent concentrations in soil for the Castex property to these screening standards resulted in the identification of no COPIs. Exposure to non-residential receptors would occur less frequently than that considered by the LDEQ RECAP–SSni and RECAP–MO1 screening standards for a residential receptor. As direct contact with soil would be expected to result in higher estimates of intake than from the ingestion of wildlife or the potential use of the property to raise produce, such as rice, or crawfish, these exposure pathways would not be expected to result in the identification of COPIs.

2.4 Risk Characterization

The objectives of the Risk Characterization are to provide estimates of extra lifetime cancer risk or noncancer hazard from exposure to constituents classified as carcinogens or non-carcinogens, respectively, and to provide scientifically-based interpretation of those estimates such that informed risk management decisions may be made. The risk characterization section is intended to provide estimates of the potential for an adverse health effect from exposure to constituents present at the site by combining the estimate of intake, calculated in the Exposure Assessment, with constituent-specific toxicity factors presented in the Toxicity Assessment.

2.4.1 Soil

As summarized in Section 2.1.1, no COPIs were identified in the soil; therefore, a formal risk evaluation for soil was not required. Having no COPIs identified in soil indicates that the constituent concentrations present in soil would result in cancer risks less than 1×10^{-6}, identified by LDEQ (2003), and/or an HQ less than the target level of 1, or less than a defined background concentration (i.e., arsenic) or action level (i.e., lead).

2.4.2 Groundwater

As discussed in Section 2.1.2.1, the identified water-bearing zones were classified as a RECAP−GW_{3ndw} aquifer; therefore, groundwater use at the site was not considered a potential exposure pathway. Consequently, no quantitative estimates of hazard (non-cancer effects) or risk (cancer effects) were deemed necessary, and no impact on a site-specific exposure scenario is expected.

2.5 Conclusions

As discussed in Section 2.1.1, none of the constituents analyzed at the Castex property were identified as final COPIs, so no adverse health effects are expected from exposure to soil on the Castex property. As discussed in Section 2.1.2.1, the identified water-bearing zones were classified as a RECAP−GW3ndw aquifer; therefore, the use of groundwater at the site was not considered a potential exposure pathway, and no adverse health effects are expected due to a lack of exposure to groundwater beneath the Castex property.

Since this report is based on the data available to me at the time of writing, I reserve the right to submit supplemental opinions after further analysis of other relevant documents or if additional data related to my conclusions becomes available.

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TABLES

Table 1a. Soil Analytical Sampling Data for Metals for Castex Development LLC Property Compared to RECAP Standards

			Constituent	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Strontium[a]	Zinc
			RECAP-SSni	12	550	3.9	23	400	2.3	39	39	4,700	2,300
			RECAP-MO1ni	12	5,500	39	230	400	23	390	390	47,000	23,000
Boring ID	Depth	Date	Expert[b,c]	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
HA-1	0-2'	6/29/2021	ICON	**5.02**	**339**	<0.460	**11.1**	**15.2**	<0.107	<3.68	—	**26.6**	**9.69**
HA-1	0-2'	6/29/2021	ERM	**3.01**	**168**	<0.200	**10.9**	**8.06**	**0.0236**	<1.00	<0.500	—	**14.1**
HA-1	2-4'	6/29/2021	ICON	**4.05**	**421**	<0.494	**10.1**	**11.2**	<0.105	<3.95	—	**17.7**	**14.1**
HA-1	2-4'	6/29/2021	ERM	**3.64**	**196**	<0.200	**10.6**	**17.3**	**0.0208**	<1.00	<0.500	—	**12.6**
HA-1	4-6'	6/29/2021	ICON	**4.71**	**283**	<0.458	**11.4**	**10.7**	<0.100	<3.66	—	**16.6**	**22.7**
HA-1	4-6'	6/29/2021	ERM	**3.51**	**226**	<0.200	**10.1**	**8.74**	**0.0197**	<1.00	<0.500	—	**19.9**
HA-2	0-2'	6/29/2021	ICON	**5.60**	**3,768**	<0.472	**36.9**	**56.6**	<0.105	<3.78	—	**177**	**27.0**
HA-2	0-2'	6/29/2021	ERM	**6.62**	**2,530**	<0.200	**35.1**	**119**	**0.0649**	<1.00	<0.500	—	**42.4**
HA-2	2-4'	6/29/2021	ICON	**4.52**	**3,348**	<0.479	**30.1**	**42.0**	<0.108	<3.83	—	**130**	**24.1**
HA-2	2-4'	6/29/2021	ERM	**9.98**	**1,040**	<0.200	**146**	**200**	**0.0452**	<1.00	<0.500	—	**93.6**
HA-2	4-6'	6/29/2021	ICON	**3.82**	**1,237**	<0.492	**11.0**	**12.7**	<0.101	<3.94	—	**86.0**	**15.8**
HA-2	4-6'	6/29/2021	ERM	**2.83**	**1,130**	<0.200	**12.0**	**9.88**	**0.0260**	<1.00	<0.500	—	**14.9**
HA-3	0-2'	6/29/2021	ICON	**4.36**	**249**	<0.461	**8.84**	**8.12**	<0.104	<3.69	—	**111**	**22.9**
HA-3	0-2'	6/29/2021	ERM	**4.25**	**194**	<0.200	**8.19**	**6.76**	**0.0165**	<1.00	<0.500	—	**14.5**
HA-3	2-4'	6/29/2021	ICON	**5.83**	**291**	<0.474	**9.80**	**10.0**	<0.0983	<3.79	—	**130**	**33.1**
HA-3	2-4'	6/29/2021	ERM	**2.79**	**103**	<0.200	**11.3**	**8.46**	**0.0179**	<1.00	<0.500	—	**15.0**
HA-3	4-6'	6/29/2021	ICON	**4.36**	**403**	<0.456	**9.44**	**9.93**	<0.0977	<3.65	—	**120**	**22.0**
HA-3	4-6'	6/29/2021	ERM	**2.85**	**104**	<0.200	**9.36**	**6.35**	**0.0303**	<1.00	<0.500	—	**20.4**
HA-4	0-2'	6/29/2021	ICON	**4.43**	**2,759**	<0.472	**22.1**	**17.13**	<0.102	<3.78	—	**142**	**49.9**
HA-4	0-2'	6/29/2021	ERM	**5.88**	**1,410**	**0.440**	**89.1**	**33.40**	**0.122**	**1.37**	**0.851**	—	**378**
HA-4	2-4'	6/29/2021	ICON	**4.24**	**1,039**	<0.469	**14.8**	**12.11**	<0.104	<3.76	—	**78.9**	**28.8**
HA-4	2-4'	6/29/2021	ERM	**4.35**	**1,160**	<0.200	**18.5**	**18.80**	**0.0340**	<1.00	<0.500	—	**37.3**
HA-4	4-6'	6/29/2021	ICON	**4.03**	**1,183**	<0.476	**14.3**	**11.29**	<0.0981	<3.81	—	**102**	**28.4**
HA-4	4-6'	6/29/2021	ERM	**3.59**	**557**	<0.200	**7.94**	**7.55**	**0.0170**	<1.00	<0.500	—	**15.5**
HA-5	0-2'	6/29/2021	ICON	**5.24**	**2,334**	<0.491	**68.0**	**23.69**	**0.131**	<3.93	—	**359**	**122**
HA-5	0-2'	6/29/2021	ERM	**7.00**	**1,930**	**0.297**	**119**	**36.70**	**0.161**	<1.00	**0.756**	—	**179**
HA-5	2-4'	6/29/2021	ICON	**4.77**	**3,084**	**0.535**	**53.4**	**40.24**	**0.170**	<3.96	—	**258**	**136**
HA-5	2-4'	6/29/2021	ERM	**4.51**	**899**	**0.922**	**73.1**	**59.60**	**0.224**	<1.00	**0.576**	—	**242**
HA-5	4-6'	6/29/2021	ICON	**3.30**	**2,282**	**0.325**	**19.8**	**26.08**	**0.119**	<3.90	—	**70.2**	**62.6**
HA-5	4-6'	6/29/2021	ERM	**4.89**	**772**	**0.268**	**94.7**	**26.50**	**0.147**	**1.46**	**0.655**	—	**166**
HA-9	0-2'	6/30/2021	ICON	**4.16**	**2,212**	<0.490	**15.8**	**19.34**	<0.109	<3.92	—	**108**	**77.6**
HA-9	0-2'	6/30/2021	ERM	**2.59**	**75.3**	<0.200	**8.39**	**5.80**	**0.0283**	<1.00	<0.500	—	**14.3**
HA-9	2-4'	6/30/2021	ICON	**3.57**	**2,023**	<0.472	**10.7**	**15.30**	<0.1020	<3.77	—	**77.7**	**13.1**
HA-9	2-4'	6/30/2021	ERM	**1.52**	**130**	<0.200	**6.76**	**7.38**	**0.0196**	<1.00	<0.500	—	**11.9**
HA-9	4-6'	6/30/2021	ICON	**2.17**	**154**	<0.475	**5.88**	**12.22**	<0.0974	<3.80	—	**33.0**	**11.2**
HA-9	4-6'	6/30/2021	ERM	<1.00	**66.0**	<0.200	**5.00**	**6.81**	<0.0155	<1.00	<0.500	—	**12.3**

Table 1a. Soil Analytical Sampling Data for Metals for Castex Development LLC Property Compared to RECAP Standards

