UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 7
11201 RENNER BOULEVARD LENEXA, KANSAS 66219

BEFORE THE ADMINISTRATOR

In the Matter of:	)	**ADMINISTRATIVE ORDER ON CONSENT**
BP Products North America Inc. Peosta, Iowa	)	**Docket No.** CWA-07-2019-0247
Respondent	)	

1. This Administrative Order on Consent ("Order") is issued pursuant to the authority vested in the U. S. Environmental Protection Agency ("EPA") by Sections 309(a)(3) and 311(c) and (e) of the Clean Water Act ("CWA"), 33 U.S.C. §§ 1319(a)(3) and 1321(c), (e) related to the BP Products North America Inc. ("Respondent") bulk oil storage facility located at 15393 Old Highway Road, Peosta, Iowa 52068 ("Facility," also known as the "Dubuque Facility").

PARTIES

2. The authority to issue an order pursuant to Section 309(a)(3) of the Clean Water Act ("CWA"), 33 U.S.C. § 1319(a)(3), is vested in the Administrator of EPA. The Administrator has delegated this authority to the Regional Administrator, EPA, Region 7, who in turn has delegated the authority to the Director of the Enforcement and Compliance Assurance Division of Region 7.

3. This Order is issued under the authority vested in the President of the United States by Section 311(c) and (e) of the CWA, 33 U.S.C. § 1321(c) and (e). The authority to issue an order pursuant to Sections 311 (c) and (e) of the CWA was delegated to the Administrator of EPA on October 22, 1991, by Executive Order 12777, 56 Fed. Reg. 54757, and further delegated to Regional Administrators by EPA Delegation Nos. 2-85 (Administrative Orders Under Section 311(e) of the CWA, January 19, 2017) and 2-89 (Removal of Discharge or Threat of Discharge, January 19, 1993). The Regional Administrator, EPA, Region 7, has delegated the authority to the Directors of the Enforcement and Compliance Assurance Division and Superfund and Emergency Management Division of Region 7.

4. Respondent, BP Products North America Inc., is a corporation engaged in the manufacture and storage of oil products, and is registered and authorized to conduct business in the state of Iowa.

STATUTORY AND REGULATORY FRAMEWORK

CWA Unauthorized Discharge

5. Section 301(a) of the CWA, 33 U.S.C. § 1311(a), prohibits the discharge of pollutants from a point source into a "navigable water of the United States, as these terms are defined by Section 502 of the CWA, 33 U.S.C. § 1362, by any person except in compliance with, *inter alia*, a permit issued pursuant to Section 402 of the CWA, 33 U.S.C. § 1342.

6. Section 309(a)(3) of the CWA, 33 U.S.C. § 1319(a)(3) states, in pertinent part, that when any person is in violation of Section 301, EPA may issue an order requiring such person to comply with the section.

CWA Oil Pollution Prevention

7. Section 311(b)(3) of the CWA, 33 U.S.C. § 1321(b)(3), prohibits the discharge of oil or hazardous substances into or upon the navigable waters of the United States or adjoining shorelines in such quantities that have been determined may be harmful to the public health or welfare or environment of the United States.

8. Section 311(a)(1) of the CWA, 33 U.S.C. § 1321(a)(1), and 40 C.F.R. § 112.2 define "oil" as "oil of any kind or in any form, including, but not limited to, petroleum [or] fuel oil...."

9. Section 311(b)(4) of the CWA, 33 U.S.C. § 1321(b)(4), authorizes EPA to promulgate a regulation to define what discharges of oil may be harmful to the public health or welfare or environment of the United States. 40 C.F.R. § 110.3 defines such discharges to include discharges of oil that violate applicable water quality standards or cause a film or a sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon the adjoining shorelines.

10. Section 311(j)(1)(C) of the CWA, 33 U.S.C. § 1321(j)(1)(C), provides in part that the President shall issue regulations "establishing procedures, methods, and equipment and other requirements for equipment to prevent discharges of oil and hazardous substances from vessels and from onshore facilities and offshore facilities, and to contain such discharges."

11. To implement Section 311(j)(1)(C), EPA promulgated regulations to prevent oil pollution at 40 C.F.R. Part 112 that set forth the requirements for the preparation and implementation of Spill Prevention Control and Countermeasure Plans ("SPCC Plans").

