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U S NAVY RESPONSES TO U S EPA REGION I AND RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT COMMENTS ON THE DRAFT SOIL FEASIBILITY STUDY FOR DECISION UNITS 3-1, 3-2 AND 3-3 AT SITE 11 TANK FARM 3 OPERABLE UNIT 15 (OU 15) NS NEWPORT RI

4/8/2016

RESOLUTION CONSULTANTS

Navy Responses to Regulatory Agency Comments
EPA Comments, February 4, 2016
RIDEM Comments, February 9, 2016

DRAFT SOIL FEASIBILITY STUDY DECISION UNITS (DU) 3-1, 3-2 AND 3-3
AT SITE 11 – TANK FARM 3 (OPERABLE UNIT 15)

April 8, 2016

EPA General Comments:

EPA General Comment 1: Please explain what data points and, more importantly, control or extrapolated points were used to determine the estimated extent of excavation. How will confirmation samples be collected outside the limits of excavation?

Response: The soil results from the DGA Report were used to estimate the extent of excavation. Prior to implementation of the selected alternative, pre-design soil sampling would be required to delineate the extent of soil that exceeds remedial goals in order to pre-define the excavation limits. As shown on Figures 12 and 15, some existing data points were used in developing the estimated extents of excavation and the ECH building within DU 3-3 was used as an excavation limit, since it is assumed the structure's foundation will remain in-place; however, the extents are not completely defined and additional sampling is needed. The pre-design soil sampling approach is discussed in Section 4 and also in the cost backup in Appendix C. The FS does not include confirmation sampling under any of the remedial alternatives.

The following sentence was added to the first paragraph of Section 2.4: "For all soil alternatives, with the exception of the No Action alternative, further soil sampling is recommended to fully delineate the extent of soils that exceed PRGs."

EPA General Comment 2: Edit the document to describe whether Navy will address TPH exceedances of the GA leachability and residential direct exposure criteria as a separate state action or include it coincidentally with this CERCLA action to address state requirements.

Response: At locations where TPH exceedances are co-located with PRG exceedances for CERCLA contaminants, the CERCLA response action will address TPH as well. The Navy will handle residual TPH outside of the CERCLA response area under the RIDEM UST and remediation regulations.

In the Executive Summary, the following paragraph has been added immediately following the bullets describing the estimated areas and volumes of impact above PRGs for DU 3-1:

"A PRG has not been developed for TPH since it is not a CERCLA-regulated contaminant; however, it is noted that residual TPH concentrations in subsurface soil in the vicinity of the former sand filter/burn pit within DU 3-1 exceed the RIDEM Residential and Industrial DECs and GA Leachability Criterion. While the remedial alternatives (other than No Action) described in this FS are expected to also address the Residential DEC for TPH through land use controls (LUCs), as described below, the Industrial DEC and GA Leachability Criterion would not be addressed. Rather, the Navy will address the residual TPH separately from the CERCLA cleanup under the RIDEM UST and Remediation regulations."

Similarly, the following paragraph has been added immediately following the bullets describing the estimated areas and volumes of impact above PRGs for DU 3-3:

"A PRG has not been developed for TPH since it is not a CERCLA-regulated contaminant; however, one surface soil sample collected within DU 3-3 during the DGA contained TPH at a concentration slightly above the Residential DEC and GA Leachability Criterion. The TPH exceedance is co-located with the most elevated concentration of PCBs and it is expected that the remedial alternatives (other than No Action) described in this FS will also address the co-located TPH to below RIDEM criteria."

See responses to EPA Specific Comments 15, 16, 24, 29, 31, 32, 45, 47, 51, 53, 56, 58, 67, 68, 69, 71, 89, and 90 for other edits made to the FS report related to TPH.

EPA General Comment 3: It appears that additional sampling will be required at AOC-001 because the data gaps investigation did not collect samples as required by the sampling and analysis plan at locations where contamination had been left in place immediately south and west of the burn chamber/oil-water separator following the site investigation work. At these two locations TPH was detected at 6,582 mg/kg at S1-2.0 (seam in concrete) and 4,133 mg/kg at S3-2.5 (beneath broken inlet pipe). EPA's comments on the SAP (September 24, 2013 e-mail) stated "The borings at the burn pit are supposed to locate the residual contamination. If initial borings do not detect this contamination, additional borings may be needed."

Response: There is some uncertainty in the exact locations of the 2004 soil samples and the sand filter/burn pit, relative to the DGA soil borings. As part of the future work to address residual TPH in that area under the RIDEM UST and remediation regulations, additional sampling would be needed to confirm that the TPH impacts previously detected will be addressed. No change is proposed to the FS.

EPA General Comment 4: Alternative S-4 should be described as "Excavation to Residential PRGs and Off-Site Disposal". Please state the cost of remediation for this alternative.

Response: The name of the alternative was revised as requested. Given the anticipated future land use, this alternative was not retained for Detailed Analysis. As such, cost was not evaluated in detail, but would clearly be much greater than the cost for Alternatives S-2 and S-3.

EPA General Comment 5: The solidification/stabilization off-site process option and thermal desorption treatment technology does not appear to have been screened out in Table 2-6 yet it was not carried forward into the detailed analysis of alternatives. Please explain.

Response: Given the small volume of contaminated soil, solidification/stabilization off-site process option is not cost effective and should have been screened out in Table 2-6. Table 2-6 was revised to screen out solidification/stabilization. An alternative involving in-situ thermal desorption was developed in Section 3.0, but was screened out and not carried through to the detailed evaluation.

EPA General Comment 6: In reviewing the background evaluation completed for the Feasibility Studies for Tank Farms 2 and 3 EPA noticed that Navy combined the surface and subsurface soil into a single data set. However, the background surface soil data is significantly

different from the subsurface data such that there is less than a 1% chance (as determined by a two sample hypothesis test) that these data could be from the same population. Consequently, it is inappropriate to combine the surface and subsurface background data and use that to determine a background value for all soil. Similarly, the Site surface and subsurface data sets are not from the same population and cannot be combined for evaluation as all soil. The appropriate way to develop background values for these reports is to develop separate surface and subsurface soil background values as was done for Tank Farms 4 and 5. Please correct the background evaluations for these two reports accordingly. This correction will not result in any change in the remedial action for surface soil at any of these sites; however, it will require land use controls to be protective of industrial receptors from exposure to subsurface soil at various locations at each tank farm based on a subsurface background value that is significantly lower than the surface background value.

Problems result when data from different populations are combined. For example, when the background surface and subsurface soil are combined into a single data set outliers result; therefore, even if this combined data were to be used it would have to be adjusted to eliminate outliers. Also, by combining data from two populations the variability in the data set becomes greater which results in unnaturally elevated threshold values. Finally, the background subsurface data are normally distributed while the background surface soil data do not follow any distribution and for that reason they should not be combined.

The Basewide Background Study evaluated surface and subsurface soil separately and determined that there were no outliers in either medium. However, upon further review of the Basewide Background Study it was determined that one of the subsurface soil data points for Newport Silt Loam listed as being used in the evaluation actually was not used. That data point was not included in the summary statistics for Newport Silt Loam and was not included in the outlier evaluation. Had it been included it would have been identified as an extreme outlier. However, that value, 17.7 mg/kg arsenic for Newport Silt Loam, was mistakenly used in the background calculations for Tank Farms 4 and 5 resulting in a subsurface background value of 9.3 mg/kg rather than the correct value of 6.0 mg/kg. Please ensure only the vetted data points are used when calculating the revised background values for Tank Farms 2 and 3.

Response: The referenced 17.7 mg/kg arsenic concentration from the Newport Silt Loam data set in Basewide Background Study was not used in calculating the background values for Tank Farm 3 (or 2), so it is not clear why the comment references that value. Separate background values have been calculated for surface and subsurface soil and the PRGs have been updated. The updated Tables 12 and 13 from Appendix A-1 and Appendix A-3 are attached. Also attached is the updated Table 2-2 Preliminary Remediation Goals and updated tables comparing the soil data to the PRGs for DU 3-1 and DU 3-3 (Tables 2-3a, 2-3b, 2-5a, and 2-5b). The PRG table in the Executive Summary was updated based on the PRGs changes as follows:

Soil Parameter	Surface Soil		Subsurface Soil		DU Applicability		
	PRG (mg/kg)	Regulatory Basis	PRG (mg/kg)	Regulatory Basis	DU 3-1	DU 3-2	DU 3-3
Human Health - Residential Use Scenario [1]							
Benzo(a)anthracene	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
Benzo(a)pyrene	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	X	X	
Benzo(b)fluoranthene	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
Chrysene	0.4	RDEC	0.4	RDEC		X	
Dibenz(a,h)anthracene	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	X	X	
Indeno(1,2,3-cd)pyrene	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
Naphthalene	0.8	Leachability	0.8	Leachability	X	X	
2,3,7,8-TCDD Equivalents	0.0000048	ILCR = 10^{-6}	0.0000048	ILCR = 10^{-6}	X		
PCBs	1	TSCA	1	TSCA		X	X
Arsenic	17	Background	7	RDEC	X		X
Chromium[2]	0.31	ILCR = 10^{-6}	0.31	ILCR = 10^{-6}	X		X
Lead	150	RDEC	150	RDEC			X
Manganese	390	RDEC	460	Background	X		X
Human Health - Industrial Use Scenario							
Benzo(a)pyrene	0.8	I/C DEC	0.8	I/C DEC		X	
Naphthalene	0.8	Leachability	0.8	Leachability		X	
PCBs	10	I/C DEC	10	I/C DEC			X
Arsenic	17	Background	7	I/C DEC	X		
Ecological							
PCBs	3.6	Ecological	3.6	Ecological			X

Notes:

1. Residential Use Scenario PRGs are reflected for establishing a land use control boundary.

2. Chromium speciation has not been performed for this site. At this time, chromium has been assumed to be hexavalent chromium even though there is no current evidence that it would be this species. Future sampling/analysis is anticipated to show that most of the chromium detected is trivalent chromium. Upon confirmation of this assumption, chromium would no longer be a COC at this site.

ILCR = 10^{-6} – Carcinogenic risk-based goal developed from the human health risk assessment

RDEC – Residential Direct Exposure Criteria (RIDEM)

I/C DEC – Industrial/Commercial Direct Exposure Criteria (RIDEM)

Leachability – GA Leachability Criteria (RIDEM)

TSCA – Toxic Substances Control Act; Section 761.61(c) of TSCA (see Appendix B for full citation) allows for risk-based cleanup of PCB remediation waste. EPA guidance on Remedial Actions for Superfund Sites with PCB Contamination (OSWER Directive #9355.4-01FS; EPA/540/G-90/007; August 1990) was utilized to develop the risk-based value presented. Written approval for the proposed risk-based cleanup must be obtained from the Director, Office of Site Remediation and Restoration, USEPA Region 1.

Background – If RIDEM criteria or risk-based PRGs were below reference concentrations for the site, the background concentration was selected

mg/kg – Milligrams per kilogram

EPA Specific Comments:

EPA Specific Comment 1: Pg vi, par 4 – Please summarize the nature of the tank investigations being conducted under State UST regulations.

Response: The text has been revised as follows: "Tank closure activities were performed in 1996 and 2000. Most of the fuel lines were closed in 1996. Additionally, fuel lines along Defense Highway were closed in 1998. The tank closure investigations, and/or response actions are being completed under state UST regulations." With regard to additional details, the team will work with EPA and RIDEM to build information together as we evolve the tank farm-wide groundwater assessment and response action. The Navy would prefer to keep this Feasibility Study focused only on DU 3-1, 3-2, and 3-3 to avoid confusion in the Administrative Record.

EPA Specific Comment 2: Pg vii, par 3 – Please introduce the number, size and former contents of the USTs. At the end of the paragraph discuss if there are any plans to transfer ownership of TF3.

Response: The following text has been added as the start of a new paragraph following the second sentence in paragraph 3: "Tank Farm 3 contains five 1.18-million gallon capacity concrete USTs (Tanks 32 to 36), two 2.1-million gallon capacity steel USTs (Tanks 69 and 70), associated support utilities, roadways, and piping systems (Figure 2). The USTs were used to store aviation fuels [jet propulsion (JP)-4, JP-5, and JP-8] and marine diesel fuel."

In the subsequent paragraph, the words "The Navy has no plans to transfer the property and.." have been added prior to "Future use of Tank Farm 3 is expected to be limited...".

EPA Specific Comment 3: Pg viii, par 3 - Regarding the second bullet, please supplement the text to clarify why this objective exists for DU 3-1. There is apparently no risk to industrial and restricted recreational users at DU 3-1 based on currently-available data.

Response: As discussed in General Comment 6, separate background values were calculated for surface and subsurface soil and the PRGs were updated. One subsurface soil sample at DU 3-1 contained arsenic concentrations above the subsurface PRG. As such, no changes were made to the RAOs.

EPA Specific Comment 4: Pg. viii, par 3 – In the first sentence assume "current" should be "currently."

Response: The typo has been corrected.

EPA Specific Comment 5: Pg ix – A PRG is not needed for chromium III and the background value listed in this table for chromium is not applicable to chromium VI. There is no background value available for chromium VI; a risk-based value needs to be used. Please add a note to the table to explain why chromium is included in this table and recognize that there is no background value available for chromium VI.

Response: The PRG for chromium has been revised to use a risk-based value for chromium VI (0.31 mg/kg), rather than the higher background value for total chromium.

The following note was added to the table: "Chromium speciation has not been performed for this site. At this time, chromium has been assumed to be hexavalent chromium even though there is no current evidence that it would be this species. Future sampling/analysis is anticipated to show that most of the chromium detected is trivalent chromium. Upon confirmation of this assumption, chromium would no longer be a COC at this site.

EPA Specific Comment 6: TSCA footnote – The risk-based standard under 40 CFR 761.61(c) applies to the risk-based eco-risk PRG. The human health-based PRG of 1 mg/kg would meet unrestricted use standards under 40 C.F.R. 761.61(a), which does not require a separate TSCA determination be issued by EPA.

Response: It appears that 40 CFR 761.61(a) would apply to a "Self-implementing on-site cleanup" where a risk assessment is not performed (no PRGs are developed) and the responsible party plans to perform a PCB soil removal action. The OSWER Directive cited appears to be more appropriate to define why a value of 1 mg/kg is used rather than a lower risk-based value calculated using site-specific exposure parameters. Use of this directive/guidance value would then result in the need for written approval under 40 CFR 761.61(c). As such, no changes were made to the text.

EPA Specific Comment 7: Pg xi, last par – Regarding the third sentence, removing all of the contamination to UU/UE within the three DU would result in there being no exceedances of CERCLA risk-standards for soil within the operable unit. It is therefore unclear why a complete excavation alternative has not been presented. Also, the Navy may consider, for Alternative 2, excavating all PCB-contaminated soil to 1 mg/kg (the unrestricted risk level) rather than the eco-risk PRG so that there are no PCB risks within the OU.

Response: A complete excavation alternative was presented in Section 3, but was removed from further evaluation due to the high costs associated with the alternatives and the limited benefit as compared to the cost of remediation, given that residential and other unrestricted use is not a current or reasonably anticipated future use of the tank farm. No changes were made to the text.

Under Alternative S-2, excavation to a PCB PRG of 1 mg/kg was not selected, since the site would still require LUCs for other COCs.

EPA Specific Comment 8: Pg xii – second sub-bullet for Alternative 2 – Change "TSCA" to "Toxic Substances Control Act (TSCA)."

Response: The text was revised as requested.

EPA Specific Comment 9: Pg 2, Section 1.1, par 1 – Together with the prior investigations at Tank Farm 3, as documented in the 2006 Site Investigation and Remedial Action Report, the Data Gaps Assessment satisfies the requirements of a Remedial Investigation for Tank Farm 3.

Response: The text was revised as follows: "Together with the prior investigations at Tank Farm 3, as documented in the 2006 Site Investigation and Remedial Action Report (SIRAR), the DGA satisfies the requirements of a Remedial Investigation (RI) for Tank Farm 3. The DGA report contains a comprehensive summary of historical activities and investigations at the Site, along with the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA).

The DGA Report evaluates and presents findings for DU 3-1, 3-2, and 3-3 at Site 11 – Tank Farm 3."

EPA Specific Comment 10: Pg 3, Section 1.3, par 2 – Please describe the number, size, and former contents of the tanks at Tank Farm 3. Please provide a summary of tank closure activities and associated remediation of soil and groundwater which have occurred. Please also cite the regulations which directed these activities. At the end of the paragraph discuss if there are any plans to transfer ownership of TF3.

Response: The following text has been added at the beginning of the paragraph: "Tank Farm 3 contains five 1.18-million gallon capacity concrete USTs (Tanks 32 to 36), two 2.1-million gallon capacity steel USTs (Tanks 69 and 70), associated support utilities, roadways, and piping systems (Figure 2). The USTs stored aviation fuels [jet propulsion (JP)-4, JP-5, and JP-8] and marine diesel fuel."

Additionally, the following text has been added at the end of the paragraph: "The tank closure investigations, and/or response actions are being completed under state UST regulations."

At the beginning of the third sentence in the subsequent paragraph, the following has been added "The Navy has no plans to transfer the property and..."

With regard to tank closure activities and associated remediation of soil and groundwater, the team will work with EPA and RIDEM to build information together as we evolve the tank farm-wide groundwater assessment and response action. The Navy would prefer to keep this Feasibility Study focused only on DU 3-1, 3-2, and 3-3 to avoid confusion in the Administrative Record.

EPA Specific Comment 11: Pg. 4, par 2 - At the end of the paragraph discuss if there are any plans to transfer ownership of TF3.

Response: The following text was added: "The Navy has no plans to transfer the property and access restrictions are not anticipated to change."

EPA Specific Comment 12: Pg 5, Section 1.3.2, par 1 - Supplement the last sentence to indicate that the oil-water separator discharge is regulated by RIDEM with a discharge permit.

Response: The following text was added "The OWS outfall is regulated by a Rhode Island Pollutant Discharge Elimination System permit."

EPA Specific Comment 13: Pg 5, Section 1.3.2, par 3 – Does any of the electrical equipment in the ECH contain or formerly contain PCBs? Are there any floor drains or cracks in the floor that would allow migration to the underlying soil?

Response: The text has been revised to read: "The ECH within DU 3-3 is shown on aerial photographs from 1954. Ground disturbance around the area suggests that it was new construction. The ECH building reportedly contained electrical equipment, including an indoor transformer (that may have contained PCB-containing oil) and batteries (Tetra Tech, 2015). During an October 2015 site visit, no floor drains or cracks were observed in the concrete floor. Electrical equipment remains, but it is not known if PCB-containing oils are present."

EPA Specific Comment 14: Pg 5, Section 1.3.3, par 2 – Please describe under which regulations the SIRAR activities were conducted. Please also append a list to the report of the AOCs related to DESC operation of the facility.

Response: The text was revised as follows: "A Draft SIRAR was published in 2006 by Tetra Tech EC, Inc. (TtEC). The objective of the report was to present a summary of the work performed from May 2004 through April 2005 and to identify and remediate AOCs related to DESC operation of the facility under RIDEM regulations. The SIRAR investigated 31 AOCs identified by Stereographic Aerial Photography Analysis from 1942 through 1995 (including but not limited to AOC-001 and AOC-020), tank walls, tank vents, oil/water separator #3, swales, and the former Valve House (Building 228), transformer locations, and groundwater.

