MODEF
VOLUNTARY CLEANUP PROGRAM
September 2020

MODEF VOLUNTARY CLEANUP PROGRAM

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Executive Summary

This updated 2020 Mineral Oil Dielectric Fluid (MODEF) Voluntary Cleanup Program (VCP) describes the protocols for the assessment and remediation of MODEF discharges from Duke Energy Florida, LLC (DEF) owned equipment. DEF's goal is to remove MODEF from the soil, sediment, surface water, and ground water to the Chapter 62-777, Florida Administrative Code (FAC) Total Recoverable Petroleum Hydrocarbon (TRPH) Cleanup Target Levels (CTLs) in 60 days or less after the discharge is discovered or reported to DEF. However, issues such as cable repairs, customer schedules, safety issues, adverse weather conditions, and substation equipment outages, which are factors outside of DEF's control, may cause DEF to exceed the cleanup goal of 60 days. The VCP presents a standardized approach for the cleanup of MODEF discharges in 60 days or less and for those that exceed 60 days.

MODEF cleanups presented in this VCP are arranged into three types: emergency, non-emergency, and greater than 60 day. Emergency and non-emergency MODEF cleanups are conducted in general accordance with the Florida Department of Environmental Protection's (FDEP or Department) May 2016 *Guidance for Mineral Oil Dielectric Fluid Emergency Response Action Protocol* (Rule 62-780.100(22), FAC) and specifically as set forth in this VCP, as well as in compliance with the Non-Petroleum De Minimis Discharge applicable provisions of Rule 62-780.550, FAC. Protocols for MODEF discharge cleanups that take longer than 60 days are conducted in accordance with applicable provisions of Rule 62-780.500, FAC. and patterned after DEF's FDEP-approved documents including: the FDEP approved 2011 MODEF Voluntary Cleanup Program (VCP), the Transformer Inspection and Replacement Program (TRIP) Environmental Response Strategy (ERS), and the Substation Assessment and Remedial Action Plan (SARAP). The cleanup protocols for the three cleanup types are summarized in the remaining portions of this executive summary. Detailed descriptions of the protocols for the three types of MODEF cleanups follow the executive summary.

MODEF discharge responses should only be implemented after attempting to determine the polychlorinated biphenyls (PCB) concentration of the failed or leaking equipment. Discharges of MODEF containing PCB concentrations of 50 parts per million (ppm) or greater should be remediated in accordance with all applicable sections of the U.S. Environmental Protection Agency (EPA) regulations contained in 40 CFR Part 761. When the PCB concentration of the failed or leaking equipment is unknown, the discharge should be remediated in accordance with DEF's EPA-approved PCB Generic Work Plan (GWP), which generally follows the self-implementing cleanup criteria described in 40 CFR 761.61(a). Discharges of MODEF containing PCB concentrations less than 50 ppm may be remediated according to this VCP and disposed of in accordance with applicable FDEP solid waste laws and regulations.

Emergency MODEF Cleanups (Remediation is Completed ≤48 Hours of Discovery)

Emergency MODEF discharge cleanups are applicable when remediation of current discharged MODEF can be completed within 48 hours after the discharge from DEF equipment is discovered or reported to DEF and the discharge has not reached groundwater. A MODEF discharge cleanup using this response scenario, in accordance with Non-Petroleum De Minimis Discharge applicable provisions of Rule 62-780.550, FAC, should consist of the following:

- Remove all soil contaminated with current discharged MODEF within the spill area (i.e. visible traces of oily soil and a buffer of one lateral foot around the visible traces), properly dispose of the contaminated soil, and restore the ground to its original configuration using clean fill;
- Wash and rinse all solid surfaces using appropriate chemical, sorbent, or absorbent materials, and collect/properly dispose of the rinse water; and,
- Document the response action activities in appropriate DEF remediation records that will be maintained in the DEF database/filing system for a period of at least five years from the date of the discharge or the date of discovery. The records shall be made available to FDEP upon request.

When a MODEF discharge cleanup cannot be completed within 48 hours, or MODEF is found to have impacted groundwater, DEF will utilize the applicable response procedures summarized below and described in Sections 3 and 4.

Non-Emergency MODEF Cleanups (Remediation is Completed within ≤60 Days from the Time of Discovery)

Non-Emergency MODEF cleanups are planned processes that may require a planned electrical outage so that the electrical equipment may be removed or safely worked around during MODEF cleanup activities. Non-emergency response actions typically take longer than 48 hours to initiate, but are completed within 60 days after the discharge from DEF Equipment is discovered or reported to DEF. In accordance with Non-Petroleum De Minimus Discharge applicable provisions of Rule 62-780.550, FAC, a MODEF discharge cleanup using this response scenario should consist of the following:

- If the MODEF spill did not result in contact with groundwater, remove all soil contaminated with current discharged MODEF within the spill area (i.e. visible traces of oily soil and a buffer of one lateral foot around the visible traces) and properly dispose of the contaminated soil;
- If the MODEF spill is found to be in groundwater (e.g. TRPH concentration exceeds the leachability soil CTL (SCTL, Table II, Chapter 62-777, FAC)), or free product or a sheen is removed from groundwater, remove and properly dispose of all affected soil as described above and:
  - Utilize a Dexsil PetroFLAG® screening kit to ensure/verify removal of soil containing MODEF so that TRPH levels remaining in the soil are less than the leachability soil CTL (SCTL, Table II, Chapter 62-777, FAC) for TRPH;
  - Physically remove all visible traces of oil/oil sheen observed in the groundwater with oil absorbent pads/material or via vacuum assisted equipment;
  - For MODEF found to be in groundwater or where a sheen is removed from groundwater, install a monitoring well, collect a representative groundwater quality sample (using FDEP Standard Operating Procedures), and submit the groundwater quality sample for confirmatory laboratory analysis to ensure that TRPH levels remaining in groundwater are less than the groundwater cleanup target level (GCTL) listed in Chapter 62-777, FAC, or an alternative cleanup level agreed to with the Department; and
- Wash and rinse all solid surfaces using appropriate chemical, sorbent, or absorbent materials;
- Collect and properly dispose of the rinse water; and,
- Document the response action activities in appropriate DEF remediation records that will be maintained in the DEF database/filing system for a period of at least five years after the date of discharge or the date of discovery. The records shall be made available to FDEP upon request.

