NJDEP Technical Guidance Document Review Form

Document: ***"Evaluation of Extractable Petroleum Hydrocarbons in Soil Technical Guidance"***

Comment Period: ***December 20, 2018 to January 31, 2019***

Committee Chairperson: John Ruhl

Comment #	Page	Section	Subsection	COMMENTS	RESPONSE
1	2	TOC		Please include list of tables and figures in the Table of Contents	This has been done to the extent practicable.
	5	2		We would like to acknowledge that NJDEP is providing the regulatory community an option to develop an AOC-specific alternative EPH product limit.	Duly Noted.
2	5	2		1st paragraph after the bullets, 2nd to last sentence: The NJDEP should revise the sentence to emphasize that delineation of EPH is required within both the unsaturated and saturated soils for the purposes of this Technical Guidance Document.	Change Made To Guidance.
1	6	3	0	First sentence, specify soil ".. EPH analysis of soil required .." instead of ".. EPH analysis required.."	Change Made To Guidance.

1	6	3		NJDEP states that crude oil is now considered a Category 1 EPH. The rationale indicated in the draft guidance document is that crude is the source of No. 2 Heating Oil. According to the US Energy Information Administration (EIA), crude oil is the source of gasoline, diesel fuel, jet fuel, kerosene, and heavy fuel oil. At sites with multiple discharges of various petroleum hydrocarbons, this would be challenging. Will NJDEP consider using the results of fractionated EPH sample to determine the "characteristics" of the petroleum mixture as a Category 1 or Category 2 EPH (i.e., fractionated EPH results with more of the large carbon chains would be Category 2)?.	No. The EPH analytical method was specifically developed to calculate human health-based (i.e., ingestion-dermal) soil remediation criteria. Because the EPH analytical method does not evaluate all hydrocarbon groups likely to be found in crude oil, the method is not appropriate for "speciation of product". To clarify, crude oil is designated Category 2 with fractionated EPH analysis generally required for determination of the sample-specific EPH SRC. However, the 8,000 mg/kg EPH default product limit is now assigned to crude oil because crude oil contains hydrocarbons with a wide range of densities and dynamic viscosities, including as the commenter noted, lighter fractions such as gasoline, jet fuel, kerosene. Sites with multiple discharges of various petroleum products should follow N.J.A.C. 7:26E-2.1 and the guidance in Section 4.1.3 **Mixtures**. No Change.
2	7	3	0	List of guidance documents -not sure exactly why LNAPL guidance is listed; it does not even mention EPH, but if because of LNAPL recovery, then the Department's In Situ Design and Performance Monitoring Tech Guidance should also be listed. Either take out the LNAPL doc reference or also include the In Situ tech guidance.	The LNAPL guidance is included because it addresses petroleum product in ground water. The Committee is also including the *In Situ Remediation: Design Considerations and Performance Monitoring Technical Guidance Document* because it references additional technical resources regarding free product and residual product. Change Made To Guidance.
1	8	4	4.2.1	Suggest rewording the end of the last sentence of the last paragraph to say "and the source has not been identified".	Change Made To Guidance with minor rewording.
	8	4	2	Recommend "product limit of 8,000 mg/kg. If calculated, the lower of an AOC-specific alternative product limit or the 30,000 mg/kg EPH ceiling limit may be utilized.	Change Made To Guidance with minor rewording.
4	9	4	2.1	With regard to the EPH Product Limits, this Technical Guidance is an important improvement from the prior EPH Protocol as it provides a clear methodology for site-specific thresholds to be calculated utilizing factors for soil and product type. However, the Department's continued reliance on a "residual saturation concentration" methodology for the development of a "defacto" remedial standard will continue to result in costly/time-consuming remedial actions and project delays. The regulatory definitions of residual and free product must be evaluated for the Department's LNAPL management policy to be updated to the state of the science.	The definitions of "residual product" and "free product" are found in N.J.A.C. 7:26E. It is outside the purview of this guidance to re-evaluate regulation. No Change.

5	9	4	2.1	The Technical Guidance document states, *"For situations where there is evidence of EPH free product (e.g., LNAPL on ground water) and EPH soil concentrations are less than the EPH product limits, additional investigation or remedial action of soil may be needed to address a source of EPH product that may have been missed during the previous investigations."* Due to the differences in residual saturation concentrations in unsaturated and saturated soils, this requirement does not recognize that, at legacy spill sites, the LNAPL body within the unsaturated and saturated zones will reach a "residual saturation concentration" where the LNAPL will be intermittent/immobile. It is likely at these legacy sites that the EPH soil concentration would be below the Default EPH Product Limits or (more likely) will be below alternative product limit concentrations. At legacy sites, the appearance of LNAPL in a monitoring well for the first time or first time in many years (i.e., decade(s)) is more of a function of a change in water table elevation that allows the LNAPL to be mobilized to a nearby monitoring well. The commenter recognizes that the Guidance says "may need" additional investigation/remediation. The Guidance should note that this would be more of a concern at new/recent spill locations where the extent and behavior of the LNAPL body and associated dissolved/vapor phase plumes are not understood and LNAPL migration may still be a concern.	The paragraph is intended as an alert that the investigator may need to re-evaluate the Conceptual Site Model and possibly conduct additional work. No Change.
	9	4	2.1	Not clear that compliance averaging is only applicable to Cat 1.	The paragraph states that compliance averaging is not allowed for EPH product limits. Section 2.0 addresses compliance averaging of EPH Category 1 soil remediation criteria. No Change.
3	9	4	2.1	First sentence -to be consistent with the rule - change "where practicable" to "the extent practicable"	Change Made To Guidance.
4	9	4	2.1	Third paragraph - specify LNAPL, including sheen, since the standard is non-noticeable or use "e.g., sheen on ground water"	LNAPL is used as an example. No Change.