EPA Specific Comment 15: Pg 5, Section 1.3.3, par 3 - Edit the last sentence on the page to indicate that at samples TF3-001-S1-2.0 and TF3-001-S3-2.5 TPH concentrations exceeded the I/C DEC of 1,000 mg/kg and also exceeded the GA leachability criterion of 500 mg/kg.

Response: The last four sentences of the paragraph have been revised as follows: "Samples were analyzed for TPH (including diesel range organics [DRO] and gasoline range organics [GRO]). At samples TF3-001-S1-2.0 and TF3-001-S3-2.5, TPH concentrations exceeded the current RIDEM Industrial/Commercial direct exposure criteria (I/C DEC) of 2,500 mg/kg and GA leachability criteria of 500 mg/kg. Additional soil samples were collected to delineate contamination. However, due to the instability of the area, the area surrounding sample TF3-001-S1-2.0 was not remediated."

EPA Specific Comment 16: Pg 6, Section 1.3.3, par 1 – Please state whether remediation under RIDEM regulations will be required due to the exceedance of I/C DEC for TPH at location TF3-001-S1-2.0.

Response: The following text was added at the end of the paragraph: "As discussed further in Section 2.0, TPH is not CERCLA contaminant and the Navy will address the residual TPH separately from the CERCLA cleanup under the RIDEM UST and Remediation regulations."

EPA Specific Comment 17: Pg 6, Section 1.3.3, par 2 – Edit the second to last sentence to read: "The maximum PCB concentration detected was 8.2 mg/kg which is below…"

Response: The text was revised as requested.

EPA Specific Comment 18: Pg 6, Section 1.3.3, par 3 – Please describe under which regulations the DGA activities were conducted.

Response: The words "under CERCLA" were added to the first sentence between "...was conducted..." and "...to refine..." and "site contaminants" was changed to "CERCLA contaminants".

EPA Specific Comment 19: Pg 8, Section 1.3.4, par 3 – Add a second sentence: "Groundwater is also classified as potable drinking water under federal drinking water standards, which apply to CERCLA cleanup actions within the Superfund site.

Response: The text was revised to state "Groundwater is also required to meet federal drinking water standards, which are relevant to CERCLA cleanup actions at the site."

EPA Specific Comment 20: Pg 8, Section 1.3.5, par 4 – In the last sentence change "100-year" to "500-year." Note whether any of the DU being addressed contain either wetlands, are within State wetland buffer areas, regulated coastal zone, or within the 100- or 500-year floodplain.

Response: The reference to the 100-year floodplain boundary, as shown on Figure 2, is accurate. Section 2.1.3 and the associated location-specific ARARs tables provide more specific discussion of whether remedial actions for soil within each DU are expected to occur in or near relevant environmental features. Section 2.1.3 has been edited to indicate that soil remedial actions at DU 3-1, 3-2, and 3-3 (other than land use controls) are not anticipated to occur within the 50-foot perimeter wetland.

EPA Specific Comment 21: Pg 8, Section 1.3.5, par 1 – Please insert "known" prior to "...source of hexavalent chromium at the Site...".

Response: The text was revised as requested.

EPA Specific Comment 22: Pg 9, Section 1.3.5, par 4 – When discussing background, has background been determined based on site-specific studies using EPA background guidance standards and have the background levels been approved by EPA and RIDEM?

Response: This paragraph summarizes the background comparison that was conducted as part of the DGA Report, which was approved by EPA and RIDEM. For additional clarity, the text was revised as follows: "As part of the DGA, metals data from the Basewide Background Study Report (Tetra Tech, 2008), was used to perform a "dataset-to-dataset" statistical comparison between the soil data at the Site and the established background concentrations of metals. The background comparison concluded..."

EPA Specific Comment 23: Pg 9, Section 1.3.5, par 6 – Does the dioxin exceed any ARAR or risk-based cleanup standard?

Response: Since ARARs have not been introduced yet, the text does not compare dioxins to ARARs. The text has been revised as follows to explain the screening criterion used in the DGA: "Surface soil concentrations ranged from 2.3 to 150 pg/g and subsurface soil concentrations ranged from 3.2 to 11.2 pg/g, with three surface soil samples and five subsurface soil samples exceeding the screening criterion of 4.2 pg/g. The screening criterion is the screening level for total TEQ of 2,3,7,8-TCDD (4.2 pg/g), divided by the congener's 2005 World Health Organization (WHO) Toxic Equivalency Factor (TEF) for humans and mammals (Van den Berg, et al, 2006)."

EPA Specific Comment 24: Pg 9, Section 1.3.5, par 7 – Please describe whether the ExTPH concentration detected from TF3-001-SB103 exceeded the GA leachability criteria. Edit the second sentence to indicate that at sample TF3-001-SB103 TPH concentrations also exceeded the GA leachability criterion of 500 mg/kg. Indicate that these were the only locations during sampling for the DGA that exceeded the RIDEM residential DEC because two samples from the 2004 Site Investigation also exceeded this threshold.

Response: The text was revised as follows: “Low levels of ExTPH contamination were detected in several samples across DU 3-1. However, TF3-001-SB103 (6 to 8 feet bgs; 2,350 mg/kg [average between sample and associated field duplicate]) was the only location where concentrations exceeded the RIDEM RDEC and GA leachability criteria of 500 mg/kg, but did not exceed the RIDEM industrial DEC of 2,500 mg/kg. This sample is located south of the former sand filter/burn pit, in proximity to a mapped bottom sediment and water line. Filter fabric was encountered during drilling. The filter fabric had been used to mark the boundary between excavated and non-excavated soil during the SIRAR field activities in 2004. Although, only one sample from the DGA exceeded RIDEM criteria for TPH, two subsurface soil samples collected during the SIRAR also exceeded RIDEM criteria for TPH. As discussed further in Section 2.0, TPH is not CERCLA contaminant and the Navy will address the residual TPH separately from the CERCLA cleanup under the RIDEM UST and Remediation regulations.”

EPA Specific Comment 25: Pg 10, Section 1.3.5, par 1 - Delete the reference to GB leachability because the groundwater is classified as GA so GB criteria are not relevant. Did it exceed GA leachability standards?

Response: The text was revised as requested. See response to comment 24 above.

EPA Specific Comment 26: Pg 10, Section 1.3.5, par 3 - Correct the first sentence to refer to 11 borings at DU 3-2.

Response: The text was revised as requested.

EPA Specific Comment 27: Pg 11, Section 1.3.5, par 1 - Edit the text to indicate that naphthalene also exceeded the GA leachability criterion.

Response: The text was revised as follows: “Naphthalene concentrations also exceeded GA leachability criteria.”

EPA Specific Comment 28: Pg 11, Section 1.3.5, par 4 - Edit the text to indicate that PCB concentrations in TF3-ECH-SB108 also exceeded the GA leachability criterion.

Response: The following sentences have been added to following fourth and last sentences in the paragraph, respectively: “One surface soil sample, TF3-ECH-SB108 (0 to 1 foot depth) also exceeded the GA leachability criteria.” and ”No subsurface soil samples exceeded the GA leachability criteria.”

EPA Specific Comment 29: Pg 12, Section 1.3.5, par 1 – Edit the text to indicate that the ExTPH concentration in TF3-ECH-SB108 also exceeded the GA leachability criterion.

Response: The text was revised as follows: “TF3-ECH-SB108 (0 to 1 feet bgs; 550 mg/kg) was the only location where concentrations exceeded the RIDEM residential DEC and GA leachability criteria of 500 mg/kg.”

EPA Specific Comment 30: Pg 12, Section 1.3.5, par 4 – Edit the PAH discussion to mention naphthalene as an exception because it is leachable and exceeded the leachability criterion.

Response: The text was revised as follows: "PAHs, such as naphthalene which was detected above the GA leachability criterion, tend to sorb to soil particles and gradually leach through the soil column by means of precipitation and/or infiltration."

EPA Specific Comment 31: Pg 15, Section 1.3.9 – Edit the text to indicate that the ExTPH concentration in TF3-001-SB103 also exceeded the GA leachability criterion.

Response: The text was revised as follows: "However, TF3-001-SB103 (6 to 8 feet bgs; 2,350 mg/kg [average between sample and associated field duplicate]) was the only location where concentrations exceeded the RIDEM residential DEC and GA leachability criteria."

EPA Specific Comment 32: Pg 17, Section 1.3.9, par 3 – Edit the text to indicate that the ExTPH concentration in TF3-ECH-SB108 also exceeded the GA leachability criterion.

Response: The text was revised as follows: "TF3-ECH-SB108 (0 to 1 feet bgs; 550 mg/kg) was the only location where concentrations exceeded the RIDEM RDEC and GA leachability criteria."

EPA Specific Comment 33: Pg 19, par 4 – In the second sentence change "applicable or relevant and appropriate laws, regulations, and standards promulgated by the federal government" to "any standard, requirement, criteria, or limitation under any Federal environmental law."

Response: The text was revised as requested.

EPA Specific Comment 34: Pg 20, Section 2.1.1, par 1 – Change the text to: "2.1.1 Definition of ARARs and TBCs

As defined by the NCP, ARARs are placed into two classifications: applicable requirements and relevant and appropriate requirements."

Response: The text was revised as requested.

EPA Specific Comment 35: Pg 21, Section 2.1.3, par 1 – In the second sentence change "100" to "500."

Replace the third sentence with: "The federally-threatened Northern Long-Eared Bat has been found overwintering in unused military structures in the area. Therefore, Building 227 in DU 3-3 will be investigated to ensure that it is not used by overwintering bats. If bats are present then the remediation will be carried out in compliance with the Endangered Species Act and species-specific regulatory standards for the Northern Long-Eared Bat."

Change blue text to black.

Response: The reference to the 100-year floodplain is accurate.

The potential overwintering of the NLEB in unused military structures is not relevant to the remedial alternatives evaluated in this FS. However, the following text was added to Section 2.1.3: "Although the estimated areas with soil impacts within the DUs appear to be a mix of

grassland and shrub land, which is not suitable habitat for the federally threatened Northern Long-eared Bat, this will need to be confirmed during planning for the remedial action."

The blue text has been changed to black.

EPA Specific Comment 36: Pg 22 Section 2.2, par 3 - Discuss if there are any plans to transfer ownership of TF3.

Response: The text has been revised as follows: "The Navy has no plans to transfer the property. Future use of Site 11…"

EPA Specific Comment 37: Pg 22 Section 2.2, par 4 – Regarding the second bullet, please supplement the text to clarify why this objective exists for DU 3-1. There is apparently no risk to industrial and restricted recreational users at DU 3-1 based on currently-available data.

Response: As discussed in General Comment 6, separate background values were calculated for surface and subsurface soil and the PRGs were updated. One subsurface soil sample at DU 3-1 contained arsenic concentrations above the subsurface Industrial PRG. As such, no changes were made to the RAOs.

EPA Specific Comment 38: Pg 24, Section 2.3, par 1 – Check to confirm that the values used for the human health risk assessment and the subsequent revisions made for this FS have not changed with the issuance of the November 2015 RSL tables. Make any necessary changes to reflect the values in the November 2015 RSL tables.

Response: The values used for this FS during development of PRGs have not changed with the issuance of the November 2015 RSL tables. The text and notes in the PRG development section have been updated to refer to the November 2015 RSL tables. Any changes to parameters used in the HHRA were noted in the text and PRG development appendix.

EPA Specific Comment 39: Pg 24, Section 2.3, par 3 - Edit the last sentence to refer to cumulative cancer risk = 1×10^{-5}.

Response: The text was revised as requested.

EPA Specific Comment 40: Pg 25, Section 2.3, par 1 & 3 – Change "Per the NCP, USEPA generally does not require cleanup to below background levels" to "CERCLA does not extend cleanup jurisdiction over soils at or less than site-specific background levels."

Response: The text was revised as requested.

EPA Specific Comment 41: Pg 25, Section 2.3, par 3 - Edit the last sentence to also include naphthalene.

Response: The referenced sentence lists analytes that were not risk drivers, but exceeded ARARs. Naphthalene would not be included because it was a risk driver.

EPA Specific Comment 42: Pg 29, Section 2.4, par 5 - Delete the parenthetical phrase "(at one location)"

Response: The text was revised as requested.

EPA Specific Comment 43: Pg 32, Section 3.1.2 – As a point of clarification, for DU 3-3 will all PCB-contaminated soils, both surface and subsurface, above the ecological PRG be removed or just the soil exceeding the PRG in the top foot where there is an ecological contact risk? If the latter is the case then the alternative also has to include maintaining the one foot of clean backfill over any remaining subsurface PCB contaminated soil that exceeds the ecological PRG and long-term monitoring to ensure that the cover remains protective.

Response: At DU 3-3, the estimated depth of excavation is 5 feet bgs. All surface and subsurface soil exceeding the ecological PRG will be removed. The beginning of the first full paragraph on Page 33 has been revised as follows: "At DU 3-3, all surface and subsurface soil exceeding the Ecological and/or Industrial PRG (including GA leachability criteria) will be removed. A total of two samples..."

EPA Specific Comment 44: Pg 32, Section 3.1.2, par 1 – After the fourth sentence insert: "If and when the ECH building is demolished, the demolition/disposal will meet TSCA protectiveness standards so as not to create a threat of release to the environment."

Response: The text was revised as requested.

EPA Specific Comment 45: Pg 33, Section 3.1.2, par 5 - Although not a CERCLA contaminant, TPH exceeded the GA leachability criteria at DU 3-1 and DU 3-3 so unless the TPH is co-located with CERCLA contaminants that will be remediated these TPH exceedances will either need to be addressed as a separate state action or included coincidentally with this CERCLA action to address state requirements. Please edit the text to address this issue.

Response: The following text was added following the first paragraph of Section 3.1.2: "TPH is not a CERCLA-regulated contaminant and therefore no PRGs were developed in this FS; however, at locations where TPH exceedances are co-located with CERCLA PRG exceedances, the CERCLA response action will address TPH as well. At DU 3-1, this alternative includes LUCs only at DU 3-1 to meet the Residential and Industrial PRGs; however, LUCs would not address the residual TPH concentrations above the RIDEM GA leachability criterion. Rather, the Navy will address the residual TPH under the RIDEM UST and remediation regulations. At DU 3-3, this alternative includes soil excavation to remove soils exceeding the Industrial and Ecological PRGs and it is expected that this action will also remove the co-located TPH to below RIDEM criteria."

EPA Specific Comment 46: Pg 34, Section 3.1.2, par 2 – In the first sentence change "the LUC Remedial Design (RD) would limit development of the site for residential use" to "the LUC Remedial Design will identify the remedial measures to be taken to restrict residential use." Include standard language describing how enforceable LUCs would be established if the Navy ever transfers the property.

Response: The text was revised as follows: "For this remedial alternative, the LUC Remedial Design (RD) will identify the remedial measures to be taken to restrict residential use and to ensure subsurface soils exceeding the Industrial PRG for arsenic at DU 3-1 are not disturbed or contacted in the future."

The following text is presented in the Detailed Description in Section 4.1.2: "As long as Navy retains ownership of the property, NAVSTA Newport enforces the LUCs and assures that each LUC is maintained appropriately by tracking it through a centralized tracking system. If the property is transferred from the Navy to another federal owner, upon meeting the requirements for transfers under the site's FFA, Navy would ensure as part of the transfer process that the gaining agency is made aware of the existing controls and would take appropriate action to ensure that such controls remain in place. If the property is ever transferred to non-federal ownership, deed restrictions, meeting state property law standards, would be recorded that would incorporate and land use restrictions. Although the Navy may transfer the procedural LUC responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity. LUCs will be maintained until the concentrations of hazardous substances in the soil are at levels that allow for unrestricted use and exposure." No changes were made to the text to address the second part of the comment.

EPA Specific Comment 47: Pg 34, Section 3.1.3, par 1 - Please refer to the comment on p. 33, §3.1.2, par 5.

Response: The following text was added following the first paragraph of Section 3.1.3: "TPH is not a CERCLA-regulated contaminant and therefore no PRGs were developed in this FS; however, at locations where TPH exceedances are co-located with CERCLA PRG exceedances, the CERCLA response action will address TPH as well. At DU 3-1, this alternative includes LUCs only at DU 3-1 to meet the Residential and Industrial PRGs; however, LUCs would not address the residual TPH concentrations above the RIDEM GA leachability criterion. Rather, the Navy will address the residual TPH under the RIDEM UST and remediation regulations. At DU 3-3, this alternative includes an asphalt cover over soils exceeding the Industrial and Ecological PRGs and it is expected that this action will also address the co-located TPH to meet RIDEM criteria."

EPA Specific Comment 48: Pg 34, Section 3.1.3, par 3 – Please supplement the text to address any issues with installing 10 inches of asphalt cover material around the transformers at DU 3-2 and around the building at DU 3-3. Clarify, if correct, that this asphalt cover will not interfere with the access to these structures. If necessary include sufficient soil removal to allow placement of the asphalt cover. The cover alternative will also require long-term monitoring to ensure the remedy remains protective. Pg 34, Section 3.1.3 – It is described that an asphalt cover will be placed over soil in excess of the I/C DECs (including RIDEM GA leachability criteria) at DU3-2 and 3-3. Alternatively, please explain why asphalt has been proposed as the cover type rather than native soil or other single barrier cap.

Response: As discussed in the text, an asphalt cover system was selected to minimize the leaching of PAHs and PCBs from soil to groundwater. The text was revised as follows: "During the remedial design, the type of cover system will be selected. This FS proposes an asphalt cover system since it will prevent direct contact, erosion, and transport of remaining soil exceeding Industrial PRGs and Ecological PRGs (DU 3-3 only). This containment system would also minimize the leaching of PAHs and PCBs from soil to groundwater. A native soil or single barrier cap would not minimize the leaching of PAHs and PCBs from soil to groundwater.

An asphalt cover system would be installed at the DU 3-2 and 3-3. The cover would be designed to not interfere with access to the structures. For the purpose of the FS, the cover

system would consist of 4 inches of asphalt pavement overlying at least 6 inches of clean sub-base material. The asphalt pavement would be installed to cover assumed impacted areas of 150 square feet at DU 3-2 and 150 square feet at DU 3-3."

EPA Specific Comment 49: Pg 35, Section 3.1.3, par 1 - Include standard language describing how enforceable LUCs would be established if the Navy ever transfers the property.

Response: The following text was added to Section 3.1.3: "For this remedial alternative, the LUC Remedial Design (RD) will identify the remedial measures to be taken to restrict residential use, maintain the integrity of covers at DU 3-2 and 3-3, and to ensure subsurface soils exceeding the Industrial PRG for arsenic at DU 3-1 are not disturbed or contacted in the future."

The following text is presented in the Detailed Description in Section 4.1.3: "As long as Navy retains ownership of the property, NAVSTA Newport enforces the LUCs and assures that each LUC is maintained appropriately by tracking it through a centralized tracking system. If the property is transferred from the Navy to another federal owner, upon meeting the requirements for transfers under the site's FFA, Navy would ensure as part of the transfer process that the gaining agency is made aware of the existing controls and would take appropriate action to ensure that such controls remain in place. If the property is ever transferred to non-federal ownership, deed restrictions, meeting state property law standards, would be recorded that would incorporate and land use restrictions. Although the Navy may transfer the procedural LUC responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity. LUCs will be maintained until the concentrations of hazardous substances in the soil are at levels that allow for unrestricted use and exposure." No changes were made to the text.

