October 23, 2015 Reference No. 079994

Sent via Email and Certified Mail

James "Jim" H. Welsh
Commissioner of Conservation
Environmental Division, Office of Conservation
Louisiana Department of Natural Resources
P.O. Box 94275
Baton Rouge, Louisiana 70804-9275

Dear Mr. Welsh:

Re: OC Legacy File No.: 016-024
Louisiana Department of Natural Resources (LDNR)
In the Matter Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Docket No. 100091
Addendum to Plan for Soil Remediation of the Exploration and Production Site in Accordance With LSA-R.S. 30:29 Within Selected Areas of the Raceland Raw Sugar, L.L.C. Property
Lafourche Parish, Louisiana

GHD is supporting Hess Corporation, through Liskow & Lewis, to evaluate environmental conditions associated with selected areas of the Raceland Raw Sugar, L.L.C. property located near Raceland, Lafourche Parish, Louisiana (see Figure 1). On July 14, 2015, GHD submitted to the Louisiana Department of Natural Resources (LDNR), Office of Conservation (OC), Environmental Division a *Plan for Soil Remediation of the Exploration and Production Site in accordance with LSA-R.S. 30:29 within Selected Areas of the Raceland Raw Sugar, L.L.C. Property* ("Plan"), on behalf of Hess Corporation, in connection with a limited admission of regulatory responsibility hearing to be held in the referenced matter beginning on November 10, 2015. GHD submits this Addendum to provide for the collection of additional analytical data to confirm delineation of constituents and compliance with appropriate Statewide Order 29-B parameters, and to provide alternative mechanisms for site access/egress at AOIs 5 and 7 in order to minimize the environmental impact of active closures on the surrounding healthy wetlands and ecosystem.

The Plan addresses a total of eight areas of interest (AOIs) within the property referenced above (see Figure 2). Six of the AOIs (1 through 6 in the Plan) are of interest due to the presence of organic and/or inorganic exploration and production related constituents detected in the environment. The remaining two AOIs (AOIs 7 and 8 in the Plan) are of interest due to the presence of radionuclide concentrations detected in the environment. This submittal focuses on providing the LDNR with details

of the sampling activities proposed in the Plan for AOIs 1 through 6 and amended details (involving material transportation techniques) of the remediation proposed for AOIs 5 and 7.

The Plan proposes Passive Closure for AOIs 1 and 2 as the most feasible plan. A contingency is included in the Plan to remove the residual exploration and production related constituents exceeding the LDNR's Statewide Order 29-B (OC 29-B) Pit Closure Standards for a submerged wetland environment in AOIs 1 and 2, if passive closure is not approved. The Plan proposes removal of the residual exploration and production related constituents exceeding the LDNR's OC 29-B Pit Closure Standards for submerged wetlands in AOIs 3 through 6.

The primary objectives of this Addendum are as follows:

- To provide the LDNR, OC, Environmental Division with a complete list of OC 29-B Pit Closure Standards for a submerged wetland environment from samples collected within the interiors and perimeters of AOIs 1 through 6 to further validate the vertical and horizontal extents of these AOIs and further demonstrate compliance with the OC 29-B pit closure regulations for submerged wetland environments
- To provide the LDNR, OC, Environmental Division with a complete list of OC 29-B Pit Closure Standards for a submerged wetland environment from samples collected within the excavations advanced to remove soil as stated in the Plan to validate the effectiveness of the remediation
- To provide the LDNR, OC, Environmental Division with additional analytical data from samples within AOIs 1 and 2 to verify that the detections of true total barium in these AOIs are associated with the mineral barite. Ecology/toxicology experts will use this mineralogy analytical data to confirm that Passive Closure is the appropriate path forward for AOIs 1 and 2
- To provide the LDNR, OC, Environmental Division with alternative proposals for site access at AOIs 5 and 7, at which active closure is proposed, in order to minimize the impact from transportation of equipment and heavy machinery on the surrounding healthy wetland environments and habitats

The remainder of this document provides details of this addendum to the Plan.

1. AOI 1

The Plan proposes Passive Closure for AOI 1 on the basis that excavation or other intrusive remediation would result in considerable harm to the existing site ecology while providing no corresponding benefit. AOI 1 is remotely located more than 500 yards from the nearest oilfield road, as shown on Figure 2. Active closure would require movement of heavy machinery through 500 yards of dense vegetation, causing unnecessary impacts to the environment and sensitive wetland habitats. Alternatively, machinery and equipment would be transported by barge along approximately a mile of canals. These canals have extensively silted up and host vibrant flotant marshes, necessitating extensive dredging which would impact the healthy vegetation and habitats within the canals. In addition, canal-based access would still require movement of heavy equipment and machinery

through 100 yards of healthy, thriving flotant marsh and bottomland hardwood forest in order to reach the site, unnecessarily impacting the same (see photographs below).

Photo 1: The photograph was taken of the canal adjacent to AOI 1. Many of the canals on the property are silted in and are completely covered in dense vegetation.

Photo 2: The photograph was taken of the canal adjacent to AOI 1. The closest entry into AOI 1 is illustrated on the right side of the photograph between the two trees.

Analyses of soil samples collected by the Plaintiff's environmental experts indicate the presence of oil and grease and total barium concentrations in soil above the respective LDNR OC 29-B Pit Closure

Standards for submerged wetlands within AOI 1.[1] To further support that Passive Closure of AOI 1 is warranted, GHD will perform mineralogy analysis on a soil sample collected from the historical sampling location within AOI 1 with the highest concentration of detected true total barium. The mineralogy analysis will provide data necessary to confirm the barium present at AOI 1 is the mineral barite associated with drilling mud (which is not bioavailable in the environment). Confirmation that the barium form present is barite would further support that the true total barium detected in AOI 1 does not pose sufficient risk to human health or ecological receptors to justify the certain habitat destruction resulting from an active closure.

To further confirm the feasibility of passive closure, GHD will collect and submit soil samples to an accredited commercial laboratory for analysis. Although the Plaintiff's experts' soil data only indicated exceedances at AOI 1 of OC 29-B Pit Closure Standards for oil and grease and total barium (the Constituents of Concern (COCs)), GHD will analyze composite soil samples obtained from the interior and perimeter of AOI 1 for the following complete list of parameters pursuant to the OC 29-B Pit Closure Standards for a submerged wetland environment:

- Soil pH
- Metals (arsenic, true total barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc)
- Oil and grease
- Radium 226 and 228

This additional sampling is intended to confirm that the only COCs present in AOI 1 are oil and grease and true total barium and to provide the LDNR, OC, Environmental Division with additional data demonstrating compliance with the OC 29-B Pit Closure Standards for passive closure.

Existing analytical data evaluated by GHD relative to the OC 29-B Pit Closure Standards indicates that AOI 1 is approximately 0.1 acre in size. GHD will collect discrete soil samples at two foot intervals from designated locations within the interior and along the perimeter of AOI 1 to verify the horizontal and vertical extent of OC 29-B Pit Closure parameters for a submerged wetland environment at AOI 1. GHD will locate two discrete sampling locations within the interior of the approximately 0.1 acre AOI 1 and four discrete sampling locations along the perimeter of the approximately 0.1 acre AOI 1, as shown in the aerial photograph of AOI 1 below.

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[1] Chlorides are not an appropriate parameter for consideration under Statewide Order 29-B in this submerged wetland environment. Notably, however, the Plaintiff/Landowner does not even allege that chloride is an issue at AOIs 1, 2, and 3.

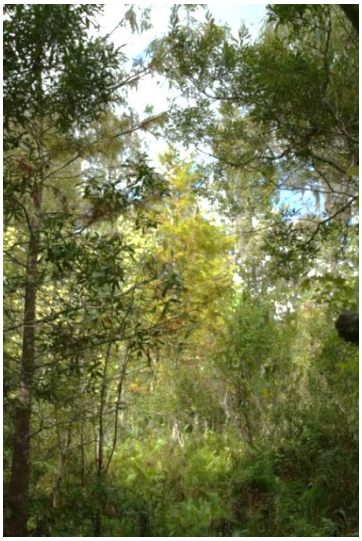
Each discrete sample will be advanced to approximately four feet (4') below surrounding grade (depth determined from an evaluation of existing data obtained from this area). A minimum of four discrete samples (0' to 2', and 2' to 4' from two locations) will be collected from the interior of AOI 1. The interior discrete samples collected from 0' to 2' will be composited and the 0' to 2' composite analyzed for the OC 29-B Pit Closure parameters previously discussed. Likewise, the interior discrete samples collected from 2' to 4' will be composited and the 2' to 4' composite sample analyzed for the OC 29-B Pit Closure parameters previously discussed. Analyses of the 2' to 4' composite sample are intended to demonstrate the vertical limit within AOI for compliance with the Passive Closure requirements.

A similar sampling protocol will be followed on the four discrete sample locations along the perimeter of AOI 1. Discrete samples will be collected from the four locations at depths of 0' to 2' and 2' to 4'. One 0' to 2' composite sample will be generated from the four 0' to 2' discrete samples and one 2' to 4' composite sample will be generated from the four 2' to 4' discrete samples. These two composite samples will be analyzed for the OC 29-B Pit Closure parameters previously discussed and the analytical results will be used to demonstrate the horizontal limit of AOI 1 for compliance with the Passive Closure requirements.

In summary, 12 discrete samples will be collected from the approximately 0.1 acre AOI 1. Four composite samples (two interior and two perimeter) generated from the 12 discrete samples (as discussed above) will be analyzed for the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment to support Passive Closure. The remaining portions of the discrete samples collected from AOI 1 will be held at the commercial laboratory for subsequent analysis, if needed, after receipt and evaluation of the analytical results from the composite samples.

2. AOI 2

Similarly to AOI 1, the Plan proposes Passive Closure for AOI 2 on the basis that excavation or other intrusive remediation would result in considerable harm to the existing site ecology while providing no corresponding benefit. Active closure would require movement of heavy machinery through dense vegetation, destroying wetland habitats, including mature cypress trees located within AOI 2 causing avoidable impacts.



Photograph 3: Photograph taken within AOI 2. Much of the AOI is covered in dense vegetation, including bald cypress trees.

Photograph 4: Photograph taken within AOI 2. Much of the AOI submerged setting is completely covered in dense vegetation, as shown in the photograph above.