12. The requirements of 40 C.F.R. Part 112 apply to owners and operators of non-transportation-related onshore facilities with an aboveground storage capacity of 1,320 gallons or greater, engaged in gathering, storing, transferring, distributing, using or consuming oil or oil products, which due to their locations, could reasonably be expected to discharge oil in quantities that may be harmful into or upon the navigable waters of the United States or

adjoining shorelines. In pertinent part, 40 C.F.R. § 112.8(c)(2) requires that secondary containment for oil storage be sufficiently impervious to contain a spill.

13. Section 311(j)(5) of the CWA, 33 U.S.C. § 1321(j)(5), provides that the President shall issue regulations requiring the owner or operator of "an onshore facility that, because of its location, could reasonably be expected to cause substantial harm to the environment by discharging into or upon the navigable waters [or] adjoining shorelines" to "submit to the President a plan for responding, to the maximum extent practicable, to a worst case discharge, and to a substantial threat of such a discharge, of oil." The plans required for facilities subject to Section 311(j)(5) are called Facility Response Plans, or "FRPs."

14. Section 311(c) of the CWA, 33 U.S.C. § 1321(c), provides authority, delegated to EPA, to "remove or arrange for the removal of a discharge, and mitigate or prevent a threat of a discharge..." of oil. Section 311(e) of the CWA, 33 U.S.C. § 1321(e), provides authority, delegated to EPA, to issue "administrative orders that may be necessary to protect the public health and welfare" due to an "actual or threatened discharge of oil . . . from a . . . facility in violation of [Section 311(b) of the CWA]" if "the President determines that there may be an imminent and substantial threat to the public health or welfare."

FINDINGS OF FACT AND CONCLUSIONS OF LAW

15. Respondent is a "person" within the meaning of Sections 311(a)(7) and 502(5) of the CWA, 33 U.S.C. §§ 1321(a)(7) and 1362(5), and 40 C.F.R. §112.2.

16. Respondent was at all relevant times the "owner or operator," within the meaning of Section 311(a)(6) of the CWA, 33 U.S.C. §1321(a)(6) and 40 C.F.R. § 112.2, of the BP Dubuque Facility.

17. Respondent stores various forms of oil, including No.2 Diesel Oil, at the Facility and transports oil to and from the Facility. No. 2 Diesel Oil is a "pollutant" as defined by Section 502(6) of the CWA, 33 U.S.C. § 1362(6). No. 2 Diesel Oil is also an "oil," as defined by Section 311(a)(1) of the CWA, 33 U.S.C. § 1321(a)(1) and 40 C.F.R. § 112.2.

18. The Facility discharges to an underground culvert, which flows into South Fork Branch 2 approximately 0.3 miles from the Facility. South Fork Branch 2 is tributary to and joins South Fork Catfish Creek approximately 1.5 miles from the Facility. South Fork Catfish Creek is tributary to and joins Catfish Creek approximately 9.4 miles from the Facility.

19. The Facility has an estimated above-ground storage capacity of over 27,000,000 gallons of oil.

20. South Fork Branch 2, South Fork Catfish Creek, and Catfish Creek are navigable waters or tributary to navigable waters of the United States, within the meaning of Section 502(7) of the CWA, 33 U.S.C. § 1362(7), and 40 C.F.R. § 112.2.

21. Respondent's Facility is an "onshore facility" within the meaning of Section 311(a)(10) of the CWA, 33 U.S.C. § 1321(a)(10), and 40 C.F.R. § 112.2.

22. Oil storage at the Facility includes "non-transportation-related" "oil storage," as defined by Appendix A to 40 C.F.R. Part 112, as incorporated by reference within 40 C.F.R. § 112.2.

23. As the owner and operator of a non-transportation-related Facility that, because of its location and storage capacity, could reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines, Respondent is subject to both Section 311(j)(1) and (5) of the CWA and the SPCC and FRP regulations set forth at 40 C.F.R. Part 112.

24. On or about August 6, 2018, a spill of No. 2 diesel fuel oil was discovered from a 2,500,000-gallon storage tank (Tank 12) at the Facility that discharged from the Facility via a stormwater outfall into the adjacent South Fork Branch 2 (the "August 6, 2018 spill").

25. The stormwater outfall referenced above at Respondent's Facility is a "point source," as defined by Section 502(14) of the CWA, 33 U.S.C. § 1362(14).