Non-De Minimis MODEF Cleanups (Remediation is Completed >60 Days from the Time of Discovery)

Certain MODEF discharge responses require greater planning and electrical outage coordination at a substation or with the customer to ensure that the electrical equipment may be removed or safely worked around during cleanup activities. In accordance with applicable provisions of Rule 62-780.500, FAC, for those sites requiring more than 60 days to complete the cleanup after the MODEF discharge from DEF equipment is discovered or reported to DEF, the following protocol will be utilized:

- For remediation activities that extend >60 days, provide notice of field activities by email to the FDEP in accordance with subsection 62-780.220(1), FAC, within seven (7) days, but not less than 24 hours, for the work that must occur beyond the 60 days;
- Remove and properly dispose of all soil contaminated with MODEF within the spill area (i.e. visible traces of oily soil;

- Utilize a Dexsil PetroFLAG® screening kit to ensure/verify removal of MODEF-impacted soil so that TRPH levels remaining in the soil are less than the leachability SCTL;
- Physically remove all visible traces of oil/oil sheen observed in the groundwater with oil absorbent pads/material or via vacuum assisted equipment;
- For MODEF found to be in groundwater or where a sheen is removed from groundwater, install a monitoring well, collect a representative groundwater quality sample, and submit the groundwater quality sample for confirmatory laboratory analysis to ensure that TRPH levels remaining in groundwater are less than the GCTL as listed in Chapter 62-777, FAC (5.0 mg/L as of the date of this VCP) or an alternative cleanup level agreed to with the Department;
- If the groundwater sample exceeds the GCTL, additional groundwater samples will be collected quarterly until two consecutive laboratory analyses with no GCTL exceedance are achieved.
- Wash and rinse all solid surfaces using appropriate chemical, sorbent, or absorbent materials;
- Collect/properly dispose of the rinse water; and,
- Document the response action activities in appropriate DEF remediation records and provide FDEP an Emergency Source Removal Report within 60 days of completion of Source Removal MODEF response actions in accordance with Rule 62-780.500(6), FAC.

1.0 Background

Duke Energy Florida LLC (DEF) has over 100,000 pad-mounted transformers, over 200,000 pole mounted transformers, and electrical oil-filled equipment (OFE) at approximately 400 substations that contain MODEF. For many years, Progress Energy, now DEF, has utilized FDEP's approved site rehabilitation protocols (MODEF VCP, TRIP ERS, and SARAP) to effectively manage MODEF discharges at these locations in order to protect the State's natural resources. DEF will continue to use the protocols, as set forth by this MODEF VCP, to manage MODEF discharges.

1.1 Purpose

DEF's VCP implements the applicable provisions of Chapter 62-780, FAC and provides procedures, specifically as set forth in this VCP, to remediate discharges of MODEF from DEF-owned equipment. The purpose of the MODEF protocols in this VCP is to ensure that MODEF cleanup criteria are protective of public health and the environment.

1.2 Objective

DEF's objective is to utilize an agreed protocol for the assessment and remediation of "de minimis" MODEF cleanups completed in no greater than 60 days after the discharge is discovered or reported to DEF. Although it is DEF's practice to clean up all MODEF discharges within 60 days, certain factors, such as cable repairs, customer schedules, and substation outages may delay remediations within that time frame. Therefore, this VCP also addresses the cleanup of non-"de minimis" MODEF discharges (i.e. cleanups completed in greater than 60 days after the discharge from DEF equipment is discovered or reported to DEF).

1.3 Applicability

This VCP applies to the cleanup of all discharges of MODEF from oil-filled containers or equipment owned by DEF unless an alternative cleanup approach has been negotiated with an applicable regulatory agency (e.g. TRIP ERS and SARAP).

1.4 PCBs

MODEF discharge responses are made after attempting to determine the PCB concentration status of the failed or leaking equipment. Discharges of MODEF containing PCB concentrations of 50 ppm or greater should be

remediated in accordance with all applicable sections of the EPA regulations contained in 40 CFR Part 761. When the PCB concentration of the failed or leaking equipment is unknown, the discharge should be remediated in accordance with DEF's EPA-approved PCB GWP, which generally follows the self-implementing cleanup criteria described in 40 CFR 761.61(a). Discharges of MODEF containing PCB concentrations less than 50 ppm may be remediated according to this VCP and disposed of in accordance with applicable FDEP solid waste laws and regulations.

1.5 VCP Organization

The remainder of the VCP is organized in three main sections. The first two sections address emergency and non-emergency MODEF cleanups conducted in general accordance with FDEP's May 2016 *Guidance for Mineral Oil Dielectric Fluid Emergency Response Action Protocol* (Rule 62-780.100(22), FAC) and specifically as set forth in this VCP, as well as in compliance with the Non-Petroleum De Minimis Discharge applicable provisions of Rule 62-780.550, FAC. The third section addresses cleanup of MODEF discharges that cannot be completed within 60 days of discovery of the discharge (i.e. non-de minimis MODEF cleanups or >60 day MODEF cleanups). In accordance with applicable provisions of Rule 62-780.500, FAC, the protocol set forth in Section 4.0 will be utilized for >60 day MODEF cleanups. Each section addresses response actions, waste disposal, and recordkeeping/reporting requirements under applicable or alternative provisions of Chapter 62-780, FAC.

2.0 Emergency MODEF Cleanups (Remediation is Completed ≤48 Hours of Discovery)

Emergency MODEF discharge cleanups are applicable when remediation of MODEF can be completed within 48 hours after the discharge from DEF equipment is discovered or reported to DEF and the discharge has not reached groundwater. When a MODEF cleanup cannot be completed within 48 hours or has reached groundwater, DEF will utilize the applicable response protocols described in Sections 3 and 4 of this document.

2.1 Discharge Response

MODEF discharge responses under an "emergency" scenario consist of the following in accordance with Non-Petroleum De Minimus applicable provisions of Rule 62-780.550, FAC:

1. PCB Screening

   a) Oil

   Check the nameplate or other label for PCB content. If PCB content is not identified, test the equipment for PCBs using a 50 parts per million (ppm) Dexsil Clor-N-Oil® test kit and collect an oil sample for confirmatory laboratory analysis. The Clor-N-Oil test measures total chlorine in oil; therefore, it is possible that a positive result may be influenced by chlorine present in the oil from sources other than PCBs. If the Clor-N-Oil test indicates PCBs are present at concentrations at or greater than 50 ppm, follow the applicable EPA PCB spill cleanup protocol. If the label or Clor-N-Oil results indicate PCBs in oil are less than 50 ppm, proceed with the cleanup beginning in paragraph 2 below.

   b) Soil

   Field screening shall be conducted if the PCB content of the OFE is ≥50 PPM or unknown. Test soil in an area most visibly impacted by mineral oil for PCBs using a 50 parts per million (ppm) Dexsil Clor-N-Soil® test kit. The Clor-N-Soil test measures total chlorine in soil; therefore, it is possible that a positive result may be influenced by chlorine present in soil from sources other than PCBs. If the Clor-N-Soil test indicates PCBs are present at concentrations at or greater than 50 ppm, follow the applicable EPA

PCB spill cleanup protocol. If Clor-N-Soil results indicate PCBs in soil are less than 50 ppm, proceed with the cleanup as described below.

