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MCRD PARRIS ISLAND
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LETTER REGARDING U S EPA REGION IV COMMENTS ON DRAFT DATA QUALITY
OBJECTIVES WORKSHEETS 10, 11 AND 17 FOR SITE 27 MOTOR-T FACILITY AREA MCRD
PARRIS ISLAND SC
3/16/2010
U S EPA REGION IV



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

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March 16, 2010

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SUBJ: EPA Review of the Draft Site 27 – Motor-T Facility Area DQOs (December 2009)

Dear Sirs:

EPA has reviewed the Draft Data Quality Objectives (DQOs) Worksheets 10, 11, and 17 for Site 27 Motor-T Facility Area (Motor-T). Before presenting general and specific comments, some discussion is provided here to lay the groundwork for EPA's comments. This discussion is intended to explain the forthcoming comments, and to provide feedback in general with regard to the document. Therefore, no response is expected with respect to the discussion, however, EPA would like to see a response to the general and specific comments which follow the discussion and a revised set of worksheets and figures, before proceeding with the remainder of the SAP.

Objectives: EPA believes the objectives of the current phase of investigation at the Motor-T Area are actually much broader and more encompassing than described in the problem statement. According to the most recent Parris Island Team meeting and other previous discussions, EPA now understands the objectives to include, in general, the following:

- **Obtain sufficient additional data to support completion of the Remedial Investigation at Sites 9, 16, 27, and 55, filling previously identified data gaps and answering outstanding questions.**
 - * Provide complete analysis of groundwater samples to address concerns regarding analytes omitted from analysis without regulatory concurrence and create a new baseline.
 - * Better refine horizontal delineation of contaminated groundwater, reducing the distance between sample locations with exceedances and the nearest non-detect in areas previously identified as areas of concern for data gaps
 - * Better refine vertical delineation of groundwater contamination, especially in areas where odors/sheens/contamination were observed in intermediate and/or deep wells.
 - * Determine if contamination exists in the vadose zone and/or surficial groundwater at concentrations of concern for vapor intrusion at existing structures in the vicinity of contamination, as well as at the future footprint of the Motor-T facility and a hypothetical private residence over the highest concentrated area of contamination.
 - * Obtain sufficient soils data to determine if any source areas and/or contamination exists at levels which require remediation in the areas of Site 9, 16, and 27 (55 being deferred until the Fiber Optic Vault (FOV) investigation and Non-Time Critical Removal Action).
 - * Obtain sufficient soils and groundwater data to suffice for use in a complete baseline risk assessment for Sites 9, 16, 27, and 55. Data from this investigation and the most recent RI data should be used for 9, 16, and 27, to be combined with post-removal data from Site 55 after the LNAPL and DDT hot spots have been removed.
- **Obtain sufficient additional soils and groundwater data to determine if construction of the Motor-T facility can proceed without impeding the Site 27 investigation and/or remediation (as determined to be necessary), and in a manner which is safe and protective of facility construction workers and future facility occupants.**
 - * Determine if any areas within the Motor-T facility footprint and/or lay-down area need remediation before construction begins.
 - * Obtain sufficient data pertaining to contamination levels within the Motor-T facility footprint and/or lay-down area which might be used to make adjustments to facility design or construction plans to ensure protection of construction workers and/or future facility occupants (e.g final selection of facility placement, construction considerations for footings, sub-slab vapor barriers, etc.)
 - * Obtain sufficient data to complete a risk assessment specific to facility construction workers and future facility occupants.
 - * Obtain sufficient data to determine that construction of the Motor-T facility can proceed in a manner without risk of further spreading existing contamination.

Likely Vertical Location of LNAPL:

There is strong data which indicates an LNAPL exists at Site 55 (recorded as several inches thick in MW11). Due to the nature of LNAPL, water table fluctuations, and a variety of other factors associated with subsurface characteristics, it can be very difficult to pin down its exact location. However, a review of what information does exist to date seems to indicate a correlation to the clay-rich semi-confining layer present at Sites 55 and 27, near to and downgradient of the Fiber Optic Vault and/or MW11.