1	9	4	2.1	Guidance states: "A Remedial Action Permit that includes both institutional controls and engineering controls required for a site where the EPH concentration exceeds the default product limits," The guidance should clarify and specify the applicability and type of permit required. The Guidance should reference if a Soil Permit is to be needed for residual product under an engeneering control if no free product is present and or if a groundwater permit will be required for free product. If a new type of permit for LNAPL will be developed, that should be stated. Instuctions for a ground water permit state : "The Ground Water Remedial Action Permit can be applied for once a ground water remedial action has been implemented and determined to be protective as follows" ... 2c. All free and/or residual product in the unsaturated and saturated zones, as determined pursuant to N.J.A.C. 7:26E-5.1(e), **is being or has been treated or removed** for all AOCs associated with this CEA." This is inconsistant with residual product in soil only that is to remain under an engeneering control.	Language has been added in the first line to clarify that the required Remedial Action Permit is "for soil". Change Made To Guidance. Addditional language for ground water remedial action permits is outside the purview of this guidance. No Change.
6	9	4	2.2	The acknowledgement that compliance with EPH Technical Guidance at larger complex facilities may be impractical is appreciated. If the NJDEP is stating there is some flexibility in applying the EPH Guidance to larger complex non-residential sites, a case study showing best management practices for EPH at large complex sites during the Technical Guidance training session would be helpful.	As stated in the Introduction of the guidance, "The focus of this guidance is on the evaluation of EPH data for its compliance with the EPH soil remediation criteria...and on EPH product limits which are not included in other technical guidance." Case study training showing best management practices for EPH at large complex sites is outside the purview of this guidance. As stated in the second paragraph of this section, "For these types of sites, the investigator is advised to seek consultation with the Department before proceeding with a determination of impracticability or making a final decision on a remedial action." No Change.
5	10	4	2.2	If claiming TI, it should be similar to gw TI in that it is re-evaluated every 5 years and it should be tracked in NJEMS. Maybe something changes so the product can be removed. Maybe a building is removed and the product is now accessible.	Outside the purview of this guidance. No Change.
6	10	4	2.2	Emphasize that you need to try to treat or remove and not simply say it can't be done. Also, point to the Department's in situ design and performance monitoring tech guidance.	Change Made To Guidance.
2	11	4	4.3	Last paragraph: Suggest rewording the 2nd sentence to say "The investigator should also collect sufficient soil volume for performance of Synthetic Precipitation Leaching Procedure (SPLP) analysis to evaluate the potential of an impact to groundwater (IGW) if contingent parameters are detected above the Default IGW screening levels.	Change Made To Guidance.

3	11	4	4.3	Begin the paragraph by indicating "For EPH concentrations exceeding 1,700 mg/kg". Add a sentance indicating EPH cannot exceed 4,000 mg/kg in an ESNR for terrestrial soil.	1st comment - Change Made To Guidance. 2nd comment - Reference is made to the 4,000 mg/kg EPH limit for ESNRs in terrestrial soil in Sections 5.1 through 5.3 and directs the investigator to the *Ecological Evaluation Technical Guidance* because the 4,000 mg/kg limit is an ecological remediation criterion and its basis is established in that guidance. Reference to the 4,000 mg/kg limit in this guidance is a courtesy alert. No Change.
1	11	4	4.4	Add website address for *Intro to Soil Remediation Standards Guidance* reference - https://www.nj.gov/dep/srp/guidance/rs/ this reference my not be obvious to the investigator (as opposed to a typical guidance document like the *Development of Site-Specific Impact to Ground Water Soil Remediation Standards Using the Synthetic Precipitation Leaching Procedure*)	Change Made To Guidance.
4	12	5	0	Reword the 2nd sentence to say "The investigator is reminded that departures from this technical guidance require written rationale to be provided if the LSRP determines the guidance is inappropriate or unnecessary, and shall be in accordance with the requirements of the Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C. 7:26C-1.2(a)3.)." which is more consistent with the ARRCS language.	Used the commenter's main suggestions and rearranged the paragraph so that the rationale for departure from guidance is last. Change Made To Guidance.
5	12	5	5.1	Step 1.B.i. suggests that excavation or treatment should be performed (Step 1) before analyzing for contingency parameters (Step 2). This also suggests that only post-excavation samples would only be subject to the contingency parameters. Was it the Department's intent that contingency analyses be performed post-remediation? If not, then it is suggested that a sentence indicating "perform Step 2 concurrently with Step 1" be added to Step 1.	The investigator must decide in advance whether to bring the equipment for contingency sampling and analysis as stated earlier in Section 4.3. The committee did not deem it necessary to reiterate this reminder. No Change.
6	12	5	5.1	Please consider separating the following sentences into 2 paragraphs, to distinguish between the point at which the investigator can stop work, and the point at which further investigation is needed. " When all EPH sample concentrations are ≤1,000 mg/kg at the AOC, then remediation is complete and an unrestricted use RAO for EPH can be issued. For all EPH sample concentrations >1,000 mg/kg, complete each of the Steps below to determine whether remediation of EPH or other contaminants is necessary."	Change Made To Guidance.