EPA Specific Comment 50: Pg 35, Section 3.1.4, par 1 - Remove the superfluous text to read: "… the soil beneath the building …." Insert as a new fifth sentence: "If and when the ECH building is demolished, the demolition/disposal will meet TSCA protectiveness standards so as not to create a threat of release to the environment.

Response: The text has been revised as follows: "LUCs, to include maintenance of the ECH building foundation, would be required at DU 3-3 to prevent access to the soil beneath the building, which has not been assessed. If the building is demolished in the future, the soil assessed and beneath the building would be assessed and remediated, if necessary, to meet Residential, Industrial, and Ecological PRGs. Demolition of this building is not considered part of the remedy. If and when the ECH building is demolished, the demolition/disposal will meet TSCA protectiveness standards so as not to create a threat of release to the environment."

EPA Specific Comment 51: Pg 35, Section 3.1.4, par 2 - Please refer to the comment on p. 33, §3.1.2, par 5.

Response: The following text was added to Section 3.1.4: "TPH is not a CERCLA-regulated contaminant and therefore no PRGs were developed in this FS; however, at locations where TPH exceedances are co-located with CERCLA PRG exceedances, the CERCLA response action will address TPH as well. At DU 3-1, this alternative includes LUCs only at DU 3-1 to meet the Residential and Industrial PRGs; however, LUCs would not address the residual TPH concentrations above the RIDEM GA leachability criterion. Rather, the Navy will address the

residual TPH under the RIDEM UST and remediation regulations. At DU 3-3, this alternative includes soil excavation to remove soils exceeding the Residential, Industrial and Ecological PRGs and it is expected that this action will also remove the co-located TPH to below RIDEM criteria."

EPA Specific Comment 52: Pg 36, Section 3.1.4, par 4 - Include standard language describing how enforceable LUCs would be established if the Navy ever transfers the property.

Response: Language about the enforceability of LUCs is presented in Section 4.0 of the FS, where alternatives brought through screening are further refined. No changes to the document were made.

EPA Specific Comment 53: Pg 37, Section 3.1.5, par 1 - Please refer to the comment on p. 33, §3.1.2, par 5.

Response: The following text was added to Section 3.1.5: "TPH is not a CERCLA-regulated contaminant and therefore no PRGs were developed in this FS; however, at locations where TPH exceedances are co-located with CERCLA PRG exceedances, the CERCLA response action will address TPH as well. At DU 3-1, this alternative includes LUCs only at DU 3-1 to meet the Residential and Industrial PRGs; however, LUCs would not address the residual TPH concentrations above the RIDEM GA leachability criterion. Rather, the Navy will address the residual TPH under the RIDEM UST and remediation regulations. At DU 3-3, this alternative includes in-situ thermal desorption to treat soils exceeding the Industrial and Ecological PRGs and it is expected that this action will also remove the co-located TPH to below RIDEM criteria."

EPA Specific Comment 54: Pg 37, Section 3.1.5, par 4 - Include standard language describing how enforceable LUCs would be established if the Navy ever transfers the property.

Response: Language about the enforceability of LUCs is presented in Section 4.0 of the FS, where alternatives brought through screening are further refined. No changes to the document were made.

EPA Specific Comment 55: Pg 40, Section 4.2.1 – Is there any likelihood that water would be generated from the excavation work (either groundwater or surface water entering the excavation) that would require removal/treatment. If so, describe how excavation water will be managed/treated/discharged as part of this alternative.

Response: Excavation will be stopped if it reaches the water table. Removal/treatment of water is not likely. No changes were made to the text.

EPA Specific Comment 56: Pg 40, Section 4.2.1, par 4 - The extent of TPH concentrations exceeding the GA leachability criteria and residential DEC at DU 3-1 and DU 3-3 will also need to be determined through additional sampling and will either need to be addressed as a separate state action or included coincidentally with this CERCLA action to address state requirements. Please edit the text to address this issue.

Response: The following text was added following the third paragraph of Section 4.2.1: "TPH is not a CERCLA-regulated contaminant and therefore no PRGs were developed in this FS; however, at locations where TPH exceedances are co-located with CERCLA PRG exceedances,

the CERCLA response action will address TPH as well. At DU 3-1, this alternative includes LUCs only at DU 3-1 to meet the Residential and Industrial PRGs; however, LUCs would not address the residual TPH concentrations above the RIDEM GA leachability criterion. Rather, the Navy will address the residual TPH under the RIDEM UST and remediation regulations. At DU 3-3, this alternative includes soil excavation to remove soils exceeding the Industrial and Ecological PRGs and it is expected that this action will also remove the co-located TPH to below RIDEM criteria."

The following sentence has been added to the end of the fourth paragraph of Section 4.2.1: "Sampling to delineate TPH concentrations will be performed under the RIDEM UST and remediation regulations."

EPA Specific Comment 57: Pg 41-42, Section 4.2.1, Tables – Regarding the volumes presented in the two tables, is the difference in the DU 3-3 volumes between excavating 28 cubic yards and 153 cubic yards solely the difference between removing down to 3.6 mg/kg PCBs rather than to 1 mg/kg PCBs in the soil?

Response: As part of Alternative S-2, 28 cubic yards, over an area of 150 square feet and 5 feet deep, will be removed from DU 3-3 to address Industrial and Ecological PRG exceedances. LUCs are also required to restrict residential use. The extent of LUCs is larger than the excavation footprint (2070 square feet at 2' deep) since it must address all residential PRG exceedances. Speaking of LUCs in terms of volume is slightly confusing. As such, the text regarding LUCs was revised to discuss in terms of area.

"The estimated areas are provided below based on currently available data. These areas will be further refined during the pre-design sampling.

Exposure Area	Area of Proposed LUCs (sq. feet)
DU 3-1	4200
DU 3-2	415
DU 3-3	2070

EPA Specific Comment 58: Pg 41, Section 4.2.1, par 4 - End the first sentence after the parenthetical phrase and delete the remainder of the sentence. Revise the third sentence to address TPH GA leachability criterion exceedances. Edit the fifth sentence to read: "... provided below based on currently available data."

Response: The text was revised as follows: "The goal of the removal is to address exceedances of the Industrial PRG and Ecological PRG (applicable to DU 3-3 only). Oil-soaked wood at DU 3-2 would also be removed as part of the soil excavation. Since concentrations of all CERCLA contaminants at DU 3-1 are below Industrial PRGs, excavation is not proposed. The areas currently targeted for excavation are presented on Figures 12 and 15. The estimated areas and volumes are provided below based on currently available data."

See the response to EPA Specific Comment 56 for specific text added to Section 4.2.1 to address TPH.

EPA Specific Comment 59: Pg 41, Section 4.2.1, par 5 - Edit the last sentence to read: "... is removed, and confirmation samples collected, if necessary to confirm that the remedial goals have been achieved, the areas ...."

Response: As discussed under "Soil Sampling" in Section 4.2.1, sampling would be conducted prior to excavation to fully delineate the extent of soils that exceed PRGs. Confirmation sampling is not expected to be needed. No change has been made to the text.

EPA Specific Comment 60: Pg 42, Section 4.2.1, par 2 - Regarding the establishment of residential LUCs, please edit the FS to clarify how Navy will determine the boundary for the residential LUCs.

Response: The text was revised as follows: "Requirements for management of excavated soil as part of any future construction activities (including sampling and disposal of contaminated soils) at DU 3-1, 3-2, and 3-3 would also be included as part of the LUCs. The areas currently targeted for LUCs are presented on Figures 9, 12, and 15. The estimated areas and volumes are provided below based on currently available data. These areas will be further refined during the pre-design sampling.

EPA Specific Comment 61: Pg 42, Section 4.2.1, par 3 - Edit the third sentence to read: "... provided below based on currently available data."

Response: The text was revised as requested.

EPA Specific Comment 62: Pg 43, Section 4.2.2, par 2 - Supplement the text to state that the alternative would be protective of human health and the environment.

Response: The following text was added: "Alternative S-2 would be protective of human health and the environment."

EPA Specific Comment 63: Pg 44, Section 4.2.2, par 3 – In the last sentence after "location-specific" insert "and."

Response: The text was revised as requested.

EPA Specific Comment 64: Pg 44, Section 4.2.2, par 4- Supplement the text to state that the alternative would provide permanent long-term protectiveness.

Response: The following text was added: "Alternative S-2 would provide permanent long-term protectiveness."

EPA Specific Comment 65: Pg 44, Section 4.2.2, par 7 - Delete the first half of the last sentence because there is risk to current receptors.

Response: The text was revised as requested.

EPA Specific Comment 66: Pg 45, Section 4.3.1 - The cover alternative will also require long-term monitoring to ensure the remedy remains protective.

Response: The text was revised as follows: "Under this alternative, an asphalt cover would be placed over soil in excess of the Industrial PRGs (including RIDEM GA Leachability Criterion) at DU 3-2 and 3-3. The cover would also cover soils exceeding the Ecological PRG at DU 3-3. LUCs would be applied to DU 3-1, 3-2, and 3-3 preventing residential use and to DU 3-3 to include maintenance of the ECH building foundation. Regular site inspections of the cover would also be performed to verify its integrity in the long-term."

EPA Specific Comment 67: Pg 45, Section 4.3.1, par 1 - Supplement the text to indicate if TPH exceedances of the GA leachability criterion will be addressed as a separate state action or included coincidentally with this CERCLA action to address state requirements.

Response: The following text was added to Section 4.3.1: "TPH is not a CERCLA-regulated contaminant and therefore no PRGs were developed in this FS; however, at locations where TPH exceedances are co-located with CERCLA PRG exceedances, the CERCLA response action will address TPH as well. At DU 3-1, this alternative includes LUCs only at DU 3-1 to meet the Residential and Industrial PRGs; however, LUCs would not address the residual TPH concentrations above the RIDEM GA leachability criterion. Rather, the Navy will address the residual TPH under the RIDEM UST and remediation regulations. At DU 3-3, this alternative includes an asphalt cover over soils exceeding the Industrial and Ecological PRGs and it is expected that this action will also address the co-located TPH to meet RIDEM criteria."

EPA Specific Comment 68: Pg 45, Section 4.3.1, par 5 - The extent of TPH concentrations exceeding the GA leachability criteria and residential DEC at DU 3-1 and DU 3-3 will also need to be determined through additional sampling and will either need to be addressed as a separate state action or included coincidentally with this CERCLA action to address state requirements. Please edit the text to address this issue.

Response: The text was revised as follows: "Prior to the remedial design, sampling will be needed to delineate the extent of soils that exceed PRGs at DU 3-1, 3-2, and 3-3. Sampling to delineate TPH concentrations will be performed under the RIDEM UST and remediation regulations."

EPA Specific Comment 69: Pg 46, Section 4.3.1, par 4 - Please also address TPH exceedances of the GA leachability criterion at DU 3-1.

Response: See response to EPA Specific Comment 67. No changes were made to the Asphalt Cover discussion.

EPA Specific Comment 70: Pg 46, Section 4.3.1, par 6 - Please supplement the text to address any issues with installing 10 inches of asphalt cover material around the transformers at DU 3-2 and around the building at DU 3-3. Clarify, if correct, that this asphalt cover will not interfere with the access to these structures. If necessary include sufficient soil removal to allow placement of the asphalt cover. The last sentence should apparently refer to geomembranes rather than geotextiles since an impervious cover is necessary. Please review to clarify the intent.

Response: The text was revised as follows: “The asphalt cover system will consist of 4 inches of asphalt pavement overlying at least 6 inches of clean sub-base material to prevent direct contact, erosion, and transport of remaining soil exceeding Industrial PRGs and Ecological PRGs (DU 3-3 only). The cover will be designed to not interfere with access to the structures. This containment system would also minimize the leaching of PAHs and PCBs from soil to groundwater. Alternate covers are possible, such as those using geomembrane materials; however, the asphalt cover system is a common approach and was used here for costing/comparison purposes.”

EPA Specific Comment 71: Pg 47, Section 4.3.1, par 1 - Please address non-CERCLA TPH exceedances of the residential DEC criterion at DU 3-1.

Response: See response to EPA Specific Comment 67. No changes were made to the LUCs and Inspection discussion.

EPA Specific Comment 72: Pg 48, Section 4.3.2, par 2 - Supplement the text to state that the alternative would be protective of human health and the environment.

Response: The text following text has been added: “Alternative S-3 would be protective of human health and the environment.”

EPA Specific Comment 73: Pg 48, Section 4.3.2, par 3 - Edit the second sentence to delete the first reference to the word “would”. The asphalt (or alternative design) cover would need to be designed, constructed and maintained to meet RI Remediation Regulation leachability control standards.

Response: The text was revised as follows: “With proper execution of this remedy, all chemical-specific ARARs and TBCs will be met and location-specific and action-specific ARARs and TBCs would be complied with.” It is not clear what portion of the RI Remediation Regulation is being referenced in the second part of the comment. An action-specific ARAR is included that addresses cover maintenance and permeability.

EPA Specific Comment 74: Pg 49, Section 4.3.2, par 1- Supplement the text to state that the alternative would provide permanent long-term protectiveness.

Response: The text following text has been added: “Alternative S-3 would provide permanent long-term protectiveness.”

EPA Specific Comment 75: Pg 49, Section 4.3.2, par 5 - Correct the first sentence to refer to “Alternative S-3”.

Response: The text was revised as requested.

EPA Specific Comment 76: Pg 49, Section 4.3.2, par 6 - Please supplement the text to address any issues with installing 10 inches of asphalt cover material around the transformers at DU 3-2 and around the building at DU 3-3. Clarify, if correct, that this asphalt cover will not interfere with the access to these structures. If necessary include sufficient soil removal to allow placement of the asphalt cover.

Response: The text was revised as follows: “Prior to implementing this alternative, a work plan would be prepared to include the specifications of the sampling approach, cover design, and site restoration. The cover will be designed to not interfere with access to the structures.”

EPA Specific Comment 77: Pg 53, Section 5.1.2 - Correct the first sentence to refer to three alternatives not four; add location-specific ARARs or explain why they are not mentioned.

Response: The text was revised as follows: “Appendix B presents the ARARs for the three alternatives. Alternatives S-2 and S-3 meet the chemical-specific, location-specific, and action-specific ARARs.”

EPA Specific Comment 78: Pg 53, Section- 5.1.3 - Please edit the first sentence to read: “... long-term effectiveness because much of the more highly-contaminated soil would be removed from the site and placed in an appropriately-regulated land fill.”

Response: The text has been revised as requested.

EPA Specific Comment 79: Pg 54, Section 5.1.5, par 1 - Supplement the text by adding: “Alternative S-2 would create more short-term risk than S-3 because of active handling of the contaminated soil which would create more dust and contact exposure.”

This discussion could be expanded to discuss traffic generated by both S-2 and S-3 and the slight risk to the community from transporting contaminated soil over public roads.

Response: The following text was added: “Alternative S-2 would create more short-term risk to workers than Alternative S-3 since active handling of the contaminated soil creates more dust and contact exposure. Under Alternatives S-2 and S-3, short-term risks to the community would be associated with transportation of contaminated soil over public roads.”

EPA Specific Comment 80: Pg 54, Section 5.1.5, par 2- Correct the last sentence to refer to Alternative S-3 not S-2.

Response: The text was revised as requested.

EPA Specific Comment 81: Pg 55, Section 5.1.6, par 6 - Edit the text to indicate that S-1 would not be administratively implementable because it does not reduce risk at the site and does not satisfy the ARARs.

Response: The following text was added: “Alternative S-1 would not be administratively feasible since it does not reduce risk at the site and does not satisfy the ARARs.”

EPA Specific Comment 82: Pg 56, Section 5.1.7 - Correct the first sentence to refer to three alternatives not four.

Response: The text was revised as requested.

EPA Specific Comment 83: Table 2-1a

For the EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination, Action to be Taken text after “humans” add “and ecological receptors.”

Add the following Federal TBCs:

Recommendations of the Technical Review Workgroup for Lead for an approach to Assessing Risks Associated with Adult Exposure to Lead In Soil	*EPA-540-R-03-001 (January 2003)*	*To be Considered*	*EPA guidance for evaluating risks posed by lead in soil.*	*Used to calculate potential risks caused by exposure to lead in soil.*
Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.	*EPA/600/R-10/005*	*To be Considered*	*EPA guidance for evaluating risks posed by dioxin.*	*Used to calculate potential risks caused by exposure to dioxin in soil.*
Cite any other guidance used to develop the PCB eco-risk PRG.				

Response: The table was revised as requested. In addition to the two items above, the guidance listed below was added. Appendix B was also revised to incorporate the Federal TBCs

Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments	*EPA/540/R-97/006*	*To be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs*
Final Guidelines for Ecological Risk Assessment	*EPA/630/R095/002F*	*To be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs*
Guidance for Developing Ecological Soil Screening Levels	*OSWER Directive 9285.7-55*	*To be Considered*	*EPA guidance for generating ecological soil screening levels*	*Used to calculate potential wildlife risks and PRGs*

Toxicological Benchmarks for Wildlife: 1996 Revision	*ES/ER/TM-86/R3*	*To be Considered*	*Oak Ridge National Laboratory guidance on toxicity values for wildlife*	*Used to calculate potential wildlife risks and PRGs*
Wildlife Exposure Factors Handbook. Vols. I and II	*EPA/600-R/R-93/187a*	*To be Considered*	*EPA guidance on identifying exposure parameters for wildlife*	*Used to calculate potential wildlife risks and PRGs*
Development and Validation of Bioaccumulation Models for Earthworms	*ES/ER/TM-220*	*To be Considered*	*Oak Ridge National Laboratory guidance on uptake of contaminants from soil to earthworms*	*Used to calculate potential wildlife risks and PRGs*

EPA Specific Comment 84: Table 2-1b

If overwintering bat habitat is present in Building 227 [or will be assessed during remedial design] add the following federal location-specific ARAR:

Federal Endangered Species Act of 1973 (ESA); Endangered and Threatened Wildlife and Plants, Special Rules: Northern Long-Eared Bat	*16 U.S.C. 1531 et seq.; 33 C.F.R. Part 320 & 50 C.F.R § 17.40(o)*	*Applicable*	*The purpose of the ESA is to "conserve the ecosystems upon with threatened and endangered species depend" and to conserve and recover listed species. Federal agencies must consult with the U.S. Fish and Wildlife Service to ensure that the actions they authorize, fund, or carry out will not jeopardize listed species. The Northern Long-Eared Bat is listed as federally threatened. The Northern Long-Eared Bat has been documented overwintering in former military structures in the area.*	*[Overwintering bats have been observed in Building 227] or [As part of pre-design investigations, Building 227 will be assessed to determine if it is potential bat overwintering habitat. If federally protected bats are located, the U.S. Fish and Wildlife Service will be consulted with during the planning process so that investigations and remedial actions do not adversely impact bat populations or habitat*

Response: The potential overwintering of the NLEB in unused military structures is not relevant to the remedial alternatives evaluated in this FS. Although the estimated areas with soil impacts within the DUs appear to be a mix of grassland and shrub land, which is not suitable habitat for the federally threatened Northern Long-eared Bat, this will need to be confirmed during planning for the remedial action. The table was revised as follows:

Requirement	*Citation*	*Status*	*Requirement Synopsis*	*Action to Be Taken to Attain Requirement*
Federal				
Federal Endangered Species Act of 1973 (ESA); Endangered and Threatened Wildlife and Plants, Special Rules: Northern Long-Eared Bat	*16 U.S.C. 1531 et seq.; 50 C.F.R § 17.40(o)*	*Applicable*	*The purpose of the ESA is to "conserve the ecosystems upon with threatened and endangered species depend" and to conserve and recover listed species. Federal agencies must consult with the U.S. Fish and Wildlife Service to ensure that the actions they authorize, fund, or carry out will not jeopardize listed species. The Northern Long-Eared Bat (NLEB) is listed as federally threatened. The NLEB range includes Coastal New England towns, such as Portsmouth, RI.*	*This requirement may be applicable if clearing of trees of 3 inch diameter at breast height or larger is needed during the remedial action and the work is to be conducted within the April 15th - September 30th time-of-year restriction, under the assumed presence of the NLEB in the area of the site. The U.S. Fish and Wildlife Service will be consulted with, if required, during the planning process so that investigations and remedial actions do not adversely impact bat populations or habitat.*

Appendix B was also revised accordingly.