- A figure "Chlorobenzene isoconcentrations in shallow groundwater (2002)", contained in the file "Chlorobenzene-05012009.pdf", indicated chlorobenzene concentrations up to 1000 µg/L in a large area between the FOV and the Motor-T area. Also the presence of an LNAPL was detected in MW11.
- As a conclusion, the report "Source Characterization and Plume Delineation Using Membrane Interface Probe (MIP) and Soil Conductivity (SC) Technologies" stated "The majority of contamination appears to be below the first confining layer, between seven and ten feet" (p. 6).
- The exception to this appears to be in the disturbed soils of the FOV immediate vicinity.
- There is apparently a clay-rich horizon which serves locally as a semi-confining layer. A majority of the contaminant mass including LNAPL is likely sorbed/bound to the clay rich semi-confining layer with saturated aquifer conditions existing below this horizon. Due to a fluctuating water table, a smear zone across this clay-rich layer has been identified at Site 55, in addition to a floating LNAPL layer.
- The semi-confining nature of the clay-rich layer creates an artesian effect and the potentiometric surface of the water table measured in a well will rise higher than the depth below the ground surface (bgs) of the clay-rich smear zone. If soil samples are collected at the interval just above the water table (7-8 ft bgs or less) as proposed, the zone of greatest contamination may not be sampled due to the local artesian groundwater effects and water table potentiometric surface is now above the clay-rich smear zone.
- Analysis of the LNAPL revealed a variety of contaminants, some so highly concentrated they may be masking even more contaminants at levels below the grossly elevated detection limits. Since it is unsure what exactly is in the LNAPL, it is very difficult to predict much about the fate and transport of the LNAPL, as well as the individual contaminants, in the subsurface over the very extended period of time it has been there (likely since the 1970's or earlier.)
- Due to the elusiveness of the LNAPL, and the variety of contaminants it contains, it is advised that a variety of field techniques be utilized to target soil sample depths within this smear zone, in real time in the field, as opposed to relying on a guideline of "just above the water table", which could result in the LNAPL being missed.

Potential existence of LNAPL finger west of MW11 near to PAI-27-SO-28 and FMP12:

There is uncertainty regarding the possibility of a potential "finger" of contamination (appearing to be chlorobenzene(s) and pesticides, but likely also containing remnant petroleum hydrocarbon constituents) extending westward from the vicinity of PAI-27-MW11 to the eastern boundary of the Motor-T area. Previous documents, prior to the drafting of the DQOs, have indicated the potential existence of such a finger. EPA believes the evidence still exists to indicate this potential and does not support the change in the maps and/or Conceptual Site Model. A relatively minor amount of additional sampling is recommended to resolve this uncertainty.

- The June 2009 Conceptual Site Model (CSM) indicated this potential finger of contamination. On CSM Figure 4-3, this finger was defined by a contour labeled "Approximate Limit of Samples with Concentration that Exceed Background and Residential or Industrial Screening Criteria". This contour was drawn to incorporate detections of relatively higher concentrations of pesticides at the PAI-27-SO-28 location. Only pesticide detections are shown on the CSM Figure 4-3. However, there were also detections of 1,4-dichlorobenzene, benzene, and especially chlorobenzene, at the 5 to 6 ft depth at this location (CSM Figure 4-1).
- Contours drawn for the December 2009 SAP worksheets (on Figures 17-1 for both the Motor-T and the FOV SAPs) had eliminated this potential finger of contamination. Location PAI-27-SO-28 was shown as an isolated hot spot of contamination. A viewpoint has been expressed in site discussions that there is no evidence of any potential finger of contamination, and that an isolated hot spot exists as a result of an activity such as surface release of wastes. However, caution dictates that the issue of this potential finger of contamination be resolved with additional data.
- A review of the available data indicates the following:
 - * There are about a half dozen soil boring locations in the immediate vicinity just downgradient of the MW11 area (CSM Fig. 4-1). There are non-detects for select VOCs in soil at most of these locations. However, the non-detects are mostly from relatively shallow depths (e.g., 0 to 1, 3 to 4 ft bgs). Only about half of these locations (in the northern part of this area) have samples including depths below 5 ft (those samples indeed are ND for chlorobenzene). Only one location in the southern part of this area (PAI-55-FDP04) had a sample below 5 ft depth (4 to 6 ft bgs). That sample had an estimated 30 ug/kg chlorobenzene.
 - * Additionally, the location PAI-27-SO-28 about 75 ft downgradient, had chlorobenzene (380 ug/kg), 1,4-dichlorobenzene, and benzene. This sample was from 4 to 6 ft bgs.
 - * The December 2009 Figure 4-2 ("Groundwater exceedances 2007 and 2008 samples") indicates that the ground-water wells in this vicinity had detections of chlorobenzene. These wells include PAI-27-TW-26S (2500 ug/L chlorobenzene), PAI-27-TW-27I, PAI-27-MW11S, PAI-27-MW12I, and the downgradient PAI-27-MW18I. These wells are screened entirely or partly below the shallowest clay layer at the site (see cross-sections in CSM Fig. 3-2). They sample the slightly deeper ground water beneath the shallowest

clay layer. It is plausible that there exists a plume of contaminants migrating beneath the clay and resulting from the denser contaminant chlorobenzene (which could have been released as a DNAPL or LNAPL/DNAPL mixture just slightly denser than water).