			Constituent	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Strontium[a]	Zinc
			RECAP-SSni	12	550	3.9	23	400	2.3	39	39	4,700	2,300
			RECAP-MO1ni	12	5,500	39	230	400	23	390	390	47,000	23,000
Boring ID	Depth	Date	Expert[b,c]	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
HA-10	0-2'	8/2/2024	ERM	**4.08**	**764**	<0.200	**19.8**	**10.8**	<0.0171	**1.16**	<0.500	**30.8**	**34.8**
HA-10	0-2'	8/2/2024	ICON	**3.03**	**866**	<0.406	**11.5**	**9.26**	<0.0979	—	—	**25.9**	**16.2**
HA-10	2-4'	8/2/2024	ERM	**3.85**	**137**	<0.200	**17.8**	**10.7**	<0.0171	<1.00	<0.500	**20.4**	**36.4**
HA-10	2-4'	8/2/2024	ICON	**2.97**	**209**	<0.411	**10.7**	**8.87**	<0.107	—	—	**18.3**	**17.6**
HA-10	4-6'	8/2/2024	ERM	**4.21**	**256**	<0.200	**18.8**	**12.3**	<0.0176	<1.00	<0.500	**22.9**	**32.8**
HA-10	4-6'	8/2/2024	ICON	**2.53**	**230**	<0.420	**10.7**	**9.17**	<0.0952	—	—	**18.8**	**17.6**
CD-1	0-2'	2/23/2022	ICON	**4.11**	**5,059**	<0.463	**8.62**	**14.12**	<0.0923	—	—	**34.5**	**11.6**
CD-1	0-2'	2/23/2022	ERM	**2.66**	**2,780**	<0.200	**7.30**	**13.30**	**0.0190**	<1.00	<0.500	—	**11.1**
CD-1	4-6'	2/23/2022	ICON	**3.25**	**148**	<0.492	**9.15**	**8.00**	<0.107	—	—	**12.5**	**11.0**
CD-1	4-6'	2/23/2022	ERM	**3.70**	**115**	<0.200	**12.7**	**9.54**	**0.0312**	<1.00	<0.500	—	**16.8**
CD-1	10-12'	2/23/2022	ICON	**6.26**	**263**	<0.472	**12.5**	**10.60**	<0.102	—	—	**22.8**	**35.4**
CD-1	10-12'	2/23/2022	ERM	<5.00	**165**	<1.00	**13.2**	**4.92**	<0.0155	<5.00	<2.50	—	**27.0**
CD-4	8-10'	3/9/2022	ERM	**4.93**	**86.0**	<0.200	**7.39**	**4.67**	<0.0144	<1.00	<0.500	—	**16.1**
CD-6	0-4'	4/12/2022	ICON	**3.94**	**213**	<0.500	**10.4**	**9.48**	<0.107	—	—	**19.7**	**15.9**
CD-6	6-8'	4/12/2022	ICON	**3.64**	**216**	<0.483	**13.7**	**9.91**	<0.109	—	—	**41.6**	**38.5**
CD-6	6-8'	4/12/2022	ERM	**2.71**	**189**	<0.200	**11.7**	**7.01**	<0.134	<1.00	<0.500	—	**33.0**
CD-6	10-12'	4/12/2022	ICON	**7.06**	**179**	<0.497	**15.0**	**11.20**	<0.0928	—	—	**43.7**	**45.9**
CD-6	10-12'	4/12/2022	ERM	**9.45**	**184**	<0.200	**19.9**	**15.60**	<0.147	<1.00	<0.500	—	**55.7**
CD-8	2-4'	4/21/2022	ICON	**3.33**	**206**	<0.498	**10.8**	**11.5**	<0.0992	—	—	**18.1**	**14.9**
CD-8	4-6'	4/21/2022	ICON	**4.21**	**445**	<0.499	**8.40**	**10.6**	<0.105	—	—	**21.5**	**20.2**
CD-8	4-6'	4/21/2022	ERM	**1.99**	**109**	<0.200	**6.30**	**5.88**	<0.153	<1.00	<0.500	—	**18.4**
CD-8	8-10'	4/21/2022	ICON	**4.85**	**292**	<0.499	**8.63**	**6.40**	<0.104	—	—	**20.4**	**31.3**
CD-8	8-10'	4/21/2022	ERM	**8.67**	**192**	<0.200	**9.28**	**9.53**	<0.135	<1.00	<0.500	—	**40.1**
CD-9	2-4'	4/27/2022	ICON	**3.01**	**213**	<0.477	**8.69**	**8.45**	<0.0992	—	—	**17.7**	**13.7**
CD-9	6-8'	4/27/2022	ICON	**0.265**	**15.5**	<0.500	**0.830**	**0.671**	<0.100	—	—	**1.73**	**1.39**
CD-9	6-8'	4/27/2022	ERM	**2.28**	**114**	<0.200	**7.31**	**5.06**	<0.160	—	—	**21.0**	**18.6**
CD-9	10-12'	4/27/2022	ICON	**5.84**	**221**	<0.498	**10.1**	**7.28**	<0.0988	—	—	**24.1**	**28.5**
CD-9	10-12'	4/27/2022	ERM	**3.93**	**193**	<0.200	**8.06**	**9.88**	<0.148	—	—	**25.4**	**27.5**
CD-10	2-4'	5/4/2022	ICON	**3.29**	**210**	<0.500	**10.7**	**14.2**	<0.101	—	—	**11.8**	**13.8**
CD-10	6-8'	5/4/2022	ICON	**1.79**	**153**	<0.495	**8.76**	**6.71**	<0.0986	—	—	**15.3**	**17.1**
CD-10	6-8'	5/4/2022	ERM	**1.71**	**134**	<0.200	**7.81**	**7.73**	<0.141	—	—	**14.3**	**14.8**
CD-10	8-10'	5/4/2022	ICON	**3.81**	**209**	<0.501	**13.4**	**7.95**	<0.0956	—	—	**24.5**	**32.6**
CD-10	8-10'	5/4/2022	ERM	**7.01**	**277**	<1.00	**13.7**	**9.04**	<0.144	—	—	**27.4**	**42.1**
CD-16	10-12'	6/10/2024	ERM	**10.9**	**228**	<0.200	**32.4**	**16.1**	<0.0185	<1.00	<0.500	—	**109**
CD-16	10-12'	6/10/2024	ICON	**5.22**	**452**	<0.782	**17.7**	**10.5**	<0.107	—	—	**3.95**	**45.7**
CD-17	8-10'	6/14/2024	ERM	**3.40**	**209**	<0.200	**23.5**	**13.7**	<0.0166	<1.00	<0.500	—	**112**

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			RECAP-MO1ni	12	5,500	39	230	400	23	390	390	47,000	23,000
Boring ID	Depth	Date	Expert[b,c]	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CD-17	8-10'	6/14/2024	ICON	**2.44**	**389**	<0.812	**13.0**	**8.19**	<0.107	—	—	**27.3**	**29.1**
CD-18	0-4'	7/23/2024	ERM	**3.76**	**312**	<0.200	**16.1**	**10.1**	**0.0242**	<1.00	<0.500	**45.3**	**126**
CD-18	0-4'	7/23/2024	ICON	**4.24**	**399**	<0.411	**11.7**	**9.32**	<0.103	—	—	**36.1**	**33.2**
CD-18	6-8'	7/23/2024	ERM	**11.0**	**303**	**0.350**	**26.3**	**16.9**	<0.0173	<1.00	<0.500	**46.8**	**68.9**
CD-18	6-8'	7/23/2024	ICON	**3.20**	**693**	<0.400	**10.7**	**8.73**	<0.107	—	—	**61.3**	**23.9**
CD-18	10-12'	7/23/2024	ERM	**15.6**	**316**	<0.200	**29.4**	**16.4**	<0.0175	<1.00	<0.500	**46.4**	**72.4**
CD-18	10-12'	7/23/2024	ICON	**8.01**	**386**	<0.402	**14.5**	**12.7**	<0.0988	—	—	**46.4**	**45.0**
CD-19	0-4'	7/29/2024	ICON	**3.82**	**171**	<0.369	**9.33**	**11.8**	<0.0993	—	—	**10.5**	**51.3**
CD-19	6-8'	7/29/2024	ERM	**2.63**	**239**	<0.200	**25.3**	**9.16**	<0.0184	<1.00	<0.500	**36.0**	**53.3**
CD-19	6-8'	7/29/2024	ICON	**3.21**	**254**	<0.421	**12.3**	**12.1**	<0.101	—	—	**24.9**	**28.8**
CD-19	8-10'	7/29/2024	ERM	**2.22**	**207**	<0.200	**25.9**	**7.47**	<0.0181	<1.00	<0.500	**33.6**	**56.3**
CD-19	8-10'	7/29/2024	ICON	<1.64	**169**	<0.410	**9.72**	**6.21**	<0.102	—	—	**22.1**	**24.8**
CD-1R	0-2'	4/30/2025	ICON	—	**3,027**	—	—	—	—	—	—	—	—
CD-01R	0-2'	4/30/2025	ERM	—	**1,180**	—	—	—	—	—	—	—	—
SB-1	0-2'	4/24/2025	ICON	**3.94**	**178**	<0.429	**10.3**	**11.4**	<0.104	—	—	**10.2**	**11.2**
SB-1	2-4'	4/25/2025	ICON	**3.98**	**246**	<0.411	**10.5**	**9.29**	<0.109	—	—	**13.9**	**15.9**
SB-1	2-4'	4/25/2025	HET	—	**287**	—	**22.7**	**9.77**	—	—	—	—	—
SB-1	6-8'	4/24/2025	ICON	**4.76**	**231**	<0.396	**10.5**	**8.49**	<0.0945	—	—	**20.0**	**31.0**
SB-1	8-10'	4/24/2025	ICON	**3.23**	**146**	<0.407	**8.14**	**6.29**	<0.0965	—	—	**14.2**	**22.6**
SB-1	13-15'	4/24/2025	ICON	**5.83**	**132**	<0.378	**11.1**	**9.56**	<0.0938	—	—	**39.6**	**43.5**
SB-2	0-2'	4/24/2025	ICON	**3.03**	**131**	<0.365	**7.94**	**9.33**	<0.101	—	—	**14.8**	**9.01**
SB-2	2-4'	4/24/2025	ICON	**3.12**	**188**	<0.386	**8.63**	**9.09**	<0.103	—	—	**19.4**	**12.5**
SB-2	6-8'	4/24/2025	ICON	**2.09**	**111**	<0.413	**7.20**	**5.98**	<0.0987	—	—	**15.6**	**16.9**
SB-2	8-10'	4/24/2025	ICON	**4.29**	**222**	<0.390	**9.32**	**7.08**	<0.103	—	—	**23.0**	**30.7**
SB-3	0-2'	4/25/2025	ICON	**4.73**	**176**	<0.422	**10.5**	**12.9**	<0.0942	—	—	**16.8**	**11.7**
SB-3	0-2'	4/25/2025	HET	—	**297**	—	**18.9**	**16.0**	—	—	—	—	—
SB-3	2-4'	4/25/2025	ICON	**2.92**	**155**	<0.410	**8.98**	**10.6**	<0.0926	—	—	**18.9**	**12.8**
SB-3	2-4'	4/25/2025	HET	—	**152**	—	**22.6**	**9.50**	—	—	—	—	—
SB-3	4-6'	4/25/2025	ICON	**5.49**	**263**	<0.395	**9.72**	**10.1**	<0.0950	—	—	**26.4**	**25.6**
SB-3	8-10'	4/25/2025	ICON	**6.89**	**242**	<0.390	**9.39**	**7.3**	<0.0927	—	—	**28.5**	**31.0**
SB-3	8-10'	4/25/2025	HET	—	**383**	—	**21.4**	**9.37**	—	—	—	—	—
SB-3	12-14'	4/25/2025	HET	—	**94.2**	—	**15.8**	**7.43**	—	—	—	—	—
SB-4	0-2'	4/24/2025	ICON	**6.05**	**236**	<0.428	**10.6**	**18.8**	<0.0991	—	—	**9.81**	**10.3**
SB-4	2-4'	4/24/2025	ICON	**5.25**	**287**	<0.416	**11.5**	**17.5**	<0.101	—	—	**14.8**	**14.7**
SB-4	7-9'	4/24/2025	ICON	**3.51**	**175**	<0.429	**8.73**	**5.87**	<0.105	—	—	**13.3**	**16.4**
SB-4	8-10'	4/24/2025	ICON	**4.06**	**99.5**	<0.410	**6.52**	**4.32**	<0.101	—	—	**9.80**	**14.3**