26. At the time of the August 6, 2018 spill, the Facility did not have a permit authorizing discharges of oil from the stormwater outfall referenced above pursuant to Section 402 of the CWA, 33 U.S.C. § 1342.

27. The oil that discharged from the facility reached and caused the observable presence of oil and a sheen in South Fork Branch 2 in violation of Sections 301(a) and 311(b)(3) of the CWA, 33 U.S.C. §§ 1311(a) and 1321(b)(3).

28. Following the August 6, 2018 spill, EPA and Iowa Department of Natural Resources ("IDNR") representatives inspected and/or obtained information about the Facility and provided oversight to Respondent's response to the August 6, 2018 spill.

29. On August 7, 2018, EPA conducted an inspection at the facility in order to determine compliance with the SPCC regulations of 40 C.F.R. Part 112 and documented that the Respondent was in violation of the requirement of 40 C.F.R. 112.8(c)(2) for secondary containment to be sufficiently impervious to contain a spill.

30. There exists a continuing threat of a "discharge" of oil as defined in Section 311(a)(2) of the CWA, 33 U.S.C. § 1321(a)(2), and 40 C.F.R. § 112.2, into navigable waters of the United States, as evidenced by Respondent's violation of Sections 301(a) and 311(b)(3) of the CWA, Respondent's violation of the containment requirement of 40 C.F.R. 112.8(c)(2), and the Facility's proximity to South Fork Branch 2, South Fork Catfish Creek, and Catfish Creek.

31. The threat of a discharge of oil from the Facility poses an imminent and substantial threat to public health or welfare of the United States, including drinking water, fish and other wildlife, public and private property, shorelines, habitat, and other living and nonliving natural resources under the jurisdiction and control of the United States.

32. The actions agreed to by Respondent and required by this Order are necessary to protect the public health and welfare of the United States, including threats and/or potential threats to drinking water, fish and other wildlife, public and private property, shorelines, habitat, and other living and nonliving natural resources under the jurisdiction and control of the United States.

33. The actions agreed to by Respondent and required by this Order are in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP") and are authorized by EPA pursuant to the authority granted in Section 311(c) and (e) of the CWA, 33 U.S.C. § 1321(c) and (e).

34. EPA has notified the state of Iowa of this action pursuant to Sections 309(a)(4) and 311(e)(1)(B) of the CWA, 33 U.S.C. §§ 1319(a)(4) and 1321(e)(1)(B).

ORDER

35. Based on the foregoing FINDINGS OF FACT and CONCLUSIONS OF LAW and pursuant to the authority of Sections 309(a)(3) and 311(c) and 311(e) of the CWA, 33 U.S.C. §§ 1319(a)(3) and 1321(c) and (e), Respondent hereby agrees and is ORDERED to take the following actions:

a. **Initial Assessment of Secondary Containment** - No later than 45 days from the effective date of this Order, Respondent shall complete an initial assessment of the subsurface features of secondary containment at the BP Dubuque Facility, consistent with Attachment A to this Order. This initial assessment may include the use of ground penetrating radar and or soil resistivity testing, as appropriate to identify subsurface characteristics of the secondary containment structures and identify areas that may be appropriate for additional subsurface sampling.

b. **Report on Initial Assessment** - Within 90 days of the effective date of this Order, Respondent shall submit a report of the results of the initial assessment of secondary containment to EPA for review and comment. This report shall include all data generated by Respondent during the initial assessment.

c. **Second Assessment of Secondary Containment** - Within 30 days of receipt of any comments from EPA, Respondent shall commence a second assessment of the integrity of secondary containment at the Facility, in a manner which addresses or responds to any comments received from EPA on the initial assessment, and as necessary to determine compliance with 40 C.F.R. § 112.8(c)(2). This second assessment shall be performed consistent with Attachment A to this Order, and may include core samples or other sampling methods, as necessary to adequately characterize the subsurface characteristics of the secondary containment, and to determine compliance with 40 C.F.R. § 112.8(c)(2).

d. **Report on Second Assessment** - Within 45 days of the conclusion of the second assessment of the integrity of secondary containment at the Facility, Respondent shall submit a report of the results of the second assessment of the integrity of secondary containment at the Facility to EPA for review and comment. This report shall include all data generated by Respondent during the second assessment.