7	12	5	5.1	Step 1.C. indicates "For all EPH sample concentrations >5,100 mg/kg, either:…" Suggest that a range be indicated here (5,100 to 8,000 mg/kg OR AOC-specific limit) since C.ii and iii. would not apply to any concentrations above the default 8,000 or the AOC-specific product determination limit (as referenced in Section 4.2.1) unless a TI determination was accepted?	Steps 1.A, 1.B, and 1.C divide Step 1 into algorithm components with the presumption that the investigator addresses Steps 1.A and 1.B prior to reaching 1.C. Therefore by default, only the exceedence(s) greater than the EPH residential SRC and less than or equal to the applicable product limit remain. No Change.
8	14	5	5.1	Step 3.B. describes the steps for remediation of 2-methylnaphthalene and naphthalene, however, it is suggested that the steps be reversed to indicate remedial investigation first as Step 3.B.i. Suggest also mentioning compliance attainment options to address these chemicals.	Step 3.B.i recognizes excavation as the more traditional option of remediation, whereas ii. alludes to all other remediation options. The committee evaluated the order several times and agreed on this format. No Change.
	14	5	1	Step 3 - not clear that you should evaluate for ssIGWSRS as an alternative to 3.B.i	Changes Made To Guidance.
9	15	5	5.2	Step 4.B. ii. refers to "However, EPH cannot exceed 4,000 mg/kg in an ESNR for terrestrial soil (see Section 6.4.5 in the Ecological Evaluation Technical Guidance)" at the end of the paragraph. Suggest indicating in Step 4.B. that removal of EPH > 4,000 mg/kg is required in the first sentence, so that it is emphasized.	EPH levels above 4,000 mg/kg in an ESNR do not always require removal. Address in accordance with the Ecological Evaluation Technical Guidance. No Change.
10	15	5	5.2	In Step 4.B., can capping under a RAP be added as a remedial option for EPH between 1,700 and 4,000 mg/kg?	
1	17	5	2	How are steps i. and iii. different? Doesn't 3.B.i say it all? You either excavate or treat soil or collect remedial action confirmation samples. And if you decide to keep the iii. Section, it should be renumbered as ii.	Step 3.B.i recognizes excavation as the more traditional option of remediation, whereas ii. alludes to all other remediation options. The numerical typographical error has been corrected.
7	17	5	2	CATEGORY 1 – Discharges of only Number 2 (No. 2) heating oil or diesel fuel: Non-Residential Land Use: Step 3.A. is comparing the sample concentrations of naphthalene to the residential direct contact soil remediation standard. In this step, naphthalene should be compared to the non-residential direct contact soil remediation standard. Please confirm.	Change Made To Guidance.
1	17	5	2	Historic Fill is not mentioned in the Guidance. Many areas in New Jersey have been documented by the department where historic fill has been used to develop the large or complex non-residential sites referenced in the Guidance. Heterogeneous fill by its composition is not well suited for the method to determine an AOC-specific alternative EPH product limit concentration based on the AOC-specific soil texture and the stored or discharged petroleum product(s). EPH limits should also be considered for Historic Fill areas. Guidance should at minimum address Historic Fill impacted by free and residual product.	Change Made To Guidance.