Table 1a. Soil Analytical Sampling Data for Metals for Castex Development LLC Property Compared to RECAP Standards

			Constituent	**Arsenic**	**Barium**	**Cadmium**	**Chromium**	**Lead**	**Mercury**	**Selenium**	**Silver**	**Strontium[a]**	**Zinc**
			RECAP-SSni	12	550	3.9	23	400	2.3	39	39	4,700	2,300
			RECAP-MO1ni	12	5,500	39	230	400	23	390	390	47,000	23,000
Boring ID	Depth	Date	Expert[b,c]	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
HA-2R	6-8'	4/23/2025	ICON	**4.82**	**1,030**	<0.386	**15.2**	**18.7**	<0.0981	—	—	**148**	**17.7**
HA-2R	8-10'	4/23/2025	ICON	**4.22**	**1,680**	<0.365	**21.3**	**25.6**	<0.0953	—	—	**235**	**16.2**
HA-2R	10-12'	4/23/2025	ICON	**5.62**	**290**	<0.393	**12.3**	**11.0**	<0.0936	—	—	**157**	**24.2**
HA-2R	0-2'	4/23/2025	HET	—	**1,570**	—	**20.2**	**17.1**	—	—	—	—	—
HA-2R	2-4'	4/23/2025	HET	—	**355**	—	**17.9**	**15.9**	—	—	—	—	—
HA-2R	8-10'	4/23/2025	HET	—	**1,100**	—	**25.8**	**25.0**	—	—	—	—	—
HA-2R	10-12'	4/23/2025	HET	—	**312**	—	**18.6**	**12.5**	—	—	—	—	—
HA-2R	14-16'	4/23/2025	HET	—	**137**	—	**16.1**	**8.06**	—	—	—	—	—
SB-1	0-2'	4/24/2025	HET	—	**194**	—	**15.9**	**13.8**	—	—	—	—	—
SB-1	2-4'	4/25/2025	HET	—	**287**	—	**22.7**	**9.8**	—	—	—	—	—
SB-1	6-8'	4/24/2025	HET	—	**254**	—	**22.0**	**9.77**	—	—	—	—	—
SB-1	8-10'	4/24/2025	HET	—	**152**	—	**16.1**	**7.59**	—	—	—	—	—
SB-1	13-15'	4/24/2025	HET	—	**180**	—	**23.3**	**12.1**	—	—	—	—	—
SB-4	0-2'	4/24/2025	HET	—	**260**	—	**17.4**	**24.4**	—	—	—	—	—
SB-4	2-4'	4/24/2025	HET	—	**193**	—	**18.6**	**10.9**	—	—	—	—	—
SB-4	8-10'	4/24/2025	HET	—	**90.1**	—	**10.8**	**6.51**	—	—	—	—	—
SB-4	12-14'	4/24/2025	HET	—	**149.0**	—	**24.8**	**12.1**	—	—	—	—	—
SB-2	0-2'	4/24/2025	HET	—	**156**	—	**18.4**	**15.6**	—	—	—	—	—
SB-2	2-4'	4/24/2025	HET	—	**221**	—	**20.5**	**12.3**	—	—	—	—	—
SB-2	6-8'	4/24/2025	HET	—	**116**	—	**15.2**	**6.41**	—	—	—	—	—
SB-2	8-10'	4/24/2025	HET	—	**345**	—	**17.0**	**8.69**	—	—	—	—	—
SB-2	12-14'	4/24/2025	HET	—	**110**	—	**15.9**	**6.83**	—	—	—	—	—
HA-10R	0-2'	4/25/2025	HET	—	**168**	—	—	—	—	—	—	—	—
HA-10R	0-2'	4/25/2025	ICON	**3.32**	**1,010**	<0.415	**10.8**	**9.90**	<0.0963	—	—	**28.0**	**14.3**

[a] Screening standards calculated using Equation 4 in Appendix H of LDEQ (2003) with RfD of 0.6 mg/kg/day for strontium (see Appendix A).

[b] Expert reporting the concentrations for the sample.

[c] ICON samples are converted from a reported mg/kg dry-weight basis to a wet-weight basis using the moisture content of the sample.

— - constituent was not included in the analysis conducted for this sample.

<9999 - constituent was not detected at the reported detection limit.

9999 - constituent was detected at the concentration specified.

9999 - constituent was present above the RECAP-SSni.

9999 - constituent was present above the RECAP-MO1ni.

Table 1b. Summary Statistics of Soil Analytical Sampling Data in 0 to 3-foot soil horizon for Metals for Castex Development LLC Property Compared to RECAP Standards

Constituent	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Strontium[a]	Zinc
RECAP-SSni (mg/kg)	**12**	**550**	**3.9**	**23**	**400**	**2.3**	**39**	**39**	**4,700**	**2,300**
RECAP-MO1ni (mg/kg)	**12**	**5,500**	**39**	**230**	**400**	**23**	**390**	**390**	**47,000**	**23,000**
# of Samples with Detects	46	60	4	57	57	16	2	3	33	46
# of Samples with Non-detects	0	0	42	0	0	30	26	13	0	0
Total # of Samples	46	60	46	57	57	46	28	16	33	46
Frequency of Detection	100.0%	100.0%	8.7%	100.0%	100.0%	34.8%	7.1%	18.8%	100.0%	100.0%
# Detects > RECAP-SSni	0	22	0	9	0	0	0	0	0	0
# Detects > RECAP-MO1ni	0	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-SSni	0	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-MO1ni	0	0	0	0	0	0	0	0	0	0
Minimum Detected Concentration	1.52	75.3	0.297	6.76	5.80	0.0165	1.16	0.576	9.81	9.01
Maximum Detected Concentration	9.98	5,059	0.922	146	200	0.224	1.37	0.851	359	378
Minimum Non-detect Concentration	---	---	0.200	---	---	0.0171	1.00	0.500	---	---
Maximum Non-detect Concentration	---	---	0.500	---	---	0.109	3.96	0.500	---	---

[a] Screening standards calculated using Equation 4 in Appendix H of LDEQ (2003) with RfD of 0.6 mg/kg/day for strontium (see Appendix A).

Table 1c. Summary Statistics of Soil Analytical Sampling Data in 0 to 15-foot soil horizon for Metals for Castex Development LLC Property Compared to RECAP Standards

Constituent	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Strontium[a]	Zinc
RECAP-SSni (mg/kg)	**12**	**550**	**3.9**	**23**	**400**	**2.3**	**39**	**39**	**4,700**	**2,300**
RECAP-MO1ni (mg/kg)	**12**	**5,500**	**39**	**230**	**400**	**23**	**390**	**390**	**47,000**	**23,000**
# of Samples with Detects	102	132	7	129	129	23	3	4	77	105
# of Samples with Non-detects	3	0	98	0	0	82	51	32	0	0
Total # of Samples	105	132	105	129	129	105	54	36	77	105
Frequency of Detection	97.1%	100.0%	6.7%	100.0%	100.0%	21.9%	5.6%	11.1%	100.0%	100.0%
# Detects > RECAP-SSni	1	32	0	19	0	0	0	0	0	0
# Detects > RECAP-MO1ni	1	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-SSni	0	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-MO1ni	0	0	0	0	0	0	0	0	0	0
Minimum Detected Concentration	0.265	15.5	0.268	0.830	0.671	0.0165	1.16	0.576	1.73	1.39
Maximum Detected Concentration	15.6	5,059	0.922	146	200	0.224	1.46	0.851	359	378
Minimum Non-detect Concentration	1.00	---	0.200	---	---	0.0144	1.00	0.500	---	---
Maximum Non-detect Concentration	5.00	---	1.00	---	---	0.160	5.00	2.50	---	---

[a] Screening standards calculated using Equation 4 in Appendix H of LDEQ (2003) with RfD of 0.6 mg/kg/day for strontium (see Appendix A).

Table 2a. Soil Analytical Sampling Data and Summary Statistics for Total Petroleum Hydrocarbons for Castex Development LLC Property Compared to RECAP Standards