e. **Proposal for Work to Achieve Compliance** - Within 45 days of Respondent's receipt of any comments from EPA on the report on the second assessment of secondary containment, Respondent shall submit a proposal to EPA for review and comment for all proposed upgrades or improvements of spill response and/or secondary containment at the Facility, as necessary to achieve compliance with 40 C.F.R. § 112.8(c)(2). The proposal shall detail a schedule for all proposed work, not to exceed six (6) months from commencement of the proposed work. BP may propose a longer schedule to EPA for review and approval, if necessary to account for the construction season or if the work cannot reasonably be implemented within six (6) months from commencement.

f. **Performance of Work** - Within 30 days of receipt of any comments from EPA on Respondent's proposed work to improve spill response and/or secondary containment at the Facility, Respondent shall commence work on the work to upgrade or improve secondary containment at the Facility, as necessary to achieve compliance with 40 C.F.R. § 112.8(c)(2). This work shall be performed in a manner that addresses or responds to comments provided by EPA, and shall be completed within six (6) months of commencement by Respondent, unless a longer period has been proposed and approved by EPA pursuant to subparagraph e, above. Respondent may request additional time to complete the work for good cause.

g. **Final Completion Report** - Within 45 days of completion of all proposed work required to improve spill response and/or secondary containment at the Facility and achieve compliance 40 C.F.R. § 112.8(c)(2), Respondent shall submit a Final Completion Report to EPA and a copy of the Facility's SPCC Plan, updated as necessary to describe the work performed by Respondent, and to comply with 40 C.F.R. § 112.5.

Submittals

36. All submittals to EPA that are required of Respondent by this Order shall be made to:

Dave Hensley
Physical Scientist (Environmental)
U.S. Environmental Protection Agency
Chemical Branch
Enforcement & Compliance Assurance Division
11201 Renner Blvd.
Email: Hensley.dave@epa.gov

37. Electronic submissions to the EPA will be deemed submitted on the date they are transmitted electronically. Any report, notification, certification, or other communication that cannot be submitted electronically to the EPA shall be submitted in hard-copy to the address provided above.

General Provisions

38. EPA and Respondent acknowledge that this Order has been negotiated in good faith and that neither consenting to the terms of this Order, nor the actions undertaken by Respondent in accordance with this Order, constitute an admission of liability.

39. By entering into this Order, Respondent (1) consents to and agrees not to contest EPA's authority or jurisdiction to issue or enforce this Order, (2) agrees to undertake all actions required by the terms and conditions of this Order, and (3) consents to be bound by the requirements set forth herein.

40. Respondent waives any and all remedies, claims for relief, and otherwise available rights to judicial or administrative review that Respondent may have with respect to any issue of fact or law set forth in this Order, including, but not limited, any right of judicial review of this Order under the CWA, or under the Administrative Procedure Act, 5 U.S.C. §§ 701-706.

41. Nothing in this Order shall be construed to relieve Respondent of the requirements of the CWA or any other applicable requirements under federal, state or local law. EPA reserves the right to take, direct, or order all actions as necessary as authorized by law for any violation of this Order, and for other future or past violations of the CWA.

42. This Order shall not constitute a permit under the CWA. Compliance with the terms of this Order shall not relieve Respondent of liability for its responsibility to obtain and comply with any required local, state and/or federal permits.

43. Failure to comply with the terms of this Order may result in your liability for significant statutory civil penalties for each violation under Section 309(d) of the CWA, 33 U.S.C. § 1319(d), as modified by 40 C.F.R. Part 19. Upon suit by the EPA, the United States District Court for the Southern District of Iowa may impose such penalties if, after notice and

opportunity for a hearing, the court determines that you have violated the CWA as described above and failed to comply with the terms of this Order. In determining the amount of any penalty, the court will consider the seriousness of violation, the economic benefit resulting from the violations, any history of such violations, any good faith efforts made to comply with legal requirements, the economic impact a penalty may have, and such other matters as justice may require. The district court has the authority to impose separate civil penalties for any violations of the CWA and for any violations of this Order.

44. EPA may subsequently amend this Order, upon written agreement with Respondent, in accordance with EPA's authority under the CWA. In the event of any such subsequent amendment to this Order, all requirements for performance of this Order not affected by the amendment shall remain as specified by the original Order. All deadlines for performance under this Order may be extended upon written approval by EPA, at its sole discretion, without formal amendment to the Order.