	17	5	2	Step 3 - not clear that you should evaluate for ssIGWSRS as an alternative to 3.B.i	Changes Made To Guidance.
	20	5	3	There should be references to the section to calculate an aoc-specific alternative EPH product limit.	Referenced in section 4.2. No Change
13	20	5	5.3	Typo: "EPH product Limit" Limit should be lower case: EPH product limit (page: 16 once and page 20 four times)	Change Made To Guidance.
11	23	NA	NA	In the Glossary, suggest clarifying that the EPH ceiling limit is 30,000 mg/kg, to make it consistent with Appendix 1 table which indicates 30,000 mg/kg as the ceiling.	Change Made To Guidance.
12	28	App 1	NA	Suggest adding a row to the Table indicating the 4,000 mg/kg EPH limit for ESNRs in terrestrial soil.	The referenced concentration is an ecological remediation criterion and not developed for this guidance. No Change.
13	28	App 1	NA	Suggest rewording the Category 2 Residential and NonResidential Default EPH product limit boxes, to say "17,000 mg/kg (except for MGP, crude oil, cutting oil, and unknown petroleum products which are 8,000 mg/kg; waste oil is parent product dependent".	Change Made To Guidance.
7	30	Apdx 2	When to use the Alternative EPH Product Limit Calculator	The draft guidance states: "The Alternative EPH Product Limit Concentration becomes the EPH product limit for the AOC regardless of whether it is less stringent or more stringent than the default concentration: Comment: The LSRP should be able to revert back to the default Product Limit Concentration (8,000 or 17,000 ppm), rather than being required to use the calculated EPH product limit. One existing similar precedent is for site-specific Impact to Ground Water Soil Remediation Standard calculations, the LSRP can choose to use the default Impact to Ground Water Soil Screening Level.	The investigator bases the decision on the Conceptual Site Model and Multiple Lines of Evidence. Change Made To Guidance.
8	52	A 3.1		An update to this basis and background document should be commissioned by the NJDEP immediately. The NJDEP should evaluate its regulatory definitions, policies, and guidance based on the current state of the science.	Re-evaluation of NJDEP regulatory definitions and non-EPH policies and other guidance is outside the purview of this guidance. No Change.
14	55	App 3.2	NA	Please consider adding additional text explaining how 3% hydrocarbons by mass of soil was selected.	The Committee considers the existing text adequate. No Change.

9	56	A 3.3		The EPH Category 1 Human Health Based Soil Remediation Criteria, Derivation document in Appendix 3.3 should be expanded to provide more information on the development of the residential criteria of 5,100 mg/kg for No. 2/diesel fuel. A copy of the EPT TPH Field Study should be included within Appendix 3.3 or be made available online along with this document. Investigators evaluating an alternative remediation standard for EPH would require access to this information.	NJDEP plans to make the TPH-EPH Field Study available on-line. The parameters and values used to calculate EPH Category 2 SRC are displayed in the new EPH Category 2 Ingestion/Dermal Residential and Nonresidential Calculators - Version 2018.
15	58	App 3.4	NA	The reference to TPH is not explained in the 2nd sentence. Although the Note explains that TPH and EPH are considered equivalent, the initial reference to TPH is not understood.	The 1,700 mg TPH/kg ESL was developed at the time petroleum storage and discharge areas were evaluated for TPH. The information in Appendix 3.4 is sourced from Frequently Asked Question 3. "How was the 1,700 mg TPH/kg ecological screening level derived?" from the Health Based and Ecological Screening Criteria for Petroleum Hydrocarbons Frequently Asked Questions (Version 4.0, August 9, 2010) [https://www.nj.gov/dep/srp/guidance/rs/eph_faq.pdf]. Appendix 3.4 has been revised.
10	58	A 3.4		The NJDEP needs to provide more information on the development of ecological criteria and ceiling concentrations. The commenter acknowledges that references to 80 documents have been posted to the NJDEP website; however, a comprehensive discussion of how the information in these various studies were utilized has not been provided by the Department in responses to the Ecological Evaluation TG comments.	This guidance simply relies on the work of the *Ecological Evaluation Technical Guidance* and any discussion of their work is not within the purview of this guidance. No Change.
11	59	A	3.5	If the RP currently has an approved NJDEP Soil Remediation Permit- for soils beneath a Building with a TPH over 10,000 mg/kg, Is there anything that is required by the LSRP when the Remedial Action Protectiveness/Biennial Certification Form is due? In other words, is the existing Soil Remediation Permit as is?	An existing Soil RAP would have required demonstrating the remedy was protective. The EPH Technical Guidance does not speak to re-evaluating the protectiveness of a remedy, it speaks to determining the EPH contaminant concentrations that may trigger institutional and engineeringing controls, and hence the necessity of a Remedial Action Permit for soil. No Change.
2	59	A.3.5		Appendix 3.5: Please clarify if this directive is a re-opener of cases with final remediation documents/RAOs issued and sites closed.	The information in Appendix 3.5 was retained from guidance associated with the EPH Protocol and pertains to active cases. It was included to provide the investigator with guidance on handling data that predates September 2010 for sites that are still open. It is not intended to set policy for cases with final remediation documents such as a No Further Action letter issued by the Department pursuant to P.L.1993, c.139 (C.58:10B-1 et al.), or a Response Action Outcome issued by a Licensed Site Remediation Professional pursuant to section 14 of P.L.2009, c.60 (C.58:10C-14). No Change.