Constituent				Diesel Range Organics (C10-C28)	Oil Range Organics (C28-C35)	C6-C8 Aliphatics	C8-C10 Aliphatics	C8-C10 Aromatics	C10-C12 Aliphatics	C10-C12 Aromatics	C12-C16 Aliphatics	C12-C16 Aromatics	C16-C21 Aromatics	C16-C35 Aliphatics	C21-C35 Aromatics
RECAP-SSni				65	180	1,200	120	65	230	120	370	180	150	7,100	180
RECAP-MO1ni				650	1,800	10,000	1,200	650	2,300	1,200	3,700	1,800	1,500	10,000	1,800
Boring ID	Depth	Date	Expert[a]	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
HA-2	0-2'	6/29/2021	ICON	**22.7**	**29.0**	—	—	—	—	—	—	—	—	—	—
HA-2	0-2'	6/29/2021	ERM	—	—	<28.7	<28.7	<28.7	<6.00	<6.00	**37.4**	<6.00	<6.00	**32.7**	<6.00
HA-2	2-4'	6/29/2021	ICON	**1,300**	<100	—	—	—	—	—	—	—	—	—	—
HA-2	2-4'	6/29/2021	ERM	—	—	<29.9	<29.9	**35.1**	**34.1**	**6.12**	**527**	**41.8**	**22.4**	**378**	**16.6**
HA-2	4-6'	6/29/2021	ICON	**123**	<15.0	—	—	—	—	—	—	—	—	—	—
HA-2	4-6'	6/29/2021	ERM	—	—	<26.8	<26.8	<26.8	**9.81**	<6.00	**154**	**13.4**	**6.46**	**131**	<6.00
HA-5	2-4'	6/29/2021	ICON	**768**	**545**	—	—	—	—	—	—	—	—	—	—
HA-5	2-4'	6/29/2021	ERM	—	—	<2.23	<2.23	<44.7	<6.00	<6.00	**20.2**	<6.00	<6.00	**131**	**22.2**
HA-5	4-6'	6/29/2021	ICON	**2,310**	**258**	—	—	—	—	—	—	—	—	—	—
HA-5	4-6'	6/29/2021	ERM	—	—	**64.4**	**147**	**77.2**	**99.2**	**11.2**	**513**	**38.4**	**34.7**	**1,560**	**133**
HA-10	0-2'	8/2/2024	ICON	<20.0	<20.0	—	—	—	—	—	—	—	—	—	—
HA-10	0-2'	8/2/2024	ERM	—	—	<0.327	**4.35**	<0.327	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	**4.05**
HA-10	2-4'	8/2/2024	ICON	<20.0	<20.0	—	—	—	—	—	—	—	—	—	—
HA-10	2-4'	8/2/2024	ERM	—	—	<0.303	<0.789	<0.303	<2.00	<2.00	**3.16**	<2.00	<2.00	<4.00	<2.00
HA-10	4-6'	8/2/2024	ICON	<19.9	<19.9	—	—	—	—	—	—	—	—	—	—
HA-10	4-6'	8/2/2024	ERM	—	—	<0.299	<0.777	<0.299	**3.84**	<2.00	**9.00**	<2.00	<2.00	<4.00	<2.00
SB-3	0-2'	4/25/2025	HET	—	—	<0.426	<1.11	<0.426	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-3	2-4'	4/25/2025	HET	—	—	—	—	—	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-3	4-6'	4/25/2025	HET	—	—	—	—	—	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-3	8-10'	4/25/2025	HET	—	—	<0.453	<1.18	<0.453	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-1	2-4'	4/25/2025	HET	—	—	—	—	—	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
HA-2R	14-16'	4/23/2025	ICON	<19.9	**36.4**	—	—	—	—	—	—	—	—	—	—
HA-2R	0-2'	4/23/2025	HET	—	—	<0.415	<1.08	<0.415	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
HA-2R	2-4'	4/23/2025	HET	—	—	—	—	—	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
HA-2R	8-10'	4/23/2025	HET	—	—	**33.1**	**53.1**	**9.68**	<40.00	**29.7**	**262**	**64.6**	**50.1**	**987**	**11.8**
HA-2R	10-12'	4/23/2025	HET	—	—	<0.495	**4.91**	**0.539**	<2.00	<2.00	<2.00	<2.00	<2.00	**4.62**	<2.00
HA-2R	14-16'	4/23/2025	HET	—	—	<0.439	<1.14	<0.439	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-1	0-2'	4/24/2025	HET	—	—	<0.448	<1.16	<0.448	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-1	2-4'	4/24/2025	HET	—	—	—	—	—	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00

Table 2a. Soil Analytical Sampling Data and Summary Statistics for Total Petroleum Hydrocarbons for Castex Development LLC Property Compared to RECAP Standards

Constituent				Diesel Range Organics (C10-C28)	Oil Range Organics (C28-C35)	C6-C8 Aliphatics	C8-C10 Aliphatics	C8-C10 Aromatics	C10-C12 Aliphatics	C10-C12 Aromatics	C12-C16 Aliphatics	C12-C16 Aromatics	C16-C21 Aromatics	C16-C35 Aliphatics	C21-C35 Aromatics
			RECAP-SSni	65	180	1,200	120	65	230	120	370	180	150	7,100	180
			RECAP-MO1ni	650	1,800	10,000	1,200	650	2,300	1,200	3,700	1,800	1,500	10,000	1,800
Boring ID	Depth	Date	Expert[a]	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SB-1	8-10'	4/24/2025	HET	—	—	<0.450	<1.17	<0.450	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-4	0-2'	4/24/2025	HET	—	—	<0.432	<1.12	<0.432	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-4	2-4'	4/24/2025	HET	—	—	<0.444	<1.15	<0.444	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-4	8-10'	4/24/2025	HET	—	—	<0.438	<1.14	<0.438	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-2	0-2'	4/24/2025	HET	—	—	<0.452	<1.18	<0.452	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-2	2-4'	4/24/2025	HET	—	—	<0.475	<1.23	<0.475	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00
SB-2	8-10'	4/24/2025	HET	—	—	<0.440	<1.14	<0.440	<2.00	<2.00	<2.00	<2.00	<2.00	<4.00	<2.00

[a] Expert reporting the concentrations for the sample.

— - constituent was not included in the analysis conducted for this sample.

<9999 - constituent was not detected at the reported detection limit.

9999 - constituent was detected at the concentration specified.

9999 - constituent was present above the RECAP-SSni.

9999 - constituent was present above the RECAP-MO1ni.

Table 2b. Summary Statistics of Soil Analytical Sampling Data in the 0 to 3-foot soil horizon for Total Petroleum Hydrocarbons for Castex Development LLC Property Compared to RECAP Standards

Constituent	Diesel Range Organics (C10-C28)	Oil Range Organics (C28-C35)	C6-C8 Aliphatics	C8-C10 Aliphatics	C8-C10 Aromatics	C10-C12 Aliphatics	C10-C12 Aromatics	C12-C16 Aliphatics	C12-C16 Aromatics	C16-C21 Aromatics	C16-C35 Aliphatics	C21-C35 Aromatics
RECAP-SSni (mg/kg)	65	180	1,200	120	65	230	120	370	180	150	7,100	180
RECAP-MO1ni (mg/kg)	650	1,800	10,000	1,200	650	2,300	1,200	3,700	1,800	1,500	10,000	1,800
# of Samples with Detects	3	2	0	1	1	1	1	4	1	1	3	3
# of Samples with Non-detects	2	3	12	11	11	15	15	12	15	15	13	13
Total # of Samples	5	5	12	12	12	16	16	16	16	16	16	16
Frequency of Detection	60.0%	40.0%	0.0%	8.3%	8.3%	6.3%	6.3%	25.0%	6.3%	6.3%	18.8%	18.8%
# Detects > RECAP-SSni	2	1	0	0	0	0	0	1	0	0	0	0
# Detects > RECAP-MO1ni	2	0	0	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-SSni	0	0	0	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-MO1ni	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Detected Concentration	22.7	29.0	---	4.35	35.1	34.1	6.12	3.16	41.8	22.4	32.7	4.05
Maximum Detected Concentration	1,300	545	---	4.35	35.1	34.1	6.12	527	41.8	22.4	378	22.2
Minimum Non-detect Concentration	20.0	20.0	0.303	0.789	0.303	2.00	2.00	2.00	2.00	2.00	4.00	2.00
Maximum Non-detect Concentration	20.0	100	29.9	29.9	44.7	6.00	6.00	2.00	6.00	6.00	4.00	6.00

Table 2c. Summary Statistics of Soil Analytical Sampling Data in the 0 to 15-foot soil horizon for Total Petroleum Hydrocarbons for Castex Development LLC Property Compared to RECAP Standards

Constituent	Diesel Range Organics (C10-C28)	Oil Range Organics (C28-C35)	C6-C8 Aliphatics	C8-C10 Aliphatics	C8-C10 Aromatics	C10-C12 Aliphatics	C10-C12 Aromatics	C12-C16 Aliphatics	C12-C16 Aromatics	C16-C21 Aromatics	C16-C35 Aliphatics	C21-C35 Aromatics
RECAP-SSni (mg/kg)	65	180	1,200	120	65	230	120	370	180	150	7,100	180
RECAP-MO1ni (mg/kg)	650	1,800	10,000	1,200	650	2,300	1,200	3,700	1,800	1,500	10,000	1,800
# of Samples with Detects	5	4	2	4	4	4	3	8	4	4	7	5
# of Samples with Non-detects	4	5	20	18	18	23	24	19	23	23	20	22
Total # of Samples	9	9	22	22	22	27	27	27	27	27	27	27
Frequency of Detection	55.6%	44.4%	9.1%	18.2%	18.2%	14.8%	11.1%	29.6%	14.8%	14.8%	25.9%	18.5%
# Detects > RECAP-SSni	4	2	0	1	1	0	0	2	0	0	0	0
# Detects > RECAP-MO1ni	3	0	0	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-SSni	0	0	0	0	0	0	0	0	0	0	0	0
# Non-detects > RECAP-MO1ni	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Detected Concentration	22.7	29.0	33.1	4.35	0.5	3.84	6.12	3.16	13.4	6.46	4.62	4.05
Maximum Detected Concentration	2,310	545	64.4	147	77.2	99.2	29.7	527	64.6	50.1	1,560	133.0
Minimum Non-detect Concentration	19.9	15.0	0.299	0.777	0.299	2.00	2.00	2.00	2.00	2.00	4.00	2.00
Maximum Non-detect Concentration	20.0	100	29.9	29.9	44.7	40.00	6.00	2.00	6.00	6.00	4.00	6.00

Table 3. Soil Analytical Sampling Data for Polycyclic Aromatic Hydrocarbons for Castex Development LLC Property Compared to RECAP Screening Standards

Constituent				2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
RECAP-Ssni				22	370	350	2200	0.62	0.33	0.62	6.2	62	0.33	220	280	0.62	6.2	2,100	230
RECAP-MO1ni				220	3,700	3,500	22,000	0.62	0.33	0.62	6.2	62	0.33	2,200	2,800	0.62	62	21,000	2,300
Boring ID	Depth	Date	Expert [a]	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
HA-5	4-6'	6/29/2021	ERM	**1.02**	<0.066	<0.066	<0.033	<0.066	<0.033	<0.066	<0.033	<0.066	<0.066	**0.038**	**0.193**	<0.033	**0.608**	**0.429**	**0.046**
HA-2R	0-2	4/23/2025	HET	<0.000224	<0.000183	<0.000134	<0.00021	**0.00072**	**0.00084**	**0.00095**	<0.00015	**0.00084**	<0.000096	**0.00118**	<0.00014	**0.00077**	<0.000097	**0.0008**	**0.00107**
HA-2R	2-4	4/25/2025	HET	<0.000224	**0.00122**	<0.000134	**0.00161**	**0.0008**	<0.0001	**0.00077**	<0.00015	**0.00231**	<0.000096	**0.00159**	<0.00014	<0.0003	**0.00103**	**0.0012**	**0.0033**

[a] Expert reporting the concentrations for the sample.

<9999 - constituent was not detected at the reported detection limit.

9999 - constituent was detected at the concentration specified.

9999 - constituent was present above the RECAP-SSni.

9999 - constituent was present above the RECAP-MO1ni.