45. If any provision or authority of the Order or the application of the Order to Respondent is held by federal judicial authority to be invalid, the application to Respondent of the remainder of the Order shall remain in full force and effect and shall not be affected by such a holding.

46. Nothing in this Order shall limit the EPA's right to obtain access to, and/or to inspect the facility, and/or to request additional information from Respondent, pursuant to the authority of Section 308 of the CWA, 33 U.S.C. § 1318, and/or any other authority. Respondent must provide and/or obtain access to the facility, to off-site areas where access is necessary to implement this Order, and to all documents related to conditions at the facility and work conducted under this Order. Respondent must provide this access to EPA and EPA's contractors and representatives, upon presentation of verifiable documentation of identity and authorization. Respondent must notify EPA immediately of any denial of access to areas that Respondent does not own or control.

47. Respondent must retain all documents and information relating to the work performed under and the implementation of this Order and relating to the oil and/or hazardous substances found on or discharged from the facility, for five years after completing removal actions required by this Order. Before destroying any documents or information, Respondent must notify EPA that the documents and/or information are available to EPA for inspection and, upon request, must provide the documents and/or information to EPA. In addition, Respondent must provide these documents and/or this information at any time before the five-year period expires at the written request of EPA.

48. This Order shall become effective and enforceable on the date that the Order is signed by EPA. Any amendments shall become effective and enforceable on the date that the amendment is signed by all Parties. Unless otherwise stated, all time periods stated herein shall be calculated in calendar days from such date.

49. This Order shall remain in effect until a written notice of termination is issued by an authorized representative of EPA. Such notice shall not be given until all of the requirements of this Order have been met.

RESPONDENT:
BP PRODUCTS NORTH AMERICA INC.

Date: Aug. 5, 2019

Gerald Maret
Gerald Maret
Attorney-in-Fact

BP Products North America Inc.

Registered Agent for BP Products North America Inc.:
The Corporation Trust Incorporated
351 West Camden Street
Baltimore, MD 21201

COMPLAINANT:
U. S. ENVIRONMENTAL PROTECTION AGENCY

Date: 8/22/2019

DeAndré Singletary
Acting Director
Enforcement and Compliance Assurance Division

Date: 8/21/2019

Mary P. Peterson
Mary Peterson
Director
Superfund and Emergency Management Division

Date: 8/16/2019

Howard C. Bunch
Sr. Assistant Regional Counsel
Office of Regional Counsel

CERTIFICATE OF SERVICE

I certify that on the date noted below I hand delivered the original and one true copy of this Administrative Order for Compliance on Consent to the Regional Docket Clerk, United States Environmental Protection Agency, Region 7, 11201 Renner Boulevard, Lenexa, Kansas 66219.

I further certify that on the date noted below I sent a copy of the foregoing Order for Compliance on Consent by first class certified mail, return receipt requested, to:

BP Products North America Inc.
c/o its Registered Agent:

The Corporation Trust Incorporated
351 West Camden Street
Baltimore, MD 21201

Date: 8/22/19

Signature

Attachment A: BP Dubuque Terminal
Permeability Assessment Plan

The primary objective for this assessment will be to determine the cause for the August 2018 release of diesel product outside of the containment berm for Tank 12. A second objective will be to assess the integrity of secondary containment provided for the remaining tanks at the BP Dubuque Terminal. This proposed scope for meeting these two objectives includes a two-phase approach beginning with an initial geophysical survey of the subsurface of berms and containment areas using ground resistivity and electromagnetic profiling. Geophysical surveys will be used to search for subsurface uniformities and anomalies that can then be used to target follow-up soil boring and geotechnical tests during the second phase of the assessment.

The following tasks are proposed to assess the integrity for secondary containment areas at the terminal facility. Initially, a geophysical survey will be used to screen locations for soil borings and soil samples that will be collected for geotechnical evaluation. Figure 1 shows locations where soil borings and containment soil samples are proposed to be collected. Prior to finalizing locations for geotechnical borings and initiating field work, sampling locations shown in Figure 1 will be confirmed or revised and submitted for Agency review when geophysical survey results become available.