* There were no MIP sampling locations in the immediate vicinity of PAI-27-SO-28 or between it and MW11S. However, a MIP sampling location (FMP12) some distance to the northwest of MW11S did indicate some petroleum fuel contamination.

Thus, the available data suggest the possibility that contamination (exemplified by chlorobenzene and pesticides) extends downgradient from the vicinity of MW11S westward toward the Motor-T area. This contamination appears to be primarily beneath the shallowest clay layer. While, if present, it may not greatly affect shallower surface soils and risk assessments for that shallower soil, it does represent a potential problem for more widespread somewhat deeper contamination that is impacting or could impact the downgradient ground water and the future of the proposed structures in the Motor-T area.

Exposure Units:

According to the draft DQOs and Figure 17-1, Site 27 was placed into one single exposure unit (EU), and Site 55 placed into a separate EU (to be addressed at a later time). Clarification is needed with respect to the PCB transformer storage area, Sites 9 and 16, and the elevated soils hit on the border between the Motor-T EU and the FOV EU. A review of existing data, as well as data gathering objectives, should assist in determining how these areas should be addressed.

- Based on Figure 10-2 it is unclear if the PCB transformer storage area is to be included as part of the Motor-T EU or not, and if not, if it is to be investigated and assessed separately now, or at a later time. In order to clear the entire area for purposes of moving forward with the Motor-T construction, it is advised to include this area, either as part of the Motor-T EU, or as its own separate EU, as appropriate, at this time. A review of historical data and COPCs may assist in this decision.
- Based on Figure 10-2 it is unclear if the areas identified as Site 9 and Site 16 are to be included with the Motor-T Area or the FOV Area investigation, and whether they are to be part of a single EU, or their own EU. It may be appropriate to include them with the Motor-T Facility investigation if RI data gaps exist, however, it may be appropriate to defer addressing them, with respect to risk assessments, etc. until you are ready to complete the RI (after FOV removal action). A review of historical data and COPCs may assist in deciding if they are to be treated as individual EUs or not.
- It is also unclear which data was included when making decisions about EUs and decisions regarding application of the Visual Sampling Plan program. It is unclear why a MARSSIM Sign Test was determined to be the most appropriate application of the VSP for the Motor-T investigation. It is unclear whether or not the elevated hit on the border between the Motor-T Facility Area and the FOV EU was or was not considered as part of this EUs data set. It appears inclusion of this data point may have caused a different approach to the use of VSP for the Motor-T Area, since the standard deviation across the site may have been elevated, in turn raising the number of samples required. When

elevated isolated hits occur within a data set, it is often standard practice to create a separate EU to delineate the hit and to keep the number of samples needed for the remaining larger area to a minimum. Creation of a separate EU for the elevated hit lowers the standard deviation within each EU, thereby reducing the number of samples needed in individual EUs. In this case, the elevated hit EU may only have the one data point, (and therefore a std. dev of 0). However, it will be necessary to project how much area within the Motor-T EU should be carved off to represent the investigation area around the hit. This can be done based on a final agreement of sample spacing for LNAPL delineation. The number of samples needed may be based on an extension of the FOV grid into the Motor-T Facility Area. The investigation may still proceed with the Motor-T area, even though the grid is a continuation of the FOV grid. EU boundaries, in turn, can be adjusted after results are in.

Based on the above fundamental beliefs and concerns, EPA offers the following comments:

GENERAL COMMENTS:

1. Given one of the purposes of the Motor-T investigation is to address the Remedial Investigation (RI) data gaps, comments previously submitted regarding the RI Phase I and II work plans, as well as feedback on Vapor Intrusion issues, would apply here in general. Be sure to include data gathering efforts to answer questions posed and fill data gaps as necessary. Please refer to previously submitted comments, emails, meeting minutes, etc. as appropriate.
2. Given one of the purposes of the Motor-T investigation is to provide data which will allow decision-making with respect to obtaining approval for moving forward with construction of the Motor-T facility, previous comments and communications pertaining to construction of the Motor-T facility as it relates to Sites 27, 55, 9 and 16 and what would be required to obtain approval would apply here in general. Be sure to include data gathering efforts to address comments and fill data gaps as necessary. Please refer to previous comments, emails, meeting minutes, etc. as appropriate.
3. Given the DQOs address the Site 27 Conceptual Site Model (CSM), unresolved comments on the previously submitted Site 27 CSM document would apply here in general, to DQO sections which address the CSM. See previously submitted comments, emails, meeting minutes, etc. as appropriate.
4. Clarify the objectives of the data gathering effort being planned. (See discussion above.) Modify the DQO worksheets to address the clarified objectives.
5. In general, to obtain a clearer perspective on contaminant distribution in the source zone/hot spot areas, it is recommended that soil cores extend into the saturated zone. The main purpose for this is that since equipment and staff will be mobilized, collection of soil cores in the saturated zone will be cost efficient and will provide valuable information and data. In general, the collection and analysis of aquifer cores in the unsaturated zone will have a lower probability of detecting contaminants. This is partially due to the fact that the core must be collected in the "entry zone" where the contaminant was spilled and migrated vertically downward in order to detect