BP/Castex-Ltd Adm-Apx S-000033

Table 4a. Soil Analytical Sampling Data for Lead for Castex Development LLC Property

			Constituent	**Lead**
			Screening Level (mg/kg)	**200**
Boring ID	Depth	Date	Expert[a,b]	mg/kg
HA-1	0-2'	6/29/2021	ICON	**18.0**
HA-1	0-2'	6/29/2021	ERM	**9.57**
HA-1	2-4'	6/29/2021	ICON	**13.7**
HA-1	2-4'	6/29/2021	ERM	**22.1**
HA-1	4-6'	6/29/2021	ICON	**13.5**
HA-1	4-6'	6/29/2021	ERM	**11.6**
HA-2	0-2'	6/29/2021	ICON	**69.7**
HA-2	0-2'	6/29/2021	ERM	**149**
HA-2	2-4'	6/29/2021	ICON	**52.4**
HA-2	2-4'	6/29/2021	ERM	**262**
HA-2	4-6'	6/29/2021	ICON	**15.5**
HA-2	4-6'	6/29/2021	ERM	**12.6**
HA-3	0-2'	6/29/2021	ICON	**10.2**
HA-3	0-2'	6/29/2021	ERM	**8.63**
HA-3	2-4'	6/29/2021	ICON	**12.6**
HA-3	2-4'	6/29/2021	ERM	**10.9**
HA-3	4-6'	6/29/2021	ICON	**12.2**
HA-3	4-6'	6/29/2021	ERM	**8.10**
HA-4	0-2'	6/29/2021	ICON	**22.6**
HA-4	0-2'	6/29/2021	ERM	**45.3**
HA-4	2-4'	6/29/2021	ICON	**15.5**
HA-4	2-4'	6/29/2021	ERM	**24.4**
HA-4	4-6'	6/29/2021	ICON	**14.6**
HA-4	4-6'	6/29/2021	ERM	**10.7**
HA-5	0-2'	6/29/2021	ICON	**33.7**
HA-5	0-2'	6/29/2021	ERM	**53.1**
HA-5	2-4'	6/29/2021	ICON	**55.2**
HA-5	2-4'	6/29/2021	ERM	**87.3**
HA-5	4-6'	6/29/2021	ICON	**41.6**
HA-5	4-6'	6/29/2021	ERM	**47.4**
HA-9	0-2'	6/30/2021	ICON	**23.0**
HA-9	0-2'	6/30/2021	ERM	**7.10**
HA-9	2-4'	6/30/2021	ICON	**18.3**
HA-9	2-4'	6/30/2021	ERM	**9.19**
HA-9	4-6'	6/30/2021	ICON	**14.5**
HA-9	4-6'	6/30/2021	ERM	**8.2**
HA-10	0-2'	8/2/2024	ERM	**13.9**
HA-10	0-2'	8/2/2024	ICON	**11.2**
HA-10	2-4'	8/2/2024	ERM	**13.1**
HA-10	2-4'	8/2/2024	ICON	**10.5**
HA-10	4-6'	8/2/2024	ERM	**14.7**

Table 4a. Soil Analytical Sampling Data for Lead for Castex Development LLC Property

			Constituent	**Lead**
			Screening Level (mg/kg)	**200**
Boring ID	Depth	Date	Expert[a,b]	mg/kg
HA-10	4-6'	8/2/2024	ICON	**10.7**
CD-1	0-2'	2/23/2022	ICON	**15.6**
CD-1	0-2'	2/23/2022	ERM	**15.0**
CD-1	4-6'	2/23/2022	ICON	**9.27**
CD-1	4-6'	2/23/2022	ERM	**11.3**
CD-1	10-12'	2/23/2022	ICON	**13.1**
CD-1	10-12'	2/23/2022	ERM	**6.36**
CD-4	8-10'	3/9/2022	ERM	**5.87**
CD-6	0-4'	4/12/2022	ICON	**11.7**
CD-6	6-8'	4/12/2022	ICON	**12.0**
CD-6	6-8'	4/12/2022	ERM	**8.38**
CD-6	10-12'	4/12/2022	ICON	**14.3**
CD-6	10-12'	4/12/2022	ERM	**21.4**
CD-8	2-4'	4/21/2022	ICON	**14.9**
CD-8	4-6'	4/21/2022	ICON	**12.5**
CD-8	4-6'	4/21/2022	ERM	**7.20**
CD-8	8-10'	4/21/2022	ICON	**7.64**
CD-8	8-10'	4/21/2022	ERM	**11.3**
CD-9	2-4'	4/27/2022	ICON	**10.2**
CD-9	6-8'	4/27/2022	ICON	**8.09**
CD-9	6-8'	4/27/2022	ERM	**5.99**
CD-9	10-12'	4/27/2022	ICON	**8.55**
CD-9	10-12'	4/27/2022	ERM	**11.8**
CD-10	2-4'	5/4/2022	ICON	**16.3**
CD-10	6-8'	5/4/2022	ICON	**8.05**
CD-10	6-8'	5/4/2022	ERM	**9.03**
CD-10	8-10'	5/4/2022	ICON	**10.1**
CD-10	8-10'	5/4/2022	ERM	**11.2**
CD-16	10-12'	6/10/2024	ERM	**22.0**
CD-16	10-12'	6/10/2024	ICON	**13.1**
CD-17	8-10'	6/14/2024	ERM	**17.7**
CD-17	8-10'	6/14/2024	ICON	**9.77**
CD-18	0-4'	7/23/2024	ERM	**13.0**
CD-18	0-4'	7/23/2024	ICON	**11.1**
CD-18	6-8'	7/23/2024	ERM	**21.4**
CD-18	6-8'	7/23/2024	ICON	**10.6**
CD-18	10-12'	7/23/2024	ERM	**22.2**
CD-18	10-12'	7/23/2024	ICON	**15.6**
CD-19	0-4'	7/29/2024	ICON	**14.7**
CD-19	6-8'	7/29/2024	ERM	**12.1**
CD-19	6-8'	7/29/2024	ICON	**14.6**

Table 4a. Soil Analytical Sampling Data for Lead for Castex Development LLC Property

			Constituent	**Lead**
			Screening Level (mg/kg)	**200**
Boring ID	Depth	Date	Expert[a,b]	mg/kg
CD-19	8-10'	7/29/2024	ERM	**9.04**
CD-19	8-10'	7/29/2024	ICON	**7.46**
SB-1	0-2'	4/24/2025	ICON	**13.2**
SB-1	2-4'	4/25/2025	ICON	**11.3**
SB-1	2-4'	4/25/2025	HET	**12.4**
SB-1	6-8'	4/24/2025	ICON	**10.6**
SB-1	8-10'	4/24/2025	ICON	**7.72**
SB-1	13-15'	4/24/2025	ICON	**12.5**
SB-2	0-2'	4/24/2025	ICON	**12.7**
SB-2	2-4'	4/24/2025	ICON	**11.7**
SB-2	6-8'	4/24/2025	ICON	**7.19**
SB-2	8-10'	4/24/2025	ICON	**9.04**
SB-3	0-2'	4/25/2025	ICON	**15.2**
SB-3	0-2'	4/25/2025	HET	**19.0**
SB-3	2-4'	4/25/2025	ICON	**12.9**
SB-3	2-4'	4/25/2025	HET	**11.9**
SB-3	4-6'	4/25/2025	ICON	**12.7**
SB-3	8-10'	4/25/2025	ICON	**9.37**
SB-3	8-10'	4/25/2025	HET	**12.7**
SB-3	12-14'	4/25/2025	HET	**9.50**
SB-4	0-2'	4/24/2025	ICON	**21.9**
SB-4	2-4'	4/24/2025	ICON	**21.0**
SB-4	7-9'	4/24/2025	ICON	**6.82**
SB-4	8-10'	4/24/2025	ICON	**5.22**
HA-2R	6-8'	4/23/2025	ICON	**24.2**
HA-2R	8-10'	4/23/2025	ICON	**35.0**
HA-2R	10-12'	4/23/2025	ICON	**13.9**
HA-2R	0-2'	4/23/2025	HET	**20.5**
HA-2R	2-4'	4/23/2025	HET	**19.9**
HA-2R	8-10'	4/23/2025	HET	**34.3**
HA-2R	10-12'	4/23/2025	HET	**17.5**
HA-2R	14-16'	4/23/2025	HET	**10.6**
SB-1	0-2'	4/24/2025	HET	**17.3**
SB-1	2-4'	4/25/2025	HET	**12.4**
SB-1	6-8'	4/24/2025	HET	**13.1**
SB-1	8-10'	4/24/2025	HET	**9.8**
SB-1	13-15'	4/24/2025	HET	**16.4**
SB-4	0-2'	4/24/2025	HET	**28.6**
SB-4	2-4'	4/24/2025	HET	**13.9**
SB-4	8-10'	4/24/2025	HET	**7.77**
SB-4	12-14'	4/24/2025	HET	**17.2**

Table 4a. Soil Analytical Sampling Data for Lead for Castex Development LLC Property

			Constituent	**Lead**
			Screening Level (mg/kg)	**200**
Boring ID	Depth	Date	Expert[a,b]	mg/kg
SB-2	0-2'	4/24/2025	HET	**18.7**
SB-2	2-4'	4/24/2025	HET	**16.3**
SB-2	6-8'	4/24/2025	HET	**7.88**
SB-2	8-10'	4/24/2025	HET	**11.3**
SB-2	12-14'	4/24/2025	HET	**9.02**
HA-10R	0-2'	4/25/2025	HET	—
HA-10R	0-2'	4/25/2025	ICON	**11.9**

a Expert reporting the concentrations for the sample.

b Where required, samples reported in mg/kg wet-weight were converted to a dry-weight basis using the moisture content of the sample.

<9999 - constituent was not detected at the reported detection limit.

9999 - constituent was detected at the concentration specified.

9999 - constituent was present above the Regional Screening Level.

Table 4b. Summary Statistics of Soil Analytical Sampling Data for Lead for Castex Development LLC Property

	0 to 3-foot soil horizon	**0 to 15-foot soil horizon**
Constituent	**Lead**	**Lead**
Screening Level (mg/kg)	**200**	**200**
# of Samples with Detects	57	129
# of Samples with Non-detects	0	0
Total # of Samples	57	129
Frequency of Detection	100.0%	100.0%
# Detects > Screeing Level	1	1
# Non-detects > Screening Level	0	0
Minimum Detected Concentration	7.10	5.22
Maximum Detected Concentration	262	262
Minimum Non-detect Concentration	---	---
Maximum Non-detect Concentration	---	---

Note: Results based on dry-weight concentrations.