Tank 4 & 12 Containment Assessment

1) A survey using Ground Penetrating Radar (GPR), Electromagnetic (EM) (Geonics EM 31), and Resistivity methods will be made of subsurface conditions beneath the Tank 12 and Tank 4 containment areas and berms, including the five locations where evidence of seepage or product was noted during cleanup efforts. It is anticipated that geophysical survey results will provide information regarding subsurface composition, including:

   - Uniformity (or variability) of soil materials used in berm and containment construction;
   - Depth to shale bedrock or definable soil layers;
   - Differences in soil moisture that would indicate differences in soil permeability;
   - Presence and extent of diesel product around the containment dike;
   - The presence and location of piping or other underground objects or structures present in the subsurface and that may extend beneath or through the berm.

2) Based on the geophysical survey results, locations for proposed soil borings and collection of Shelby tubes will be determined considering existing piping and/or berm penetrations, soil anomalies/textures, and the potential for preferential flow pathways through containment areas or berms.

3) Prior to the start of any geotechnical field work, geophysical survey results and proposed boring locations will be submitted for Agency review and comment.

4) Standard penetration tests will be conducted during boring advancement. It is anticipated that two Shelby tubes will be collected from each boring. Preliminary expectations are for collection of a Shelby tube from each boring location at an elevation between +1 ft to -2 ft of the current ground surface within the containment area for Tank 12 (approximately between 911 ft and 908 ft elevation) and from Tank 4 (approximately 908 to 905 ft elevation). A second Shelby tube will be collected from the same boring beginning at a depth 1 foot below the bottom of the first core (3-6 feet below the ground surface of the adjacent containment area). Four soil borings will be completed across the shared berm between Tank 12 and Tank 4 at intervals of approximately 50-75 feet. Seven additional borings will be collected from the exterior berms on the east side of Tank 12 and Tank 4.

5) As a preliminary estimate, four Shelby tubes are anticipated to be collected from the top 0-36 inches of the ground surface from two locations within the Tank 12 berm and two additional locations from the Tank 4 containment areas. One of the Shelby tubes will be collected in each berm from the lowest surface elevation in the containment area, generally near the drainage outlet. The location for a second Shelby tube will be determined based on results from the geophysical survey or in proximity to observed berm seepage.

6) Shelby tube samples collected from berms and the containment floor will be analyzed for:
   - Soil Classification in accordance with the Unified Soils Classification System (USCS) (ASTM D 2487)
   - Natural moisture content (ASTM D 2216)
   - Grain size analysis (ASTM D 1140, ASTM D 422, or ASTM D7928)
   - Atterberg Limits (ASTM D 4318) will be evaluated on half of the Shelby tube samples Collected

   Testing for permeability will be conducted from at least one of the Shelby tubes collected from each location. Permeability from the second Shelby tube collected from each boring may be included for testing depending on soil properties:
   - Permeability will be analyzed using a flexible walled permeameter (ASTM method D5084).

7) Data collected from tasks 1-6 will be used in a seepage model (SEEP/W) and the American Petroleum Institute's LNAPL Distribution and Recovery Model (LDRM) as part of an assessment of containment performance. Observations on the extent of product movement since the August 2018 release will be used in the calibration of the models.

Assessment of Containment Integrity for the Tank Farm beyond Tanks 4 & 12

A review of drainage logs for the BP Dubuque Terminal (Figure 2) indicates that manual drainage events for the Tank 4, 5, and 12 containment areas conducted between June 2016 to March 2019 occurred on less than half of the dates that dikes were drained from the other containment areas at the terminal. Permeability and soil properties determined from the investigation of the containment for Tanks 4 and 12 will be included in the assessment of secondary containment conditions for the other tanks at the facility.

Containment integrity for the facility will be investigated based on:

1) Geophysical results from the initial investigation of Tank 4 and Tank 12 berms;

2) A geophysical investigation using a resistivity survey will be conducted of tank containment areas and berms. Resistivity survey results will be supplemented with subsurface conditions identified using Ground Penetrating Radar (GPR) and Electromagnetic (EM) equipment (Geonics EM 31) will be conducted for the tank containment areas and berms;

3) Results from the geophysical survey will be used to identify buried process piping present within the berm and/or locations of berm penetrations with the potential to be preferential flow pathways through the containment berm. The presence of anomalies in the geophysical survey, potentially the result of differences in soil texture, moisture, or soil materials will also be considered in determining locations for collecting soil cores;

4) Prior to the start of any geotechnical field work, survey results and proposed boring locations will be submitted for Agency review and comment.