contamination. This is a relatively limited and heterogeneous volume of contaminated media. However, once the LNAPL reaches the water table, it spreads out and is generally distributed across the low and high water table elevations (i.e., smear zone). This information can be used to help better understand the location of possible sources and distribution patterns. Specific comments and recommendations are included below which discuss this matter further.

6. Due to the elusiveness of the LNAPL and the variety of contaminants it may contain, it is advised that a variety of field techniques be utilized to target soil sample depths within the smear zone, in real time in the field, as opposed to relying on a guideline of "just above the water table", which could result in the LNAPL being missed. This applies at Site 55, and just across the border of Site 27 downgradient from PAI-27-SO-28, MW11 and FMP 12. (See discussion above.) Modify the DQO worksheets to address this issue.
7. Figures: EPA has previously requested that MIP locations be included on maps and figures. Include MIP data on all tag maps and MIP locations on Figures in the future, showing the locations of the MIP data points in relation to the other site investigation locations. Revise Figures 10-3, 10-4, and 17-1 to include MIP locations/data. Be prepared to discuss the potential for use of additional MIP data to obtain more detailed vertical delineation and/or to drive sub-sample vertical locations.
8. Available data suggest the possibility that contamination (exemplified by chlorobenzene and pesticides) extends downgradient from the vicinity of MW11S westward toward the Motor-T area. This contamination appears to be primarily beneath the shallowest clay layer. While, if present, it may not greatly affect shallower surface soils and risk assessments for that shallower soil, it does represent a potential problem for more widespread somewhat deeper contamination that is impacting or could impact the downgradient ground water and the future of the proposed structures in the Motor-T area. The investigation should be designed to specifically delineate the contaminated area(s) within the Motor-T study area downgradient from PAI-27-SO-28, MW11, and FMP12 during the Motor-T Facility investigation. Otherwise, address this area in the FOV investigation (see discussion above.)
9. A few additional ground-water and soil sampling locations are recommended for the area downgradient of PAI-27-SO-28, MW11 and FMP12.
10. Additional soil sampling locations are recommended for the NW corner of the FOV Exposure Area to prevent a data gap in this area (i.e., a uniform sampling grid over the entire FOV Exposure Area is recommended - see FOV comments). This grid could be continued into the Motor-T area to investigate the areas of elevated contamination along the boundary between the two investigation areas.
11. Existing data and objectives of the data gathering effort should be reviewed to clarify exposure units within the Motor-T Facility investigation area. Specifically, clarify: 1) if the PCB transformer area is part of the Motor-T EU or not, or if it should be a separate EU within the Motor-T Facility investigation area; 2) whether it would be appropriate to include a separate EU for the elevated contamination area just inside the Motor-T boundary from the FOV investigation area, and 3) whether or not Sites 9 and 16 are part

of the investigation, and if so, whether or not they are separate EUs.. Modify the DQO Worksheets to address this issue. (See discussion above.)

12. Update maps and figures to include the most recently proposed facility footprint location.
13. It is recommended that VOCs and pesticides be added to the analytes for the ground-water samples for the Motor-T area investigation. In general, ensure that groundwater analytes reflect soil analytes, which in turn reflect Site COPCs for each EU established.