EPA Specific Comment 85: Table 2-2 - There is no Note #3; please add it or delete the note from the table.

A PRG is not needed for chromium III and the background value listed in this table for chromium is not applicable to chromium VI. There is no background value available for chromium VI; a risk-based value needs to be used. Please add a note to the table to explain why chromium is included in this table and recognize that there is no background value available for chromium VI.

Response: The chromium PRG for the residential use scenario was revised to 0.31 mg/kg. The following notes were added to Table 2-2, which is attached: "3. Residential use scenario PRGs are reflected for establishing the land use control boundary.

4. Chromium speciation has not been performed for this site. At this time, chromium has been assumed to be hexavalent chromium even though there is no current evidence that it would be this species."

EPA Specific Comment 86: Table 2-3 - Correct the residential PRG for TEQ to 4.8; a residential PRG for total chromium is not necessary; correct the name identifier for petroleum from "nonpetroleum" to "extractable TPH" or "TPH-Diesel Range".

Response: The table has been revised accordingly and also separated into two tables for surface and subsurface soil (see attached Tables 2-3a and 2-3b).

EPA Specific Comment 87: Table 2-5 - A residential PRG for total chromium is not necessary; correct the name identifier for petroleum from "nonpetroleum" to "extractable TPH" or "TPH-Diesel Range".

Response: As discussed in EPA Specific Comment 85, chromium has been assumed to be hexavalent chromium. As such, a chromium PRG of 0.31 mg/kg was established for residential use. The text and tables were revised accordingly and also separated into two tables for surface and subsurface soil (see attached Tables 2-5a and 2-5b).

In Tables 2-3 through 2-5, nonpetroleum was revised to "Extractable TPH C8-C44".

EPA Specific Comment 88: Table 2-6, p. 2 - Change "Treatment: Off-Site" to "Source Control"; only one of the process options involves treatment.

Response: The table was revised as requested.

EPA Specific Comment 89: Table 3-1 - For Alternatives S-2 through S-5, edit the text to describe whether Navy will address TPH exceedances of the GA leachability and residential direct exposure criteria as a separate state action or include it coincidentally with this CERCLA action to address state requirements. If conducted coincidentally with the CERCLA action edit the elements of the alternatives to address the TPH exceedances (e.g., extend the LUCs and the asphalt cover or the excavation). Please rephrase Alternative S-4 to: Excavation to Residential PRGs and Off-Site Disposal.

For Alternative S-3 add long-term monitoring of the cover.

Response: The following text was added to the end of Table 3-1: "Note: At locations where TPH exceedances are co-located with PRG exceedances for CERCLA contaminants, the CERCLA response action will address TPH as well. The Navy will handle residual TPH under the RIDEM UST and remediation regulations."

For Alternative S-3 the text was revised as follows: "Apply LUCs to DU 3-2 and 3-3 that restrict cover disturbance and require maintenance of the asphalt covers. Regular site inspections of the cover would also be performed to verify the continued maintenance of LUCs until the cleanup levels have been achieved. LUCs would also be applied to DU 3-1, 3-2, and 3-3 preventing residential use and to DU 3-3 to require maintenance of the ECH building foundation."

EPA Specific Comment 90: Table 3-3 thru 3-6 - Please address how non-CERCLA TPH exceedances of the GA leachability and residential DEC criteria will be managed.

Response: The following text was added to Tables 3-3 thru 3-6: "At locations where TPH exceedances are co-located with PRG exceedances for CERCLA contaminants, the CERCLA response action will address TPH as well. The Navy will handle residual TPH under the RIDEM UST and remediation regulations."

EPA Specific Comment 91: Table 4-2 - For "Magnitude of Residual Risk" state that industrial and ecological risk would be reduced to acceptable levels through contamination removal and residential risk would be managed by restricting access.

For "Ability to Monitor Effectiveness" also state that supplemental sampling would identify the extent of contamination to insure the initial effectiveness of the cap and LUCs.

Response: The following text was added to "Magnitude of Residual Risk": "Under this alternative, risks to industrial users and ecological receptors would be reduced to acceptable levels through contamination removal. Risks to residential users would be reduced by restricting access."

The following text was added to "Ability to Monitor Effectiveness": "Additional sampling would be performed to identify the extent of contamination to ensure the initial effectiveness of the excavation and LUCs. Five-year reviews will also be conducted to monitor effectiveness."

Similar changes were also made to Table 4-3.

EPA Specific Comment 92: Figure 3- Zoom in on the structure and include locations for samples collected prior to 2013 that are still relevant (i.e., TF3-001-S1-2.0 and TF3-001-S3-2.5).

Edit the figure to differentiate between abandoned in place and active ring drain/BSW drainage lines.

Response: The figure was zoomed in as requested and the 2004 sample locations were added. A label has been added to indicate that the inlet and outlet lines from the sand filter/burn pit are believed to be abandoned in place. See attached revised Figure 3.

EPA Specific Comment 93: Figures 6 thru 9 - Add samples collected prior to 2013 if still relevant.

Response: The 2004 sample locations have been added to Figure 3 for background, but are not shown on Figures 6 through 9 because the samples were only analyzed for TPH there are no PRGs, since TPH is not a CERCLA contaminant.

EPA Specific Comment 94: Figure 12 - Because oil-soaked wood was apparently observed at TF3-020-SB102B it would be appropriate to extend the excavation/remediation in that direction to include that location.

The location of electrical infrastructure would be pertinent for this figure. Please add it if available from Navy.

Add another note to the table: "Remedial boundaries subject to change based on planned supplemental sampling."

Response: Figure 12 was revised to include excavation of SB102B and the revised version is attached. The following notes were added to Figure 12:

3. Although PRG exceedances were not observed at SB102B, remedial actions are proposed to address the oil-soaked wood.
4. Remedial boundaries subject to change based on planned supplemental sampling.

The area and volume of contaminated soil at DU 3-2 was also revised based on the inclusion of TF3-020-SB102B. The text was revised accordingly. Electrical infrastructure information is not available.

EPA Specific Comment 95: Figure 15 - Add another note to the table: "Remedial boundaries subject to change based on planned supplemental sampling." Show both sample concentrations for TF3-ECH-SS108-0001: 140 mg/kg and 77 mg/kg; the location of electrical infrastructure would be pertinent for this figure. Please add it if available from Navy.

Response: Figure 15 was revised (see attachment) to include the following notes:

3. PRG exceedances for chromium are not reflected on this figure. Hexavalent chromium has been identified as a potential COC, based on an assumption that the detected chromium is hexavalent chromium. There is no evidence that hexavalent chromium is actually present and further sampling/analysis would be expected to show that most of the chromium detected is trivalent chromium.
4: Remedial boundaries subject to change based on planned supplemental sampling.

At locations where a field duplicate was collected, the average concentration was used. No changes were made to the figure or text.

EPA Specific Comment 96: Appendix B

Table B-1a

Add the following Federal TBCs:

Recommendations of the Technical Review Workgroup for Lead for an approach to Assessing Risks Associated with Adult Exposure to Lead In Soil	*EPA-540-R-03-001 (January 2003)*	*To be Considered*	*EPA guidance for evaluating risks posed by lead in soil.*	*This alternative would not prevent exposure to lead in soil at DU 3-1, 3-2, and 3-3 which contributes to a calculated risk, developed using this guidance.*
Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.	*EPA/600/R-10/005*	*To be Considered*	*EPA guidance for evaluating risks posed by dioxin.*	*This alternative would not prevent exposure to dioxin in soil at DU 3-1, 3-2, and 3-3 which contributes to a calculated risk, developed using this guidance.*

Cite any other guidance used to develop the PCB eco-risk PRG.				

Response: the following TBCs were added to Table B-1a:

Recommendations of the Technical Review Workgroup for Lead for an approach to Assessing Risks Associated with Adult Exposure to Lead In Soil	*EPA-540-R-03-001 (January 2003)*	*To be Considered*	*EPA guidance for evaluating risks posed by lead in soil.*	*Used to calculate potential risks caused by exposure to lead in soil. This alternative would not prevent exposure to lead in soil at DU 3-3 which contributes to a calculated risk, developed using this guidance.*
Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.	*EPA/600/R-10/005*	*To be Considered*	*EPA guidance for evaluating risks posed by dioxin.*	*Used to calculate potential risks caused by exposure to dioxin in soil. This alternative would not prevent exposure to dioxin contamination in soil at DU 3-1 which contributes to a calculated risk, developed using this guidance.*
Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments	*EPA/540/R-97/006*	*To Be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs. This alternative would not prevent exposure to PCBs in soil at DU 3-3 which contribute to a calculated risk, developed using this guidance.*
Final Guidelines for Ecological Risk Assessment	*EPA/630/R095/002F*	*To Be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs. This alternative would not prevent exposure to PCBs in soil at DU 3-3 which contribute to a calculated risk, developed using this guidance.*

Guidance for Developing Ecological Soil Screening Levels	*OSWER Directive 9285.7-55*	*To Be Considered*	*EPA guidance for generating ecological soil screening levels*	*Used to calculate potential wildlife risks and PRGs. This alternative would not prevent exposure to PCBs in soil at DU 3-3 which contribute to a calculated risk, developed using this guidance.*
Toxicological Benchmarks for Wildlife: 1996 Revision	*ES/ER/TM-86/R3*	*To Be Considered*	*Oak Ridge National Laboratory guidance on toxicity values for wildlife*	*Used to calculate potential wildlife risks and PRGs. This alternative would not prevent exposure to PCBs in soil at DU 3-3 which contribute to a calculated risk, developed using this guidance.*
Wildlife Exposure Factors Handbook. Vols. I and II	*EPA/600-R/R-93/187a*	*To Be Considered*	*EPA guidance on identifying exposure parameters for wildlife*	*Used to calculate potential wildlife risks and PRGs. This alternative would not prevent exposure to PCBs in soil at DU 3-3 which contribute to a calculated risk, developed using this guidance.*
Development and Validation of Bioaccumulation Models for Earthworms	*ES/ER/TM-220*	*To Be Considered*	*Oak Ridge National Laboratory guidance on uptake of contaminants from soil to earthworms*	*Used to calculate potential wildlife risks and PRGs. This alternative would not prevent exposure to PCBs in soil at DU 3-3 which contribute to a calculated risk, developed using this guidance.*

EPA Specific Comment 97: Remove Table B-1b (there are no location-specific ARARs for the No Action alternative).

Response: Table was removed as requested.

EPA Specific Comment 98: Table B-2a

For the EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination, Action to be Taken text change to: "Used in the development of the PRG for surface soil at DU 3-2 and 3-3 to be protective of unrestricted use by humans and ecological receptors. The action to be taken under this alternative will mitigate risk to receptors through excavation of soils in DU 3-3

that exceed the ecological PRG and instituting land use controls to restrict residential use at DU 3-1, 3-2, and 3-3 for areas exceeding the residential PRG."

Add the following Federal TBCs:

Recommendations of the Technical Review Workgroup for Lead for an approach to Assessing Risks Associated with Adult Exposure to Lead In Soil	*EPA-540-R-03-001 (January 2003)*	*To be Considered*	*EPA Guidance for evaluating risks posed by lead in soil.*	*Used to compute the potential risks caused by exposure to lead in site soil. The action to be taken under this alternative will mitigate risk to receptors through excavation of soil that exceeds the PRGs for industrial use at DU 3-2 and 3-3 and land use controls to restrict residential use*
Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.	*EPA/600/R-10/005*	*To be Considered*	*EPA guidance for evaluating risks posed by dioxin.*	*Used in the development of the dioxin PRG for soil to be protective of unrestricted use by humans. The action to be taken under this alternative will mitigate risk to receptors through land use controls to restrict*
Cite any other guidance used to develop the PCB eco-risk PRG.				

Response: Regarding the EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination, the text was edited as requested. The following TBCs were added to Table B-2a:

Recommendations of the Technical Review Workgroup for Lead for an approach to Assessing Risks Associated with Adult Exposure to Lead In Soil	*EPA-540-R-03-001 (January 2003)*	*To Be Considered*	*EPA guidance for evaluating risks posed by lead in soil.*	*Used to calculate potential risks caused by exposure to lead in soil. The action to be taken under this alternative will mitigate risk to receptors through land use controls to restrict residential use at DU 3-1, 3-2, and 3-3.*

Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.	*EPA/600/R-10/005*	*To Be Considered*	*EPA guidance for evaluating risks posed by dioxin.*	*Used to calculate potential risks caused by exposure to dioxin in soil. The action to be taken under this alternative will mitigate risk to receptors through land use controls to restrict residential use at DU 3-1, 3-2, and 3-3.*
Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments	*EPA/540/R-97/006*	*To Be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through excavation of soil that exceeds the ecological PRG at DU 3-3.*
Final Guidelines for Ecological Risk Assessment	*EPA/630/R095/002F*	*To Be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through excavation of soil that exceeds the ecological PRG at DU 3-3.*
Guidance for Developing Ecological Soil Screening Levels	*OSWER Directive 9285.7-55*	*To Be Considered*	*EPA guidance for generating ecological soil screening levels*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through excavation of soil that exceeds the ecological PRG at DU 3-3.*
Toxicological Benchmarks for Wildlife: 1996 Revision	*ES/ER/TM-86/R3*	*To Be Considered*	*Oak Ridge National Laboratory guidance on toxicity values for wildlife*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through excavation of soil that exceeds the ecological PRG at DU 3-3.*
Wildlife Exposure Factors Handbook. Vols. I and II	*EPA/600-R/R-93/187a*	*To Be Considered*	*EPA guidance on identifying exposure parameters for wildlife*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through excavation of soil that exceeds the ecological PRG at DU 3-3.*

Development and Validation of Bioaccumulation Models for Earthworms	*ES/ER/TM-220*	*To Be Considered*	*Oak Ridge National Laboratory guidance on uptake of contaminants from soil to earthworms*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through excavation of soil that exceeds the ecological PRG at DU 3-3.*

EPA Specific Comment 99: Table B-2b

If overwintering bat habitat is present in Building 227 [or will be assessed during remedial design] add the following federal location-specific ARAR:

Federal Endangered Species Act of 1973 (ESA); Endangered and Threatened Wildlife and Plants, Special Rules: Northern Long-Eared Bat	*16 U.S.C. 1531 et seq.; 33 C.F.R. Part 320 & 50 C.F.R § 17.40(o)*	*Applicable*	*The purpose of the ESA is to "conserve the ecosystems upon with threatened and endangered species depend" and to conserve and recover listed species. Federal agencies must consult with the U.S. Fish and Wildlife Service to ensure that the actions they authorize, fund, or carry out will not jeopardize listed species. The Northern Long-Eared Bat is listed as federally threatened. The Northern Long-Eared Bat has been documented overwintering in former military structures in the area.*	*[Overwintering bats have been observed in Building 227] or [As part of pre-design investigations, Building 227 will be assessed to determine if it is potential bat overwintering habitat. If federally protected bats are located, the U.S. Fish and Wildlife Service will be consulted with during the planning process so that investigations and remedial actions do not adversely impact bat populations or habitats that may be present.*

Response: The potential overwintering of the NLEB in unused military structures is not relevant to the remedial alternatives evaluated in this FS. Although the estimated areas with soil impacts within the DUs appear to be a mix of grassland and shrub land, which is not suitable habitat for the federally threatened Northern Long-eared Bat, this will need to be confirmed during planning for the remedial action. Table B-2b was revised as follows:

Requirement	*Citation*	*Status*	*Requirement Synopsis*	*Action to Be Taken to Attain Requirement*
Federal Endangered Species Act of 1973 (ESA); Endangered and Threatened Wildlife and Plants, Special Rules: Northern Long-Eared Bat	*16 U.S.C. 1531 et seq.; 50 C.F.R § 17.40(o)*	*Applicable*	*The purpose of the ESA is to "conserve the ecosystems upon with threatened and endangered species depend" and to conserve and recover listed species. Federal agencies must consult with the U.S. Fish and Wildlife Service to ensure that the actions they authorize, fund, or carry out will not jeopardize listed species. The Northern Long-Eared Bat (NLEB) is listed as federally threatened. The NLEB range includes Coastal New England towns, such as Portsmouth, RI.*	*The estimated areas with soil impacts within the DUs may be suitable habitat for the federally threatened NLEB. If clearing of tress of 3 inch diameter at breast height or larger (within the NLEB habitat) is required during April 15th - September 30th time-of-year restriction, the U.S. Fish and Wildlife Service will be consulted with so investigations and remedial actions do not adversely impact bat populations or habitat.*

EPA Specific Comment 100: Table B-2c

Pg 1 – If any water will be generated from the excavation work federal and State ARARs should be added to address any treatment that will be required prior to discharge of the treated water back into the ground, to a POTW, or into surface waters.

For the Action to be Taken text for the TSCA citation add a new third sentence: "LUCs will prevent residential development in areas where PCB contaminated soil exceeds residential levels, will prevent exposure to inaccessible soil under the ECH building, and will establish requirements that any demolition of the ECH building will not cause any release of PCB-contaminated media."

Note that if the Navy decides to remove all PCBs to 1 mg/kg then the Section of the TSCA regulations to be cited would to 40 CFR 761.61(a) which does not require EPA to make a separate TSCA determination.

Response: As discussed in the response to EPA Specific Comment 55, water is not expected to be generated from excavation work. No changes were made to the table.

The text was revised as follows: "All soil exceeding identified Industrial and Ecological PRGs for PCBs at DU 3-3 will be excavated and disposed of off-site. The excavation, transportation, and management of PCB contaminated media will be performed in a manner to comply with TSCA, including air monitoring during remedial activities. Land use controls will prevent residential development in areas where PCB contaminated soil exceeds residential levels, will prevent exposure to inaccessible soil under the ECH building, and will establish requirements that any demolition of the ECH building will not cause any release of PCB-contaminated media The ROD will include a finding by the Director, Office of Site Remediation and Restoration, USEPA Region 1, that the remedy's soil PCB cleanup levels, along with the excavation and management of the contaminated media will not pose an unreasonable risk to human health or the environment."