5) Borings will be conducted through the berms that comprise the exterior of the tank farm and that are on the downgradient side of groundwater flow in the containment area. The preliminary drawing (Figure 1) that accompanies this work plan shows boring locations placed at intervals of approximately 150-250 feet and arranged such that berm locations nearest the lowest elevations within a containment area will be included;

6) Borings will be completed using standard penetration tests and split spoon sampling. It is anticipated that two Shelby tubes will be collected from each boring: The first will be collected at an elevation between +1 ft to -2 ft of the current ground surface for the floor of the containment area. A second Shelby tube will be collected from the same boring beginning at a depth 1 foot below the bottom of the first core (3-6 feet below the ground surface of the containment area);

7) It is anticipated that one Shelby tube will be collected from the top 0-36 inches of ground surface within each containment area. These will be collected at the lowest elevation in the containment area (near the drainage piping). If indicated by the geophysical survey a second Shelby tube will be collected.

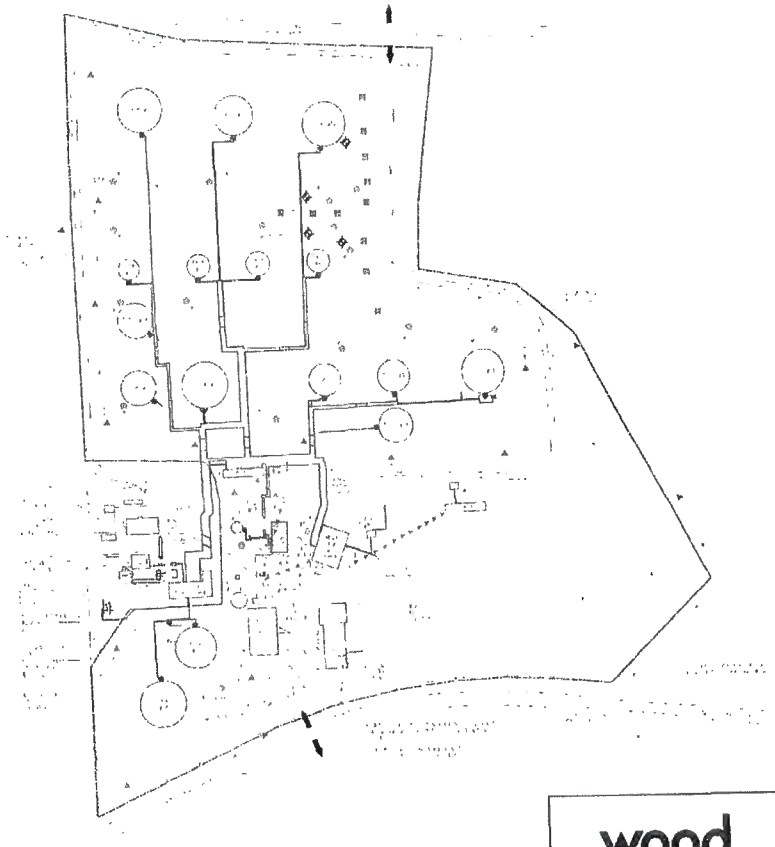
8) Shelby tube samples collected from berms and the containment floor will be analyzed for:
    - Soil Classification in accordance with the Unified Soils Classification System (USCS) (ASTM D 2487)
    - Natural moisture content (ASTM D 2216)
    - Grain size analysis (ASTM D 1140 or ASTM D 422)
    - Atterberg Limits (ASTM D 4318) will be evaluated on half of the Shelby tube samples collected.

    It is anticipated that permeability testing will be conducted from one of the Shelby tubes collected at each boring location. Permeability for the second Shelby tube collected from a boring may be determined based on soil conditions observed. Permeability will be conducted using ASTM method D5084 (Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter).

Deliverable:

Following completion of the investigation described in the scope of work above, a draft summary report with the data and geotechnical results obtained will be compiled and provided to the Agency for its review. This report will include an assessment of the condition of secondary containment at the facility and recommendations for additional data collection, if necessary.

Results from the geophysical and geotechnical investigations will be used as inputs to a SEEP/W model and API's LDRM model to simulate performance of site containment. Permeability, soil characteristics, and modeling results will be detailed in the report.



0 200' 400'

SCALE: 1 INCH = 200 FEET

wood.

Provisional Boring Locations
Dubuque Terminal
Peosta, IA

FIGURE
1

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE	REV. NO.
GAP	6550185060		04/16/19	-	-