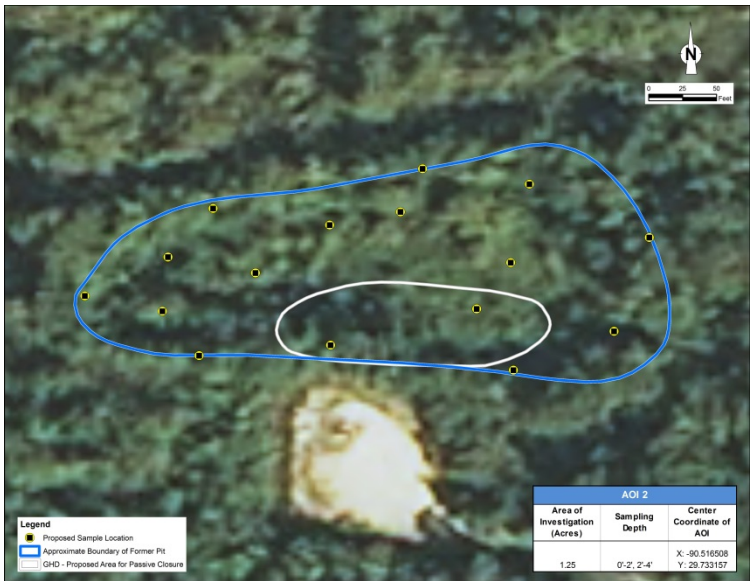
Analyses of soil samples collected by the Plaintiff's environmental experts indicate the presence of total barium concentrations in soil above the respective LDNR OC 29-B Pit Closure Standards for submerged wetlands within AOI 2. To further support that Passive Closure of AOI 2 is warranted, GHD will perform mineralogy analysis on a soil sample collected from the historical sampling location within AOI 2 with the highest concentration of detected true total barium. The mineralogy analysis will provide data necessary to confirm the barium form present at AOI 2 is the mineral barite associated with drilling mud (which is not bioavailable in the environment). Confirmation that the barium form present is barite would further support that the true total barium detected in AOI 2 does not pose sufficient risk to human health or ecological receptors to justify the certain habitat destruction resulting from an active closure.

To further confirm the feasibility of passive closure, GHD will collect and submit soil samples to an accredited commercial laboratory for analysis. Although the Plaintiff's experts' soil data only indicated exceedances at AOI 2 of OC 29-B Pit Closure Standards for true total barium (the COCs), GHD will analyze composite soil samples obtained from the interior and perimeter of AOI 2 for the following complete list of parameters pursuant to the OC 29-B Pit Closure Standards for a submerged wetland environment:

- Soil pH
- Metals (arsenic, true total barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc)
- Oil and grease
- Radium 226 and 228

This additional sampling is intended to confirm that the only COCs present in AOI 2 is true total barium and to provide the LDNR,OC, Environmental Division with additional data demonstrating compliance with the OC 29-B Pit Closure Standards for passive closure.

Existing aerial photography evaluated by GHD indicates that the former pit associated with AOI 2 is approximately 1.25 acres in size (although GHD's evaluation of existing analytical data indicates the presence of true total barium in excess of the OC 29-B standard is isolated to a significantly smaller area). GHD will collect discrete soil samples at two foot intervals from designated locations within the interior and along the perimeter of AOI 2 to verify the horizontal and vertical extent of OC 29-B Pit Closure parameters for a submerged wetland environment. GHD will locate 10 discrete sampling locations within the interior of the approximately 1.25 acre AOI 2 and eight discrete sampling locations along the perimeter of the approximately 1.25 acre AOI 2, as shown in the aerial photograph of AOI 2 below and on Figure 4.



Each discrete sample will be advanced to approximately four feet (4') below surrounding grade (depth determined from an evaluation of existing data obtained from this area). A minimum of 20 discrete samples (0' to 2', and 2' to 4' from ten locations) will be collected from the interior of AOI 2. The interior discrete samples collected from 0' to 2' from the five discrete samples collected in the western half of AOI 2 will be composited into one sample and the five discrete samples collected from 0' to 2' from the eastern half of AOI 2 will also be composited (the dash line in the above aerial photograph of AOI 2 demarks the western versus eastern boundaries). The two 0' to 2' composite samples generated from the interior discrete samples at AOI 2 will be analyzed for the OC 29-B Pit Closure parameters previously discussed. Likewise, the interior discrete samples collected from 2' to 4' will be composited and the two, 2' to 4' composite samples analyzed for the OC 29-B Pit Closure parameters previously discussed. Analyses of the 2' to 4' composite samples are intended to demonstrate the vertical limit within AOI 2 for compliance with the Passive Closure requirements.

A similar sampling protocol will be followed on the eight discrete sample locations along the perimeter of AOI 2. Discrete samples will be collected from the eight perimeter locations at depths of 0' to 2' and 2' to 4'. Four 0' to 2' composite samples (north, south, east, west perimeter samples) will be generated from the eight 0' to 2' discrete samples and, likewise, four 2' to 4' composite samples will be generated from the eight 2' to 4' discrete samples. These eight composite samples will be analyzed for the OC 29-B Pit Closure parameters previously discussed and the analytical results will be used to demonstrate the horizontal limit of AOI 2 for compliance with the Passive Closure requirements.

In summary, 36 discrete samples will be collected from the approximately 1.25 acre impounded area associated with AOI 2. Twelve composite samples (four interior and eight perimeter) generated from the 36 discrete samples (as discussed above) will be analyzed for the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment to support Passive Closure. The remaining portions of the discrete samples collected from AOI 2 will be held at the commercial laboratory for subsequent analysis, if needed, after receipt and evaluation of the analytical results from the composite samples.

3. AOI 3

The Plan proposes excavation of soil in AOI 3 and will include the collection and analyses of soil samples to verify the horizontal and vertical delineation and compliance with the OC 29-B Pit Closure Standards prior to soil removal and to validate the effectiveness of the soil removal action upon completion of the action. These soil samples will be submitted to an accredited, commercial laboratory for analysis.

Although the Plaintiff's experts' soil data only indicated exceedances at AOI 3 of the OC 29-B Pit Closure Standard for oil and grease (the COC), GHD will analyze all of the following parameters pursuant to the OC 29-B Pit Closure Standards for a submerged wetland environment:

- Soil pH
- Metals (arsenic, true total barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc)
- Oil and grease
- Radium 226 and 228

Existing analytical data evaluated by GHD relative to the OC 29-B Pit Closure Standards indicates that AOI 3 is approximately 0.01 acre in size. This additional sampling is intended to confirm that the only COC present in AOI 3 is oil and grease and to provide the LDNR, OC, Environmental Division with additional data demonstrating the effectiveness of the soil removal action and compliance with the OC 29-B Pit Closure Standards.

<u>Pre-Soil Excavation Sampling</u>

Prior to implementing the soil removal action presented in the Plan for AOI 3, GHD will collect discrete soil samples at two foot intervals from designated locations within the interior and along the perimeter of AOI 3 to verify the horizontal and vertical extent of OC 29-B Pit Closure parameters for a submerged wetland environment. GHD will locate two discrete sampling locations within the interior of the approximately 0.01 acre AOI 3 and four discrete sampling locations along the perimeter of the approximately 0.01 acre AOI 3, as shown in the aerial photograph of AOI 3 below and on Figure 5.

Each discrete sample will be advanced to approximately four feet (4') below surrounding grade (depth determined from an evaluation of existing data obtained from this area). A minimum of four discrete samples (0' to 2', and 2' to 4' from two locations) will be collected from the interior of AOI 3. The interior discrete samples collected from 0' to 2' from the two discrete samples will be composited into one sample for analyses of the previously discussed OC 29-B Pit Closure parameters. Likewise, the interior discrete samples collected from 2' to 4' will be composited into one composite sample analyzed for the OC 29-B Pit Closure parameters previously discussed.

A similar sampling protocol will be followed on the four discrete sample locations along the perimeter of AOI 3. Discrete samples will be collected from the four perimeter locations at depths of 0' to 2' and 2' to 4'. One 0' to 2' composite sample will be generated from the four 0' to 2' discrete samples and, likewise, one 2' to 4' composite sample will be generated from the four 2' to 4' discrete samples. These two composite samples will be analyzed for the OC 29-B Pit Closure parameters previously discussed and the analytical results will be used to demonstrate the horizontal limit of AOI 3 for compliance with OC 29-B.

In summary, 10 discrete samples will be collected prior to implementation of the soil removal action from the approximately 0.01acre AOI 3. Four composite samples (two interior and two perimeter) generated from the 10 discrete samples (as discussed above) will be analyzed for the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment to support compliance with the OC 29-B regulations. The remaining portions of the discrete samples collected from AOI 3 will be held at the commercial laboratory for subsequent analyses, if needed, after receipt and evaluation of the analytical results from the composite samples.

Post-Soil Excavation Sampling

A minimum of four discrete soil samples will be collected from the bottom of the excavation advanced within AOI 3 to two feet below the bottom of the soil excavation. These discrete soil samples will be composited into one sample for analyses of the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment previously discussed above. The remaining portions of the discrete samples collected from AOI 3 will be held at the commercial laboratory for subsequent analysis, if needed, after receipt and evaluation of the analytical results from the composite sample.

4. AOI 4

The Plan proposes excavation of soil in AOI 4, and will include the collection and analyses of soil samples to verify the horizontal and vertical delineation and compliance with the OC 29-B Pit Closure Standards prior to soil removal and to validate the effectiveness of the soil removal action upon completion of the action. These soil samples will be submitted to an accredited, commercial laboratory for analysis.

Although the Plaintiff's experts' data only indicated exceedances at AOI 4 of the OC 29-B Pit Closure Standard for true total barium (the COC), GHD will analyze all of the following parameters pursuant to the OC 29-B Pit Closure Standards for a submerged wetland environment:

- Soil pH

- Metals (arsenic, true total barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc)
- Oil and grease
- Radium 226 and 228

Existing analytical data evaluated by GHD relative to the OC 29-B Pit Closure Standards indicates that AOI 4 is approximately 0.05 acre in size. This additional sampling is intended to confirm that the only COC present in AOI 4 is true total barium and to provide the LDNR, OC, Environmental Division with additional data demonstrating the effectiveness of the soil removal action and compliance with the OC 29-B Pit Closure Standards.

Pre-Soil Excavation Sampling

Prior to implementing the soil removal action presented in the Plan for AOI 4, GHD will collect discrete soil samples at two foot intervals from designated locations within the interior and along the perimeter of AOI 4 to verify the horizontal and vertical extent of OC 29-B Pit Closure parameters for a submerged wetland environment. GHD will locate two discrete sampling locations within the interior of the approximately 0.05 acre AOI 4 and four discrete sampling locations along the perimeter of the approximately 0.05 acre AOI 4, as shown in the aerial photograph of AOI 4 below and on Figure 6.