SPECIFIC COMMENTS:

14. **SAP Worksheet 10, Section 10.2.2, Petroleum Hydrocarbons Removal – Site 55 (2001 and 2003), Page 10-3:** This section discusses that petroleum hydrocarbon LNAPL and water were removed from the FOV, Site 55, in 2001 and again in 2003. This section indicates that free product and water removal from the vault were conducted as a previous investigation and removal action. However, it is not clear from the text whether the removal of free product and water was conducted as a CERCLA clean-up removal action as indicated in this section. The volumes of free product and water removed during 2001 and 2003 and their disposition were not reported in this section. Additionally, subsurface soil most likely contaminated due to the presence of free product in the FOV would have had to have been excavated to some depth below the ground surface to facilitate the installation of the FOV. As such, the soil volumes removed and ultimate disposition of the soils was not reported in this section. If the Navy is intending for the free product removal being conducted as a CERCLA “previous investigation and remedial action” the volumes of free product/water and soil removed from Site 55 and their ultimate disposition should be included in the SAP. Alternatively, provide a brief statement as to the type of operational action which occurred and disposition of soils/materials removed, as well as provide a reference of where the detailed data and information can be located.
15. **SAP Worksheet 10, Section 10.2.5:** Update the 3rd sentence to address all purposes for which the SAP is being developed, or make the statement more general to indicate the Motor-T but not specify the “purpose(s)” of the investigation (see “objectives” discussion above).
16. **SAP Worksheet 10, Section 10.3 Conceptual Site Model, Page 10-5:** There is no discussion in this section regarding the clay-rich horizon which serves locally as a semi-confining layer. A majority of the contaminant mass including LNAPL is likely sorbed/bound to the clay-rich semi-confining layer with saturated aquifer conditions existing below this horizon. Due to a fluctuating water table, a smear zone across this clay-rich layer has been identified at Site 55 as well as a floating LNAPL layer. The semi-confining nature of the clay-rich layer creates an artesian effect and the potentiometric surface of the water table measured in a well will rise higher than the depth below the ground surface (bgs) of the clay-rich smear zone. The text in this section states that in order to address the potential for Site 55 to act as a continuing source of contamination to Site 27, refined delineation is necessary to support a non-time critical removal effort. However, if soil samples are collected at the interval just above the water table (7-8 ft bgs) as proposed, the zone of greatest contamination may not be sampled due

to the local artesian groundwater effects and water table potentiometric surface is now above the clay-rich smear zone. The conceptual site model should be revised to address this issue.

17. **SAP Worksheet 10, Section 10.3 Conceptual Site Model, Page 10-6:** The first full paragraph indicates what will be covered for a HH risk assessment based on the Conceptual Site Model. However, it is unclear which specific data (soils, LNAPL, groundwater) will be used pertaining to which specific form of inhalation of vapors (exposed groundwater/LNAPL, showering, building intrusion, etc.). The text here, as well as that which is in Figure 10-5, are still somewhat vague with respect to this. Please further clarify the exposure scenarios specific to soil, groundwater, and or LNAPL (if encountered) for each specific exposure pathway and receptor. A table or bullets may be an easier approach to portray the details.
18. **SAP Worksheet 10, Section 10.3 Conceptual Site Model, Page 10-6:** This section should also clearly state that the presence of Principal Threat Source Material (PTSM) would require treatment and/or removal. EPA's Guide to Principal Threat and Low Level Threat Waste (November 1991) clearly identifies LNAPL as PTSM which requires treatment. Hopefully, this might only be an issue at the border between the Motor-T Facility Area and the FOV Area as described above, if at all, for the Motor-T Area data gathering effort. However, we will not know that until the data is in. At that point, if LNAPL is encountered within the boundaries of the Motor-T Facility study area, a decision will be needed as to what would be necessary to move forward with the Motor-T construction (e.g. a change in placement of facility footprint, treatment, removal, etc.)
19. **SAP Worksheet 10, Section 10.3 Conceptual Site Model, Page 10-6:** Contaminant migration from soil to ground water is not specifically mentioned or discussed as a potential problem in the Motor-T area that may require further investigation and/or remediation. However, soil-to-groundwater PALs have been specified in Worksheet 11. This section should clarify that this is an issue and state that it will need to be addressed.
20. **SAP Worksheet 10, Section 10.3 Conceptual Site Model, Page 10-6:** The last paragraph on Page 10-6 states that ecological risk "will not be evaluated as part of this investigation." This appears to be in conflict with Figure 10-5, which represents exposure of small birds and mammals to surface soils. Please resolve this conflict. Once resolved, it should be noted that while a complete ecological risk assessment may not be necessary in order to determine if the Motor-T facility construction may proceed, at a minimum ecological risk discussions, expanding on what you have here, should be included as part of the RI baseline risk assessment, as well as in the streamlined risk section of the EE/CA (upcoming for the FOV Area) as required.
21. **SAP Worksheet 11, Section 11.1 Problem Statements, Page 1:** Revise the problem statement to address all of the clarified objectives of this investigation. Address filling RI data gaps and clearing the Motor-T Area for construction, including LNAPL/hot-spot delineation at the border as well as the necessary risk assessment information. Especially focus on the portion beginning "... additional soil and groundwater samples are needed to ...", and "...the project team will decide...". (See objectives discussion above.)