2. Remove all soil contaminated with MODEF within the spill area (i.e. visible traces of oily soil and a buffer of one lateral foot around the visible traces), properly dispose of the excavated soil, and restore the ground to its original configuration by backfilling with clean fill and rock, as necessary. Commercially available backfill used to provide fill for residential uses will be obtained for backfilling excavations. In addition, thermally treated soil meeting the requirements of Rule 62-713.520(2), FAC, may be used for backfill.
3. Wash and rinse all solid surfaces using appropriate chemical, sorbent, or absorbent materials and collect/properly dispose of the rinse water.
4. These emergency response actions will be initiated within 48 hours after DEF is notified of the discharge or becomes aware of the electrical outage, unless such actions must be delayed in case of circumstances including but not limited to civil emergency, adverse weather conditions, lack of access to the site, or emergency operating conditions.

2.2 Waste Disposal

MODEF impacted soil will be disposed at a DEF-approved, FDEP permitted treatment/disposal facility.

2.3 Recordkeeping

Upon completion of response action activities, appropriate DEF remediation records set forth below, as applicable, will be maintained in the DEF database/filing system for a period of at least five years from the date of discharge or the date of discovery and shall be made available for FDEP review upon request:

- Date of discharge or date of discovery of discharge;
- Location of discharge (e.g. street address of discharge, if known);
- A statement regarding whether the MODEF discharge release is believed to have resulted from a PCB transformer or other PCB contaminated electrical equipment as defined in 40 CFR Part 761, based on company knowledge, records search, screening, etc.;
- The estimated quantity of MODEF discharged;
- The volume of free MODEF collected, if any;
- The volume and location of impacted soil excavated; and,
- The name and/or address of facility where free MODEF, impacted soil was disposed or treated, including disposal and/or treatment manifests or certifications.

3.0 Non-Emergency MODEF Cleanups (Remediation is Completed within ≤60 Days from the Time of Discovery)

Non-Emergency MODEF cleanups are planned processes that may require a planned electrical outage so that the electrical equipment may be removed or safely worked around during MODEF cleanup activities. Non-emergency response actions typically take longer than 48 hours to initiate and are completed within 60 days after the discharge is discovered or reported to DEF.

3.1 Discharge Response

The following protocol will be followed for de minimis, non-emergency MODEF response actions in accordance with Non-Petroleum De Minimus applicable provisions of Rule 62-780.550, FAC:

1. PCB Screening

   a) Oil

   Check the nameplate or other label for PCB content. If PCB content is not identified, test the equipment for PCBs using a 50 ppm Dexsil Clor-N-Oil® test kit and collect an oil sample for confirmatory laboratory analysis. The Clor-N-Oil test measures total chlorine in oil; therefore, it is possible that a positive result may be influenced by chlorine present in the oil from sources other than PCBs. If the Clor-N-Oil test indicates PCBs are present at concentrations at or greater than 50 ppm, follow the applicable EPA PCB spill cleanup protocol. If the label or Clor-N-Oil results indicate PCBs in oil are less than 50 ppm, proceed with the cleanup beginning in paragraphs 2. or 3. below.

   b) Soil

   Field screening shall be conducted if the PCB content of the OFE is ≥50 PPM or unknown. Test soil in an area most visibly impacted by MODEF for PCBs using a 50 ppm Dexsil Clor-N-Soil® test kit. The Clor-N-Soil test measures total chlorine in soil; therefore, it is possible that a positive result may be influenced by chlorine present in soil from sources other than PCBs. If the Clor-N-Soil test indicates PCBs are present at concentrations at or greater than 50 ppm, follow the applicable EPA PCB spill cleanup protocol. If Clor-N-Soil results indicate PCBs in soil are less than 50 ppm, proceed with the cleanup as described below.

2. If the MODEF spill has not resulted in contact with groundwater, remove all soil contaminated with MODEF within the spill area (i.e. visible traces of oily soil and a buffer of one lateral foot around the visible traces) and proceed to subparagraphs 3.b-3.d below.

3. If MODEF is found to be in groundwater, follow paragraph 1. above plus the following:

   a) Utilize a Dexsil PetroFLAG® screening kit to confirm removal of soil containing MODEF greater than the leachability SCTL for TRPH (340 milligrams per kilogram (mg/kg) as of the date of this VCP). Samples should be collected at each of the four sidewalls and bottom of the excavation for a minimum of five samples to ensure the cleanup is complete. Samples should be collected from soil most heavily impacted by MODEF, especially the smear zone immediately above the water table if the MODEF appears to have intercepted the water table. Record the results of each sampling event, including location of each sample and all sample results.
   b) Place all excavated soil in appropriate containers (e.g. 55-gallon drum, roll-off container, or soil vacuum truck) or on plastic sheeting and cover to prevent contact with rainfall or stormwater runoff.
   c) Transport MODEF impacted wastes for disposal at a licensed soil treatment/disposal facility.
   d) Restore area to its original configuration via backfilling with clean fill and rock as necessary. Commercially available backfill used to provide fill for residential uses will be obtained for backfilling excavations. In addition, thermally treated soil meeting the requirements of Rule 62-713.520(2), FAC may be used for backfill.
   e) For MODEF found to be in groundwater or where a sheen is removed from groundwater, confirmatory laboratory analysis will be conducted to ensure that TRPH levels are less than the GCTL as listed in Chapter 62-777, FAC (5.0 mg/L as of the date of this VCP) in groundwater, or an alternative number agreed to with the Department.

      i. Both additional soil and groundwater will be physically removed via appropriate techniques (e.g. vacuum truck, etc.) until the soil is confirmed to contain less than the leachability based soil cleanup target level for the protection of groundwater listed in Chapter 62-777, FAC. (LB-SCTL) (340 mg/kg as of the date of this VCP) for TRPH and no sheen is present on the groundwater.
      ii. As described in sub-subparagraph iv. below, a groundwater sample will be collected when MODEF affected soil with a TRPH concentration greater than the leachability based soil cleanup target level listed in Chapter 62-777, FAC, (340 mg/kg as of the date of this VCP) is identified at or below the water table, or when a sheen is observed on the water table.

iii. A groundwater sample will be collected from a temporary monitor well installed in the vicinity of each remediated area. All groundwater sampling activities proposed at MODEF sites will be conducted in accordance with the Department's Standard Operating Procedures (SOP-001/01) and Chapter 62-160, FAC.

iv. Groundwater samples will be collected and submitted to a NELAC-certified laboratory according to Chapter 62-160, FAC for analysis of TRPH using the FL PRO Method. Groundwater quality results will be compared to applicable GCTLs.