Each discrete sample will be advanced to approximately four feet (4') below surrounding grade (depth determined from an evaluation of existing data obtained from this area). A minimum of four discrete samples (0' to 2', and 2' to 4' from two locations) will be collected from the interior of AOI 4. The interior discrete samples collected from 0' to 2' from the two discrete samples will be composited into one sample for analyses of the previously discussed OC 29-B Pit Closure parameters. Likewise, the interior discrete samples collected from 2' to 4' will be composited into one composite sample analyzed for the OC 29-B Pit Closure parameters previously discussed.

A similar sampling protocol will be followed on the four discrete sample locations along the perimeter of AOI 4. Discrete samples will be collected from the four perimeter locations at depths of 0' to 2' and 2' to 4'. One 0' to 2' composite sample will be generated from the four 0' to 2' discrete samples and, likewise, one 2' to 4' composite sample will be generated from the four 2' to 4' discrete samples. These two composite samples will be analyzed for the OC 29-B Pit Closure parameters previously discussed and the analytical results will be used to demonstrate the horizontal limit of AOI 4 for compliance with OC 29-B.

In summary, 12 discrete samples will be collected prior implementation of the soil removal action from the approximately 0.05 acre AOI 4. Four composite samples (two interior and two perimeter) generated from the 10 discrete samples (as discussed above) will be analyzed for the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment to support compliance with the OC 29-B regulations. The remaining portions of the discrete samples collected from AOI 4 will be held at the commercial laboratory for subsequent analyses, if needed, after receipt and evaluation of the analytical results from the composite samples.

Post-Soil Excavation Sampling

A minimum of four discrete soil samples will be collected from the bottom of the excavation advanced within AOI 4 to two feet below the bottom of the soil excavation. These discrete soil samples will be composited into one sample for analyses of the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment previously discussed above. The remaining portions of the discrete samples collected from AOI 4 will be held at the commercial laboratory for subsequent analysis, if needed, after receipt and evaluation of the analytical results from the composite sample.

5. AOI 5

The Plan proposes excavation of soil in AOI 5. Excavation at this AOI is feasible to comply with OC 29-B Pit Closure Standards, as this area is accessible via an adjacent oilfield access road, and thus soil excavation could occur without unduly disturbing and impacting the surrounding healthy vegetation, environment and habitats. Further, AOI 5 borders an active exploration and production (E&P) operations field office trailer and salt water tanks. In contrast, AOIs 1 and 2 have been reclaimed by nature and are more susceptible to damage caused by machinery accessing and egressing these locations to actively close them.

The Plan includes the collection and analyses of soil samples to verify the horizontal and vertical delineation and compliance with the OC 29-B Pit Closure Standards prior to soil removal and to validate the effectiveness of the soil removal action upon completion of the action. These soil samples will be submitted to an accredited, commercial laboratory for analysis.

Although the Plaintiff's experts' data only indicated exceedances at AOI 5 of the OC 29-B Pit Closure Standard for oil and grease and true total barium (the COCs), GHD will analyze all of the following parameters pursuant to the OC 29-B Pit Closure Standards for a submerged wetland environment:

- Soil pH
- Metals (arsenic, true total barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc)

- Oil and grease
- Radium 226 and 228

Existing analytical data evaluated by GHD relative to the OC 29-B Pit Closure Standards indicates that AOI 5 is approximately 0.52 acre in size. This additional sampling is intended to confirm that the only COCs present in AOI 5 are oil & grease and true total barium and to provide the LDNR, OC, Environmental Division with additional data demonstrating the effectiveness of the soil removal action and compliance with the OC 29-B Pit Closure Standards.

Pre-Soil Excavation Sampling

Prior to implementing the soil removal action presented in the Plan for AOI 5, GHD will collect discrete soil samples at two foot intervals from designated locations within the interior and along the perimeter of AOI 5 to verify the horizontal and vertical extent of OC 29-B Pit Closure parameters for a submerged wetland environment. GHD will locate five discrete sampling locations within the interior of the approximately 0.52 acre AOI 5 and eight discrete sampling locations along the perimeter of the approximately 0.52 acre AOI 5, as shown in the aerial photograph of AOI 5 below and on Figure 7.

Each discrete sample will be advanced from a minimum of approximately four feet (4') below surrounding grade to a maximum of approximately 10' below surrounding grade, depending on the location relative to the depth determined from an evaluation of existing data obtained from this area. A minimum of 15 discrete samples (0' to 2', 2' to 4', 4' to 6' from the five locations) will be collected from the interior of AOI 5. The interior discrete samples collected from 0' to 2' from the five discrete samples will be composited into one sample for analyses of the previously discussed OC 29-B Pit Closure parameters. Likewise, the interior discrete samples collected from 2' to 4', 4' to 6', and other depths necessary to vertically delineate the COCs, will be composited into one composite sample per each sampling depth interval (2' to 4', 4' to 6', etc.) for analyses of the OC 29-B Pit Closure parameters previously discussed.

A similar sampling protocol will be followed on the eight discrete sample locations along the perimeter of AOI 5. Discrete samples will be collected from the four perimeter locations at depths of 0' to 2', 2' to 4', 4' to 6', and deeper, depending on the historical data collected in proximity to the discrete sample location. Four, 0' to 2' composite samples will be generated from the eight 0' to 2' discrete samples and, likewise, four subsequent depth composite samples per sampling depth interval (2' to 4', 4' to 6', etc.) will be generated from the respective sampling depth interval discrete samples. These composite samples will be analyzed for the OC 29-B Pit Closure parameters previously discussed and the analytical results will be used to demonstrate the horizontal limit of AOI 5 for compliance with OC 29-B.

In summary, a minimum of 39 discrete samples will be collected prior to implementation of the soil removal action from the approximately 0.52 acre AOI 5. A minimum of 15 composite samples (three interior and 12 perimeter) generated from the 39 discrete samples (as discussed above) will be analyzed for the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment to support compliance with the OC 29-B regulations. The remaining portions of the discrete samples collected from AOI 5 will be held at the commercial laboratory for subsequent analyses, if needed, after receipt and evaluation of the analytical results from the composite samples.

Post-Soil Excavation Sampling

A minimum of five discrete soil samples will be collected from the bottom of the excavation advanced within the approximate 0.52 acre AOI 5 to two feet below the bottom of the soil excavation. These discrete soil samples will be composited into one sample for analyses of the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment previously discussed above. The remaining portions of the discrete samples collected from AOI 5 will be held at the commercial laboratory for subsequent analysis, if needed, after receipt and evaluation of the analytical results from the composite sample.

6. AOI 6

The Plan proposes excavation of soil in AOI 6. Excavation at this AOI is feasible to comply with OC 29-B Pit Closure Standards versus other areas of the site due to the location of and accessibility to AOI 6. Like AOI 5, AOI 6 is adjacent to an oilfield access road, and could therefore be accessed without unduly disturbing the surrounding environment. Further, AOI 6 borders an active E&P operation. In contrast, AOIs 1 and 2 have been reclaimed by nature and are more susceptible to damage caused by machinery accessing and egressing these locations to actively close them. The Plan proposes excavation of soil in AOI 6, and will include the collection and analyses of soil samples to verify the horizontal and vertical extent of compliance with the OC 29-B Pit Closure Standards prior to soil removal and to validate the effectiveness of the soil removal action upon completion of the action. These soil samples will be submitted to an accredited, commercial laboratory for analysis.

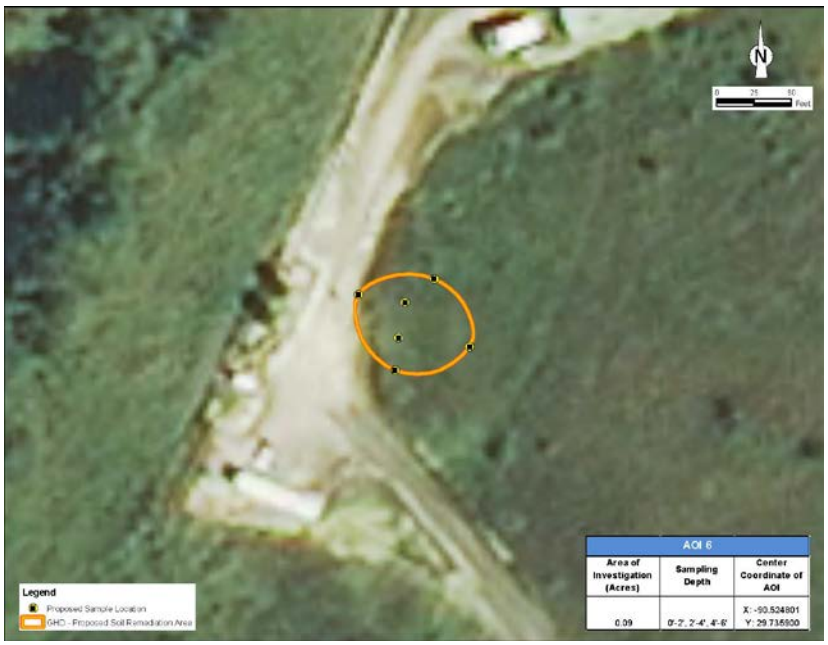
Although the Plaintiff’s experts’ soil data only indicated exceedances at AOI 6 of the OC 29-B Pit Closure Standard for oil and grease (the COC), GHD will analyze all of the following parameters pursuant to the OC 29-B Pit Closure Standards for a submerged wetland environment:

- Soil pH

- Metals (arsenic, true total barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc)
- Oil and grease
- Radium 226 and 228

Pre-Soil Excavation Sampling

Prior to implementing the soil removal action presented in the Plan for AOI 6, GHD will collect discrete soil samples at two foot intervals from designated locations within the interior and along the perimeter of AOI 6 to verify the horizontal and vertical extent of OC 29-B Pit Closure parameters for a submerged wetland environment. GHD will locate two discrete sampling locations within the interior of the approximately 0.09 acre AOI 6 and four discrete sampling locations along the perimeter of the approximately 0.09 acre AOI 6, as shown in the aerial photograph of AOI 6 below and on Figure 8.