Table 5. Groundwater Analytical Sampling Results for Chloride and TDS for Castex Development LLC Property

Sample Name	Screened Interval	Zone	Date	Expert	Chloride (mg/L)	TDS (mg/L)
CD-1A	13-18'	A	3/18/2022	ICON	29.2	370
CD-1A	13-18'	A	3/18/2022	ERM	21.4	372
CD-1B	32-37'	A	3/18/2022	ICON	71.7	388
CD-1B	32-37'	A	3/18/2022	ERM	36.3	420
CD-1C	48-58'	B	3/21/2022	ICON	40.9	413
CD-1C	48-58'	B	3/21/2022	ICON	44.3	404
CD-1C	48-58'	B	3/21/2022	ERM	44.4	408
CD-2A	33-43'	A	3/17/2022	ICON	13,100	20,300
CD-2A	33-43'	A	3/17/2022	ERM	13,300	27,500
CD-2B	58-68'	B	3/17/2022	ICON	2,450	4,060
CD-2B	58-68'	B	3/17/2022	ERM	2,510	6,230
CD-3A	27-42'	A	3/17/2022	ICON	21,400	35,800
CD-3A	27-42'	A	3/17/2022	ERM	22,000	38,500
CD-3B	60-65'	B	3/18/2022	ICON	3,520	6,020
CD-3B	60-65'	B	3/18/2022	ERM	3,190	8,060
CD-4A	27-42'	A	3/21/2022	ICON	372	1,080
CD-4A	27-42'	A	3/21/2022	ERM	409	1,120
CD-4B	62-67'	B	3/21/2022	ICON	1,230	2,020
CD-4B	62-67'	B	3/21/2022	ERM	1,150	2,580
CD-5A	28-43'	A	3/21/2022	ICON	250	835
CD-5A	28-43'	A	3/21/2022	ERM	204	842
CD-5B	65-70'	B	3/23/2022	ICON	12,900	21,300
CD-5B	65-70'	B	3/23/2022	ERM	12,900	26,500
CD-5C	90-95'	B	5/9/2022	ICON	311	855
CD-5C	90-95'	B	5/9/2022	ERM	208	666
CD-5D	95-110'	C	6/16/2022	ICON	55.4	327
CD-5D	95-110'	C	6/16/2022	ERM	54.7	392
CD-6A	30-40'	A	5/12/2022	ICON	303	845
CD-6A	30-40'	A	5/12/2022	ERM	295	928
CD-6B	56-66'	B	5/12/2022	ICON	72.7	436
CD-6B	56-66'	B	5/12/2022	ERM	75.2	454
CD-8A	20-30'	A	5/10/2022	ICON	12.6	432
CD-8A	20-30'	A	5/10/2022	ERM	11.0	428
CD-8B	52-62'	B	5/10/2022	ICON	180	1,070
CD-8B	52-62'	B	5/10/2022	ERM	199	744
CD-9A	26-36'	A	5/9/2022	ICON	47.1	534
CD-9A	26-36'	A	5/9/2022	ERM	45.8	536
CD-9B	58-68'	B	5/9/2022	ICON	105	387
CD-9B	58-68'	B	5/9/2022	ERM	94.2	386
CD-10A	30-40'	A	5/10/2022	ICON	41.0	309
CD-10A	30-40'	A	5/10/2022	ERM	35.6	294
CD-10D	67-82'	B	6/21/2022	ICON	80.4	245
CD-10D	67-82'	B	6/21/2022	ERM	20.1	342
CD-12A	7-17'	A	6/13/2022	ICON	28.6	242

Table 5. Groundwater Analytical Sampling Results for Chloride and TDS for Castex Development LLC Property

Sample Name	Screened Interval	Zone	Date	Expert	Chloride (mg/L)	TDS (mg/L)
CD-12A	7-17'	A	6/13/2022	ERM	25.8	422
CD-12B	29-39'	A	6/13/2022	ICON	30.1	351
CD-12B	29-39'	A	6/13/2022	ERM	28.8	388
CD-13A	22-32'	A	6/13/2022	ICON	92.1	675
CD-13A	22-32'	A	6/13/2022	ERM	75.1	726
CD-13B	32-42'	A	6/13/2022	ICON	183	790
CD-13B	32-42'	A	6/13/2022	ERM	178	870
CD-13C	58-68'	B	6/14/2022	ICON	74.6	562
CD-13C	58-68'	B	6/14/2022	ERM	68.9	520
CD-16A1	16-26'	A	6/13/2024	ICON	82.0	626
CD-16A1	16-26'	A	6/13/2024	ERM	78.1	642
CD-16A2	36-46'	A	6/13/2024	ICON	195	673
CD-16A2	36-46'	A	6/13/2024	ERM	203	705
CD-16B	63-68'	B	6/13/2024	ICON	74.0	361
CD-16B	63-68'	B	6/13/2024	ERM	70.9	355
CD-17A1	16-26'	A	6/18/2024	ICON	474	975
CD-17A1	16-26'	A	6/18/2024	ERM	354	1,050
CD-17A2	39-49'	A	6/18/2024	ICON	230	835
CD-17A2	39-49'	A	6/18/2024	ERM	167	858
CD-17B	62-72'	B	6/18/2024	ICON	278	621
CD-17B	62-72'	B	6/18/2024	ERM	248	756
CD-18A	16-26'	A	8/6/2024	ICON	96.0	436
CD-18A	16-26'	A	8/6/2024	ERM	104	456
CD-18B	32-42'	A	8/6/2024	ICON	297	828
CD-18B	32-42'	A	8/6/2024	ERM	277	756
CD-18C	52-57'	B	8/6/2024	ICON	176	547
CD-18C	52-57'	B	8/6/2024	ERM	163	536
CD-18D	64-74'	B	8/6/2024	ICON	148	470
CD-18D	64-74'	B	8/6/2024	ERM	145	496
CD-19A	10-20'	A	8/7/2024	ICON	1,140	2,120
CD-19A	10-20'	A	8/7/2024	ERM	1,150	2,480
CD-19B	32-42'	A	8/7/2024	ICON	734	1,470
CD-19B	32-42'	A	8/7/2024	ERM	713	1,680
CD-19C	52-62'	B	8/7/2024	ICON	168	557
CD-19C	52-62'	B	8/7/2024	ERM	156	525
CD-19D	94-104'	B	7/30/2024	ICON	64.4	347
CD-19D	94-104'	B	7/30/2024	ERM	65.7	348

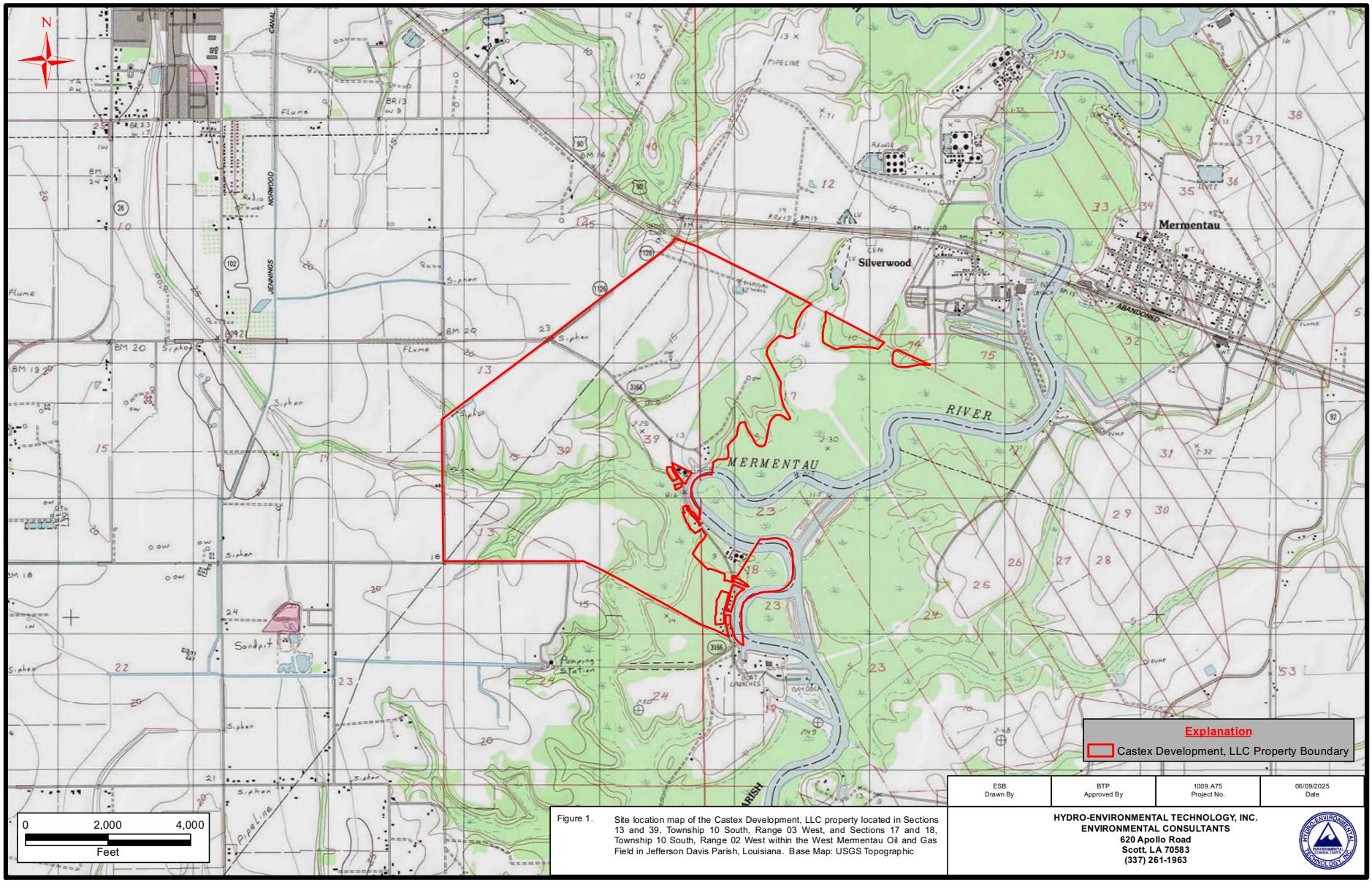
Table 5. Groundwater Analytical Sampling Results for Chloride and TDS for Castex Development LLC Property

Sample Name	Screened Interval	Zone	Date	Expert	Chloride (mg/L)	TDS (mg/L)
Summary Statistics						
	Chloride (mg/L)			TDS (mg/L)		
Zone	Minimum	Maximum	Average	Minimum	Maximum	Average
A	11.0	22,000	1,794	242	38,500	3,475
B	20.1	12,900	1,235	245	26,500	2,588

9999 - constituent was present above the chloride MCL of 250 mg/L.

9999 - constituent was present above a TDS value of 500 mg/L.