3	59	A.3.5		Appendix 3.5: Please clarify if compliance averaging of EPH would be allowed prior to re-sampling for naphthalene and 2-methylnaphthalene.	Yes, but successful compliance averaging of EPH does not negate the requirement at N.J.A.C. 7:26E-2.1(d) to sample locations with EPH > 1000 mg/kg for naphthalene and 2-methylnaphthalene. No Change.
4	59	A.3.5		Appendix 3.5: Previously, the NJDEP has approved compliance averaging of TPH results including samples above 10,000 mg/kg. Please clarify if compliance averaging of TPH results is not longer acceptable and the rationale behind the decision. If it is no longer allowed, please provide clarity if this is a re-opener of cases with final remediation documents/RAOs issued and sites closed.	For both surface and subsurface soils, 10,000 mg/kg was set as the maximum allowable total organic contaminants, set at approximately 10% of the lower end of average field capacities (8-30%), a point beyond which movement of free product in soil could occur. NJDEP policy has not allowed and does not currently allow for compliance averaging of soil TPH results in exceedence of 10,000 mg/kg. However, there may be cases where this was done in error. It is beyond the purview of this guidance to make a policy call whether this will reopen cases with final remediation documents. No Change.
3	9 32 33	4 A 2 A 2.1	2	"The Technical Guidance document states, "If the default product limit is exceeded, this guidance provides an option for determining an AOC-specific alternative EPH product limit as described in Appendix 2." Appendix 2, Step 6. requires that "If the AOC has more than one lithologic zone with EPH concentrations that exceed the default EPH product limit...calculate an AOC-specific alternative product limit for each additional product zone." Appendix 2.1, second bullet states, "Collect additional grain size soil samples where the EPH product concentrations exceed the default product limit is larger than one-quarter acre...based on the delineation of the site." Question: If there are multiple AOCs on a particular site that exceed the default EPH Product Limit and those AOCs are in an area less than one-quarter acre and there is one lithologic zone, please clarify whether a grain size analysis is required for each AOC or if the grain size analysis can be applied to multiple AOCs.	If there is one lithologic zone within an area of one-quarter acre, and all the AOCs are delineated both horizontally and vertically to the respective EPH default product limits for the petroleum products discharged, it may be appropriate to locate "shared" grain size distribution soil samples to address multiple AOCs based on site-specific circumstances. Change Made To Guidance
2	NA	NA	NA	Variables: Can the investigator adjust other variables; can the investigator calculate site-specific: Viscosity (dynamic viscosity of the petroleum product) and/or Density (density of the petroleum product)?	No. The calculator has fixed values for dynamic viscosity and density based on fresh product in order to generate an alternative EPH product limit that is adequately protective. However, because of the great variation in crude oils and MGP petroleum, the investigator is advised to contact the Department for determination of petroleum product-specific dynamic viscosity and density for discharges of these petroleum products.

3	NA	NA	NA	MLE: Is an EPH value the only factor in determined the presence of free/residual product; what about multiple lines of evidence, MLE (i.e. absence of plume migration, monitoring wells, soil borings, etc.)? – essentially does the site-specific proposed in the new guidance replace the current 8,000/17,000 limits (for Cat. 1 and 2)	Provided they are suppported by MLE, the new guidance provides a method to develop AOC-specific EPH alternative product limits for soil that replace the EPH default concentrations of 8,000 and 17,000 mg/kg.
4	NA	NA	NA	Saturated Soils: How should the guidance be applied to EPH concentrations detect below the groundwater table (i.e. +3 ft. below the seasonally-low groundwater table)?	The EPH soil remediation criteria are direct contact soil remediation critera based on the ingestion-dermal exposure pathway which does not limit delineation and remediation based on ground water table depth [N.J.A.C. 7:26E-4.2(a)1 and -4.2(a)2]. Refer also to Question No. 8 of the August 2010 *Health Based and Ecological Screening Criteria for Petroleum Hydrocarbons Frequently Asked Questions*. Similarly, EPH in soil in exceedence of the applicable product limits must be delineated pursuant to N.J.A.C. 7:26E-4.2(a)4 and remediated pursuant to N.J.A.C. 7:26E-5.1(e), in both the saturated and unsaturated zones.
5	NA	NA	NA	Age: Did the committee consider the age of the product and age of the release when they developed the guidance? How does the Department view cases with old product, released over 30 years ago, and does the Department intend to treat new and old cases/spills differently?	The concentration of EPH in soil is compared to the respective soil remediation criteria and product limits, and reveals the current conditions of soil quality. The age of the discharge does not factor into attainment and compliance with respect to the EPH soil remediation criteria or product limits. Consequently, there is no need to treat old cases differently than new cases.
6	NA	NA	NA	Tools: Are there any other tools besides the calculator the investigator should consider when determining the free product/residual product limit?	The EPH product calculator spreadsheet “Alternative EPH Product Limit Concentration for Soil in this AOC” is the tool provided for development of an AOC-specific EPH product limit concentration. The investigator needs to determine if the alternative limit developed is protective given the site conditions.
8	NA	NA	NA	The calculator seems to be using old exposure factors (body weight of 70 kg for adult instead of 80 kg, skin surface area of 2,800 cm2 for a child instead of 2,373 cm2) as compared to EPA. However, the values appear to be consistent with those identified in the 2017 NJDEP Soil Remediation Standards (7:26D).	Correct. To be consistent with the exposure factors used to derive the current NJDEP Soil Remediation Standards, the former USEPA approved exposure factors for body weight, skin surface area, and soil adherence were used to calculate EPH soil remediation criteria.