Each discrete sample will be advanced to approximately six feet (6') below surrounding grade (depth determined from an evaluation of existing data obtained from this area). A minimum of six discrete samples (0' to 2', 2' to 4', and 4' to 6' from two locations) will be collected from the interior of AOI 6. The interior discrete samples collected from 0' to 2' from the two discrete samples will be composited into one sample for analyses of the previously discussed OC 29-B Pit Closure parameters. Likewise, the interior discrete samples collected from 2' to 4' will be composited into one composite sample analyzed for the OC 29-B Pit Closure parameters previously discussed. Again, the interior discrete samples collected from 4' to 6' will be composited into one composite sample analyzed for the OC 29-B Pit Closure parameters previously discussed,

A similar sampling protocol will be followed on the four discrete sample locations along the perimeter of AOI 6. Discrete samples will be collected from the four perimeter locations at depths of 0' to 2', 2' to 4', and 4' to 6'. One 0' to 2' composite sample will be generated from the four 0' to 2' discrete samples,

one 2' to 4' composite sample will be generated from the four 2' to 4' discrete samples, and one 4' to 6' composite sample generated from the four 4' to 6' discrete samples. These three composite samples will be analyzed for the OC 29-B Pit Closure parameters previously discussed and the analytical results will be used to demonstrate the horizontal limit of AOI 6 for compliance with OC 29-B.

In summary, a minimum of 18 discrete samples will be collected prior implementation of the soil removal action from the approximately 0.09 acre AOI 6. Six composite samples (three interior and three perimeter) generated from the 18 discrete samples (as discussed above) will be analyzed for the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment to support compliance with the OC 29-B regulations. The remaining portions of the discrete samples collected from AOI 6 will be held at the commercial laboratory for subsequent analyses, if needed, after receipt and evaluation of the analytical data from the composite samples.

Post-Soil Excavation Sampling

A minimum of four discrete soil samples will be collected from the bottom of the excavation advanced within AOI 6 to two feet below the bottom of the soil excavation. These discrete soil samples will be composited into one sample for analyses of the complete list of OC 29-B Pit Closure parameters for a submerged wetland environment previously discussed above. The remaining portions of the discrete samples collected from AOI 6 will be held at the commercial laboratory for subsequent analysis, if needed, after receipt and evaluation of the analytical results from the composite sample.

7. Summary of Soil Sampling Procedure

Below is a Table summarizing pre-excavation confirmatory sampling. The intent of the pre-excavation confirmatory sampling is to horizontally and vertical define the extent of OC 29-B Pit Closure COCs applicable to a submerged wetland environment.

Summary of Pre-Excavation Confirmatory Sampling

AOI Designation	Estimated Area of Investigation (Acres)	Minimum Number of Discrete Sample Locations			Anticipated Sampling Depth (feet below surface)	Minimum Number of Discrete Samples to be Collected			Minimum Number of Composite Samples to Be Analyzed
		Interior	Perimeter	Total		Interior	Perimeter	Total	
AOI 1	0.1	2	4	6	4	4	8	12	4
AOI 2	1.25	10	8	18	4	20	16	36	12
AOI 3	0.01	2	4	6	4	4	8	12	4
AOI 4	0.05	2	4	6	4	4	8	12	4

AOI 5	0.52	5	8	13	10	15	24	39	15
AOI 6	0.09	2	4	6	6	6	12	18	6

8. Addendum to Access/Egress AOIs 5 and 7

Further consideration of the use of barges to access AOIs 5 and 7 for remediation and removal of excavated soil from these AOIs indicates that the vibrant flotant marsh environment and ecological habitats now existing in the canals adjacent to these AOIs would be significantly impacted. As such, GHD has modified the access/egress plan for these two AOIs to use land vehicles versus barges. Land access/egress using existing roads within the site provides the most environmentally protective mechanism to achieve the remediation proposed for AOIs 5 and 7.

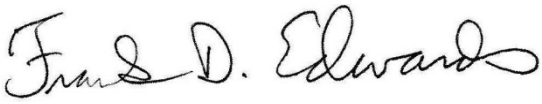
9. Addendum to Cost for Access/Egress to AOIs 5 and 7

Attached is a revised cost estimate for the remediation. The schedule for implementation will remain unchanged.

Should you have any questions or comments regarding this submittal, please contact GHD at (225) 292-9007.

Sincerely,

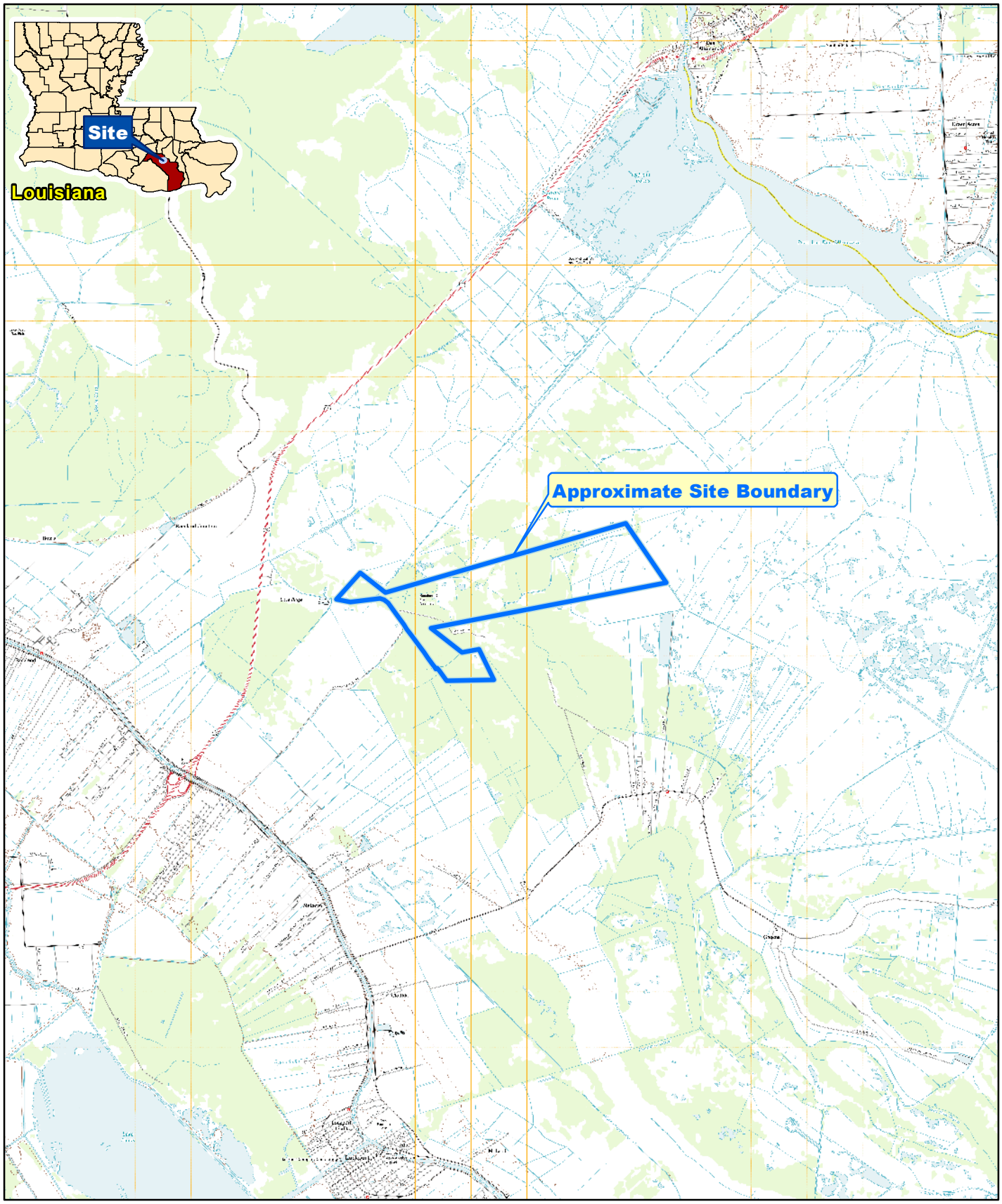
GHD



Frank D. Edwards

JH/cmp/1

Encl.



Source: ESRI World Topographic Maps.

0 1.5
Miles

Coordinate System:
NAD 1983 UTM Zone 15N

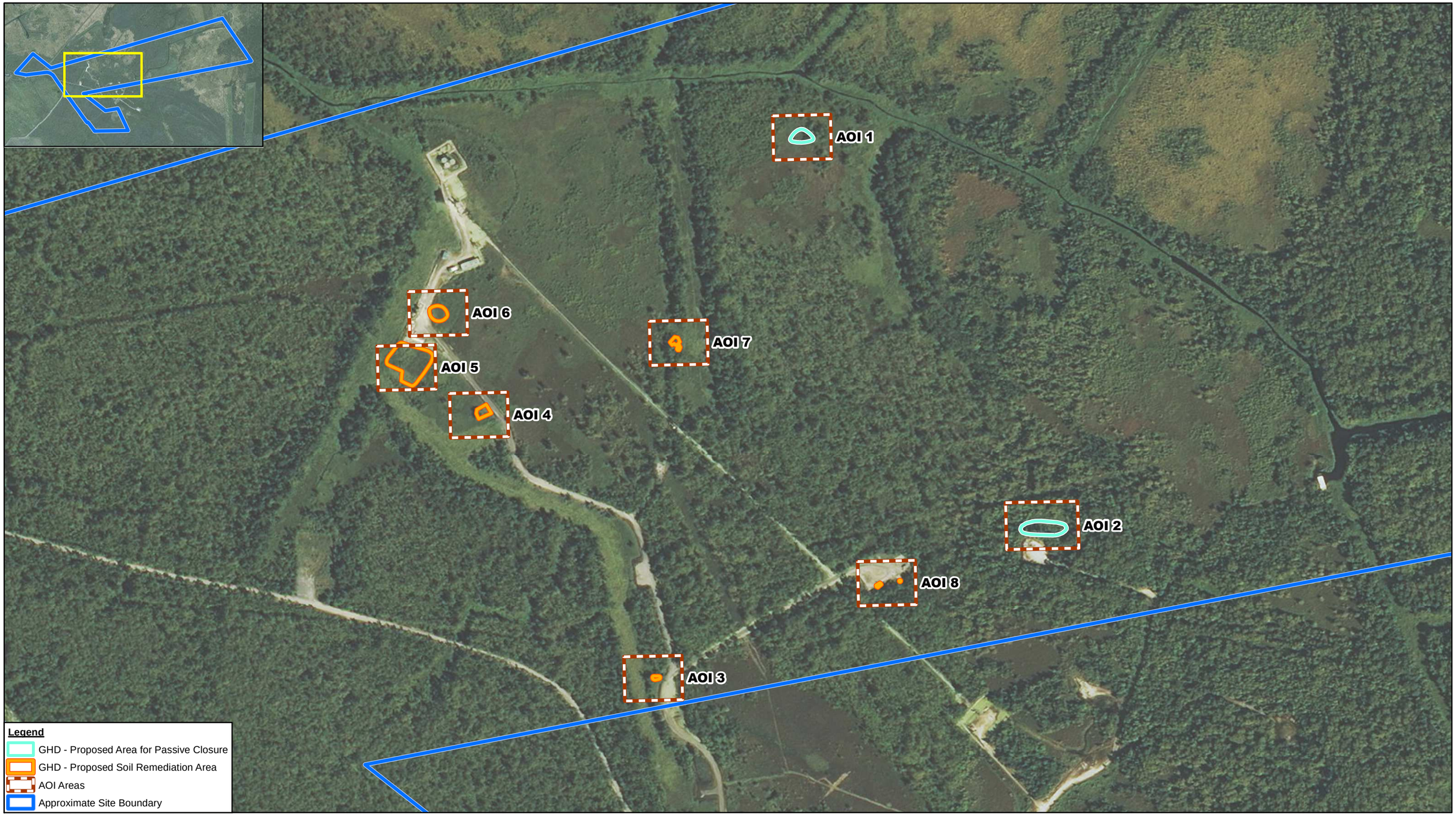
FOR LISKOW & LEWIS ON BEHALF OF
HESS CORPORATION
LAFOURCHE PARISH, LOUISIANA
STERLING SUGARS, INC. V. AMERADA
HESS CORPORATION, ET AL