Regarding the last part of the comment, it appears that 40 CFR 761.61(a) would apply to a "Self-implementing on-site cleanup" where a risk assessment is not performed (no PRGs are developed) and the responsible party plans to perform a PCB soil removal action. The OSWER Directive cited appears to be more appropriate to define why a value of 1 mg/kg is used rather than a lower risk-based value calculated using site-specific exposure parameters. Use of this directive/guidance value would then result in the need for written approval under 40 CFR 761.61(c). As such, no changes were made based on this part of the comment.

EPA Specific Comment 101: Table B-3a

For the EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination, Action to be Taken text change to: "Used in the development of the PRG for surface soil at DU 3-2 and 3-3 to be protective of unrestricted use by humans and ecological receptors. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soils in DU 3-3 that exceed the ecological PRG and instituting land use controls to restrict residential use at DU 3-1, 3-2, and 3-3 for areas exceeding the residential PRG."

Add the following Federal TBCs:

Recommendations of the Technical Review Workgroup for Lead for an approach to Assessing Risks Associated with Adult Exposure to Lead In Soil	*EPA-540-R-03-001 (January 2003)*	*To be Considered*	*EPA Guidance for evaluating risks posed by lead in soil.*	*Used to compute the potential risks caused by exposure to lead in site soil. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soil that exceeds the PRGs for industrial use at DU 3-2 and 3-3 and land use controls to restrict residential use at DU 3-1, 3-2, and 3-3.*

Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.	*EPA/600/R-10/005*	*To be Considered*	*EPA guidance for evaluating risks posed by dioxin.*	*Used in the development of the dioxin PRG for soil to be protective of unrestricted use by humans. The action to be taken under this alternative will mitigate risk to receptors through land use controls to restrict residential use at DU 3-1, 3-2, and 3-3.*
Cite any other guidance used to develop the PCB eco-risk PRG.				

Response: The text related to the EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination text was revised as requested. Table B-3a was revised as shown below.

Recommendations of the Technical Review Workgroup for Lead for an approach to Assessing Risks Associated with Adult Exposure to Lead In Soil	*EPA-540-R-03-001 (January 2003)*	*To Be Considered*	*EPA guidance for evaluating risks posed by lead in soil.*	*Used to compute the potential risks caused by exposure to lead in site soil. The action to be taken under this alternative will mitigate risk to receptors through land use controls to restrict residential use at DU 3-1, 3-2, and 3-3.*
Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.	*EPA/600/R-10/005*	*To Be Considered*	*EPA guidance for evaluating risks posed by dioxin.*	*Used in the development of the dioxin PRG for soil to be protective of unrestricted use by humans. The action to be taken under this alternative will mitigate risk to receptors through land use controls to restrict residential use at DU 3-1, 3-2, and 3-3.*
Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments	*EPA/540/R-97/006*	*To Be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soil that exceeds the ecological PRG at DU 3-3.*

Final Guidelines for Ecological Risk Assessment	*EPA/630/R095/002F*	*To Be Considered*	*EPA guidance for conducting ecological risk assessments*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soil that exceeds the ecological PRG at DU 3-3.*
Guidance for Developing Ecological Soil Screening Levels	*OSWER Directive 9285.7-55*	*To Be Considered*	*EPA guidance for generating ecological soil screening levels*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soil that exceeds the ecological PRG at DU 3-3.*
Toxicological Benchmarks for Wildlife: 1996 Revision	*ES/ER/TM-86/R3*	*To Be Considered*	*Oak Ridge National Laboratory guidance on toxicity values for wildlife*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soil that exceeds the ecological PRG at DU 3-3.*
Wildlife Exposure Factors Handbook. Vols. I and II	*EPA/600-R/R-93/187a*	*To Be Considered*	*EPA guidance on identifying exposure parameters for wildlife*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soil that exceeds the ecological PRG at DU 3-3.*
Development and Validation of Bioaccumulation Models for Earthworms	*ES/ER/TM-220*	*To Be Considered*	*Oak Ridge National Laboratory guidance on uptake of contaminants from soil to earthworms*	*Used to calculate potential wildlife risks and PRGs. The action to be taken under this alternative will mitigate risk to receptors through installation of an asphalt cover over soil that exceeds the ecological PRG at DU 3-3.*

EPA Specific Comment 102: Table B-3b

If overwintering bat habitat is present in Building 227 [or will be assessed during remedial design] add the following federal location-specific ARAR:

Federal Endangered Species Act of 1973 (ESA); Endangered and Threatened Wildlife and Plants, Special Rules: Northern Long-Eared Bat	*16 U.S.C. 1531 et seq.; 33 C.F.R. Part 320 & 50 C.F.R § 17.40(o)*	*Applicable*	*The purpose of the ESA is to "conserve the ecosystems upon with threatened and endangered species depend" and to conserve and recover listed species. Federal agencies must consult with the U.S. Fish and Wildlife Service to ensure that the actions they authorize, fund, or carry out will not jeopardize listed species. The Northern Long-Eared Bat is listed as federally threatened. The Northern Long-Eared Bat has been documented overwintering in former military structures in the area.*	*[Overwintering bats have been observed in Building 227] or [As part of pre-design investigations, Building 227 will be assessed to determine if it is potential bat overwintering habitat. If federally protected bats are located, the U.S. Fish and Wildlife Service will be consulted with during the planning process so that investigations and remedial actions do not adversely impact bat populations or habitats that may be present.*

Response: Table B-3b was revised as follows:

Requirement	Citation	Status	Requirement Synopsis	Action to Be Taken to Attain Requirement
Federal Endangered Species Act of 1973 (ESA); Endangered and Threatened Wildlife and Plants, Special Rules: Northern Long-Eared Bat	*16 U.S.C. 1531 et seq.; 50 C.F.R § 17.40(o)*	*Applicable*	*The purpose of the ESA is to "conserve the ecosystems upon with threatened and endangered species depend" and to conserve and recover listed species. Federal agencies must consult with the U.S. Fish and Wildlife Service to ensure that the actions they authorize, fund, or carry out will not jeopardize listed species. The Northern Long-Eared Bat (NLEB) is listed as federally threatened. The NLEB range includes Coastal New England towns, such as Portsmouth, RI.*	*The estimated areas with soil impacts within the DUs may be suitable habitat for the federally threatened NLEB. If clearing of tress of 3 inch diameter at breast height or larger (within the NLEB habitat) is required during April 15th - September 30th time-of-year restriction, the U.S. Fish and Wildlife Service will be consulted with so investigations and remedial actions do not adversely impact bat populations or habitat.*

EPA Specific Comment 103: Appendix C – Cost Estimates

Planning Cost Backup Worksheet:

<u>DU 3-1</u> Two (2) depth intervals should be planned for some of the 30 planned samples.

<u>DU 3-3</u> Lead contamination will have to be defined in four directions so more than two (2) samples locations will be needed.

Two depth intervals should be planned for some of the planned PCB samples based on known existing contamination distribution. More than eight PCB samples will likely be needed because PCBs will have to be defined both north and south of the building.

Response: At DU 3-1, the following changes were made:

> Assume 30 surface soil samples and 45 subsurface soil samples will be collected and analyzed for dioxins, PAHs, and manganese.
> Assume 10 soil samples will be collected and analyzed for arsenic (previous not included).

At DU 3-3, the following changes were made:

> Assume 4 surface soil samples and 4 subsurface soil samples will be collected and analyzed for lead
> Assume 8 surface soil samples and 12 subsurface soil samples will be collected and analyzed for PCBs

Cost estimates were also updated based on earlier comments and the updated Appendix C and Table 5-1 are attached.

RIDEM General Comments:

RIDEM General Comment 1. Please note that a table of action-specific ARARs was not provided in this FS. Please provide this table in the response to comments, which should be similar to the ARARs listed in the RODs for Tank Farms 4 (DU 4-1) and 5 (DU 5-1).

Response: Action-specific ARARs are alternative specific. Tables B-2c and B-3c present the Action-Specific ARARs and TBC. No changes were made to text.

RIDEM Specific Comments:

RIDEM Specific Comment 1. p. vii, Executive Summary, Site Description, 3rd paragraph, last sentence – Please replace "soil-soaked" with "oil-soaked."

Response: Text was revised as requested.

RIDEM Specific Comment 2. p. 4, Section 1.3.2, 1st paragraph – Please change "Tanks 60 and 70" to "Tanks 69 and 70."

Response: Text was revised as requested.

RIDEM Specific Comment 3. p. 23, Section 2.3, Human Health – Soil, 3rd paragraph – In the fourth sentence, please change "dioxins" to "dioxins/furans, expressed as the 2,3,7,8-TCDD Equivalent". Also, please note that the EPA RSLs were reissued in November 2015. Please confirm that toxicity values and volatilization factors for the contaminants of concern have not changed. Lastly, please provide a discussion, either in this section or in Appendix A.3, of how site-specific background values were calculated.

Response: The text was revised as follows: "As described in Section 1.3.7, these contaminants include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, dioxins/furans (expressed as the 2,3,7,8-TCDD Equivalent), PCBs, arsenic, and chromium (see Table 2-2)."

As noted in the response to EPA Specific Comment 38, the values used for this FS during development of PRGs have not changed with the issuance of the November 2015 RSL tables. References to the June 2015 update in the 4th paragraph have been revised to refer to the November 2015 update.

The footnote at the bottom of Page 25 was moved to the body of the text and expanded upon as follows:

"Background concentrations have been established for metals in soils at NAVSTA Newport and Tank Farm 3 using an EPA-approved basewide background study (Tetra Tech, 2008). In the DGA report (Tetra Tech, 2015), it was determined that the Newport Silt Loam background data from the Basewide Background Study Report was appropriate for comparison to site data based upon historical soil maps. Site specific background soil concentrations were calculated for arsenic, lead, and manganese in surface and subsurface soil using the Newport Silt Loam background data set identified in the DGA report. A 95% Upper Prediction Limit was calculated

using the USEPA ProUCL software (Version 5.0.00). The background data set and ProUCL output are provided in Appendix A.3."

RIDEM Specific Comment 4. p. 28, Section 2.4, DU 3-1, 1st bullet - It appears that the bullet should be placed between the second and third sentences, after "Residential PRGs". For consistency with subsequent sections, the order of the bullets for "Residential PRGs" and "Industrial PRGs" should be switched.

Response: The text was revised as follows:

"Figure 9 summarizes all soil sample locations that have PRG exceedances for metals, dioxins, and/or PAHs and shows an estimated extent of soil impacts for the purpose of evaluating remedial alternatives. Note that there are no Ecological PRGs for DU 3-1, since the DGA Report concluded that there were no unacceptable risks to ecological receptors at DU 3-1.

- Industrial PRGs: For the purpose of evaluating remedial alternatives, an impacted area totaling approximately 150 square feet is estimated, based on the data collected in the DGA report. The impacted volume of subsurface soil is estimated to be approximately 28 cubic yards based on an assumed average 5 foot depth of impact (2 to 7 feet bgs based on current data showing impacts from 4 to 6 feet bgs). This volume encompasses the subsurface soil that exceeds Industrial PRGs.

- Residential PRGs: For the purpose of evaluating remedial alternatives, an impacted area approximately 4,280 square feet or 0.1 acres is estimated, based on the data collected in the DGA report. Assuming an average depth of 5 feet (current data shows impacts from the ground surface to 1 to 8 feet bgs), the impacted volume of soil is estimated to be approximately 793 cubic yards."

RIDEM Specific Comment 5. p. 33, Section 3.1.2, Limited Soil Excavation with Land Use Controls, last paragraph, last sentence – Because an impermeable barrier is a direct contact and infiltration control and not a storm water control, please replace "Storm water runoff controls (such as an impermeable cover)" with "An impermeable cover."

Response: The text was revised as requested.

RIDEM Specific Comment 6. p. 34, Section 3.1.2, Land Use Controls, 2nd paragraph – Please change the reference from "the ROD" to the "the future ROD."

Response: Text was revised as requested

RIDEM Specific Comment 7. p. 35, Section 3.1.3, 2nd paragraph, 1st sentence – Please change the reference from "the ROD" to "the future ROD."

Response: Text was revised as requested

RIDEM Specific Comment 8. p. 35, Section 3.1.4, 1st paragraph – At the end of the third sentence, please change "be assessed" to "been assessed". In the fourth sentence, please remove the first appearance of "assessed and."

Response: The text was revised as requested.

RIDEM Specific Comment 9. p. 36, Section 3.1.4, Excavation – Please refer to comment #5 regarding the last paragraph, last sentence of this section.

Response: The text was revised as follows: "Once the excavation is complete, an impermeable cover will not need to be implemented because the contaminant concentrations would not exceed the RIDEM GA Leachability Criteria."

RIDEM Specific Comment 10. p. 42, Section 4.2.1, LUCs and Inspections, 3rd paragraph – Please change the reference from "the ROD" to "the future ROD."

Response: Text was revised as requested

RIDEM Specific Comment 11. p.49, Section 4.3.2, Implementability – Please change "AlternativesS-2" to "Alternative S-3."

Response: Text was revised as requested

RIDEM Specific Comment 12. p. 54, Section 5.1.5, Environmental Impacts, last sentence – Please change "Alternative S-2" to "Alternative S-3."

Response: Text was revised as requested

RIDEM Specific Comment 13. p. 56, Section 5.1.7, Cost, 1st sentence – Please change "four alternatives" to "three alternatives."

Response: Text was revised as requested

RIDEM Specific Comment 14. Table 2-3, Analytical Results – Soil at Decision Unit 3-1 – The Residential PRG to TCDD TEQ is 4.8 ng/kg, according to Table 12 of Appendix A in the FS. Please correct for consistency.

Response: The analytical result tables were revised to reflect a TCDD TEQ PRG of 4.8 ng/kg.

RIDEM Specific Comment 15. Table 2-6, Technology & Process Option Screening for Soil – Please move thermal desorption from "Treatment: on-site" to "treatment: in situ."

Response: Since a thermal desorption process option was already included under "Treatment: in situ", that option has been modified to indicate "Potentially Applicable: The most cost-effective in-situ treatment option." The thermal desorption process option under "Treatment: on-site" has been modified to indicate "Screened out: Other treatment technologies are more cost-effective with equivalent mitigation of risks for site organic COCs."

RIDEM Specific Comment 16. Figure 13, Soils Exceeding Residential PRGs for Metals – Decision Unit 3-3 – Chromium at location SB-108 (0-1") exceeds the PRG, but is not highlighted on this figure. Please update this figure and Figure 15.

Response: Based on comments received from the EPA, the PRG for chromium was revised to 0.31 mg/kg. All relevant figures were updated based on this edit and are attached.

RIDEM Specific Comment 17. Appendix A.1, Table 12 – The PRG selection criteria is unclear from the table itself; please add a footnote explaining the process.

Response: The following note was added to Table 12: "For the contaminants listed above, selected PRGs were identified as the lower of the risk-based goals or ARAR (if available). If site-specific background values are available and applicable, the greater of the two values was selected as the PRG."

RIDEM Specific Comment 18. Appendix A.3 – This appendix provides analytical results and ProUCL outputs for site-specific background sample results, but does not provide any explanation of how background concentrations were derived or what output concentrations were used. Please provide a discussion of how site-specific background values were calculated.

Response: The appendix has not been modified, but additional text has been added to Section 2.3 Development of Preliminary Remediation Goals. See response to RIDEM Specific Comment for the added text.

Table 2-2
Preliminary Remediation Goals (PRGs) for Soil

Analyte	Surface Soil Selected PRG (mg/kg)	Surface Soil Basis[1]	Subsurface Soil Selected PRG (mg/kg)	Subsurface Soil Basis[1]	Decision Unit Applicability[2] DU 3-1	DU 3-2	DU 3-3
Human Health - Residential Use Scenario[3]							
Benzo(a)anthracene	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
Benzo(a)pyrene	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	X	X	
Benzo(b)fluoranthene	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
Chrysene	0.4	RDEC	0.4	RDEC		X	
Dibenzo(a,h)anthracene	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	X	X	
Indeno(1,2,3-cd)pyrene	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
Naphthalene	0.8	Leachability	0.8	Leachability	X	X	
2,3,7,8-TCDD Equivalents	0.0000048	ILCR = 10^{-6}	0.0000048	ILCR = 10^{-6}	X		
PCBs	1	TSCA	1	TSCA		X	X
Arsenic	17	Background	7	RDEC	X		X
Chromium[4]	0.31	ILCR = 10^{-6}	0.31	ILCR = 10^{-6}	X		X
Lead	150	RDEC	150	RDEC			X
Manganese	390	RDEC	460	Background	X		X
Human Health - Industrial Use Scenario							
Benzo(a)pyrene	0.8	I/C DEC	0.8	I/C DEC		X	
Naphthalene	0.8	Leachability	0.8	Leachability		X	
PCBs	10	I/C DEC	10	I/C DEC			X
Arsenic	17	Background	7	I/C DEC	X		
Ecological							
PCBs	3.6	Ecological	3.6	Ecological			X

Notes

1. See Appendix A.1 and A.2 for Human Health and Ecological PRG development and basis:
   ILCR = 10^{-6} - Carcinogenic risk-based goal developed from the human health risk assessment
   RDEC and I/C DEC - RIDEM Remediation Regulations, DEM-DSR-01-93, November 2011, Table 1 (Residential and Industrial/Commercial Direct Exposure Criteria [DEC])
   Leachability - RIDEM Remediation Regulations, DEM-DSR-01-93, November 2011, Table 2 (GA Leachability Criteria)
   TSCA - Toxic Substances Control Act; Section 761.61(c) of TSCA (see Appendix B for full citation) allows for risk-based cleanup of PCB remediation waste. EPA guidance on Remedial Actions at Superfund Sites with PCB Contamination (OSWER Directive #9355.4-01FS; EPA/540/G-90/007; August 1990) was utilized to develop the risk-based value presented. Written approval for the proposed risk-based cleanup must be obtained from the Director, Office of Site Remediation and Restoration, USEPA Region 1.
   Background - If RIDEM criteria or risk-based PRGs were below reference concentrations for the site, the background concentration was selected.
2. While the human health risk assessment evaluated all three AOCs together, the various analytes were analyzed/detected in specific AOCs based on the conceptual site model. The PRGs are applicable to those specific AOCs.