9	NA	NA	NA	The chemicals that you can input concentrations for are different than previously, e.g., input concentration for mineral oils, naphthalene, etc. instead of carbon chains of aliphatics and aromatics. Will the lab will analyze for EPH differently now?	The Version 2019 EPH Category 2 ingestion/dermal health-based soil remediation criterion calculators for the residential and non-residential scenarios use the same fractionated EPH analytical results as the current version and there are no changes to the EPH analytical method or reporting of results.
12	NA	NA	NA	The excel seems to open with the calculator spreadsheet and also a blank excel spreadsheet, which seems like a glitch to be fixed.	The Version 2019 EPH Category 2 soil remediation criterion calculators use the same Aliphatic and Aromatic EC ranges as those in the current calculator and are based on the EXTRACTABLE PETROLEUM HYDROCARBONS METHODOLOGY (Version 3.0).
10	NA	NA	NA	Cat. 2 Calculator - Comment: Please clarify that the AL and AR fractionation ranges correspond to the same aliphatics EC and aromatics EC ranges used in the current calculator.	When first opening, it is best to have all other Excel spreadsheets closed. Drag the EPH spreadsheet calculator onto the desktop. The first time the spreadsheet is opened, it may present a blank sheet until the “enable macros” button is clicked. If asked to make the spreadsheet calculator a trusted document, reply "yes". The spreadsheet does not initially open to a spreadsheet. It first opens to a menu where the user must either select the residential or nonresidential option. Once selected, the appropriate spreadsheet opens.
5	NA	NA		Please consider providing information / guidance for LSRPs to investigate and remediate petroleum releases which are not including in Category 1 or Category 2 EPH, (e.g., Mineral Spirits).	This guidance pertains to the the investigation and remediation of Category 1 and Category 2 EPH petroleum products identified in Section 4.1. Mineral spirits and other light petroleum distillates are volatile organics and are not part of this guidance.

				Comment No. 1. The product limits recommended in the EPH Guide are largely based on residual saturation levels reported by Brost and Devaull (2000). These residual saturation levels are more relevant and less overconservative than similarly applied chemical-specific ceiling screening levels defined by 'Soil Saturation Limits', as in other selected guidance documents (such as USEPA, 1996). But the residual saturations included in Brost and Devaull (2000) are based on tests conducted in sand and dry soils in and from the unsaturated zone (Hoag and Marley, 1986; Mercer and Cohen, 1990, Zytner et al., 1993). These levels are generally conservative (overestimating risk) for evaluating petroleum mobility. They can significantly overestimate mobility in more broadly defined conditions including wet soils, loams, and clays. Thus, the proposed limits of 8,000 mg/kg and 17,000 mg/kg, for categories 1 and 2 EPH products respectively, or the ceiling limit of 30,000 mg/kg, may be unduly conservative particularly for heavier fractions (category 2) in finer-grained sediments (sands, silts, and clays). The values are not directly applicable for wet or saturated zone soils. The overall screening process may also be under-conservative (underestimating risk) in selected geologies. We suggest noted exceptions in fractured bedrock, karst, and dual-porosity soils. Descriptions of petroleum liquids migration in these complex systems is well described in CL:AIRE, 2014.	It is correct that the values from Brost and DeVaull (2000) have been obtained based on observations. However, the hydraulic conditions of each sample are not known, and therefore, the NJDEP believes that a theoretically based approach is more reproducible. In the literature, including the work of Brost and DeVaull (2000), the "residual" value is assumed to occur sometimes in situations where the NAPL forms rings that are disconnected from the overall hydraulics. However, such a value is too small (i.e. too conservative), and for this reason, the NJDEP wanted to use a more realistic value, which can be only based on the flow. Thus, the notion of residual NAPL cannot be dissociated from "flow", as there is no hard threshold above which the NAPL moves and below which it is immobile. More precisely, the determination depends on the moving speed of the NAPL. The commenters are aware that as the NAPL content decreases, its intrinsic permeability decreases until the NAPL is "practically" immobile. The role of Darcy flow or flow is also subsumed in Comments 1 through 4, where it was argued that higher viscosity oils would have a higher residual content. Thus, only by using Darcy's law that one is able to provide an arbitrary threshold. In this technical guidance, it is assumed that if a NAPL moves by less than 0.01 foot per year, it is immobile. The value is taken from the NJDEP 2013 IGW SESOIL FAQ. Thus, we do not agree with Comment 1 that the residual content depends on properties that cannot be measured. The 30,000 mg/kg EPH ceilingi concentration s not a mobility-based limit, but is a maximum EPH concentration above which the committee considers the soil to be too contaminated to behave as a natural soil.