079994-00
Oct 14, 2015

VICINITY MAP

FIGURE 1

GIS File: I:\WP\6-chars\07----\0799--\079994\079994 Figures\079994-00 Corr DNR001\Figure 1 Raceland_Vicinity_Map.mxd



Source: 2013 ESRI World Imagery.

0 400
Feet

Coordinate System:
NAD 1983 UTM Zone 15N

Note:
If Passive Closure is not approved, a contingency soil mitigation plan will be implemented.
AOI - Area of Interest

FOR LISKOW & LEWIS ON BEHALF OF HESS CORPORATION
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STERLING SUGARS, INC. V. AMERADA HESS CORPORATION, ET AL

GHD-DESIGNATED AREAS OF INTEREST
EVALUATED FOR REMEDIATION

079994-00
Oct 23, 2015

FIGURE 2

GIS File: J:\GIS\Projects\79000s\79994\79994-00(DNR002)PR\79994-00(DNR002)PR-BR008 Designated Areas of Interest.mxd

AOI 1		
Area of Investigation (Acres)	Sampling Depth	Center Coordinate of AOI
0.10	0'-2', 2'-4'	X: -90.519732 Y: 29.737930

Source: 2013 USDA NAIP Aerial Imagery.

0 50
Feet

Coordinate System:
NAD 1983 UTM Zone 15N

N

FOR LISKOW & LEWIS ON BEHALF OF HESS CORPORATION
LAFOURCHE PARISH, LOUISIANA
STERLING SUGARS, INC. V. AMERADA HESS CORPORATION, ET AL

GHD-DESIGNATED AREAS OF INTEREST EVALUATED FOR REMEDIATION - AOI 1

79994-00
Oct 23, 2015

FIGURE 3

GIS File: J:\GIS\Projects\79000s\79994\79994-00(DNR002)PR\79994-00(DNR002)PR-BR001 AOI 1 - Sampling Plan.mxd

AOI 2		
Area of Investigation (Acres)	Sampling Depth	Center Coordinate of AOI
1.25	0'-2', 2'-4'	X: -90.516508 Y: 29.733157

Source: 2013 USDA NAIP Aerial Imagery.

0 50
Feet

Coordinate System:
NAD 1983 UTM Zone 15N

N

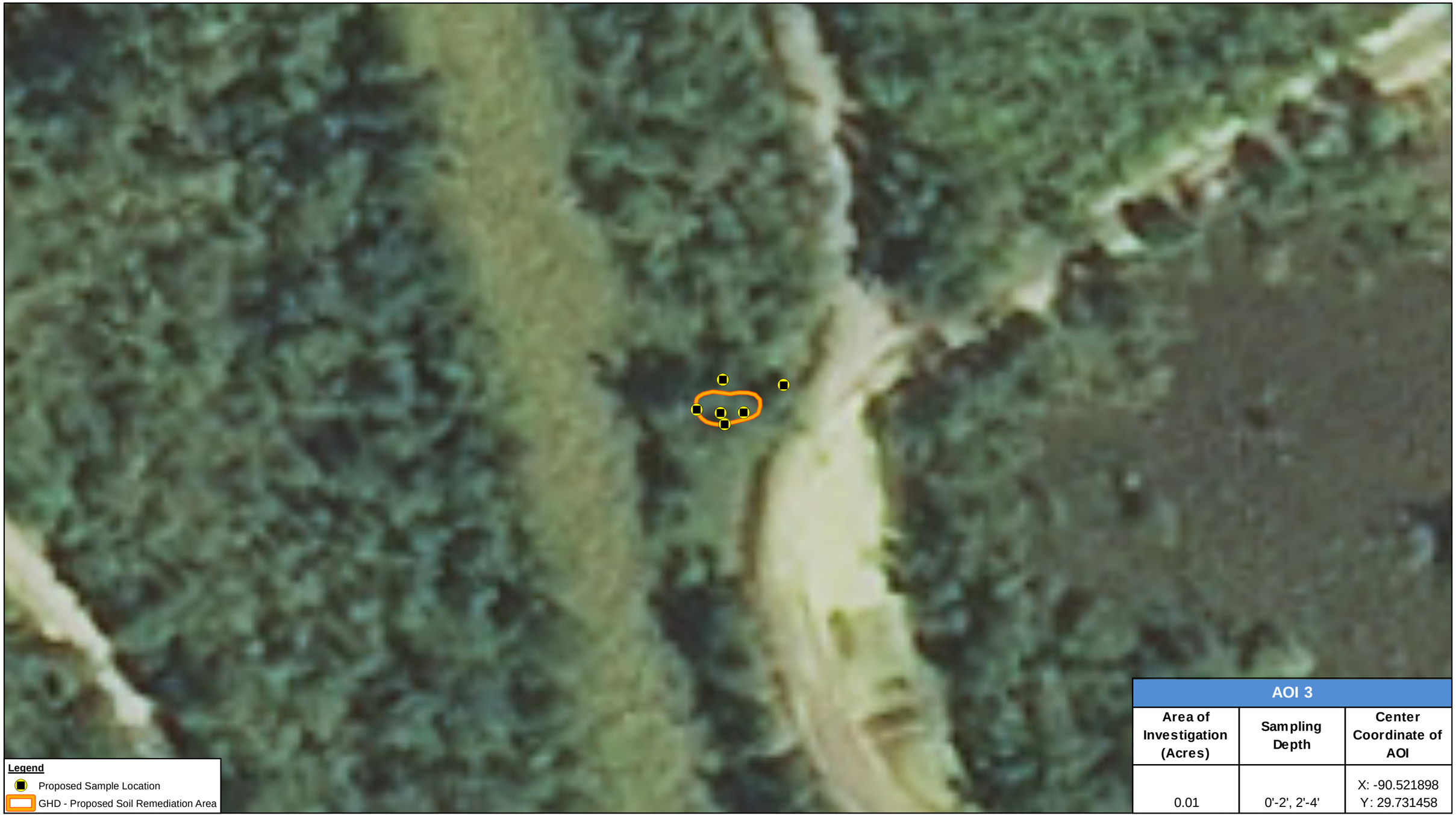
FOR LISKOW & LEWIS ON BEHALF OF HESS CORPORATION
LAFOURCHE PARISH, LOUISIANA
STERLING SUGARS, INC. V. AMERADA HESS CORPORATION, ET AL

GHD-DESIGNATED AREAS OF INTEREST EVALUATED FOR REMEDIATION - AOI 2

79994-00
Oct 23, 2015

FIGURE 4

GIS File: J:\GIS\Projects\79000s\79994\79994-00(DNR002)PR\79994-00(DNR002)PR-BR002 AOI 2 - Sampling Plan.mxd



AOI 3		
Area of Investigation (Acres)	Sampling Depth	Center Coordinate of AOI
0.01	0'-2', 2'-4'	X: -90.521898 Y: 29.731458

Source: 2013 USDA NAIP Aerial Imagery.

0 50
Feet

Coordinate System:
NAD 1983 UTM Zone 15N

N

GHD

FOR LISKOW & LEWIS ON BEHALF OF HESS CORPORATION
LAFOURCHE PARISH, LOUISIANA
STERLING SUGARS, INC. V. AMERADA HESS CORPORATION, ET AL

GHD-DESIGNATED AREAS OF INTEREST EVALUATED FOR REMEDIATION - AOI 3

79994-00
Oct 23, 2015

FIGURE 5

GIS File: J:\GIS\Projects\79000s\79994\79994-00(DNR002)PR\79994-00(DNR002)PR-BR003 AOI 3 - Sampling Plan.mxd

AOI 4		
Area of Investigation (Acres)	Sampling Depth	Center Coordinate of AOI
0.05	0'-2', 2'-4', 4'-6'	X: -90.524210 Y: 29.734703

Source: 2013 USDA NAIP Aerial Imagery.

0 50
Feet

Coordinate System:
NAD 1983 UTM Zone 15N

FOR LISKOW & LEWIS ON BEHALF OF HESS CORPORATION
LAFOURCHE PARISH, LOUISIANA
STERLING SUGARS, INC. V. AMERADA HESS CORPORATION, ET AL

GHD-DESIGNATED AREAS OF INTEREST EVALUATED FOR REMEDIATION - AOI 4

79994-00
Oct 23, 2015

FIGURE 6

GIS File: J:\GIS\Projects\79000s\79994\79994-00(DNR002)PR\79994-00(DNR002)PR-BR004 AOI 4 - Sampling Plan.mxd

AOI 5		
Area of Investigation (Acres)	Sampling Depth	Center Coordinate of AOI
0.52	0'-2', 2'-4', 4'-6', 6'-8', 8'-10'	X: -90.525203 Y: 29.735317

Source: 2013 USDA NAIP Aerial Imagery.

0 50
Feet

Coordinate System:
NAD 1983 UTM Zone 15N

N

FOR LISKOW & LEWIS ON BEHALF OF HESS CORPORATION
LAFOURCHE PARISH, LOUISIANA
STERLING SUGARS, INC. V. AMERADA HESS CORPORATION, ET AL

GHD-DESIGNATED AREAS OF INTEREST EVALUATED FOR REMEDIATION - AOI 5

79994-00
Oct 23, 2015

FIGURE 7

GIS File: J:\GIS\Projects\79000s\79994\79994-00(DNR002)PR\79994-00(DNR002)PR-BR005 AOI 5 - Sampling Plan.mxd

AOI 6		
Area of Investigation (Acres)	Sampling Depth	Center Coordinate of AOI
0.09	0'-2', 2'-4', 4'-6'	X: -90.524801 Y: 29.735900

Source: 2013 USDA NAIP Aerial Imagery.