Table 2-3a
Analytical Results - Surface Soil at Decision Unit 3-1

Site			SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011
Sample ID			TF3-001-SB101-0102	TF3-001-SS102-0001	TF3-001-SS103-0001	TF3-001-SS104-0001	TF3-001-SS105-0001	TF3-001-SS106-0001	TF3-001-SS107-0001	TF3-001-SS108-0001	TF3-001-SS109-0001
Location ID			TF3-001-SB101	TF3-001-SB102	TF3-001-SB103	TF3-001-SB104	TF3-001-SB105	TF3-001-SB106	TF3-001-SB107	TF3-001-SB108	TF3-001-SB109
Sample Date			11/22/2013	11/22/2013	11/22/2013	11/21/2013	11/21/2013	11/22/2013	11/22/2013	11/22/2013	11/22/2013
Sample Type			N	N	N	N	N	N	N	N	N
Depth Interval			1 - 2 ft	0 - 1 ft	0 - 1 ft	0 -1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Analytical Parameter	Residential PRG	Industrial PRG									
Metals (mg/kg)											
ALUMINUM			13200	13500	12300	12700	12200	12200	10400	11800	14600
ANTIMONY			0.08	0.09 J	0.14 J	0.09 J	0.07 J	0.08	0.08	0.07 J	0.06 J
ARSENIC	17	17	5.6	7.8	6	6.5	7.1	6.4	5.1	5.6	7.2
BARIUM			28.5	19.1	22.5	22.8	19.2	32	16.4	33.5	16.6
BERYLLIUM			0.35	0.32	0.36	0.36	0.34	0.32	0.29	0.3	0.3
CADMIUM			0.08	0.08 J	0.1	0.12	0.1 J	0.08	0.09	0.07 J	0.08
CALCIUM			844	859 J	932 J	642 J	878 J	1180	928	1260	1200 J
CHROMIUM, TOTAL	0.31		16.8	17.8	16.7	15.6	16.8	19.3	17.1	19.6	22.3
COBALT			10.2	11	11.7	12	13	10.8	12	10.5	20.9
COPPER			15.1	17 J	17.1 J	17.8 J	20.2 J	18.5	17.5	15.4	22.8 J
IRON			22500	31900	27000	24200	28000	25600	28200	23000	34500
LEAD			12.8	18.9 J	21.4 J	20.7 J	14.4 J	13.4	16.2	11.4	14.4 J
MAGNESIUM			2750	3260	2980	2730	3160	4270	3320	4230	5280
MANGANESE	390		305	342 J	415 J	414 J	412 J	351	404	314	514 J
MERCURY			0.03	0.03	0.03	0.04	0.04	0.03 J	< 0.02 U	< 0.013 U	< 0.015 U
NICKEL			19.2	22.9	24.7	21.9	23.8	20.1	22.3	19.6	32.5
POTASSIUM			786	394 J	544 J	437 J	385 J	1010	470	1050	472 J
SELENIUM			0.52 J	0.4 J	0.38 J	0.45	0.38 J	0.29 J	0.28 J	0.3 J	0.33 J
SILVER			0.06 J	0.07 J	0.06 J	0.07 J	0.05 J	0.04 J	0.05 J	0.03 J	0.04 J
SODIUM			53.5 J	48.4 J	69.2 J	37.3 J	47.3 J	46.4 J	32.9 J	64.1 J	35.7 J
THALLIUM			0.09	0.08 J	0.07 J	0.08	0.07 J	0.07	0.05 J	0.07 J	0.05 J
VANADIUM			22.4	20.9	27	21.2	20.3	20.9	18.4	24.4	20
ZINC			52.2	94.4	68.3	63.6	60.8	54.7	59.5	48.7	76.8
Dioxin/Furans (ng/kg)											
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN			2.8 J	7.1	5.4 J	6.2 J	4.1 J	1200	1.8 J	500	1.7 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN			56	74	62	60	53	7000	44	1900	30
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN			< 0.075 U	< 0.091 U	< 0.11 U	< 0.13 U	0.34 J	100	< 0.053 U	20	< 0.086 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN			0.76 J	0.85 J	1.3 J	1 J	< 0.51 U	43	< 0.38 U	17	0.5 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN			0.66 J	0.81 J	0.74 J	0.69 J	0.74 J	38	0.22 J	30	0.34 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN			0.61 J	0.88 J	0.5 J	1 J	0.66 J	49	0.68 J	31	0.39 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN			0.95 J	1.4 J	1.4 J	1.2 J	1.5 J	150	0.51 J	68	0.53 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN			< 0.054 U	< 0.046 U	< 0.06 U	< 0.069 U	< 0.031 U	< 0.56 U	< 0.042 U	< 0.24 U	< 0.045 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN			1.1 J	1.9 J	1.8 J	1.3 J	1.6 J	88	0.48 J	70	0.71 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN			0.23 J	0.18 J	0.29 J	0.24 J	< 0.037 U	3.5 J	0.075 J	1.9 J	< 0.045 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN			< 0.094 U	0.47 J	0.47 J	0.33 J	0.25 J	11	< 0.072 U	10	< 0.091 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN			< 0.05 U	0.58 J	0.59 J	0.55 J	0.47 J	28	0.39 J	21	0.1 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN			0.25 J	0.31 J	0.23 J	0.29 J	0.15 J	2.8 J	0.22 J	1.9 J	< 0.047 U
2,3,7,8-TETRACHLORODIBENZOFURAN			< 0.24 U	< 0.44 U	< 0.2 U	0.36 J	< 0.32 U	< 0.43 U	< 0.23 U	< 0.33 U	< 0.26 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN			< 0.05 U	< 0.057 U	< 0.05 U	< 0.055 U	< 0.038 U	0.4 J	< 0.042 U	0.51 J	< 0.053 U
HEPTACHLORODIBENZOFURAN			5.3 J	17 J	11 J	16	9.4	4100	4.3 J	960	3.8 J
HEPTACHLORODIBENZO-P-DIOXINS			100	130	120	110	95	9300	76	3100	51
HEXACHLORODIBENZOFURAN			4.6 J	9.1 J	9 J	8.2 J	6.1 J	1100	5.6	560	2.7 J
HEXACHLORODIBENZO-P-DIOXIN			9.5 J	14 J	14 J	12 J	11	850	4.5 J	570	5.4 J
OCTACHLORODIBENZOFURAN			5.2 J	17	11 J	18	7.7 J	4200	3.2 J	590	3.5 J
PENTACHLORODIBENZOFURAN			3.6 J	4.5 J	4.2 J	4 J	2.6 J	160 J	4.6 J	100 J	0.56 J
PENTACHLORODIBENZO-P-DIOXIN			2.1 J	2.6 J	2.4 J	2.5 J	1.5 J	85 J	1.6 J	64 J	0.76 J
TCDF, TOTAL			3.2 J	3.5 J	2.8 J	3.1 J	2.5 J	21	2.8 J	11 J	0.35 J
TEQ	4.8		4.01946	5.0265	3.928	3.8616	3.19871	150.005	3.24521	64.314	2.28505
TETRACHLORODIBENZO-P-DIOXIN			0.7 J	1.2 J	0.94 J	0.79 J	0.84 J	7.1 J	0.68 J	5.1 J	0.16 J
Miscellaneous Parameters (%)											
TOTAL SOLIDS			84	86	86	87	87	88	90	88	89

Table 2-3a
Analytical Results - Surface Soil at Decision Unit 3-1

Site			SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011
Sample ID			TF3-001-SB101-0102	TF3-001-SS102-0001	TF3-001-SS103-0001	TF3-001-SS104-0001	TF3-001-SS105-0001	TF3-001-SS106-0001	TF3-001-SS107-0001	TF3-001-SS108-0001	TF3-001-SS109-0001
Location ID			TF3-001-SB101	TF3-001-SB102	TF3-001-SB103	TF3-001-SB104	TF3-001-SB105	TF3-001-SB106	TF3-001-SB107	TF3-001-SB108	TF3-001-SB109
Sample Date			11/22/2013	11/22/2013	11/22/2013	11/21/2013	11/21/2013	11/22/2013	11/22/2013	11/22/2013	11/22/2013
Sample Type			N	N	N	N	N	N	N	N	N
Depth Interval			1 - 2 ft	0 - 1 ft	0 - 1 ft	0 -1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Analytical Parameter	Residential PRG	Industrial PRG									
Semi Volatile Organic Compounds (SVOCs) (mg/kg)											
2-METHYLNAPHTHALENE			< 0.011 UJ	< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 UJ	< 0.01 UJ	< 0.01 UJ	< 0.011 U
ACENAPHTHENE			< 0.011 U	0.0017 J	< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.01 U	< 0.01 U	< 0.011 U
ACENAPHTHYLENE			< 0.011 U	0.0018 J	0.0015 J	0.0017 J	0.0017 J	< 0.011 U	0.0013 J	< 0.01 U	< 0.011 U
ANTHRACENE			< 0.011 U	0.005 J	0.0033 J	0.004 J	0.0031 J	0.0018 J	0.0031 J	< 0.01 U	0.0016 J
BENZO[A]ANTHRACENE	0.16		< 0.0066 U	0.041	0.043 J	0.041	0.038	0.022 J	0.039	< 0.0076 U	0.015 J
BENZO[A]PYRENE	0.016		0.0075 J	0.042	0.048 J	0.05	0.039	0.026 J	0.047 J	0.0079 J	0.014 J
BENZO[B]FLUORANTHENE	0.16		0.012 J	0.064	0.09 J	0.076	0.057	0.04	0.08	0.016 J	0.029 J
BENZO[G,H,I]PERYLENE			< 0.011 UJ	0.019 J	0.023 J	0.024	0.012 J	0.012 J	0.023 J	0.0057 J	0.0075 J
BENZO[K]FLUORANTHENE			0.0064 J	0.035 J	0.025 J	0.029 J	0.028	0.018 J	0.03	0.0057 J	0.0075 J
CHRYSENE			0.0064 J	0.05	0.05 J	0.053	0.042	0.03	0.054	0.0086 J	0.013 J
DIBENZ[A,H]ANTHRACENE	0.016		< 0.011 U	0.0095 J	0.0098 J	0.0095 J	0.0061 J	0.0055 J	0.01 J	0.0029 J	0.0029 J
FLUORANTHENE			0.0093 J	0.075	0.052	0.073	0.04	0.038	0.052	0.012 J	0.02 J
FLUORENE			< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.01 U	< 0.01 U	< 0.011 U
INDENO[1,2,3-CD]PYRENE	0.16		0.0067 J	0.041	0.033 J	0.046	0.027	0.025 J	0.043 J	0.0054 J	0.0097 J
NAPHTHALENE	0.8		< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.011 U	< 0.01 U	< 0.01 U	< 0.011 U
PHENANTHRENE			0.0048 J	0.028	0.023 J	0.024	0.012 J	0.011 J	0.017 J	0.004 J	0.011 J
PYRENE			0.0068 J	0.074	0.1 J	0.072	0.036	0.057	0.067	0.0097 J	0.03 J
TOTAL PAHs			0.0599	0.487	0.5016	0.5032	0.3412	0.2863	0.4664	0.0779	0.1612
Petroleum Hydrocarbons (mg/kg)											
Extractable TPH C8-C44			120	91	320	48	36	140	150	140	91
TPH-GASOLINE RANGE C6-C12			< 2.4 U	< 2.3 U	< 2.5 U	< 2.7 U	< 2.2 U	< 2.9 U	< 2.1 U	< 2.3 U	28
Volatile Organic Compounds (mg/kg)											
1,2,4-TRIMETHYLBENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
1,2-DIBROMOETHANE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
1,3,5-TRIMETHYLBENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
2-BUTANONE			0.012 J	0.017 J	0.026 J	0.03 J	0.03 J	0.007 J	< 0.012 UJ	0.016 J	0.0074 J
2-HEXANONE			< 0.012 UJ	< 0.012 UJ	< 0.014 UJ	< 0.012 UJ	< 0.012 UJ	< 0.011 UJ	< 0.012 UJ	< 0.012 UJ	< 0.014 U
4-ISOPROPYLTOLUENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	0.00097 J	< 0.0028 U
4-METHYL-2-PENTANONE			< 0.012 UJ	< 0.012 UJ	< 0.014 UJ	< 0.012 UJ	< 0.012 UJ	< 0.011 UJ	< 0.012 UJ	< 0.012 UJ	< 0.014 U
ACETONE			< 0.22 TB	< 0.21 TB	< 0.32 TB	< 0.33 TB	< 0.35 TB	< 0.082 TB	< 0.076 TB	< 0.21 TB	< 0.1 TB
BENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
BROMOFORM			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
BROMOMETHANE			< 0.0048 UJ	< 0.005 UJ	< 0.0055 UJ	< 0.005 UJ	< 0.0048 UJ	< 0.0042 UJ	< 0.0048 UJ	< 0.005 UJ	< 0.0055 U
CARBON DISULFIDE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
CYCLOHEXANE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
ETHYLBENZENE			0.00066 J	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
ISOPROPYLBENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
M- AND P-XYLENE			0.0037 J	< 0.005 UJ	< 0.0055 UJ	< 0.005 UJ	< 0.0048 UJ	< 0.0042 UJ	< 0.0048 UJ	< 0.005 UJ	< 0.0055 U
METHYL ACETATE			0.06 J	< 0.003 UJ	< 0.0033 UJ	< 0.003 UJ	< 0.0029 UJ	0.008 J	0.0076 J	0.023 J	< 0.0033 UJ
METHYL CYCLOHEXANE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
METHYL TERT-BUTYL ETHER			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
NAPHTHALENE	0.8		< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
N-BUTYLBENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
O-XYLENE			0.0016 J	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
PROPYLBENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
SEC-BUTYLBENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
STYRENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
TERT-BUTYLBENZENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
TOLUENE			< 0.0024 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.0025 UJ	< 0.0024 UJ	< 0.0021 UJ	< 0.0024 UJ	< 0.0025 UJ	< 0.0028 U
XYLENES, TOTAL			0.0052 J	< 0.0075 UJ	< 0.0082 UJ	< 0.0075 UJ	< 0.0072 UJ	< 0.0064 UJ	< 0.0072 UJ	< 0.0075 UJ	< 0.0082 U

Notes:

1. Red shading indicates Residential PRG exceeded.

2. Blue shading indicates Industrial and Residential PRGs exceeded.

Table 2-3b
Analytical Results - Subsurface Soil at Decision Unit 3-1

Site			SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011
Sample ID			TF3-001-SB101-0204	TF3-001-SB102-0406	TF3-001-SB103-0608-D	TF3-001-SB103-0608	TF3-001-SB104-0204	TF3-001-SB105-0204	TF3-001-SB105-0204-D	TF3-001-SB106-0204	TF3-001-SB107-0204-D
Location ID			TF3-001-SB101	TF3-001-SB102	TF3-001-SB103	TF3-001-SB103	TF3-001-SB104	TF3-001-SB105	TF3-001-SB105	TF3-001-SB106	TF3-001-SB107
Sample Date			11/22/2013	11/22/2013	11/22/2013	11/22/2013	11/21/2013	11/21/2013	11/22/2013	11/22/2013	11/22/2013
Sample Type			N	N	FD	N	N	N	FD	N	FD
Depth Interval			2 - 4 ft	4 - 6 ft	6 - 8 ft	6 - 8 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Analytical Parameter	Residential PRG	Industrial PRG									
Metals (mg/kg)											
ALUMINUM			10600	13000	13900	13100	10500	9400		12200	12400
ANTIMONY			0.06 J	0.1 J	0.07 J	0.1 J	0.05 J	0.07 J		0.09	0.07 J
ARSENIC	7	7	4.5	6.1	6.5	7	5.5	5.8		6.6	6.2
BARIUM			20.2	20.9	36	36.6	16	14.4		16.2	12.7
BERYLLIUM			0.34	0.36	0.44	0.43	0.32	0.36		0.38	0.31
CADMIUM			0.07	0.09 J	0.11	0.12	0.07	0.07 J		0.1	0.11
CALCIUM			800	3110 J	3700 J	6420 J	616 J	314 J		573	729
CHROMIUM, TOTAL	0.31		13.3	16.7	16.4	16.9	13.4	12.1		17.4	16.6
COBALT			10	13.2	12.9	16	9.3	10.2		12.4	14.2
COPPER			12.7	14.2 J	12.8 J	14.3 J	11.3 J	13 J		19.2	17
IRON			22500	26900	27800	32000	20000	20000		33900	34800
LEAD			11.7	17.9 J	11.6 J	10.6 J	11.7 J	7.1 J		11.8	15.7
MAGNESIUM			2320	3300	2880	3270	2420	2510		3140	3720
MANGANESE	460		366	383 J	485 J	704 J	271 J	276 J		405	584
MERCURY			0.03 J	0.04	< 0.02 U	< 0.016 U	0.02 J	< 0.018 U		< 0.017 U	< 0.016 U
NICKEL			18.6	23.7	23.3	26.8	16.8	16.9		23.5	27.4
POTASSIUM			443	383 J	590 J	619 J	386 J	408 J		418	273
SELENIUM			0.35 J	0.36 J	0.5	0.36 J	0.27 J	0.24 J		0.4 J	0.32 J
SILVER			0.05 J	0.06 J	0.06 J	0.05 J	0.04 J	0.02 J		0.04 J	0.04 J
SODIUM			40.4 J	49.9 J	66.7 J	87 J	34.2 J	36.6 J		32.3 J	35 J
THALLIUM			0.07	0.07 J	0.09 J	0.08 J	0.07	0.07 J		0.06 J	0.04 J
VANADIUM			19.9	21.6	22.4	23.6	17.8	15.4		21.4	17.3
ZINC			51.7	69.6	83.2	89.8	44.2	44.4		63.6	73.5
Dioxin/Furans (ng/kg)											
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN			2.7 J	7.5		< 0.85 U	1.6 J	< 0.75 U	< 0.95 U	15	3 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN			45	66		50	39	99 J	45 J	150	130
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN			< 0.047 U	< 0.097 U		< 0.097 U	< 0.047 U	0.14 J	0.12 J	0.86 J	< 0.045 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN			< 0.35 U	2.1 J		0.71 J	0.4 J	< 0.26 U	0.73 J	0.76 J	< 0.41 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN			0.45 J	0.64 J		0.2 J	0.16 J	0.39 J	0.26 J	0.8 J	0.62 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN			0.6 J	0.6 J		0.23 J	0.94 J	0.77 J	0.26 J	1.9 J	2.9 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN			0.64 J	1.2 J		0.4 J	0.39 J	0.26 J	0.35 J	1.5 J	1.1 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN			< 0.033 U	< 0.045 U		< 0.06 U	< 0.04 U	0.24 J	< 0.036 U	< 0.041 U	0.11 J
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN			0.78 J	1.4 J		0.53 J	0.46 J	0.43 J	0.4 J	1.4 J	1.2 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN			< 0.042 U	0.15 J		< 0.052 U	< 0.046 U	0.13 J	0.071 J	0.21 J	< 0.035 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN			< 0.068 U	0.33 J		< 0.093 U	< 0.058 U	< 0.064 U	< 0.058 U	< 0.086 U	0.22 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN			0.28 J	0.69 J		< 0.054 U	0.25 J	0.18 J	0.24 J	0.62 J	0.21 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN			< 0.043 U	0.39 J		< 0.055 U	< 0.048 U	0.15 J	0.14 J	< 0.047 U	0.12 J
2,3,7,8-TETRACHLORODIBENZOFURAN			< 0.26 U	< 0.16 U		< 0.2 U	< 0.17 U	< 0.3 U	< 0.21 U	< 0.26 U	< 0.33 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN			< 0.048 U	< 0.064 U		< 0.057 U	< 0.041 U	< 0.036 U	< 0.046 U	< 0.048 U	< 0.037 U
HEPTACHLORODIBENZOFURAN			4.8 J	13 J		1.5 J	2.7 J	< 1.2 U	1.7 J	36	7.6
HEPTACHLORODIBENZO-P-DIOXINS			79	120		88	67	160 J	77 J	240	210
HEXACHLORODIBENZOFURAN			4.1 J	10 J		2.7 J	3.6 J	1.6 J	3 J	16	7.4
HEXACHLORODIBENZO-P-DIOXIN			6.1	12 J		5.6 J	4 J	2.7 J	4.6 J	12 J	8.1 J
OCTACHLORODIBENZOFURAN			3.4 J	12 J		5 J	2.6 J	< 1.4 U	4.8 J	33	4.9 J
PENTACHLORODIBENZOFURAN			2.2 J	5.4 J		1.5 J	1.7 J	0.28 J	2.7 J	3.3 J	2.9 J
PENTACHLORODIBENZO-P-DIOXIN			1.3 J	2.2 J		1.6 J	1.2 J	3.3 J	1.9 J	3.8 J	4.2 J
TCDF, TOTAL			1.8 J	3.7 J		1.7 J	2 J	0.86 J	2.1 J	1.6 J	2.2 J
TEQ	4.8		3.33302	4.5231		4.9085	3.21678	7.5673	4.32077	10.1728	10.30147
TETRACHLORODIBENZO-P-DIOXIN			0.4 J	0.84 J		0.64 J	1.4 J	1.3 J	0.55 J	1.2 J	0.69 J
Miscellaneous Parameters (%)											
TOTAL SOLIDS			87	78	85	84	88	89		88	89