				Comment No. 2. As proposed in the EPH Guide, a significant amount of calculation, including collection and processing of grain size data, mass concentration, and LNAPL mobility evaluation were used to calculate an alternative EPH product limit in soil. But the calculator as documented in the EPH Guide appears to be based on 'flow' equations (Darcy's law) and flow parameters (permeability, viscosity). This is not relevant or applicable for evaluating 'no-flow' residual concentrations. Residual 'no-flow' conditions are dependent (Lake, 1989) on other [hard-to-measure] parameters including surface and capillary forces (or tension), the geometry of the porous media, and the possible presence (and flow) of water and air. We therefore suggest inclusion and use of simpler, more direct and relevant measurement in evaluating residual levels. A paint filter test (EPA method 9095B) is a practical and direct approach in obtaining mobility information. The reviewers have also evaluated oil mobility in shallow soils, in multiple instances, using observation or absence of oil in a shallow dug test pit after a prescribed time (30 minutes) as an indication of oil mobility, consistent with NOAA (2013). These measurements would be more directly relevant to the issue under evaluation (mobility or immobility); could be generated with less effort and with shorter turnaround times; and would not rely on indirect correlations and intervening calculations between soil properties and fluid parameters.	The proposed tests have their advantages and disadvantages. However, a common theme is the flow of NAPL within a given duration (5 minutes or 30 minutes, depending on the test). We believe we captured the essence of these tests when we considered the travel time using Darcy's law. The EPH Alternative Product Limit Calculator in Soil was designed with a conservative (i.e., protective) basis using well-established hydraulic relations, and literature-based default values (such as viscosity and density) to represent the properties of specific hydrocarbons. Vertical movement is assumed as an additional conservative consideration. Soil grain size is a reasonably accessible measurement, and is often performed on samples from contaminate sites for other reasons. However, the committee believes that the calculator as presented provides a suitable alternative to the previous default values for Categories 1 and 2.

				Comment No. 3. There is little to no information in the EPH Guide which differentiates between unsaturated zone petroleum liquid mobility and LNAPL mobility and migration in water-saturated soils and groundwater. The residual saturation levels reported by Brost and Devaull (2000) apply for unsaturated zone soils. The measurements suggested in Comment 2 also apply mainly for unsaturated soils. There is ample and relatively new guidance on evaluating petroleum liquid mobility in water-saturated soils and groundwater. We suggest its incorporation by reference (ITRC, 2018). This assessment includes evaluation using multiple lines of evidence including (i) a stable footprint (stable and decreasing thickness), (ii) a shrinking dissolved phase plume, (iii) LNAPL velocity using Darcy velocity and bail down tests, (iv) measured LNAPL thickness < critical thickness to invade water-wet pores, (v) declining recovery rates that would generally indicate reduced potential for LNAPL mobility, and (vi) age of the release (abated release, timing of release, and weathering indicators). Added flexibility in addressing large and/or complex sites is also warranted and is included in the EPH Guide; some common issues arising at LNAPL sites are addressed in API (2018).	The technical guidance pertains to EPH in soil. Regarding unsaturated versus saturated conditions, the NJDEP believes that due to the fluctuation of the water table in New Jersey, determining whether a compound remains in the unsaturated or saturated zone is not always possible. The behavior of NAPL when water is present is not easy to predict; sometimes water flow enhances NAPL flow (i.e., flushing), and in other cases it could slow the downward movement of NAPL due to buoyancy (NAPL is lighter than water). Also, if the NAPL occupies the pore space during unsaturated conditions, it would occupy the small pores (dead ends), and thus the residual amount would be independent, to a large extent, of the water movement. The lines of investigations proposed by the Commenters are obviously great tools to better understand the system. We note in particular the usage of the Darcy flow to estimate NAPL movement, which is included in the technical guidance.
				Comment No. 4. Technical impracticability section acknowledges large or complex non-residential sites that may contain physical obstacles and no accessibility to the product to meet regulatory requirements. However, whether the LNAPL accumulated in place is physically recoverable or not were not discussed. LNAPL transmissivity metrics are reliable indicators of recoverability. At LNAPL transmissivity values of 0.1 to 0.8 ft2/d recovery is not practicable and LNAPL in the saturation zone remains largely residual (ITRC, 2018).	The Commenters are pointing out that there are situations where NAPL cannot be accessed by machinery for removal. The Commenters are arguing that if the transmissibility is small, then one may not take action for removal of NAPL. This is similar to our thrust on estimating the residual content based on flow and mobility. But in our approach, we determined the hydraulic gradient of the system, and then the acceptable distance for travel (0.01 foot/year). The focus of the EPH technical guidance is on the evaluation of EPH data for compliance with the EPH soil remediation criteria which are not included in the Department's Remediation Standards (N.J.A.C. 7:26D), and on EPH product limits which are not included in other technical guidance. Other technical guidance is available for addressing LNAPL in bedrock and in ground water