0 50
Feet

Coordinate System:
NAD 1983 UTM Zone 15N

N

FOR LISKOW & LEWIS ON BEHALF OF HESS CORPORATION
LAFOURCHE PARISH, LOUISIANA
STERLING SUGARS, INC. V. AMERADA HESS CORPORATION, ET AL

GHD-DESIGNATED AREAS OF INTEREST EVALUATED FOR REMEDIATION - AOI 6

79994-00
Oct 23, 2015

FIGURE 8

GIS File: J:\GIS\Projects\79000s\79994\79994-00(DNR002)PR\79994-00(DNR002)PR-BR006 AOI 6 - Sampling Plan.mxd

Table 3A

Summary of Cost Estimate for the Most Feasible Plan
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
Raceland Raw Sugars, LLC Property
Lafourche Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Task	Subtotal Estimate (US $, Rounded to Nearest $100)
Mobilization, Demobilization, and Site Preparation	$377,700
Mitigation of Soil in Area of Interest 3	$24,200
Mitigation of Soil in Area of Interest 4	$118,100
Mitigation of Soil in Area of Interest 5	$1,890,900
Mitigation of Soil in Area of Interest 6	$81,700
Mitigation of Soil in Area of Interest 7	$142,600
Mitigation of Soil in Area of Interest 8	$29,200
Pre and Post Remediation Soil Sampling & Closure Report	$189,800
Total Estimate	**$2,854,200**

Notes:
1) The Areas of Interest presented above were designated by GHD for this site.
2) Detailed cost breakdowns for each of the above tasks are included in supplemental tables specific to each Area of
3) The sales tax in Lafourche Parish is 9.4%.
4) The rates for rental equipment and subcontractor services are cost + 10%.

Table 3B

Mobilization, Demobilization, and Regulatory Compliance Itemized Cost Estimate
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
Applicable to GHD Designated Areas of Interest 1 through 8
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Estimated Cost of Associated with Personnel and Equipment Mobilization/Demobilization to the Site and Regulatory Compliance of Mitigation Action				
Description	**Quantity**	**Units**	**Unit Cost**	**Cost (US $, Rounded to the Nearest $100)**
Senior Project Manager	30	Hours	$136.00	$4,100
Project Manager (Construction)	30	Hours	$124.00	$3,700
Site Superintendent (Construction)	30	Hours	$109.00	$3,300
Equipment Operator	30	Hours	$58.95	$1,800
Equipment Operator	30	Hours	$59.95	$1,800
Equipment Operator	30	Hours	$60.95	$1,800
Environmental Permitting/Environmental Compliance	240	Hours	$120.00	$28,800
Preparation and Resource Management	120	Hours	$205.00	$24,600
			Subtotal	**$69,900**
Estimated Cost of Equipment During Mobilization/Demobilization				
CAT 320 Excavator with Hydraulic Thumb	2	Days	$1,117.96	$2,200
CAT 307 Mini Excavator with Hydraulic Thumb	2	Days	$555.97	$1,100
CAT 299 Skid Steer with Bucket and Forks	2	Days	$546.34	$1,100
CAT 950 Rubber Tire Loader with Bucket and Forks	2	Each	$1,350.21	$2,700
Superintendent Truck	2	Days	$222.63	$400
Field Pickup Truck	2	Days	$168.48	$300
Tool Crib, Small	2	Days	$168.48	$300
Flexi float Temporary Bridge System	3	Months	$25,776.83	$77,300
Hand Wash Station	3	Months	$84.24	$300
Port-a-lets	3	Months	$168.48	$500
12'x56' Office Trailer	3	Months	$673.90	$2,000
20 kW Generator	6	Months	$1,642.64	$9,900
Poly Mats	60	Days	$9.63	$600
			Subtotal	**$98,700**
Estimated Cost of Materials During Mobilization/Demobilization (Expendables and Fuel)				
Diesel Fuel for Office Trailer	5,760	Gallon	$3.55	$20,400
Turbidity Curtain with 3 Feet Tall Skirt	600	Linear Feet	$14.44	$8,700
Oil Boom	600	Linear Feet	$11.25	$6,800
Sorbent Boom	9,000	Linear Feet	$0.96	$8,700
			Subtotal	**$44,600**
Estimated Cost of Subcontractors During Mobilization/Demobilization (Transportation Charges for Equipment, Specialty Items, Line Relocation)				
Delivery of Heavy Equipment	4	Each	$440.00	$1,800
Delivery of Poly Mats	2	Load	$2,750.00	$5,500
Pickup of Heavy Equipment	4	Each	$440.00	$1,800
Pickup of Poly Mats	2	Each	$2,750.00	$5,500
Delivery of Flexifloat Temporary Bridge System	1	Each	$7,700.00	$7,700
Pickup of Flexifloat Temporary Bridge System	1	Each	$7,700.00	$7,700
Crane Services for Setting/Decommissioning Temporary Bridge	2	Each	$18,700.00	$37,400
Delivery, Blocking and Anchoring of Office Trailers	4	Each	$1,444.08	$5,800
Electrical Terminations and Disconnects for Office Trailers	4	Each	$1,540.00	$6,200
Relocation of Existing Aboveground Produced Water Line	1	Lump Sum	$80,000.00	$80,000
Relocation of Existing Aboveground Crude Oil Line	1	Lump Sum	$25,000.00	$25,000
			Subtotal	**$159,400**
Estimated Cost of Miscellaneous Expenses Associated with Mobilization/Demobilization (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	18	Days	$40.00	$700
Lodging	18	Days	$90.00	$1,600
Vehicle Mileage	4,800	Miles	$0.58	$2,800
			Subtotal	**$5,100**
			Estimated Total	**$377,700**

Notes:
1) GHD assumes that the office trailer adjacent to the GHD designated Area of Interest 5 will be relocated. GHD will provide the office trailer with temporary power.
2) GHD has included pricing for the rental, delivery, installation, and decommissioning of Flexifloat Temporary Bridge System.
3) GHD has included costs to relocate the existing aboveground, produced water line near GHD designated Areas of Interest - 4 and 5 to facilitate access to these Areas of Interest.
4) GHD has included pricing for turbidity curtain, oil boom, and sorbent boom that may be deployed during implementation of the most feasible plan.

Table 3C

Itemized Cost Estimate to Implement The Most Feasible Plan to Mitigate Soil
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Designated Area of Interest 3
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Estimated Cost of Personnel (Management, Superintendent, Operators, Environmental Scientist)				
Description	**Quantity**	**Units**	**Unit Cost**	**Cost (US $, Rounded to Nearest $100)**
Project Manager (Construction)	5	Hours	$124.00	$600
Site Superintendent (Construction)	15	Hours	$109.00	$1,600
Equipment Operator	15	Hours	$58.95	$900
Equipment Operator	15	Hours	$58.95	$900
Equipment Operator	15	Hours	$58.95	$900
Environmental Scientist	30	Hours	$124.00	$3,700
Project Engineer	16	Hours	$205.00	$3,300
			Subtotal	**$11,900**
Estimated Cost of Equipment (Excavators, Skid Steer, Front End Loader, Vehicles, Mats, Tooling)				
CAT 320 Excavator with Hydraulic Thumb	2	Days	$1,117.96	$2,200
CAT 307 Mini Excavator with Digging Bucket	2	Days	$555.97	$1,100
CAT 299 Skid Steer with Bucket and Forks	2	Days	$546.34	$1,100
CAT 950 Rubber Tire Loader with Bucket and Forks	2	Each	$1,350.21	$2,700
Superintendent Truck	2	Days	$185.00	$400
Field Pickup Truck	2	Days	$140.00	$300
Poly Mats	60	Days	$9.63	$600
Tool Crib, Small	2	Days	$168.48	$300
			Subtotal	**$8,700**
Estimated Cost of Materials (Backfill, Fuel)				
Fill Material	24	Cubic Yards	$13.24	$317.70
Diesel Fuel	90	Gallons	$3.55	$319.50
			Subtotal	**$637.20**
Estimated Cost of Subcontractors (Transportation, Disposal Fees)				
Transportation Services	4	Hours	$114.32	$500
Disposal Fees	117	Barrels	$14.44	$1,700
			Subtotal	**$2,200**
Estimated Cost of Miscellaneous Items (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	4	Day	$40.00	$200
Lodging	4	Day	$90.00	$400
Vehicle Mileage	320	Miles	$0.58	$200
			Subtotal	**$800**
			Estimated Total	**$24,200**

Notes:
1) GHD recommends a focused removal of soil within Area of Interest 3 as the most feasible plan.
2) Excavated soils will be transported for disposal at R360-Bourg's facility via sealed trucks.
3) Area of Interest 3 will be cleared and grubbed within the focused area of soil removal to facilitate the excavation.
4) Smaller, lighter equipment will be utilized where possible to minimize damage to the surrounding wetlands.