4. Risk Based Corrective Action (RBCA) Remediation Strategies

a) Other case by case utilization of RBCA concepts, principles, and factors (including engineering or institutional controls), as applicable, may be used for impacted media upon notification to and approval by the FDEP.

b) Applicable RBCA provisions of Chapter 62-780, FAC may be utilized to implement the potential strategies referenced in subparagraph 4.a above.

c) At some MODEF sites, structures or other types of obstructions may cover soil that has been impacted by MODEF and the possibility of a safety or structural concern may prevent the removal of a structure to address impacted soil. It may not, therefore, be possible to remove all impacted soil at some sites.

d) Alternative SCTLs: In cases where impacted soil cannot be addressed by removal methods, DEF may propose engineering or institutional controls to address impacted soil or may propose the use of alternative SCTLs according to the applicable procedures described in "Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, FAC" (February 2005 or as amended) or using site specific soil parameter data to calculate an alternative SCTL per the formula detailed in Figure 8, Chapter 62-777, FAC. The procedures for the development of alternative SCTLs at Non-Emergency MODEF sites are summarized below.

After all attempts at removal of impacted soil have been completed, soil samples will be collected for onsite screening of TRPH to assess the vertical and horizontal extent of remaining impacted soil. An additional sample will be collected from the most impacted area for laboratory analysis of TRPH using the FL PRO Method and for TRPH speciation using the Massachusetts Department of Environmental Protection (MADEP) Method or for site specific soil parameter data using the formula detailed in Figure 8, Chapter 62-777, FAC to develop an alternative SCTL. The results of the FL PRO analysis will be used to verify whether the soil sample contains elevated concentrations of TRPH. The TRPH results will be compared to the alternative SCTL calculated using site specific soil parameter data or if alternative SCTLS are developed using the MADEP method, MADEP results will be compared to the alternative SCTLs presented in Table C-9 of the Technical Report, "Development of Cleanup Target Levels (CTLs) for Chapter 62-777, FAC" (February 2005 or as amended). The CTLs are set forth in the attached Table 1 .

If MADEP results are greater than the applicable CTLs, then additional sampling may be required to complete the evaluation of alternative SCTLs, as described in the following sections.

5. Supplemental Remediation Strategy Details

a) Alternative CTLs – Soil Remediation, Exposure Exceedance

If MODEF affected soil, impacted greater than the exposure SCTL for TRPH, is present in an area that cannot be excavated, a sample will be collected for MADEP analysis and the results compared to the alternative cleanup target levels for TRPH fractions listed in Section 3.1 subparagraph 4.d above. If the MADEP results indicate residential exposure SCTLs are exceeded, the following procedures will be followed:

i. Evaluate the feasibility of moving or supporting structures, or removing trees to facilitate removal of affected soil.

ii. If the feasibility is acceptable, then soil will be removed in accordance with the updated VCP procedures described above.
iii. If the feasibility of moving or supporting trees/structures is not acceptable or the abatement takes longer than 60 days to complete, then the applicable procedures described in Section 4 of this VCP for cleanups requiring greater than 60 days to complete will be implemented.

b) Alternative CTLs – Soil Remediation, Leachability Exceedance

If MADEP soil samples are collected and the results exceed one or more leachability SCTLs for speciated TRPH fractions, the following procedures will be followed:

i. If direct exposure SCTLs are also exceeded, the procedures listed in subparagraph a above will be implemented.
ii. If the MADEP results fail one or more of the leachability SCTLs, a sample will be collected, prepared using the Synthetic Precipitation Leaching Procedure (SPLP), and analyzed for TRPH using the FL PRO Method. If the SPLP results reflect no exceedance of the TRPH GCTL and soil containing TRPH greater than the LB-SCTL (340 mg/kg as of the date of this VCP) is not detected at or below the estimated level of the seasonal high water table and a sheen is not present on the water table, a groundwater sample will not be collected. If soil containing TRPH greater than the LB-SCTL (340 mg/kg as of the date of this VCP) remains at or below the water table or a sheen remains on the water table, a groundwater sample will be collected as described in subparagraph c below to confirm that no impact to groundwater has occurred at a concentration greater than the TRPH GCTL. If the TRPH result exceeds the TRPH GCTL, refer to subparagraph c below.
iii. If the SPLP TRPH analysis exceeds the TRPH GCTL (5 mg/L as of the date of this VCP), the procedures listed in subparagraph c below will be implemented to ensure there are no impacts to groundwater greater than GCTLs. In addition, an evaluation will be conducted to assess the feasibility of soil removal versus soil confirmation sampling. If soil removal is conducted, procedures already described herein will be used. If soil removal is not feasible, the soil confirmation sampling procedures listed in Section 4.1. subparagraph 5.c will be implemented.

c) Alternative CTLs – Groundwater Sampling

This section contains procedures for assessment and remediation of groundwater in the event that MODEF affected soil (TRPH greater than the LB-SCTL) is identified at the water table, or free product or a sheen is observed on the water table. The procedures below outline additional groundwater assessment and remediation in the event that soil analytical results exceed one or more LB-SCTLs.

i. If soil containing TRPH greater than the LB-SCTL cannot be removed to the water table or a sheen remains on the water table, a groundwater sample will be collected to confirm that no impact to groundwater has occurred that exceeds the TRPH GCTL.
ii. If a MADEP leachability SCTL is exceeded but a soil sample analyzed using SPLP for TRPH does not exceed the TRPH GCTL, and soil containing TRPH greater than the LB-SCTL is not detected at or below the estimated level of the seasonal high water table and a sheen is not present on the water table, then a groundwater sample will not be collected.
iii. If a soil sample is analyzed using the SPLP for TRPH and the result exceeds the GCTL, a groundwater sample will be collected to confirm that no impacts to groundwater are present. If the groundwater sample has no GCTL exceedances, then no additional groundwater monitoring actions will be undertaken if cleanup is completed by soil removal per Section 3.1.5.b.iii. If soil removal is not feasible, the soil confirmation sampling procedures listed in Section 4.1.5.c and groundwater monitoring procedures in Section 4.1.5.d.iii will be implemented.
iv. If the groundwater sample shows impacts exceeding GCTLs, then at least one additional temporary well will be installed at the down gradient property boundary, or at a location best suited for the property.
v. If the property boundary (or other) groundwater sample passes GCTLs, but the source area groundwater did not, the following options are available:

- If the groundwater concentrations are within natural attenuation default concentrations, (NADCs, Table V, Chapter 62-777, FAC) then Natural Attenuation Monitoring (NAM) may be implemented according to the procedures described in Section 4.1 sub-subparagraph 5.d.v.
- If the MODEF concentration in groundwater at the source area exceeds natural attenuation default concentrations, source area remediation may be proposed in accordance with Chapter 62-780, FAC.
- If engineering or institutional controls are available and appropriate under Chapter 62-780, FAC, a proposal utilizing such control(s) may be developed and submitted for the Department's consideration.

vi. If any groundwater sample collected from a property boundary well contains TRPH greater than the GCTL, DEF will propose offsite groundwater monitoring down gradient from the site and evaluate remedial alternatives.