22. **SAP Worksheet 11, Section 11.2 Identify The Inputs To The Decision, Page 1:** Due to the difficulty in locating LNAPL, identify additional specific field techniques which will be used to drive sub-sample vertical location. (See discussions above.) Previous documents and technical review comments regarding investigation of the LNAPL mentioned the use or potential use of additional screening methods to supplement the proposed field screening kits, other than just those listed here. These included soil vapor screening with an FID, visual observations, odors, hydrophobic dyes, UV fluorescence, and MIP data. It is recommended that further consideration be given to the use of some of these methods. EPA would like to discuss these approaches. A final decision with respect to these screening methods may result in the need to add inputs to the decisions here in Section 11.2. Things to consider are:

a. It is recommended to consider the use of direct push downhole sensing such as laser-induced fluorescence (LIF) or membrane interface probe (MIP) prior to the collection of soil cores. While downhole sensors may not be applicable to DDT delineation, they could be appropriate for the higher concentrated LNAPL. Delineation of LNAPL would therefore provide a good indicator for the presence of DDT and other pesticide contaminants. It should be noted that the same GeoProbe rig and crew used for the MIP or LIF screening activities could also be used for the collection of aquifer cores. Ideally, real time data from preliminary field screening efforts could be used to focus aquifer core collection activities during the same mobilization.

b. The use of several techniques to screen and/or measure LNAPL and DDT have been proposed, including, (1) soil vapor screening with an FID, (2) visual observations for hydrocarbon staining or sheens, (3) odors, (4) DDT soil field screening test kits, (5) TPH screening field test kits, (6) laboratory analysis confirmation samples, and (7) observation of sheens or LNAPL in boreholes left open. Although this list of screening and measurement techniques is extensive, there are two other techniques to consider or substitute in this list that may improve the screening. These include hydrophobic dyes for NAPL detection, and UV fluorescence as an indication of petroleum contamination. For example, Oil Red O dye is a powder that will dissolve in NAPL but not water and will show up as a red dye (in NAPL). Oil Red O has fewer health risks relative to other dyes (i.e., Sudan IV), requires less stringent personal protection, is cheap, and can be purchased commercially.

23. **SAP Worksheet 11, Section 11.2 Identify The Inputs To The Decision, Page 2:** The second bulleted item (#5) on Page 2 indicates the USEPA Regions 3, 6 and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites; Residential and Industrial Soil Values and Risk-Based Migration to Groundwater Soil Screening Level (SSL) values, Tap Water. However, the proper screening levels utilized for this investigation should be the USEPA Regional Screening Levels (RSLs) for Superfund sites. The most recent RSL was updated in December 2009. Revise the text and appropriate figures to indicate the most recent version of the USEPA RSLs will be utilized as screening criteria for this investigation.

24. **SAP Worksheet 11, Section 11.2 Identify The Inputs To The Decision, Page 2:** The same bullet mentioned above identifies soil-to-groundwater SSLs as being PALs. Contaminant migration from soil to ground water is not specifically mentioned or

discussed as a potential problem in the Motor-T Area that may require further investigation and remediation. It is not obvious based on the text up to this point that a comparison to these SSLs would be necessary, however, for the record EPA does expect this to be a part of the analysis. Also, clarification is needed for Figure 10-3 SSLs values.