Table 3D

Itemized Cost Estimate to Implement The Most Feasible Plan to Mitigate Soil
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Designated Area of Interest 4
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Description	Quantity	Units	Unit Cost	Cost (US $, Rounded to Nearest $100)
Estimated Cost for Personnel (Management, Superintendent, Operators, Environmental Scientist)				
Senior Project Manager	4	Hours	$136.00	$500
Project Manager (Construction)	8	Hours	$124.00	$1,000
Site Superintendent (Construction)	30	Hours	$109.00	$3,300
Equipment Operator	30	Hours	$58.95	$1,800
Equipment Operator	30	Hours	$58.95	$1,800
Equipment Operator	30	Hours	$58.95	$1,800
Environmental Scientist	50	Hours	$124.00	$6,200
Project Engineer	4	Hours	$205.00	$800
			Subtotal	**$17,200**
Estimated Cost for Equipment (Excavators, Skid Steer, Front End Loader, Vehicles, Mats)				
CAT 320 Excavator with Hydraulic Thumb	1	Week	$2,853.26	$2,900
CAT 307 Mini Excavator with Digging Bucket	1	Week	$1,391.13	$1,400
CAT 299 Skid Steer with Bucket and Forks	1	Week	$1,367.06	$1,400
CAT 950 Rubber Tire Loader with Bucket and Forks	1	Week	$3,376.74	$3,400
Superintendent Truck	1	Week	$555.00	$600
Field Pickup Truck	1	Week	$420.00	$400
Poly Mats	150	Days	$9.63	$1,400
Tool Crib, Small	1	Week	$505.43	$500
			Subtotal	**$12,000**
Estimated Cost for Materials (Fill Material, Fuel)				
Fill Material	452	Cubic Yards	$13.24	$6,000
Fuel	400	Gallons	$3.55	$1,400
			Subtotal	**$7,400**
Estimated Cost for Subcontractors (Material Transportation, Disposal Fees, Amphibious Excavator)				
Transportation Services	36	Hours	$114.32	$4,100
Disposal Fees	2,169	Barrels	$14.44	$31,300
Operational Fees for Amphibious Excavation and Backfilling	5	Days	$8,666.90	$43,300
			Subtotal	**$78,700**
Estimated Cost for Miscellaneous Items (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	20	Day	$40.00	$800
Lodging	20	Day	$90.00	$1,800
Vehicle Mileage	300	Mile	$0.58	$200
			Subtotal	**$2,800**
			Estimated Total	**$118,100**

Notes:
1) GHD recommends a focused removal of soil within Area of Interest 4 as the most feasible plan.
2) Excavated soils will be transported for disposal at R360-Bourg's facility via sealed trucks.
3) Area of Interest 4 will be cleared and grubbed within the focused area of soil removal to facilitate the excavation.
4) Soils will be excavated with amphibious equipment and transferred to the access road, where they will be loaded into trucks and transported for disposal.

Table 3E

Itemized Cost Estimate to Implement The Most Feasible Plan to Mitigate Soil
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Designated Area of Interest 5
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Description	Quantity	Units	Unit Cost	Cost (US $, Rounded to Nearest $100)
Estimated Cost for Personnel (Management, Superintendent, Operators, Environmental Scientists)				
Senior Project Manager	21	Hours	$136.00	$2,800
Project Manager (Construction)	160	Hours	$124.00	$19,800
Site Superintendent (Construction)	417	Hours	$109.00	$45,400
Equipment Operator	417	Hours	$58.95	$24,600
Equipment Operator	0	Hours	$58.95	$0
Equipment Operator	0	Hours	$58.95	$0
Environmental Scientist	480	Hours	$124.00	$59,500
Project Engineer	24	Hours	$205.00	$4,900
			Subtotal	**$157,000**
Estimated Cost for Equipment (Excavator, Front End Loader, Vehicles, Mats)				
CAT 320 Excavator with Hydraulic Thumb	2	Months	$7,310.66	$14,600
CAT 950 Rubber Tire Loader with Bucket and Forks	2	Months	$8,441.85	$16,900
Superintendent Truck	2	Months	$1,665.00	$3,300
Base Stabilization for Pile Driving	533	Cubic Yards	$30.00	$15,990
Poly Mats	2,880	Days	$9.63	$27,700
Field Pickup Truck	2	Days	$140.00	$300
Tool Crib, Small	2	Months	$1,260.00	$2,500
			Subtotal	**$81,290**
Estimated Cost for Materials (Fill Material, Sheet Piling)				
Fill Material	5,111	Cubic Yards	$13.24	$67,700
Sheet Piles (390'x30')	11,700	square feet	$60.00	$702,000
Sheet Piles (220'x20')	4,400	square feet	$50.00	$220,000
			Subtotal	**$989,700**
Estimated Cost for Subcontractors (Sheet Pile Installation, Disposal Fees, Amphibious Excavators, Waste Transportation, Environmental Monitoring)				
Disposal Fees (R360-Bourg)	5,111	Cubic Yards	$45.00	$230,000
Waste Transportation	341	Loads	$550.00	$187,400
Operational Fees for Amphibious Excavation and Backfilling	34	Days	$2,500.00	$85,000
Environmental Monitoring Service	48	Days	$3,000.00	$144,000
			Subtotal	**$646,400**
Estimated Cost for Miscellaneous Items (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	112	Days	$40.00	$4,500
Lodging	112	Days	$90.00	$10,100
Vehicle Mileage	3,360	Miles	$0.58	$1,900
			Subtotal	**$16,500**
			Estimated Total	**$1,890,890**

Notes:
1) GHD recommends a focused removal of soil within Area of Interest 5 as the most feasible plan.
2) Area of Interest 5 will be cleared and grubbed within the focused area of soil removal to facilitate the excavation.
3) A sheet pile wall will be installed to isolate the impacted sediments from the canal and surrounding wetland areas.
4) Excavated soils will be loaded on to barges with amphibious equipment for subsequent disposal at R360-Bourg.
5) Fill material will be delivered via tri-axle trucks, stockpiled in the adjacent area, and installed with amphibious equipment.
6) Additional fill material, disposal fees, and waste transportation have been included beyond targeted excavation to account for potential sloughing due to varying excavation depths.
7) GHD assumes that the office trailer in the area adjacent to Area of Interest 5 will be relocated. Pricing for the trailer relocation has been included under the Site Preparation Task.
8) GHD assumes that the existing aboveground produced water pipeline adjacent to the access road will be relocated. Pricing for the relocation has been included in the Site Preparation Task.
9) GHD assumes that the sheet piles will remain in place until the area has been backfilled.

Table 3F

Itemized Cost Estimate to Implement The Most Feasible Plan to Mitigate Soil
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Designated Area of Interest 6
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Estimated Cost for Personnel (Management, Superintendent, Operators, Environmental Scientist)				
Description	**Quantity**	**Units**	**Unit Cost**	**Cost (US $, Rounded to the Nearest $100)**
Project Manager (Construction)	8	Hours	$124.00	$1,000
Site Superintendent (Construction)	20	Hours	$109.00	$2,200
Equipment Operator	20	Hours	$58.95	$1,200
Equipment Operator	20	Hours	$58.95	$1,200
Equipment Operator	20	Hours	$58.95	$1,200
Environmental Scientist	40	Hours	$124.00	$5,000
Project Engineer	8	Hours	$205.00	$1,600
			Subtotal	**$13,400**
Estimated Cost for Equipment (Excavators, Skid Steer, Front End Loader, Vehicles, Mats, Tooling)				
CAT 320 Excavator with Hydraulic Thumb	2	Days	$1,117.96	$2,200
CAT 307 Mini Excavator with Digging Bucket	2	Days	$555.97	$1,100
CAT 299 Skid Steer with Bucket and Forks	2	Days	$546.34	$1,100
CAT 950 Rubber Tire Loader with Bucket and Forks	2	Days	$1,350.21	$2,700
Superintendent Truck	2	Days	$185.00	$400
Field Pickup Truck	2	Days	$140.00	$300
Poly Mats	60	Days	$9.63	$600
Tool Crib, Small	2	Days	$140.00	$300
			Subtotal	**$8,700**
Estimated Cost for Materials (Fill Material, Fuel)				
Fill Material	593	Cubic Yards	$13.24	$7,800
Diesel Fuel	160	Gallons	$3.55	$600
			Subtotal	**$8,400**
Estimated Cost for Subcontractors (Material Transportation, Disposal Fees)				
Transportation Services	79	Hours	$114.32	$9,000
Disposal Fees	2,846	Barrels	$14.44	$41,100
			Subtotal	**$50,100**
Estimated Cost for Miscellaneous Items (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	8	Days	$40.00	$300
Lodging	8	Days	$90.00	$700
Vehicle Mileage	120	Miles	$0.58	$100
			Subtotal	**$1,100**
			Estimated Total	**$81,700**

Notes:
1) GHD recommends a focused removal of soil within Area of Interest 6 as the most feasible plan.
2) Excavated soils will be transported for disposal at R360-Bourg's facility via sealed trucks.
3) Extended reach excavation equipment will be used as necessary to accommodate remedial excavation activities.

Table 3G

Itemized Cost Estimate to Implement the Recommended Most Feasible Plan
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Designated Area of Interest 7
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Description	Quantity	Units	Unit Cost	Cost (US $, Rounded to the Nearest $100)
Estimated Cost for Personnel				
Project Manager/RSO	84	Hours	$80.00	$6,720
Equipment Operator	72	Hours	$45.00	$3,240
NORM Surveyor	72	Hours	$45.00	$3,240
NORM Surveyor	72	Hours	$45.00	$3,240
			Subtotal	**$16,400**
Estimated Cost for Equipment				
Amphibious Excavator	7	Days	$3,090.00	$21,630
25 Cubic yard Rolltop Rolloff Box	42	Days	$15.00	$630
Field Pickup Truck	6	Days	$135.00	$810
Field Pickup Truck	6	Days	$135.00	$810
Tool Box	6	Days	$450.00	$2,700
			Subtotal	**$26,600**
Estimated Cost for Materials				
Fill Material	120	Cubic Yards	$16.00	$1,920
Diesel	1,650	Gallons	$4.00	$6,600
			Subtotal	**$8,500**
Estimated Cost for Subcontractors				
Transportation Services (Bourg)	4	Loads	$1,450.00	$5,800
Transportation Services (Wallisville, TX)	3	Loads	$3,162.00	$9,486
Disposal (NORM)	220	Barrels	$245.00	$53,900
Disposal (NOW)	288	Barrels	$20.00	$5,760
Equipment Mob & De-Mob	1		$7,740.00	$7,740
			Subtotal	**$82,700**
Estimated Cost for Miscellaneous Items				
Per Diem & Lodging	24	Days	$124.00	$2,976
Miscellaneous Items	1	Days	$1,700.00	$1,700
NORM Sample Analysis	10	Each	$250.00	$2,500
On Charter & Off Charter Survey	1		$1,200.00	$1,200
			Subtotal	**$8,400**
			Estimated Total	**$142,600**

Notes:
1) Dr. Frazier recommends a focused removal of soil within Areas of Interest 7 as the most feasible plan.
2) Excavated soils will be transported for disposal at the R360-Bourg and Sabine Environmental Services facilities via sealed trucks.
3) Extended reach excavation equipment will be used as necessary to accommodate remedial excavation activities.