				Comment No. 5. It is not clear how the EPH threshold of 1,000 mg/kg in the Guide was set for requiring additional analyses, particularly for the heavier fractions. Furthermore, this low threshold EPH level could trigger costly remobilization, or samples may need to be split in the field for future analyses. We suggest an EPH threshold value of the lower of: (1) Half the applied EPH ingestion/dermal screening value, either default (EPH Category 1) or site-specific (Category 2), or (2) Half the value of the relevant EPH product-limit concentration. Either the default (proposed limits of 8,000 mg/kg and 17,000 mg/kg, for categories 1 and 2 EPH products respectively, or the ceiling limit of 30,000 mg/kg), or the applicable site-specific EPH product-limit determination.	The greater than 1,000 mg/kg EPH trigger for additional analyses applies to No. 2 heating oil and diesel fuel (Category 1 EPH petroleum products). It is a promulgated analytical requirement pursuant to the Technical Requirements For Site Remediation (N.J.A.C. 7:26E-2.1(d)). The basis was provided in Frequently asked questions 5 and 9 of NJDEP's Health Based and Ecological Screening Criteria for Petroleum Hydrocarbons Frequently Asked Questions (Version 4.0, August 9, 2010) https://www.nj.gov/dep/srp/guidance/rs/eph_faq.pdf. For the heavier petroleum products defined as Category 2 EPH, additional analyses, whether a requirement to be analyzed concurrently with EPH or triggered by exceedence of an EPH concentration, are also based on promulgated regulatory requirement (N.J.A.C. 7:26E-2.1(d)).
4	NA	NA	NA	Question # 1 - In the draft EPH Guidance document- it is unclear if a site currently under an approved NJDEP Soil Rem Permit for TPH over 10,000 mg/kg (older case under a large manufacturing building) whether the Permit would be deemed to not be protective of human health and the environment because of the new Guidance, and additional investigation and or remediation would be required?	An existing Soil RAP would have required demonstrating the remedy was protective. The EPH Technical Guidance does not speak to re-evaluating the protectiveness of a remedy, it speaks to determining the EPH contaminant concentrations that may trigger institutional and engineeringing controls, and hence the necessity of a Remedial Action Permit for soil.

4	NA	NA	NA	Question # 2- Delineation for the contingency analyses when you only have to perform the analyses on 25% of the samples can be problematic. For example- if say the "initial round of sampling/analyses" it is shown that the contingency analyses do not exceed a standard at a specific EPH concentration- can that higher EPH value be applied for all other sample locations, especially if they surround a soil sample contingency analyses? The basis for the question is demonstrating to NJDEP that Category 1 contingency compounds (naphthalene and 2-methylnaphthalene) are delineated when only 25% of the soil samples are analyzed for the contingency compounds. This may be best explained by the following simple illustration: •Five soil sample locations - source area and four horizontal delineation sample locations •Source sample - EPH 7,900 mg/kg, contingency analyses exceeds a standard •Source sample vertical delineation sample EPH 4,000 mg/kg •Four Horizontal delineation samples - range between 6,000 mg/kg and 3,000 mg/kg.- per regs analyzed the next highest EPH 6,000 mg/kg and no contingency exceedances. •Are the contingency compounds delineated with one sample exceedance and one sample below standards? •Yes, if NJDEP agrees that based upon this site analyses that all EPH samples 6,000 mg/kg and below do not have contingency exceedances. •No, if NJDEP wants a contingency analyses at each delineation point. •If NJDEP goes with the latter, then additional delineation sampling is required and the cost far exceeds the contingency analyses costs if all samples were analyzed for contingency from the outset.	The 3rd paragraph of FAQ 17a of the August 9, 2010 *Health Based and Ecological Screening Criteria for Petroleum Hydrocarbons Frequently Asked Questions (Version 4.0)* states "If the results of the contingency samples detect any contaminant above its contaminant-specific soil remediation standard, delineation of that contaminant of concern is required, irrespective of any future sampling conducted for EPH analysis." Therefore, it is recommended for each soil sample collected for EPH analysis, to collect a parallel soil sample for contingency analyses and place on analytical hold.
4	NA	NA	NA	Question #3 - Category 2 Fractionization. It would be interesting to see some example calculations for the various petroleum fractionations and how they impact determining compliance with the multiple potential standards (RDCSRS, NRDCSRS, Ecological, Free Product, etc..	Beyond the purview of the guidance, but will include examples in the technical guidance training session.