3.2 Waste Disposal

MODEF impacted soil will be disposed at a DEF-approved, FDEP permitted treatment/disposal facility.

3.3 Recordkeeping

Upon completion of response action activities, appropriate DEF remediation records set forth below, as applicable, will be maintained in the DEF database/filing system for a period of at least five years from the date of discharge or the date of discovery and made available to FDEP upon request:

- Date of discharge or date of discovery of discharge;
- Location of discharge (e.g. street address of discharge, if known) and a narrative description or illustration indicating where the discharge occurred;
- A statement regarding whether the MODEF discharge is believed to have resulted from a PCB transformer or other PCB contaminated electrical equipment as defined in 40 CFR Part 761, based on company knowledge, records search, screening, etc.
- The estimated quantity of MODEF discharged;
- Narrative description or illustration indicating where samples were taken;
- Screening method used;
- TRPH information and a description of any physical obstacles, if applicable, preventing removal to levels below the lower of the direct exposure or leachability soil cleanup target level for TRPH, or an alternative number agreed to with the Department;
- Narrative description or illustration of the limits of the excavation;
- The volume of free MODEF collected, if any;
- The volume and location of impacted soil excavated or groundwater recovered;
- Copies of all field screening results and laboratory reports, including those done for disposal; and,
- The name and/or address of the facility where free MODEF-impacted soil or groundwater was disposed or treated, including disposal and/or treatment manifests or certifications.

3.4 Timeframes

As described in the *Guidance for Mineral Oil Dielectric Fluid Emergency Response Action Protocol* (Rule 62-780.100(22), FAC) Attachment "A" and "B", a MODEF release normally has very low toxicity in the environment and is unlikely to pose a chronic health risk if removed in a timely manner. In recognition of this low toxicity and of the need for continuous and reliable flow of electricity to neighborhoods, for the purposes of implementing this voluntary cleanup protocol, in accordance with Rule 62-780.790(3), FAC, the timeframe for completion of activities under this Section 3.0 can be extended to a total of 60 days, without further approval or notification to the FDEP, provided all

work will be completed within 60 days. If the response action activities take longer than 60 days to complete, the protocols and recordkeeping requirements in Section 4 will be followed.

4.0 Non-De Minimis MODEF Cleanups (Remediation is Completed >60 Days from the Time of Discovery)

Certain MODEF discharge responses require greater planning and electrical outage coordination at a substation or with the customer to ensure that the electrical equipment may be removed or safely worked around during cleanup activities. In accordance with applicable provisions of Rule 62-780.500, FAC, for those MODEF sites requiring more than 60 days after the discharge from DEF equipment is discovered or reported to DEF, DEF will utilize the protocol set forth below.

4.1 Discharge Response

The following protocol will be followed for Source Removal MODEF response actions:

1. PCB Screening

   a) Oil

   Check the nameplate or other label for PCB content. If PCB content is not identified, test the equipment for PCBs using a 50 ppm Dexsil Clor-N-Oil® test kit and collect an oil sample for confirmatory laboratory analysis. The Clor-N-Oil test measures total chlorine in oil; therefore, it is possible that a positive result may be influenced by chlorine present in the oil from sources other than PCBs. If the label or Clor-N-Oil test indicates PCBs are present at concentrations at or greater than 50 ppm, follow the applicable EPA PCB spill cleanup protocol. If field screening results indicate <50 ppm PCBs, proceed with the cleanup beginning in paragraph 2. below.

   b) Soil

   Field screening shall be conducted if the PCB content of the OFE is ≥50 PPM or unknown. Test soil in an area most visibly impacted by mineral oil for PCBs using a 50 ppm Dexsil Clor-N-Soil® test kit. The Clor-N-Soil test measures total chlorine in soil; therefore, it is possible that a positive result may be influenced by chlorine present in soil from sources other than PCBs. If the Clor-N-Soil test indicates PCBs are present at concentrations at or greater than 50 ppm, follow the applicable EPA PCB spill cleanup protocol. If Clor-N-Soil results indicate PCBs in soil are less than 50 ppm, proceed with the cleanup as described below.

2. Cleanup Activities – Assessment / Cleanup Strategies for Soil

   a) For remediation activities that extend > 60 days, provide notice of field activities by email to the FDEP in accordance with subsection 62-780.220(1), FAC, within seven (7) days, but not less than 24 hours, of work that extends beyond 60 days.
   b) Delineate the extent of visible surface staining, if any.
   c) Excavate affected soil.
   d) Utilize a Dexsil PetroFLAG® screening kit to confirm removal of soil containing MODEF greater than the leachability SCTL for TRPH (340 mg/kg as of the date of this VCP). Samples should be collected at each of the four sidewalls and bottom of the excavation for a minimum of five samples to ensure the cleanup is complete. Samples should be collected from soil most heavily impacted by MODEF, especially the smear zone immediately above the water table if the MODEF appears to have intercepted the water table. Record the results of each sampling event, including location of each sample and all sample results.
   e) Once excavation is complete, record the overall dimensions and location of the required excavation.

f) Place all excavated soil in appropriate containers (e.g. 55-gallon drum, roll-off container, or soil vacuum truck) or on plastic sheeting and covered to prevent contact with rainfall or stormwater runoff.
g) Transport MODEF impacted wastes for disposal at a licensed soil treatment/disposal facility.
h) Restore area to its original configuration via backfilling with clean fill and rock as necessary. Commercially available backfill used to provide fill for residential uses will be obtained for backfilling excavations. In addition, thermally treated soil meeting the requirements of Rule 62-713.520(2), FAC may be used for backfill.