25. **SAP Worksheet 11, Section 11.2 Identify The Inputs To The Decision, Page 2:** Please explain the Navy's intent with respect to background data. If needed, either identify the Parris Island background data set as an input to the decision here, and/or determine if a site specific site background data set will be necessary. In this case, identify it here, as well as establish the collection of the data as an additional objective to this data gathering effort, and address it in all appropriate places in these worksheets.
26. **SAP Worksheet 11, Section 11.3 Define the Study Boundaries, Page 2:** Section 11.3 states "*The horizontal boundary for the Motor T Exposure Unit is presented in Figure 10-2.*" Figure 10-2 is unclear, does not relate the Motor-T Facility Investigation area to the FOV area boundaries and is more difficult to use. Consider referencing a different figure for boundaries, such as Figures 10-3, 10-4, or 17-1, or add the FOV Area to 10-2 for better representation.
27. **SAP Worksheet 11, Section 11.3 Define the Study Boundaries, Page 2:** Section 11.3 apparently indicates a single exposure unit (EU) for the Motor-T Facility Area, and another for the FOV area investigation. Please explain if the PCB transformer area is to be addressed in the Motor-T investigation or the FOV investigation, and as one EU or separate EUs, addressed now or deferred until later. (See Exposure Unit discussions above.)
28. **SAP Worksheet 11, Section 11.3 Define the Study Boundaries, Page 2:** Section 11.3 apparently indicates a single exposure unit (EU) for the Motor-T Facility Area, and another for the FOV area investigation. Please explain if Sites 9 and/or 16 are to be addressed in the Motor-T investigation or the FOV investigation, and as one EU combined or separate EUs, addressed now, or deferred until later. (See Exposure Unit discussions above.)
29. **SAP Worksheet 11, Section 11.3 Define the Study Boundaries, Page 2:** In Section 11.3 it is unclear how decisions were made regarding establishing EUs, determining how Visual Sampling Plan (VSP) would be applied, and exactly what data was included in the VSP decisions. Please explain. Consider establishment of an additional EU to better fit the existing data, in the area of the "hot spot" along the boundary between the Motor-T and FOV areas, then update VSP applications. (See Exposure Unit discussions above.)
30. **SAP Worksheet 11, Section 11.3 Define the Study Boundaries, Page 2:** If it is decided to create an additional exposure unit to address the elevated hit at the border, EPA would suggest agreement be reached on the sample spacing for the LNAPL delineation for the FOV Area, then that spacing be applied to the FOV Area and continued into the Motor-T Area to an agreed upon distance from the border. Since it has not yet been determined if LNAPL exists at the border, the Motor-T Facility elevated hit investigation using this grid may still proceed with the Motor-T investigation. Once data is in, if LNAPL is encountered within the boundaries of the Motor-T Facility study area,

the team will have to decide what would be necessary to move forward with the Motor-T construction (e.g. a change in placement of facility footprint, treatment, removal, etc.).

31. **SAP Worksheet 11, Section 11.3 Define the Study Boundaries, Page 3:** The vertical boundary has been defined for surface soils and subsurface soils. It may be necessary to also define a vertical boundary for LNAPL delineation, if sampling for that purpose is in some way contrary to what may be needed for a risk assessment for soils. It could be decided what depth would be most appropriate for use in a risk assessment. Then, in the area of LNAPL investigation in the Motor-T Facility along the border with the FOV area, additional vertical samples could be taken for delineating the LNAPL/hot spot. Currently the subsurface soil vertical boundary is defined as the foot of soil just above the water table (Worksheet 11 indicates the depth to the water table is 5 to 8 ft bgs, and Worksheet 17 indicates the soil sample interval just above the water table would be 7 to 8 ft bgs). If the soil sampling takes place during high water table conditions, the soil samples might be collected above any soil that would have been previously contacted by ground water. These soil samples might not be indicative of contamination that has previously been transported downgradient in ground water or by an LNAPL plume at a greater depth. Contamination may be most evident in the soil interval that is in contact most of the time with ground water and/or any LNAPL plume, or bound in the clay-rich layers. While such samples would contain both ground water and soil, they are more likely to be indicative of the extent of LNAPL contamination. If desired, after such soil samples had been analyzed, phase-partitioning calculations could be used for a rough approximation of the contaminant concentrations and mass that would occur in the dissolved, sorbed, and NAPL phases. Please clarify how you will reconcile what vertical sampling is needed for the risk assessment with what is needed for LNAPL delineation in your defined vertical boundaries. Based on the points raised above, it is recommended that the saturated soils in the top portion of the water table be sampled, for purposes of contaminant extent delineation (these samples would likely be in addition to those subsurface soil samples that are collected for human health risk assessment and may be targeted via field screening techniques discussed above).
32. **SAP Worksheet 11, Section 11.3 Define the Study Boundaries, Page 3:** As noted in the comment above as well as previous technical reviews and memos, it is not clear if the deepest proposed soil samples would include the interval just below the shallowest clay layer where previous work has indicated the presence of contamination. If not, it is recommended that the interval be sampled. Field screening techniques could help to determine when these samples would be appropriate.
33. **SAP Worksheet 11, Section 11.4 Develop Decision Rules, Page 3:** Revise the decision rules section to address all objectives identified for the Motor-T Area investigation. (See Objectives discussion above.) Be sure to include soil-to-gw screens. Also, modify the last sentence to accurately reflect all decisions which will need to be made in order for the Motor-T facility construction to proceed.
34. **SAP Worksheet 11, Section 11.5 Specify Tolerable Limits on Decision Error, Pages 3 and 4:** Revise the section to further explain and justify the approach used when applying VSP in these investigations. The calculated number of required samples (50, with 30 to be collected in addition to the existing 20 samples for the Motor-T area) is