FIGURES



ESB	BTP	1009.A75	06/09/2025
Drawn By	Approved By	Project No.	Date

Figure 1. Site location map of the Castex Development, LLC property located in Sections 13 and 39, Township 10 South, Range 03 West, and Sections 17 and 18, Township 10 South, Range 02 West within the West Mermentau Oil and Gas Field in Jefferson Davis Parish, Louisiana. Base Map: USGS Topographic

HYDRO-ENVIRONMENTAL TECHNOLOGY, INC.
ENVIRONMENTAL CONSULTANTS
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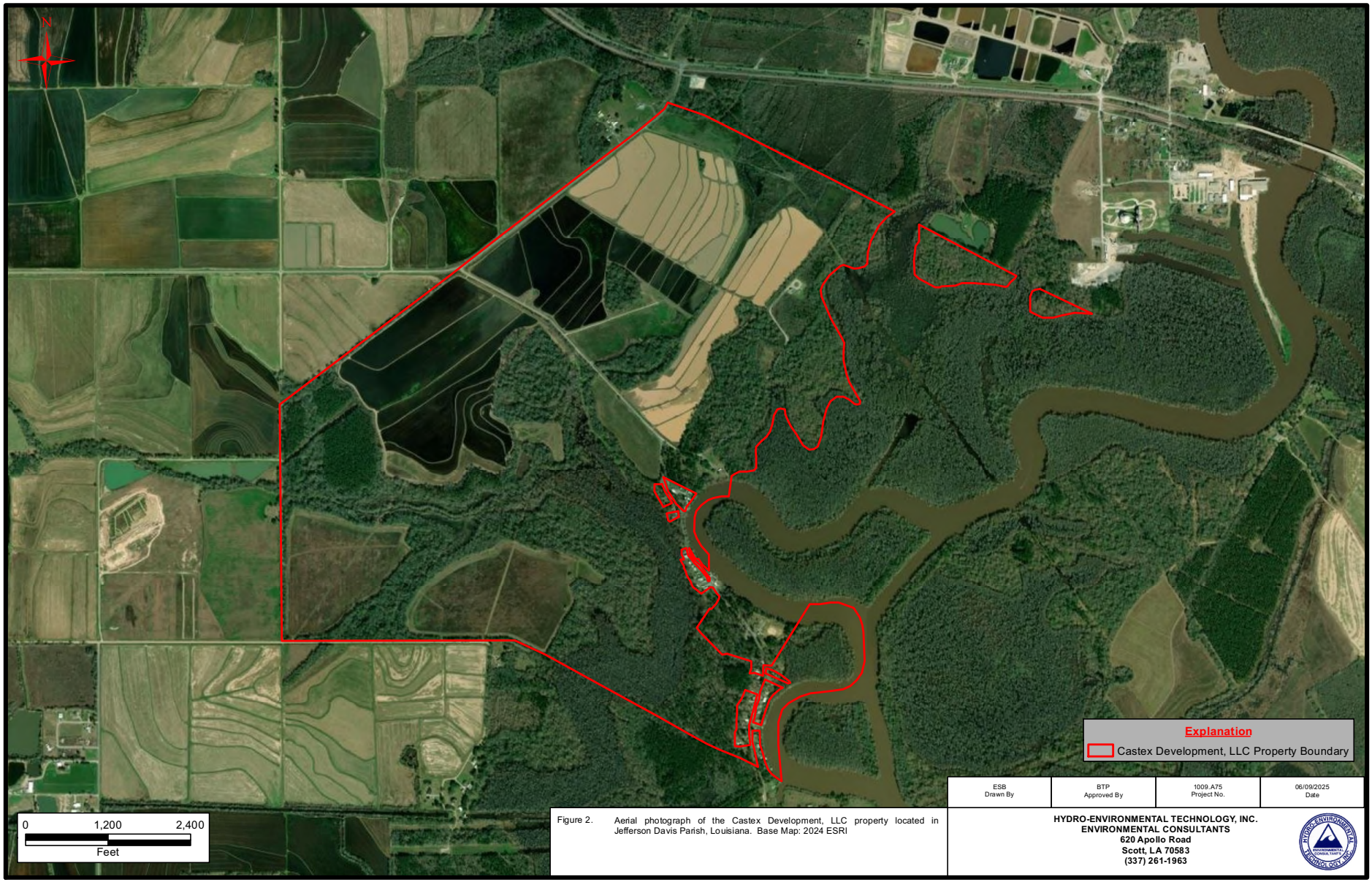

Figure 2. Aerial photograph of the Castex Development, LLC property located in Jefferson Davis Parish, Louisiana. Base Map: 2024 ESRI

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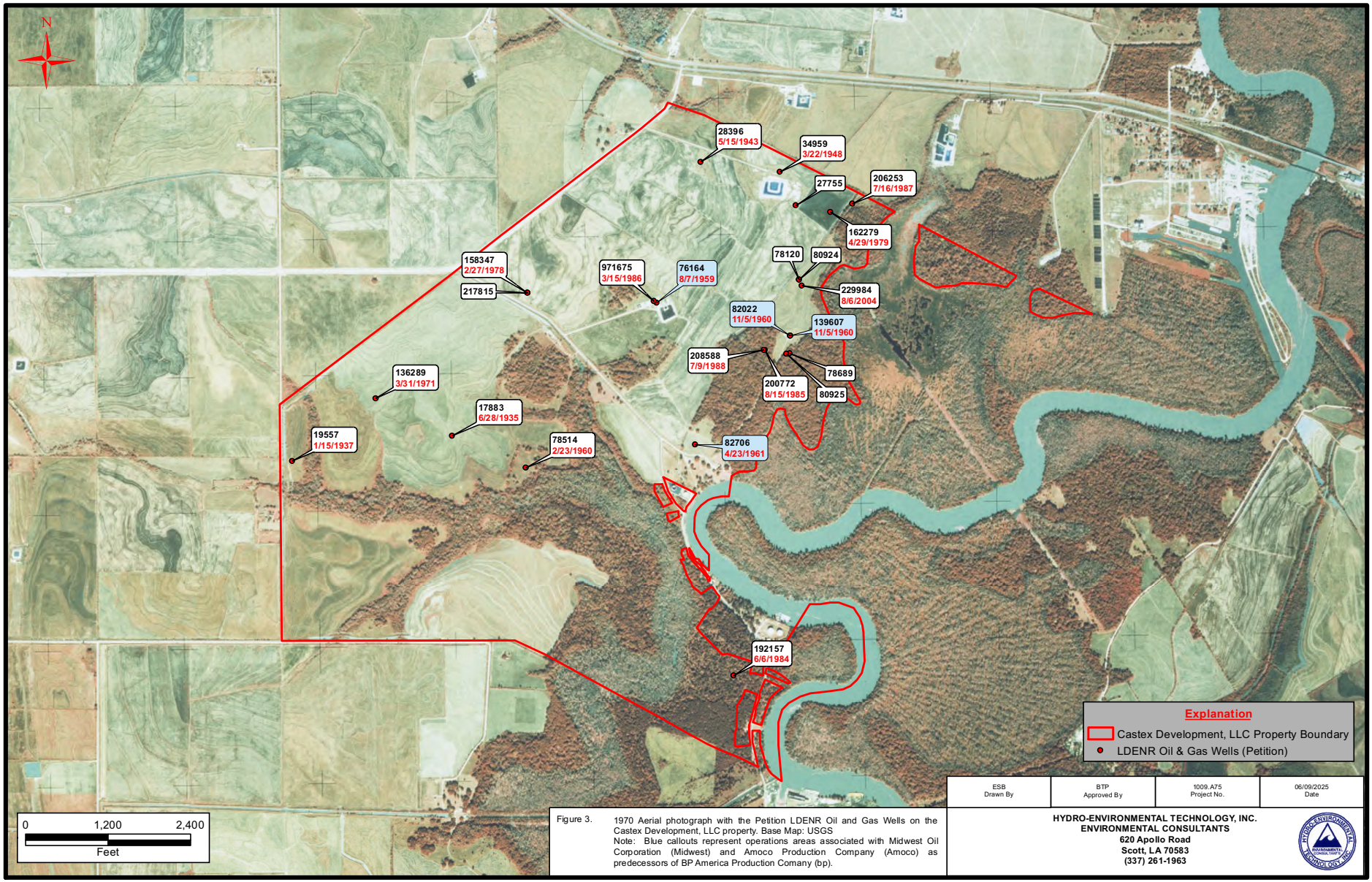

Figure 3. 1970 Aerial photograph with the Petition LDENR Oil and Gas Wells on the Castex Development, LLC property. Base Map: USGS
Note: Blue callouts represent operations areas associated with Midwest Oil Corporation (Midwest) and Amoco Production Company (Amoco) as predecessors of BP America Production Comany (bp).