Table 2-3b
Analytical Results - Subsurface Soil at Decision Unit 3-1

Site			SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011
Sample ID			TF3-001-SB101-0204	TF3-001-SB102-0406	TF3-001-SB103-0608-D	TF3-001-SB103-0608	TF3-001-SB104-0204	TF3-001-SB105-0204	TF3-001-SB105-0204-D	TF3-001-SB106-0204	TF3-001-SB107-0204-D
Location ID			TF3-001-SB101	TF3-001-SB102	TF3-001-SB103	TF3-001-SB103	TF3-001-SB104	TF3-001-SB105	TF3-001-SB105	TF3-001-SB106	TF3-001-SB107
Sample Date			11/22/2013	11/22/2013	11/22/2013	11/22/2013	11/21/2013	11/21/2013	11/22/2013	11/22/2013	11/22/2013
Sample Type			N	N	FD	N	N	N	FD	N	FD
Depth Interval			2 - 4 ft	4 - 6 ft	6 - 8 ft	6 - 8 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Analytical Parameter	Residential PRG	Industrial PRG									
Semi Volatile Organic Compounds (SVOCs) (mg/kg)											
2-METHYLNAPHTHALENE			< 0.01 UJ	< 0.013 U	< 0.035 U	< 0.034 U	< 0.011 U	< 0.011 U		< 0.011 UJ	< 0.011 UJ
ACENAPHTHENE			< 0.01 U	0.0066 J	0.063 J	0.072	< 0.011 U	< 0.011 U		0.0059 J	< 0.011 U
ACENAPHTHYLENE			< 0.01 U	< 0.013 U	< 0.035 U	< 0.034 U	< 0.011 U	< 0.011 U		< 0.011 U	< 0.011 U
ANTHRACENE			0.0014 J	0.0078 J	< 0.035 U	< 0.034 U	< 0.011 U	< 0.011 U		0.011 J	< 0.011 U
BENZO[A]ANTHRACENE	0.16		< 0.011 U	0.069 J	< 0.035 U	0.019 J	0.0074 J	< 0.011 U		0.033	< 0.012 U
BENZO[A]PYRENE	0.016		0.011 J	0.074 J	< 0.035 U	0.018 J	0.0076 J	< 0.011 U		0.024 J	0.013 J
BENZO[B]FLUORANTHENE	0.16		0.017 J	0.11	< 0.035 U	0.036 J	0.013 J	< 0.011 U		0.037	0.02 J
BENZO[G,H,I]PERYLENE			0.0023 J	0.028 J	< 0.035 U	0.0098 J	0.0042 J	< 0.011 U		0.0051 J	0.0031 J
BENZO[K]FLUORANTHENE			0.0082 J	0.044	< 0.035 U	0.014 J	0.0059 J	< 0.011 U		0.014 J	0.0089 J
CHRYSENE			0.012 J	0.082 J	< 0.035 U	< 0.034 U	0.0098 J	< 0.011 U		0.038	0.013 J
DIBENZ[A,H]ANTHRACENE	0.016		< 0.01 U	0.012 J	< 0.035 U	< 0.034 U	< 0.011 U	< 0.011 U		0.0048 J	0.0027 J
FLUORANTHENE			0.017 J	0.11 J	0.021 J	0.064 J	0.017 J	< 0.011 U		0.077	0.023
FLUORENE			< 0.01 U	0.0071 J	0.17	0.21	< 0.011 U	< 0.011 U		0.0053 J	< 0.011 U
INDENO[1,2,3-CD]PYRENE	0.16		0.0089 J	0.058 J	< 0.035 U	0.011 J	0.0083 J	< 0.011 U		0.02 J	0.012 J
NAPHTHALENE	0.8		< 0.01 U	< 0.013 U	< 0.035 U	< 0.034 U	< 0.011 U	< 0.011 U		< 0.011 U	< 0.011 U
PHENANTHRENE			0.0081 J	0.067 J	0.33	0.37	0.0083 J	< 0.011 U		0.09	0.011 J
PYRENE			0.018 J	0.15	0.041 J	0.078	0.015 J	< 0.011 U		0.076	0.018 J
TOTAL PAHs			0.1039	0.8255	0.625	0.9018	0.0965	0 U		0.4411	0.1247
Petroleum Hydrocarbons (mg/kg)											
Extractable TPH C8-C44			68	320 J	2200	2500	120 J	< 10 U		17 J	140
TPH-GASOLINE RANGE C6-C12			< 2.3 U	< 4.8 U	81 J	42 J	< 2.1 U	< 2.2 U		< 2.5 U	< 2.2 U
Volatile Organic Compounds (mg/kg)											
1,2,4-TRIMETHYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
1,2-DIBROMOETHANE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
1,3,5-TRIMETHYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
2-BUTANONE			0.0092 J	0.006 J	0.016 J	0.01 J	< 0.01 UJ	0.013 J		0.0084 J	< 0.014 UJ
2-HEXANONE			< 0.018 UJ	< 0.0072 UJ	< 0.012 UJ	< 0.014 UJ	< 0.01 UJ	< 0.012 U		< 0.014 UJ	< 0.014 UJ
4-ISOPROPYLTOLUENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
4-METHYL-2-PENTANONE			< 0.018 UJ	< 0.0072 UJ	< 0.012 UJ	< 0.014 UJ	< 0.01 UJ	< 0.012 U		< 0.014 UJ	< 0.014 UJ
ACETONE			< 0.14 TB	< 0.077 TB	< 0.11 TB	< 0.11 TB	0.076 J	0.14 J		< 0.14 TB	< 0.059 TB
BENZENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
BROMOFORM			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
BROMOMETHANE			< 0.007 UJ	< 0.0029 UJ	< 0.005 UJ	< 0.0055 UJ	< 0.004 UJ	< 0.0046 U		< 0.0055 UJ	< 0.0055 UJ
CARBON DISULFIDE			< 0.0035 UJ	0.0015 J	0.055 J	0.039 J	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
CYCLOHEXANE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
ETHYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
ISOPROPYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	0.0052 J	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
M- AND P-XYLENE			< 0.007 UJ	< 0.0029 UJ	< 0.005 UJ	< 0.0055 UJ	< 0.004 UJ	< 0.0046 U		< 0.0055 UJ	< 0.0055 UJ
METHYL ACETATE			< 0.0042 UJ	< 0.0017 UJ	0.027 J	< 0.0033 UJ	< 0.0024 UJ	< 0.0028 UJ		0.022 J	0.017 J
METHYL CYCLOHEXANE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
METHYL TERT-BUTYL ETHER			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
NAPHTHALENE	0.8		< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
N-BUTYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	0.062 J	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
O-XYLENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
PROPYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
SEC-BUTYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	0.057 J	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
STYRENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
TERT-BUTYLBENZENE			< 0.0035 UJ	< 0.0014 UJ	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
TOLUENE			< 0.0035 UJ	0.0014 J	< 0.0025 UJ	< 0.0028 UJ	< 0.002 UJ	< 0.0023 U		< 0.0028 UJ	< 0.0028 UJ
XYLENES, TOTAL			< 0.01 UJ	< 0.0044 UJ	< 0.0075 UJ	< 0.0082 UJ	< 0.0061 UJ	< 0.0069 U		< 0.0082 UJ	< 0.0082 UJ

Notes:

1. Red shading indicates Residential PRG exceeded.
2. Blue shading indicates Industrial and Residential PRGs exceeded.

Table 2-3b
Analytical Results - Subsurface Soil at Decision Unit 3-1

Site			SITE 00011	SITE 00011	SITE 00011
Sample ID			TF3-001-SB107-0204	TF3-001-SB108-0204	TF3-001-SB109-0406
Location ID			TF3-001-SB107	TF3-001-SB108	TF3-001-SB109
Sample Date			11/22/2013	11/22/2013	11/22/2013
Sample Type			N	N	N
Depth Interval			2 - 4 ft	2 - 4 ft	4 - 6 ft
Analytical Parameter	Residential PRG	Industrial PRG			
Metals (mg/kg)					
ALUMINUM			12300	12600	15500
ANTIMONY			0.08	0.1 J	0.05 J
ARSENIC	7	7	7	6.8	9.8
BARIUM			12.7	17.5	12.9
BERYLLIUM			0.34	0.33	0.26
CADMIUM			0.11	0.09	0.11
CALCIUM			910	814	963 J
CHROMIUM, TOTAL	0.31		18.5	16.6	23.9
COBALT			15.6	13.5	18.3
COPPER			19.3	17.3	18.1 J
IRON			35200	29000	36200
LEAD			13.7	12.7	10.8 J
MAGNESIUM			3710	3320	5330
MANGANESE	460		576	441	495 J
MERCURY			< 0.014 U	< 0.017 U	< 0.012 U
NICKEL			30.2	26.2	35.7
POTASSIUM			265	376	326 J
SELENIUM			0.39 J	0.41 J	0.27 J
SILVER			0.04 J	0.04 J	0.03 J
SODIUM			27.7 J	42.2 J	37.6 J
THALLIUM			0.04 J	0.06 J	0.04 J
VANADIUM			19.4	18.8	19.4
ZINC			87	63.8	88.5
Dioxin/Furans (ng/kg)					
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN			3.1 J	18	41
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN			140	120	23
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN			< 0.065 U	0.87 J	1.2 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN			< 0.23 U	0.85 J	15
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN			0.68 J	1.4 J	0.22 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN			1.2 J	2 J	1.9 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN			1.1 J	2.9 J	0.27 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN			< 0.064 U	< 0.039 U	< 0.05 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN			1.3 J	3.1 J	0.36 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN			0.12 J	< 0.037 U	0.32 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN			0.24 J	0.53 J	< 0.07 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN			0.45 J	0.83 J	0.58 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN			0.16 J	0.12 J	1 J
2,3,7,8-TETRACHLORODIBENZOFURAN			< 0.31 U	< 0.24 U	< 0.2 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN			< 0.056 U	< 0.03 U	< 0.097 U
HEPTACHLORODIBENZOFURAN			7.9	36	46 J
HEPTACHLORODIBENZO-P-DIOXINS			230	200	38
HEXACHLORODIBENZOFURAN			6.3 J	22	25
HEXACHLORODIBENZO-P-DIOXIN			9.2 J	24 J	3.1 J
OCTACHLORODIBENZOFURAN			5.9 J	23	74
PENTACHLORODIBENZOFURAN			3.6 J	5 J	8.7 J
PENTACHLORODIBENZO-P-DIOXIN			5.1 J	4 J	1.6 J
TCDF, TOTAL			2.4 J	2 J	4.1 J
TEQ	4.8		11.19737	6.3696	4.1668
TETRACHLORODIBENZO-P-DIOXIN			0.69 J	0.87 J	0.75 J
Miscellaneous Parameters (%)					
TOTAL SOLIDS			89	88	88

Table 2-3b
Analytical Results - Subsurface Soil at Decision Unit 3-1

Site			SITE 00011	SITE 00011	SITE 00011
Sample ID			TF3-001-SB107-0204	TF3-001-SB108-0204	TF3-001-SB109-0406
Location ID			TF3-001-SB107	TF3-001-SB108	TF3-001-SB109
Sample Date			11/22/2013	11/22/2013	11/22/2013
Sample Type			N	N	N
Depth Interval			2 - 4 ft	2 - 4 ft	4 - 6 ft
Analytical Parameter	Residential PRG	Industrial PRG			
Semi Volatile Organic Compounds (SVOCs) (mg/kg)					
2-METHYLNAPHTHALENE			< 0.011 UJ	< 0.01 UJ	< 0.011 U
ACENAPHTHENE			< 0.011 U	< 0.01 U	< 0.011 U
ACENAPHTHYLENE			< 0.011 U	< 0.01 U	< 0.011 U
ANTHRACENE			< 0.011 U	< 0.01 U	< 0.011 U
BENZO[A]ANTHRACENE	0.16		< 0.0099 U	< 0.0033 U	< 0.011 U
BENZO[A]PYRENE	0.016		0.01 J	< 0.01 UJ	< 0.011 U
BENZO[B]FLUORANTHENE	0.16		0.019 J	0.0055 J	< 0.011 U
BENZO[G,H,I]PERYLENE			< 0.011 UJ	< 0.01 UJ	< 0.011 U
BENZO[K]FLUORANTHENE			0.0057 J	< 0.01 U	< 0.011 UJ
CHRYSENE			0.011 J	< 0.01 U	0.0029 J
DIBENZ[A,H]ANTHRACENE	0.016		< 0.011 U	< 0.01 U	< 0.011 U
FLUORANTHENE			0.014 J	0.0051 J	0.0029 J
FLUORENE			< 0.011 U	< 0.01 U	< 0.011 U
INDENO[1,2,3-CD]PYRENE	0.16		0.0092 J	0.0026 J	< 0.011 U
NAPHTHALENE	0.8		< 0.011 U	< 0.01 U	< 0.011 U
PHENANTHRENE			0.0057 J	0.0029 J	< 0.011 U
PYRENE			0.013 J	< 0.01 U	0.0031 J
TOTAL PAHs			0.0876	0.0161	0.0089
Petroleum Hydrocarbons (mg/kg)					
Extractable TPH C8-C44			110	71	44
TPH-GASOLINE RANGE C6-C12			< 2.5 U	< 2.4 U	< 2.1 U
Volatile Organic Compounds (mg/kg)					
1,2,4-TRIMETHYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
1,2-DIBROMOETHANE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
1,3,5-TRIMETHYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
2-BUTANONE			0.0098 J	0.012 J	< 0.012 U
2-HEXANONE			< 0.011 UJ	< 0.018 UJ	< 0.012 U
4-ISOPROPYLTOLUENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
4-METHYL-2-PENTANONE			< 0.011 UJ	< 0.018 UJ	< 0.012 U
ACETONE			< 0.14 TB	< 0.25 TB	< 0.043 TB
BENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
BROMOFORM			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
BROMOMETHANE			< 0.0044 UJ	< 0.007 UJ	< 0.005 UJ
CARBON DISULFIDE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
CYCLOHEXANE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
ETHYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
ISOPROPYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
M- AND P-XYLENE			< 0.0044 UJ	< 0.007 UJ	< 0.005 U
METHYL ACETATE			0.016 J	0.021 J	< 0.003 U
METHYL CYCLOHEXANE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
METHYL TERT-BUTYL ETHER			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
NAPHTHALENE	0.8		< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
N-BUTYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
O-XYLENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
PROPYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
SEC-BUTYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
STYRENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
TERT-BUTYLBENZENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
TOLUENE			< 0.0022 UJ	< 0.0035 UJ	< 0.0025 U
XYLENES, TOTAL			< 0.0067 UJ	< 0.01 UJ	< 0.0075 U

Notes:

1. Red shading indicates Residential PRG exceeded.
2. Blue shading indicates Industrial and Residential PRGs exceeded.

Table 2-5a
Analytical Results - Surface Soil at Decision Unit 3-3

Site				SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011
Sample ID				TF3-ECH-SS101-0001	TF3-ECH-SS102-0001	TF3-ECH-SS103-0001	TF3-ECH-SS104-0001	TF3-ECH-SS105-0001	TF3-ECH-SS106-0001	TF3-ECH-SS107-0001	TF3-ECH-SS108-0001-D	TF3-ECH-SS108-0001
Location ID				TF3-ECH-SB101	TF3-ECH-SB102	TF3-ECH-SB103	TF3-ECH-SB104	TF3-ECH-SB105	TF3-ECH-SB106	TF3-ECH-SB107	TF3-ECH-SB108	TF3-ECH-SB108
Sample Date				11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013
Sample Type				N	N	N	N	N	N	N	FD	N
Depth Interval				0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Analytical Parameter	Residential PRG	Industrial PRG	Ecological PRG									
Metals (mg/kg)												
ALUMINUM				10900	9970	8830	7660	10800	9960	11500	11500	11500
ANTIMONY				0.08 J	0.06 J	0.2 J	0.11 J	0.08 J	0.12 J	0.1 J	0.35 J	0.3 J
ARSENIC	17			3.9	4.3	3.4	6.3	4.1	3.8	3.2	3.8	3.7
BARIUM				25.2	20.1	23.4	19.7	24.2	21.8	21.1	30.1	27.9
BERYLLIUM				0.44	0.52	0.37	0.31	0.38	0.4	0.36	0.41	0.43
CADMIUM				0.09 J	0.06 J	0.29	0.11	0.08	0.08	0.1	0.43	0.24
CALCIUM				1420 J	470 J	2890 J	2590 J	619 J	879 J	1580 J	3400 J	3990 J
CHROMIUM, TOTAL	0.31			12.6	12.5	11.2	11.6	12.8	12.2	13.2	19.8	13.2
COBALT				7.1	9.2	5.8	8.5	7.3	10.5	7.4	7.3	6.6
COPPER				13.8	13.6	58.2	18.3	12.8	16	12.7	63.8 J	25.3 J
IRON				16400	18600	13900	17800	17700	17600	18700	17000	16600
LEAD	150			17.4	10.1	299	23.3	21.2	24.9	13.3	72.2 J	32.9 J
MAGNESIUM				2450	2960	2310	3110	2600	2550	3240	3030	2980
MANGANESE	390			240	269	211	317	257	303	317	240	252
MERCURY				0.1	< 0.015 U	0.04	< 0.02 U	0.03 J	0.03 J	0.03 J	< 0.02 U	0.03
NICKEL				12.1	13.2	10.5	14.1	12.7	12.9	14.3	11.8	11.2
POTASSIUM				560	540	450	460	477	524	642	671	683
SELENIUM				0.38 J	0.27 J	0.26 J	0.22 J	0.27 J	0.28 J	0.4	0.35	0.44
SILVER				0.05 J	0.03 J	0.07	0.05 J	0.06 J	0.03 J	0.04 J	0.07	0.05 J
SODIUM				47.7 J	< 28.1 U	< 32.7 U	< 66.7 U	< 36.1 U	< 39.8 U	43.5 J	47.5 J	63.4 J
THALLIUM				0.09 J	0.07	0.06	0.05 J	0.08	0.08	0.07	0.08	0.09
VANADIUM				19.2	15.4	14.4	26.5	17.4	16.3	18.5	19.6	18.8
ZINC				46.9	32.7	48.1	40.7	35.4	34.5	52	53.8	43.4
PCBs (mg/kg)												
AROCLOR-1016				< 0.0092 U	< 0.0091 U	< 0.0083 U	< 0.047 U	< 0.009 U	< 0.0089 U	< 0.0093 U	< 0.83 U	< 0.36 U
AROCLOR-1221				< 0.0092 U	< 0.0091 U	< 0.0083 U	< 0.047 U	< 0.009 U	< 0.0089 U	< 0.0093 U	< 0.83 U	< 0.36 U
AROCLOR-1232				< 0.011 U	< 0.011 U	< 0.0098 U	< 0.056 U	< 0.011 U	< 0.01 U	< 0.011 U	< 0.98 U	< 0.42 U
AROCLOR-1242				< 0.0092 U	< 0.0091 U	< 0.0083 U	< 0.047 U	< 0.009 U	< 0.0089 U	< 0.0093 U	< 0.83 U	< 0.36 U
AROCLOR-1248				< 0.0092 U	< 0.0091 U	< 0.0083 U	< 0.047 U	< 0.009 U	< 0.0089 U	< 0.0093 U	< 0.83 U	< 0.36 U
AROCLOR-1254				< 0.0092 U	< 0.0091 U	< 0.0083 U	< 0.047 U	< 0.009 U	< 0.0089 U	< 0.0093 U	< 0.83 U	< 0.36 U
AROCLOR-1260	1	10	3.6	0.12	0.065 J	2.8 J	< 0.047 UJ	0.064 J	0.14 J	0.22	77 J	140 J
AROCLOR-1262				< 0.0092 U	< 0.0091 U	< 0.0083 U	< 0.047 U	< 0.009 U	< 0.0089 U	< 0.0093 U	< 0.83 U	< 0.36 U
AROCLOR-1268				< 0.0092 U	< 0.0091 U	< 0.0083 U	< 0.047 U	< 0.009 U	< 0.0089 U	< 0.0093 U	< 0.83 U	< 0.36 U
POLYCHLORINATED BIPHENYLS (PCBS)				0.12	0.065	2.8	< 95 U	0.064	0.14	0.22	77	140
Miscellaneous Parameters (%)												
TOTAL SOLIDS				86	88	91	90	88	89	89	90	90
Petroleum Hydrocarbons (mg/kg)												
Extractable TPH C8-C44				120	18 J	120	430 J	63	71	110	460	550
TPH-GASOLINE RANGE C6-C12				< 2.7 U	< 2.7 U	< 2.7 U	< 2.2 U	< 2.3 U	< 2.6 U	< 2.6 U	< 2.3 U	< 2.3 U

Notes:

1. Red shading indicates Residential PRG exceeded.
2. Blue shading indicates Industrial, Residential, and Ecological (if applicable) PRGs exceeded.
3. Purple shading indicates Residential and Ecological PRGs exceeded.