3. Cleanup Activities – Assessment / Cleanup Strategies for Groundwater

a) Assessment and remediation of lateral and vertical impacts will be performed, as necessary, when MODEF affected soil (with a TRPH concentration greater than the LB-SCTL) is identified at or below the water table, or a sheen or free product is observed on the water table, to ensure that the applicable groundwater cleanup target level is not exceeded.
b) Both additional soil and groundwater will be physically removed via appropriate techniques (e.g. vacuum truck, etc.) until the soil is confirmed to contain less than the LB-SCTL for TRPH and no sheen is present on the groundwater.
c) As described in subparagraphs d and e below, a groundwater sample will be collected when MODEF affected soil with a TRPH concentration greater than the LB-SCTL is identified at or below the water table, or when a sheen is observed on the water table.
d) A groundwater sample will be collected from a temporary monitor well installed in the vicinity of each remediated area. All groundwater sampling activities proposed at MODEF sites will be conducted in accordance with the Department's Standard Operating Procedures (SOP-001/01) and Chapter 62-160, FAC.
e) Groundwater samples will be collected and submitted to a NELAC-certified laboratory according to Chapter 62-160, FAC for analysis of TRPH using the FL PRO Method. Groundwater quality results will be compared to GCTLs as described in Table I, Chapter 62-777, FAC.
f) Upon completion of additional remediation activities and required sampling, clean backfill will be placed in the remediated area, as needed. Only commercially available backfill used to provide fill for residential uses will be obtained for backfilling MODEF excavations. In addition, thermally treated soil meeting the requirements of Rule 62-713.520(2), FAC may be used for backfill. If subsequent review of field and/or laboratory analytical data confirm that additional remediation activities are required in the backfill area, further applicable cleanup activities under this paragraph 3 will be undertaken.

4. Risk Based Corrective Action Remediation (RBCA) Strategies

a) Other case by case utilization of RBCA concepts, principles, timeframes, and factors (including engineering or institutional controls), as applicable, may be used for impacted media upon notification to and approval by the FDEP.
b) Applicable RBCA provisions of Chapter 62-780, FAC may be utilized to implement the potential strategies referenced in subparagraph 4.a above.
c) For remediation activities that extend > 60 days, provide FDEP an Emergency Source Removal Report within 60 days of completion of Source Removal MODEF response actions in accordance with Rule 62-780.500(6), FAC, and Table A referenced therein. Such report shall include the information specified in subsection 4.3. However, Notice of Initiation of Emergency Response Action, an Emergency Source Removal Proposal, and an Emergency Source Removal Status Report referenced in Table A shall not be required. Email notification per 4.1.2a satisfies the Notice of Initiation of Emergency Response Action requirement. This MODEF VCP document satisfies the Emergency Source Removal Proposal requirement.
d) At some MODEF sites, structures or other types of obstructions may cover soil that has been impacted by MODEF and the possibility of a safety or structural concern may prevent the removal of a structure to address impacted soil. It may not, therefore, be possible to remove all impacted soil at some sites.
e) Alternative SCTLs: In cases where impacted soil cannot be addressed by removal methods, DEF may propose engineering or institutional controls to address impacted soil or may propose the use of

alternative SCTLs according to the procedures described in "Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, FAC" (February 2005 or as amended) or by using site specific soil parameter data to calculate an alternative SCTL per the formula detailed in Figure 8, Chapter 62-777, FAC. The procedures for the development of alternative SCTLs at Non-Emergency MODEF sites are summarized below.

After all attempts at removal of impacted soil have been completed, soil samples will be collected for onsite screening of TRPH to assess the vertical and horizontal extent of remaining impacted soil. An additional sample will be collected from the most impacted area for laboratory analysis of TRPH using the FL PRO Method and for TRPH speciation using the MADEP Method or for site specific soil parameter data using the formula detailed in Figure 8, Chapter 62-777, FAC to develop an alternative SCTL. The results of the FL PRO analysis will be used to verify whether the soil sample contains elevated concentrations of TRPH. The TRPH results will be compared to the alternative SCTL calculated using site specific soil parameter data or if alternative SCTLS are developed using the MADEP method, MADEP results will be compared to the alternative SCTLs presented in Table C-9 of the Technical Report, "Development of Cleanup Target Levels (CTLs) for Chapter 62-777, FAC" (February 2005 or as amended). The CTLs are set forth in the attached Table 1.

If MADEP results are greater than the applicable CTLs, then additional sampling may be required to complete the evaluation of alternative SCTLs, as described in the following sections.

5. Supplemental Remediation Strategy Details

a) Alternative CTLs – Soil Remediation, Exposure Exceedance

If MODEF affected soil, impacted greater than the exposure SCTL for TRPH, is present in an area that cannot be excavated, a sample will be collected for MADEP analysis, and the results compared to the alternative cleanup target levels for TRPH fractions referenced in Section 4.1 subparagraph 4.e above. If the MADEP results indicate residential exposure SCTLs are exceeded, the following procedures will be followed:

i. Evaluate the feasibility of moving or supporting structures, or removing trees to facilitate removal of affected soil.
ii. If the feasibility is acceptable then soil will be removed in accordance with the VCP procedures described above.
iii. If the feasibility of moving or supporting trees/structures is not acceptable then natural attenuation soil confirmation sampling procedures listed in subparagraph c may be implemented.

b) Alternative CTLs – Soil Remediation, Leachability Exceedance

If MADEP soil samples are collected and the results exceed one or more leachability SCTLs for speciated TRPH fractions, the following procedures will be followed:

i. If direct exposure SCTLs are also exceeded, the procedures listed in subparagraph a) above will be implemented.
ii. If the MADEP results fail one or more of the leachability SCTLs, a sample will be collected, prepared using the SPLP, and analyzed for TRPH using the FL PRO Method. If the SPLP results reflect no exceedance of the TRPH GCTL and soil containing TRPH greater than the LB-SCTL is not detected at or below the estimated level of the seasonal high water table and a sheen is not present on the water table, a groundwater sample will not be collected. If soil containing TRPH greater than the LB-SCTL remains at or below the water table or a sheen remains on the water table, a groundwater sample will be collected as described in subparagraph d) below to confirm that no impact to groundwater has occurred greater than the TRPH GCTL. If the groundwater results exceed the TRPH GCTL refer to subparagraph d) below.

iii. If the SPLP TRPH analysis exceeds the TRPH GCTL, the procedures listed in subparagraph d) below will be implemented to ensure there are no impacts to groundwater greater than GCTLs. In addition, an evaluation will be conducted to assess the feasibility of soil removal versus soil confirmation sampling. If soil removal is conducted, procedures already described herein will be used. If soil removal is not feasible, the soil confirmation sampling procedures listed below will be implemented.