33. **SAP Worksheet 17, Sampling Design and Rationale:** If it is decided to use more than 1 EU for the FOV investigation area, modify Worksheet 17 to address each EU sampling design accordingly.
34. **SAP Worksheet 17, Sampling Design and Rationale:** In the text just before Soil Sampling, Worksheet 17 states "*The extent of contamination in soil and groundwater will be defined during this investigation*"; however, the FOV investigation does not include the collection and analysis of ground water. Please clarify if the FOV investigation is to include any groundwater samples.
35. **SAP Worksheet 17, Sampling Design and Rationale:** Since there are no groundwater samples to be taken as part of this investigation, it is not clear how the investigation will fully define the vertical and horizontal extent of ground-water contamination. While it is likely, as stated in Worksheet 17, that much of the known contamination is located above the water table, the Worksheet does acknowledge that there may be contamination in ground water. The depth of the contamination is not clear. Worksheet 17 indicates an assumed depth of 10 feet for the source zone (yet sample collection is only anticipated to extend to a depth of about 7 to 8 feet). Due to this issue, a number of these technical review comments have stressed the importance of the saturated zone just below the water table. It is recommended that this depth interval be fully investigated, and that clarification be provided on how the proposed investigation will define the full extent of contamination in ground water in the FOV area. If the proposed soil sampling interval of 7 to 8 ft is below the water table, such samples would be appropriate to address this issue.
36. **SAP Worksheet 17, Sampling Design and Rationale, Soil Sampling:** See comments above. It is recommended that the clay-rich semi-confining layer be targeted for sampling. Modify Worksheet 17 as needed to do so.
37. **SAP Worksheet 17, Sampling Design and Rationale, Soil Sampling:** Worksheet 17 discusses the depth intervals for collection of soil samples, including subsurface soil collection in the one-foot interval just above the water table. As discussed above in a comment for Worksheet 11, it is recommended that subsurface soil samples be collected in an interval at the water table that is or has previously been under saturated conditions to ensure that the soil had been in contact with any shallow dissolved contaminant or LNAPL plume.
38. **SAP Worksheet 17, Sampling Design and Rationale Soil Sampling:** EPA recommends agreement be reached on the sampling interval and approach for the FOV LNAPL delineation, then that approach be applied for sample location determination across the FOV EU and continued across the border into the Motor-T Area to investigate areas downgradient from the PAI-27-SO-28, MW11, and FMP12. This may or may not be a separate EU for the Motor-T investigation. If it is not agreed to investigate the area just across the border from the FOV EU in the same manner as the FOV EU, then it may be necessary to push the boundary line further west to include this area in with the FOV. Modify Worksheets to address this issue.
39. **SAP Worksheet 17, Sampling Design and Rationale Soil Sampling:** See comment 20 regarding specifying additional field techniques to help target sample location depths in

the subsurface. These included soil vapor screening with an FID, visual observations, odors, hydrophobic dyes, UV fluorescence, and MIP data. EPA would like to discuss which of these would be most appropriate and will be included in the investigation.

40. **SAP Worksheet 17, Sampling Design and Rationale Soil Sampling:** It is unclear what would be driving sampling at 4-5 feet and/or "just above the water table" at 7-8 feet. Please explain how these sample depths target LNAPL delineation. EPA would like to discuss these intervals. Agreement needs to be reached on the vertical sampling intervals.
41. **SAP Worksheet 17, Sampling Design and Rationale Soil Sampling:** There is a discrepancy in some proposed soil sample locations for the Motor-T area, between Figure 17-1 of the Motor-T Worksheet 17 and Figure 17-1 of the FOV Worksheet 17. Figure 17-1 of the Motor-T Worksheet 17 shows three proposed soil sample locations in the SE corner of the Motor-T area, while Figure 17-1 of the FOV Worksheet 17 shows only two proposed soil sample locations in the SE corner (and which are slightly shifted in location). It is recommended that this discrepancy be explained and the figures corrected.
42. **SAP Worksheet 17, Sampling Design and Rationale Soil Sampling:** The FOV Exposure Area is covered by the proposed soil sampling grid locations, except for the NW corner. It is not clear why this data gap was left. It is recommended that the entire FOV Exposure Area be uniformly covered by the proposed sample grid.

DQOs for Site 55 Fiber Optic Vault were never fully discussed. A facilitated DQO session may have helped eliminate the need for this volume of comments. In the future, EPA would appreciate DQO discussions prior to the drafting of DQO documents. If there are any questions on these comments, please do not hesitate to contact me at (404) 562-9969.

Sincerely,



Lila Llamas
Senior RPM

cc: Meredith Amick, SCDHEC
Annie Gerry, SCDHEC
Mark Sladic, TtNUS ✓