Table 3H

Itemized Cost Estimate to Implement the Recommended Most Feasible Plan
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Designated Area of Interest 8
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Estimated Cost of Personnel				
Description	**Quantity**	**Units**	**Unit Costs**	**Cost (US $, Rounded to Nearest $100)**
Project Manager/RSO	60	Hours	$80.00	$4,800
Equipment Operator	48	Hours	$45.00	$2,200
NORM Surveyor	48	Hours	$45.00	$2,200
NORM Surveyor	48	Hours	$45.00	$2,200
			Subtotal	**$11,400**
Estimated Cost of Equipment				
25 Cubic Yard Rolloff Box	3	Days	$15.00	$45
25 Cubic Yard Rolloff Box	3	Days	$15.00	$45
Dump Trailer	4	Days	$100.00	$400
Case 580 Rubber Tire Backhoe	4	Each	$450.00	$1,800
Field Pickup Truck	4	Days	$135.00	$500
Field Pickup Truck	4	Days	$135.00	$500
Tool Box	4	Days	$450.00	$1,800
			Subtotal	**$5,090**
Estimated Cost of Materials				
Fill Material	40	Cubic Yards	$16.00	$600.00
Diesel Fuel	60	Gallons	$4.00	$200.00
			Subtotal	**$800.00**
Estimated Cost of Subcontractors				
Transportation Services	2	Loads	$1,450.00	$2,900
Disposal Fees	144	Barrels	$20.00	$2,900
Equipment Mob & De-Mob	1		$600.00	$600
			Subtotal	**$6,400**
Estimated Cost of Miscellaneous Items				
Per Diem & Lodging	16	Day	$125.00	$2,000
Miscellaneous Items	1	Day	$1,700.00	$1,700
Vehicle Mileage	620	Miles	$0.55	$300
NORM Sample Analysis	6	Each	$250.00	$1,500
			Subtotal	**$5,500**
			Estimated Total	**$29,200**

Notes:
1) Dr. Frazier recommends a focused removal of soil within Areas of Interest 8 as the most feasible plan.
2) Excavated soils will be transported for disposal at the R360-Bourg and Sabine Environmental Services facilities via sealed trucks.
3) Extended reach excavation equipment will be used as necessary to accommodate remedial excavation activities.

Table 3I

Pre and Post Remediation Soil Sampling
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
Areas of Interest 1 through 8
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Estimated Cost for Personnel (Management, Environmental Scientist)				
Description	**Quantity**	**Units**	**Unit Cost**	**Cost (US $, Rounded to the Nearest $100)**
Personnel (Management, Environmental Scientist)				
Principal	45	Hours	$205.00	$9,200
Environmental Scientists	420	Hours	$124.00	$52,100
Environmental Scientists	90	Hours	$119.00	$10,700
Drafting	30	Hours	$103.00	$3,100
Administration	20	Hours	$63.00	$1,300
			Subtotal	**$76,400**
Estimated Cost for Materials & Equipment (Sampling Equipment, Expendables)				
Sampling Equipment	14	Days	$601.70	$8,400
Expendables	14	Days	$150.43	$2,100
			Subtotal	**$10,500**
Estimated Cost for Subcontractors (Airboat Transportation, Environmental Drilling, Analytical Laboratory)				
Airboat Drilling Rig	2	Day	$4,813.60	$9,600
Airboat Support Boat	2	Day	$1,444.08	$2,900
Environmental Drilling	5	Day	$2,166.12	$10,800
Analytical Laboratory Data	155	Samples	$476.55	$73,900
			Subtotal	**$97,200**
Estimated Cost for Miscellaneous Items (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	42	Days	$40.00	$1,700
Lodging	42	Days	$90.00	$3,800
Vehicle Mileage	400	Miles	$0.58	$200
			Subtotal	**$5,700**
			Estimated Total	**$189,800**

Notes:
1) Samples will be conducted throughout the mitigation process to monitor effectiveness.
2) Samples will be collected with the use of direct push technology or vibracore technology.
3) Samples will be submitted to a commercial laboratory for analysis of the Louisiana Department of Natural Resources, Office of Conservation, Statewide Order 29-B, Pit Closure Parameters.

Table 4A

Itemized Cost Estimate for a Contingency to Implement the Recommended Most Feasible Plan
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Desinated Area of Interest 1
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Estimated Cost for Personnel (Management, Environmental Scientist)				
Description	**Quantity**	**Units**	**Unit Cost**	**Cost (US $, Rounded to the Nearest $100)**
Senior Project Manager	5	Hours	$136.00	$700
Project Manager (Construction)	20	Hours	$124.00	$2,500
Site Superintendent (Construction)	80	Hours	$109.00	$8,700
Equipment Operator	80	Hours	$58.95	$4,700
Environmental Scientist	80	Hours	$124.00	$9,900
Project Engineer	8	Hours	$205.00	$1,600
			Subtotal	**$28,100**
Estimated Cost for Equipment (Vehicles)				
Superintendent Truck	1	Week	$555.00	$600
Tool Crib, Small	1	Week	$420.00	$400
			Subtotal	**$1,000**
Estimated Cost for Subcontractors (Amphibious Excavators, Marine Transportation, Disposal Fees, Backfill Material)				
Operational Fees for Amphibious Excavation and Backfilling	8	Days	$11,310.20	$90,500
Disposal Fees (R360-Bourg)	967	Barrels	$14.44	$14,000
Waste Transportation	8	Days	$6,655.00	$53,200
Environmental Monitoring Service	8	Days	$2,406.80	$19,300
Standby Time for Amphibious Equipment	5	Days	$2,750.00	$13,800
Backfill Material and Transportation	8	Days	$5,676.96	$45,400
			Subtotal	**$236,200**
Estimated Cost for Miscellaneous Items (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	10	Days	$40.00	$400
Lodging	10	Days	$90.00	$900
Vehicle Mileage	240	Miles	$0.58	$100
			Subtotal	**$1,400**
			Estimated Total	**$266,700**

Notes:
1) GHD contingency plan for Area of Interest 1 is a focused removal of soil, should the landowner not consent to passive closure.
2) The above cost is in addition to the costs associated with CRA's recommended most feasible plan.
3) GHD will make every reasonable effort to minimize the disturbance to the surrounding areas.
4) Excavated soils will be transported at R360-Bourg's facility via barge(s).
5) AOI 1 is a remote area, inaccessible by road. All work will be conducted with amphibious equipment including excavators, marsh buggies, tug boats and shallow water barges. Soils will be excavated to the approved limits. Soil samples will be collected and submitted for analysis. Once the analytical results have been received, the area will be backfilled.

Table 4B

Itemized Cost Estimate for a Contingency to Implement the Recommended Most Feasible Plan
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
GHD Designated Area of Interest 2
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Description	Quantity	Units	Unit Cost	Cost (US $, Rounded to Nearest $100)
Estimated Cost for Personnel (Management, Superintendent, Operators, Environmental Scientist)				
Senior Project Manager	5	Hours	$136.00	$700
Project Manager (Construction)	18	Hours	$124.00	$2,300
Site Superintendent (Construction)	55	Hours	$109.00	$6,000
Equipment Operator	55	Hours	$58.95	$3,200
Equipment Operator	55	Hours	$58.95	$3,200
Equipment Operator	55	Hours	$58.95	$3,200
Environmental Scientist	110	Hours	$124.00	$13,600
Project Engineer	8	Hours	$205.00	$1,600
			Subtotal	**$33,800**
Estimated Cost for Equipment (Excavators, Skid Steer, Front End Loader, Vehicles, Mats, Tooling)				
CAT 320 Excavator with Hydraulic Thumb	1	Week	$2,853.26	$2,900
CAT 307 Mini Excavator with Digging Bucket	1	Week	$1,391.13	$1,400
CAT 299 Skid Steer with Bucket and Forks	1	Week	$1,367.06	$1,400
CAT 950 Rubber Tire Loader with Bucket and Forks	1	Week	$3,376.74	$3,400
Superintendent Truck	1	Week	$555.00	$600
Field Pickup Truck	1	Week	$420.00	$400
Poly Mats	180	Days	$9.63	$1,700
Tool Crib, Small	1	Week	$420.00	$400
			Subtotal	**$12,200**
Estimated Cost for Materials (Fill Material, Fuel)				
Fill Material	724	Cubic Yards	$13.24	$9,600
Diesel Fuel	375	Gallons	$3.55	$1,300
			Subtotal	**$10,900**
Estimated Cost for Subcontractors (Transportation, Disposal)				
Transportation Services	133	Hours	$114.32	$15,200
Disposal Fees	3477	Barrels	$14.44	$50,200
			Subtotal	**$65,400**
Estimated Cost for Miscellaneous Items (Lodging, Subsistence, Mileage for Personnel)				
Per Diem	25	Days	$40.00	$1,000
Lodging	25	Days	$90.00	$2,300
Vehicle Mileage	240	Miles	$0.58	$100
			Subtotal	**$3,400**
			Estimated Total	**$125,700**

Notes:
1) GHD contingency plan for Area of Interest 2 is a focused removal of soil, should the landowner not consent to passive closure.
2) The above cost is in addition to the costs associated with GHD's recommended most feasible plan.
3) Excavated soils will be transported for disposal at R360-Bourg's facility via sealed trucks.
4) The area will be cleared and grubbed as necessary to accommodate the remedial excavation.
5) Smaller equipment will be utilized as necessary to preserve the specified wetlands vegetation.
6) GHD assumes the utility lines that intersect the access road to AOI 2 will be de-energized and/or raised prior to the implementation of the recommended most feasible plan.

Table 4C

Summary of Estimated Costs for the Most Feasible Plan with Contingencies for GHD-Designated Areas of Interest 1 and 2
Plan for Remediation of Soil in the Exploration and Production Sites in Accordance with LSA-R.S. 30:29
Raceland Raw Sugars, LLC Property
Lafourche, Parish, Louisiana
Sterling Sugars, Inc. v. Amerada Hess Corporation, et al.
Prepared for Liskow & Lewis on Behalf of Hess Corporation

Task	Total
Mobilization, Demobilization, and Site Preparation	$377,700
Mitigation of Soil in Area of Interest 3	$24,200
Mitigation of Soil in Area of Interest 4	$118,100
Mitigation of Soil in Area of Interest 5	$1,890,900
Mitigation of Soil in Area of Interest 6	$81,700
Mitigation of Soil in Areas of Interest 7	$142,600
Mitigation of Soil in Areas of Interest 8	$29,200
Active Mitigation of Soil in Area of Interest 1	$266,700
Active Mitigation of Soil in Area of Interest 2	$125,700
Mitigation Effectiveness Confirmation Sampling & Closure Report	$189,800
Total	**$3,246,600**

Notes:
1) The Areas of Interest presented above were designated by GHD and Dr. John Frazier for this Site.
2) Detailed cost breakdowns for each of the above task are included in supplemental tables specific to each Area of Interest.
3) The sales tax in Lafourche Parish is 9.4%.
4) The rates for rental equipment and subcontractor services are cost + 10%.
5) The blue shaded line items are the recommended most feasible plan. The bright yellow shaded items are contingencies in addition to the cost for the most feasible plan. The contingencies assume the landowner will not approve Passive