c) Natural Attenuation and Soil Confirmation Sampling

Natural Attenuation Monitoring (NAM) refers to the reliance on natural processes to achieve site-specific remedial objectives. NAM is an appropriate and applicable remedial strategy to use in areas of MODEF impact where soil with MADEP exceedances of TRPH SCTL fractions remain beneath structures (e.g. buildings, substation equipment, etc.) or trees, which cannot be removed without extensive cost. NAM soil confirmation sampling procedures are described as follows:

i. If MADEP results exceed one or more residential speciated TRPH fraction SCTLs, soil samples will be collected from the impacted soil on an annual basis for up to five years to monitor the progress of natural attenuation.
   - Soil samples will be collected for field screening and laboratory analysis. The PetroFLAG® kit will be used to screen the sample prior to laboratory analysis to ensure the sample is representative of the impacted soil (i.e., greater than the LB-SCTL for TRPH). The sample will be submitted to the laboratory for analysis of TRPH using the FL PRO and MADEP methods. If the laboratory results confirm that TRPH is present at a concentration greater than the LB-SCTL and the MADEP results show no exceedances of TRPH fraction CTLs, then NAM activities will be terminated.
   - In the event that PetroFLAG® screening indicates soil containing TRPH greater than the LB-SCTL is no longer present in the impacted area, a minimum of four samples will be collected to confirm the screening results. Samples will be collected both laterally and vertically at appropriate intervals depending on extent of the original impacted area. If all soil samples collected for screening contain TRPH less than the LB-SCTL, then additional sampling and soil removal will be terminated.

ii. If the MADEP results exceed one or more leachability TRPH fraction SCTLs and the TRPH SPLP results exceed the TRPH GCTL, groundwater samples will be collected from the impacted area as described in subparagraph d) below.

d) Alternative CTLs – Groundwater Sampling

This subparagraph contains procedures for assessment and remediation of groundwater in the event that MODEF affected soil is identified at or below the water table, or a sheen is observed on the water table. The procedures below outline additional groundwater assessment and remediation in the event that soil analytical results exceed one or more TRPH (total and fractions) leachability SCTLs.

i. If soil containing TRPH greater than the LB-SCTL remains at or below the water table or a sheen remains on the water table, a groundwater sample will be collected to confirm that no impact to groundwater has occurred greater than the TRPH GCTL (See Attachment 1).

ii. If a MADEP leachability SCTL is exceeded but a soil sample analyzed using the SPLP for TRPH does not exceed the TRPH GCTL, and soil containing TRPH greater than the LB-SCTL is not detected at or below the estimated level of the seasonal high water table and a sheen is not present on the water table, then a groundwater sample will not be collected (See Attachment 2).

iii. If a soil sample is analyzed using the SPLP for TRPH and the results are greater than the TRPH GCTL, no additional groundwater monitoring actions will be undertaken if cleanup is completed by soil removal under sub-subparagraph b.iii above, or an engineering control is implemented to prevent leaching from soil to groundwater. If additional soil removal or an engineering control is not an option, then a minimum of two quarterly groundwater sampling events will be conducted to demonstrate that contaminants will not leach into ground water at concentrations that exceed the TRPH GCTL. If groundwater samples indicate no GCTL

exceedance after two consecutive quarterly groundwater samples, then no additional groundwater monitoring actions will be undertaken.

iv. If a groundwater sample shows impacts exceeding GCTLs, then at least one additional temporary well will be installed at the down gradient property boundary, or at a location best suited for the property.

v. If the property boundary (or other) groundwater sample passes GCTLs, but the source area groundwater sample did not, the following options are available:
   - If the groundwater concentrations are within natural attenuation default concentrations, then NAM may be implemented as follows:
     - Groundwater samples will be collected from the source well and property boundary well on a quarterly basis for analysis of TRPH. The sample results will be evaluated for evidence of natural attenuation for a period of up to five years. If attenuation of TRPH to less than the GCTL has not occurred after five years, a Site Assessment Report and Risk Assessment Report or Remedial Action Plan will be submitted to FDEP.
     - If any groundwater sample collected from a property boundary well contains TRPH greater than the GCTL, DEF will propose offsite groundwater monitoring down gradient from the site and evaluate remedial alternatives.
   - If the MODEF concentration in groundwater at the source area exceeds natural attenuation default concentrations, source area remediation may be proposed in accordance with Chapter 62-780, FAC.
   - If engineering or institutional controls are available and appropriate under Chapter 62-780, FAC, a proposal utilizing such control(s) may be developed and submitted for the Department's consideration.

vi. If any groundwater sample collected from a property boundary well contains TRPH greater than the GCTL, DEF will propose offsite groundwater monitoring down gradient from the site and evaluate remedial alternatives.

4.2 Waste Disposal

MODEF impacted soil will be disposed at a DEF-approved, FDEP permitted treatment/disposal facility.

4.3 Recordkeeping and Reporting

Upon completion of response action activities appropriate DEF remediation records set forth below, as applicable, will be maintained in the DEF database/filing system for a period of at least five years and will be provided to FDEP in the Emergency Source Removal Report referenced in subparagraph 4.1.4.c) :

- Date of discharge or date of discovery of discharge;
- Location of discharge (e.g. street address of discharge, if known) and a narrative description or illustration indicating where the discharge occurred;
- A statement regarding whether the MODEF discharge is believed to have resulted from a PCB transformer or other PCB contaminated electrical equipment as defined in 40 CFR Part 761, based on company knowledge, records search, screening, etc.
- The estimated quantity of MODEF discharged;
- Narrative description or illustration indicating where samples were taken;
- Screening method used;
- TRPH information and a description of any physical obstacles, if applicable, preventing removal to levels below the lower of the direct exposure or leachability soil cleanup target level for TRPH, or an alternative number agreed to with the Department;
- Narrative description or illustration of the limits of the excavation;
- The volume of free MODEF collected, if any;
- The volume of impacted soil excavated or groundwater recovered;

- A scaled site map showing the locations of all excavations, soil borings and monitoring wells;
- Copies of all field screening results and laboratory reports, including those done for disposal; and,
- The name and/or address of the facility where free MODEF, impacted soil, or groundwater was disposed or treated, including disposal and/or treatment manifests or certifications.

If an exceedance of an applicable CTL remains due to MODEF following the remedial actions described above, the results of NAM, proposed plans for Engineering Controls/Institutional Controls, Site Assessment Reports (Rule 62-780.600(8), FAC), Risk Assessment Reports (Rule 62-780.650, FAC) or Remedial Action Plans (Rule 62-780.700, FAC), as applicable, will be prepared and submitted to the Department within the timeframe listed below under Schedules, in accordance with Table A and other requirements of Chapter 62-780, FAC. Applicable portions of reports submitted to the Department will be signed and sealed by a Professional Geologist or Professional Engineer registered in the State of Florida.

4.4 Notice for Discovery of Contamination Beyond Property Boundaries

Notification of contamination beyond property boundaries will be completed within the timeframe listed in Subsection 4.6 below according to Section 376.30702, Florida Statutes (F.S.) and Rule 62-780.220, FAC. Notice will be provided as follows:

- Form 62-780.900(1), FAC, *Initial Notice of Contamination Beyond Property Boundaries*

4.5 Subsequent Notice of Contamination Beyond Source Property Boundaries for Establishment of a Temporary Point of Compliance

Subsequent notification of contamination beyond source property boundaries for establishment of a temporary point of compliance will be completed according to Section 376.30701(2)(b), F.S. and Rule 62-780.220(3), FAC.