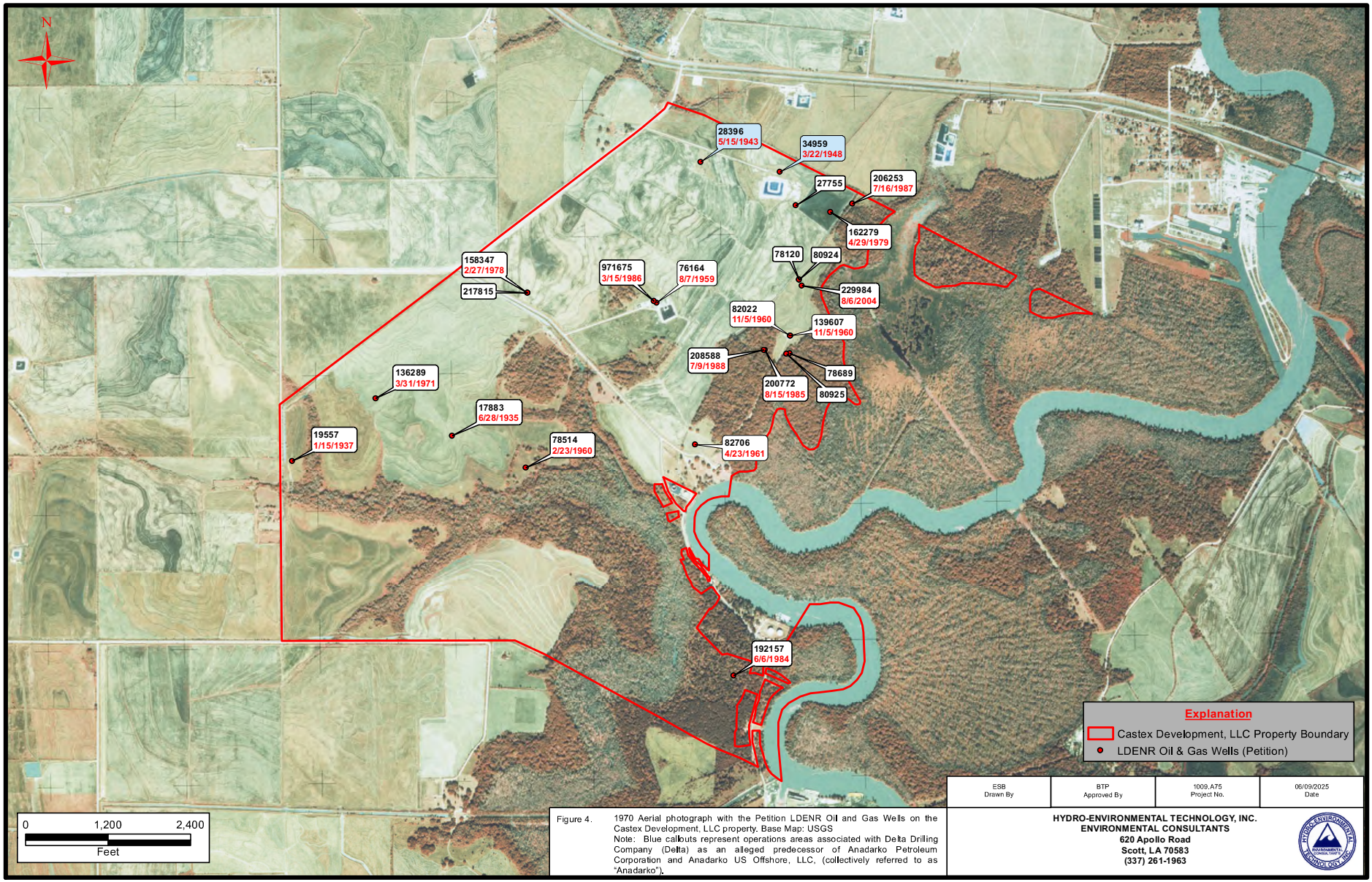

Figure 4. 1970 Aerial photograph with the Petition LDENR Oil and Gas Wells on the Castex Development, LLC property. Base Map: USGS
Note: Blue callouts represent operations areas associated with Delta Drilling Company (Delta) as an alleged predecessor of Anadarko Petroleum Corporation and Anadarko US Offshore, LLC, (collectively referred to as "Anadarko").

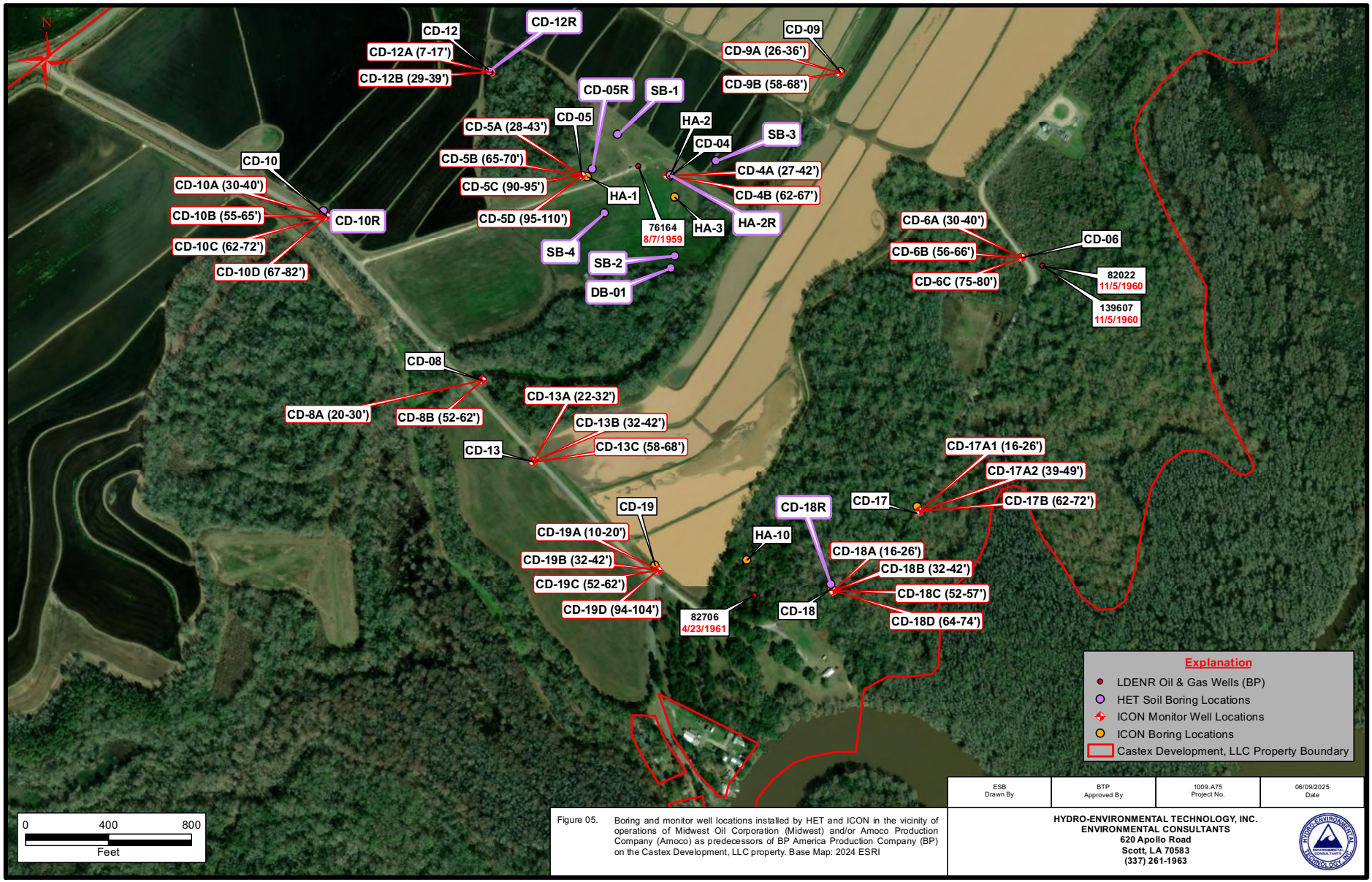

Figure 05. Boring and monitor well locations installed by HET and ICON in the vicinity of operations of Midwest Oil Corporation (Midwest) and/or Amoco Production Company (Amoco) as predecessors of BP America Production Company (BP) on the Castex Development, LLC property. Base Map: 2024 ESRI

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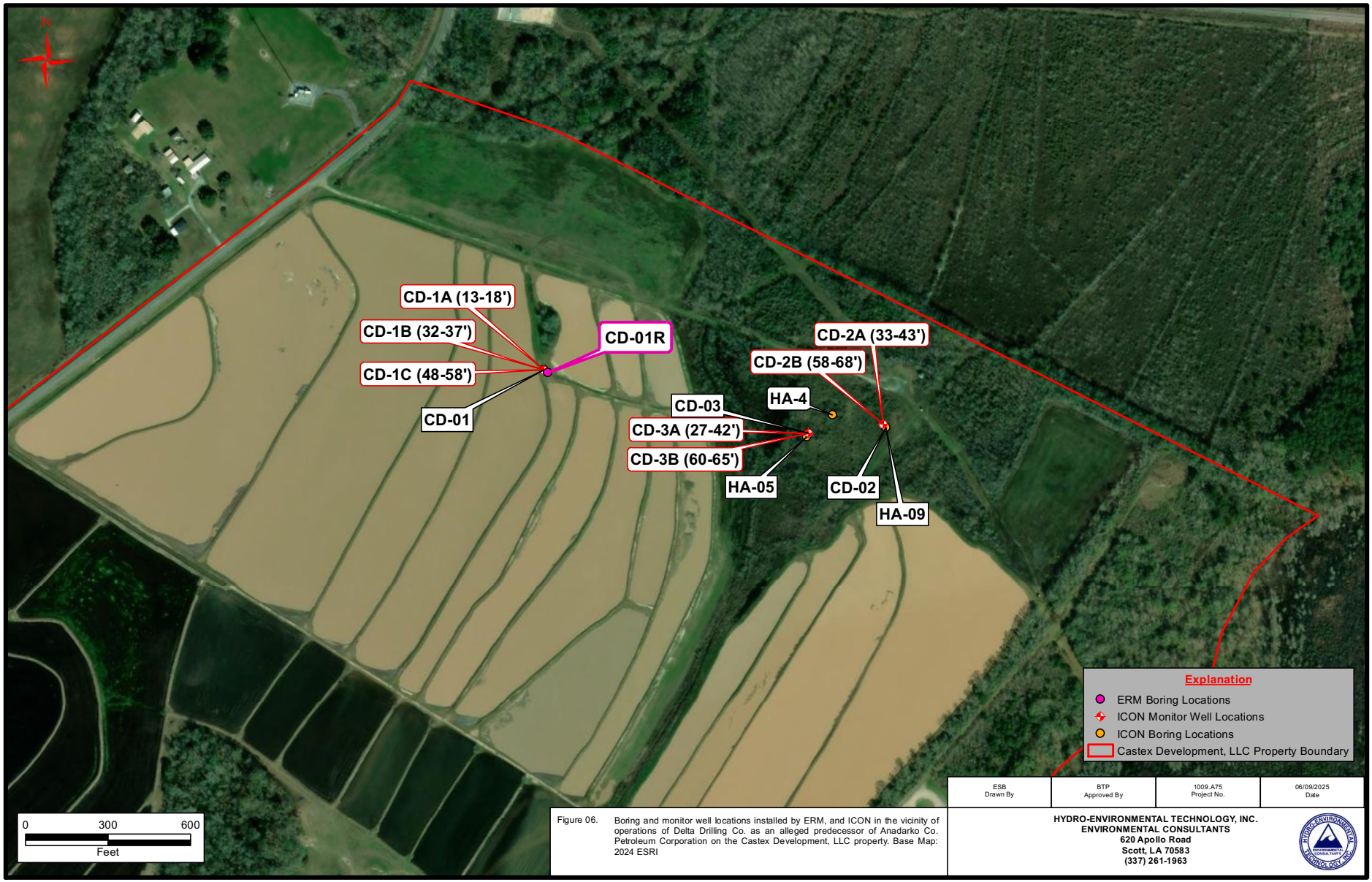

ESB	BTP	1009.A75	06/09/2025
Drawn By	Approved By	Project No.	Date

Figure 06. Boring and monitor well locations installed by ERM, and ICON in the vicinity of operations of Delta Drilling Co. as an alleged predecessor of Anadarko Co. Petroleum Corporation on the Castex Development, LLC property. Base Map: 2024 ESRI

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