4.6 Schedules

The deliverables listed below will be submitted to the FDEP, in accordance with Table A and other requirements of Chapter 62-780, FAC, according to the following schedule:

- Initial Notice of Contamination Beyond Property Boundaries within 10 days of receipt of laboratory analytical results that indicate contamination exists in any medium beyond the property boundaries at which MODEF rehabilitation was initiated.
- Remedial Action Plan within 90 days following approval of a Site Assessment Report, if needed.
- Engineering Controls/Institutional Controls proposals within 90 days following approval of a Site Assessment Report, as appropriate.

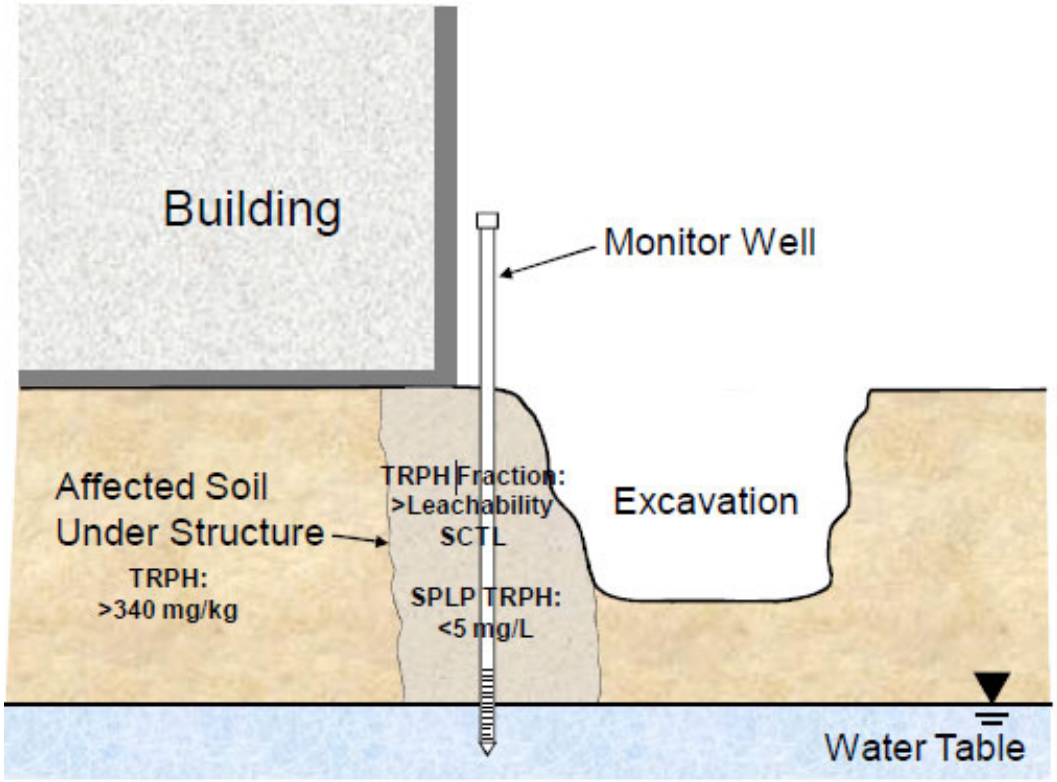
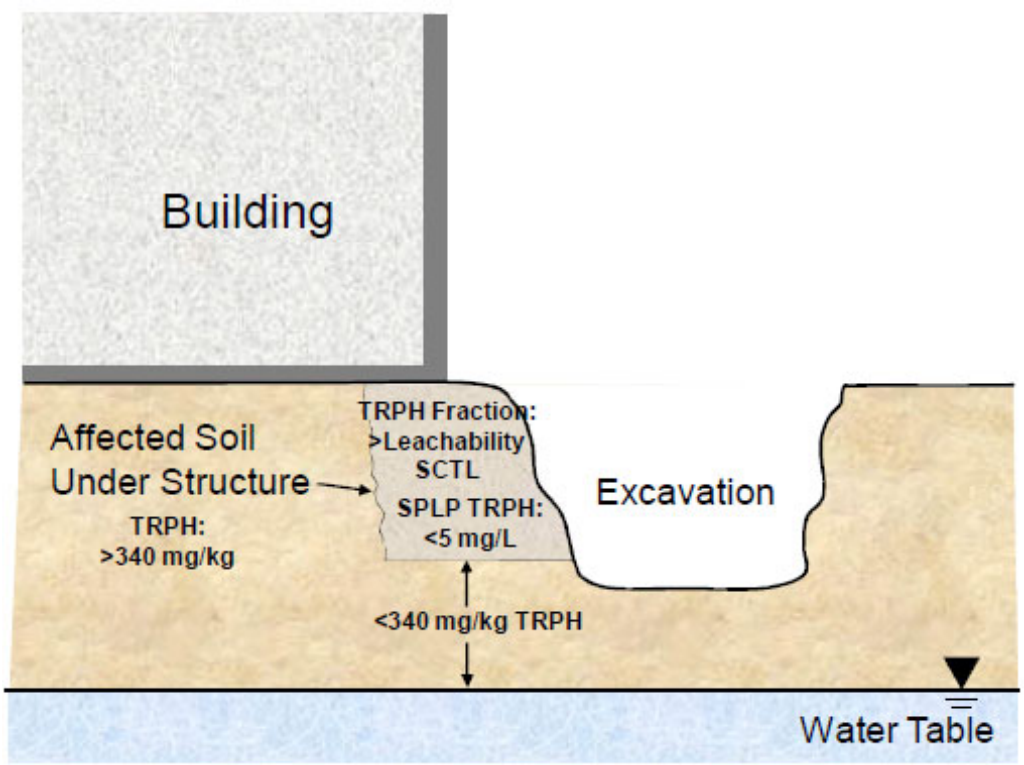
TABLE 1

Direct Exposure and Leachability Soil CTLs for TRPH Fractions Identified Using the MADEP Methodology

MADEP FRACTION	RESIDENTIAL (mg/kg)	INDUSTRIAL (mg/kg)	LEACHABILITY (mg/kg)
Aromatics			
C9-C10	560	3400	380
C11-C22	1800	15000	1000
Aliphatics			
C5-C8	7100	38000	960
C9-C12	1700	11000	31000
C9-C18	2900	21000	140000
C19-C36	42000	280000	1000000

Source: Table C-9, Technical Report, "Development of Cleanup Target Levels (CTLs) for Chapter 62-777, FAC" (February 2005)

Attachment 1 - Natural Attenuation Monitoring, Groundwater Sampling Required



Attachment 2 –Natural Attenuation Monitoring, Groundwater Sampling Not Required