Table 2-5a
Analytical Results - Surface Soil at Decision Unit 3-3

Site Sample ID Location ID Sample Date Sample Type Depth Interval				SITE 00011 TF3-ECH-SS109-0001 TF3-ECH-SB109 11/19/2013 N 0 - 1 ft	SITE 00011 TF3-ECH-SS110-0001 TF3-ECH-SB110 11/19/2013 N 0 - 1 ft
Analytical Parameter	Residential PRG	Industrial PRG	Ecological PRG		
Metals (mg/kg)					
ALUMINUM				12400	13900
ANTIMONY				0.08 J	0.05 J
ARSENIC	17			3.9	3.6
BARIUM				24.3	23.5
BERYLLIUM				0.47	0.46
CADMIUM				0.09	0.04 J
CALCIUM				925 J	914 J
CHROMIUM, TOTAL	0.31			14.2	13.7
COBALT				8.9	5.3
COPPER				13.3	5.6
IRON				23200	15000
LEAD	150			11	7.6
MAGNESIUM				3150	1990
MANGANESE	390			314	165
MERCURY				< 0.02 U	< 0.02 U
NICKEL				14.3	9.4
POTASSIUM				609	475
SELENIUM				0.36 J	0.53
SILVER				0.04 J	0.07 J
SODIUM				41 J	50 J
THALLIUM				0.09	0.1
VANADIUM				22	22
ZINC				39.4	26.9
PCBs (mg/kg)					
AROCLOR-1016				< 0.0094 U	< 0.0098 U
AROCLOR-1221				< 0.0094 U	< 0.0098 U
AROCLOR-1232				< 0.011 U	< 0.012 U
AROCLOR-1242				< 0.0094 U	< 0.0098 U
AROCLOR-1248				< 0.0094 U	< 0.0098 U
AROCLOR-1254				< 0.0094 U	< 0.0098 U
AROCLOR-1260	1	10	3.6	1.8	0.15 J
AROCLOR-1262				< 0.0094 U	< 0.0098 U
AROCLOR-1268				< 0.0094 U	< 0.0098 U
POLYCHLORINATED BIPHENYLS (PCBS)				1.8	0.15
Miscellaneous Parameters (%)					
TOTAL SOLIDS				88	86
Petroleum Hydrocarbons (mg/kg)					
Extractable TPH C8-C44				42 J	12 J
TPH-GASOLINE RANGE C6-C12				< 2.4 U	< 2.6 U

Notes:

1. Red shading indicates Residential PRG exceeded.
2. Blue shading indicates Industrial, Residential, and Ecological (if applicable) PF
3. Purple shading indicates Residential and Ecological PRGs exceeded.

Table 2-5b
Analytical Results - Subsurface Soil at Decision Unit 3-3

Site				SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011	SITE 00011
Sample ID				TF3-ECH-SB101-0204	TF3-ECH-SB102-0204	TF3-ECH-SB103-0204	TF3-ECH-SB104-0204	TF3-ECH-SB105-0204	TF3-ECH-SB106-0204-D	TF3-ECH-SB106-0204	TF3-ECH-SB107-0204	TF3-ECH-SB108-0204
Location ID				TF3-ECH-SB101	TF3-ECH-SB102	TF3-ECH-SB103	TF3-ECH-SB104	TF3-ECH-SB105	TF3-ECH-SB106	TF3-ECH-SB106	TF3-ECH-SB107	TF3-ECH-SB108
Sample Date				11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013	11/19/2013
Sample Type				N	N	N	N	N	FD	N	N	N
Depth Interval				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Analytical Parameter	Residential PRG	Industrial PRG	Ecological PRG									
Metals (mg/kg)												
ALUMINUM				10700	9300	10100	14100	10000	9880	10100	10900	10300
ANTIMONY				0.06 J	0.08 J	0.05 J	< 0.038 U	0.05 J	0.07 J	0.05 J	0.07 J	0.12 J
ARSENIC	7			3.8	4.1	3.8	3.6	5.1	3.7	3.7	3.6	3.5
BARIUM				23.6	18.9	21.8	28.8	24.1	19.8	22.1	22.2	22.1
BERYLLIUM				0.44	0.38	0.41	0.34	0.41	0.39	0.36	0.39	0.4
CADMIUM				0.06 J	0.05 J	0.05 J	0.04 J	0.05 J	0.09	0.06 J	0.05 J	0.13
CALCIUM				789 J	541 J	710 J	631 J	421 J	860 J	1440 J	1200 J	856 J
CHROMIUM, TOTAL	0.31			12.7	11.1	12.4	14.7	12.4	12.7	12.6	11.5	13.4
COBALT				6.8	6.4	7.3	6.8	7.1	7.8	8.6	6.3	7.2
COPPER				11.4	11.1	12.9	6.8	9.3	13.4	13.9	10.6	11.5
IRON				16300	17500	17600	15200	14000	19500	19000	16200	17700
LEAD	150			8.2	7.8	8.1	7.2	6.5	11.9	13.1	8.9	21.5
MAGNESIUM				2430	2380	2790	2330	2170	2900	3140	2510	2660
MANGANESE	460			205	178	213	211	235	288	316	235	231
MERCURY				< 0.02 U	< 0.015 U	< 0.02 U	0.04	< 0.02 U	0.04	< 0.02 U	< 0.014 U	< 0.013 U
NICKEL				10.6	10.8	12.6	9.6	9.1	15.1	14.4	10.5	11.3
POTASSIUM				615	553	637	765	484	573	725	574	768
SELENIUM				0.29 J	0.39	0.24 J	0.48	0.23 J	0.27 J	0.22 J	0.26 J	0.23 J
SILVER				0.03 J	0.02 J	0.02 J	0.09	0.04 J	0.03 J	0.04 J	0.04 J	0.03 J
SODIUM				46.6 J	33.3 J	< 35.7 U	< 50.9 U	< 33.6 U	< 30 U	< 35.9 U	42 J	46.6 J
THALLIUM				0.09	0.08	0.08 J	0.13	0.09	0.07 J	0.08	0.07 J	0.09
VANADIUM				17.8	16.7	15.7	21.6	18.1	15.2	16.5	15.8	17.1
ZINC				28	27.5	30.4	24.7	21.2	46.4	42.9	28.3	32
PCBs (mg/kg)												
AROCLOR-1016				< 0.0094 U	< 0.0093 U	< 0.0087 U	< 0.01 U	< 0.0086 U	< 0.0092 U	< 0.042 U	< 0.0089 U	< 0.18 U
AROCLOR-1221				< 0.0094 U	< 0.0093 U	< 0.0087 U	< 0.01 U	< 0.0086 U	< 0.0092 U	< 0.042 U	< 0.0089 U	< 0.18 U
AROCLOR-1232				< 0.011 U	< 0.011 U	< 0.01 U	< 0.012 U	< 0.01 U	< 0.011 U	< 0.05 U	< 0.01 U	< 0.21 U
AROCLOR-1242				< 0.0094 U	< 0.0093 U	< 0.0087 U	< 0.01 U	< 0.0086 U	< 0.0092 U	< 0.042 U	< 0.0089 U	< 0.18 U
AROCLOR-1248				< 0.0094 U	< 0.0093 U	< 0.0087 U	< 0.01 U	< 0.0086 U	< 0.0092 U	< 0.042 U	< 0.0089 U	< 0.18 U
AROCLOR-1254				< 0.0094 U	< 0.0093 U	< 0.0087 U	< 0.01 U	< 0.0086 U	< 0.0092 U	< 0.042 U	< 0.0089 U	< 0.18 U
AROCLOR-1260	1	10	3.6	< 0.0094 U	< 0.0093 U	0.022 J	< 0.01 UJ	< 0.0086 UJ	0.21 J	0.2 J	0.062	7.6
AROCLOR-1262				< 0.0094 U	< 0.0093 U	< 0.0087 U	< 0.01 U	< 0.0086 U	< 0.0092 U	< 0.042 U	< 0.0089 U	< 0.18 U
AROCLOR-1268				< 0.0094 U	< 0.0093 U	< 0.0087 U	< 0.01 U	< 0.0086 U	< 0.0092 U	< 0.042 U	< 0.0089 U	< 0.18 U
POLYCHLORINATED BIPHENYLS (PCBS)				< 19 U	< 19 U	0.022	< 20 U	< 17 U	0.21	0.2	0.062	7.6
Miscellaneous Parameters (%)												
TOTAL SOLIDS				89	88	93	82	88	91	90	91	93
Petroleum Hydrocarbons (mg/kg)												
Extractable TPH C8-C44				8.9 J	9.1 J	6.6 J	13 J	8.4 J	170 J	210 J	16 J	46 J
TPH-GASOLINE RANGE C6-C12				< 2.4 U	< 2.5 U	< 2.1 U	< 2.4 U	< 2.4 U	< 1.4 U	< 2 U	< 2.2 U	< 2 U

Notes:

1. Red shading indicates Residential PRG exceeded.
2. Blue shading indicates Industrial, Residential, and Ecological (if applicable) PRGs exceeded.
3. Purple shading indicates Residential and Ecological PRGs exceeded.

Table 2-5b
Analytical Results - Subsurface Soil at Decision Unit 3-3

Site				SITE 00011	SITE 00011
Sample ID				TF3-ECH-SB109-0204	TF3-ECH-SB110-0204
Location ID				TF3-ECH-SB109	TF3-ECH-SB110
Sample Date				11/19/2013	11/19/2013
Sample Type				N	N
Depth Interval				2 - 4 ft	2 - 4 ft
Analytical Parameter	Residential PRG	Industrial PRG	Ecological PRG		
Metals (mg/kg)					
ALUMINUM				11200	9260
ANTIMONY				0.06 J	0.06 J
ARSENIC	7			3.4	4.1
BARIUM				24.9	19.2
BERYLLIUM				0.47	0.44
CADMIUM				0.11	0.07 J
CALCIUM				1200 J	838 J
CHROMIUM, TOTAL	0.31			14.3	10.9
COBALT				9.5	7.6
COPPER				17.8	10.9
IRON				21900	16000
LEAD	150			20.1	6.7
MAGNESIUM				3540	2330
MANGANESE	460			336	273
MERCURY				< 0.01 U	< 0.016 U
NICKEL				15.4	11.3
POTASSIUM				875	661
SELENIUM				0.25 J	0.25 J
SILVER				0.03 J	0.03 J
SODIUM				41 J	53.8 J
THALLIUM				0.1	0.09
VANADIUM				25.4	17.3
ZINC				68.8	27.2
PCBs (mg/kg)					
AROCLOR-1016				< 0.01 U	< 0.0091 U
AROCLOR-1221				< 0.01 U	< 0.0091 U
AROCLOR-1232				< 0.012 U	< 0.011 U
AROCLOR-1242				< 0.01 U	< 0.0091 U
AROCLOR-1248				< 0.01 U	< 0.0091 U
AROCLOR-1254				< 0.01 U	< 0.0091 U
AROCLOR-1260	1	10	3.6	0.69	0.21
AROCLOR-1262				< 0.01 U	< 0.0091 U
AROCLOR-1268				< 0.01 U	< 0.0091 U
POLYCHLORINATED BIPHENYLS (PCBS)				0.69	0.21
Miscellaneous Parameters (%)					
TOTAL SOLIDS				77	91
Petroleum Hydrocarbons (mg/kg)					
Extractable TPH C8-C44				13 J	12 J
TPH-GASOLINE RANGE C6-C12				< 2.8 U	< 1.9 U

Notes:

1. Red shading indicates Residential PRG exceeded.
2. Blue shading indicates Industrial, Residential, and Ecological (if applicable) PF
3. Purple shading indicates Residential and Ecological PRGs exceeded.

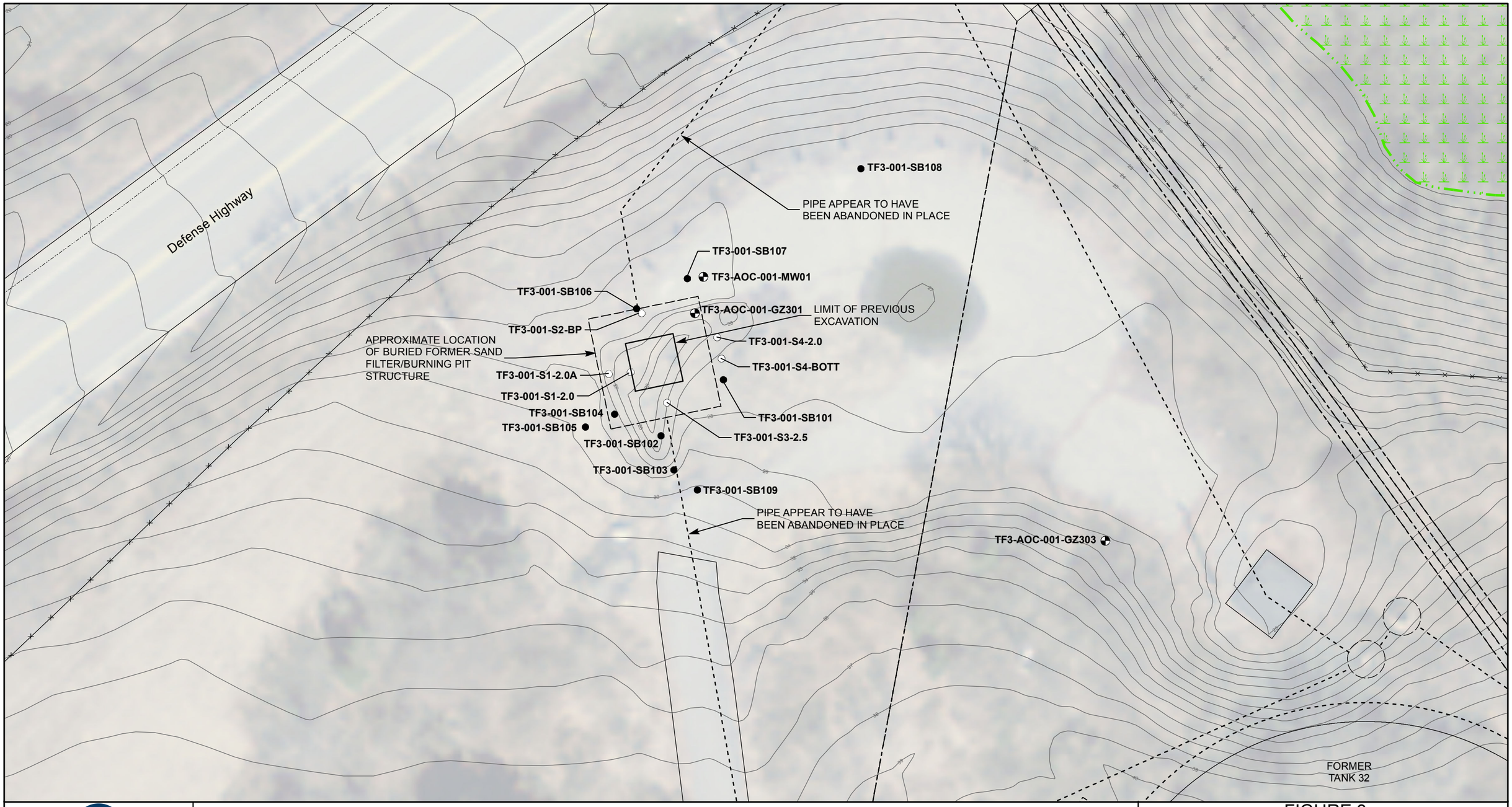
Table 5-1
Cost Sensitivity Analysis Summary

Cost Estimate Scenarios	Alternative S-2 Limited Soil Excavation with Land Use Controls	Alternative S-3 Containment with Land Use Controls
Lower-end cost projection(1)	$367,000	$373,000
Baseline cost estimate(2)	$480,000	$494,000
Upper-end cost projection(3)	$624,000	$629,000

Notes:
(1) Cost rounded to nearest $1,000. Eliminate contingency costs; apply a 25% reduction to O&M and Five-Year Review costs
(2) Cost rounded to nearest $1,000. Cost estimate as provided in the baseline alternative (Appendix C)
(3) Cost rounded to nearest $1,000. Cost estimates expanded as follows:

Alternative S-2: Double the area and volume of limited excavation from 60 cubic yards to 120 cubic yards; increase number of delineation samples by 20%; increase number of waste characterization samples to 2 samples (1 sample per 100 cubic yards); increase data validation hours to 70; increase cost of annual LUC site inspection by 20%

Alternative S-3: Double the area of the asphalt cover from 325 square feet to 650 square feet; increase number of delineation samples by 20%; increase data validation hours to 70; increase cost of annual LUC site inspection by 20%



RESOLUTION CONSULTANTS

Drawn:	JB	04/06/2016
Approved:	MK	04/06/2016
Project #:	60266436	

Legend

- Monitoring Well Location
- Sample Point Location (2004)
- Soil Sample Location (2013)
- Site 11 Boundary
- Wetland
- Topographic Contour Line (NAVD 88)
- Petroleum Distribution (Remaining)
- Ring Drain/BSW Drainage (Remaining)

N

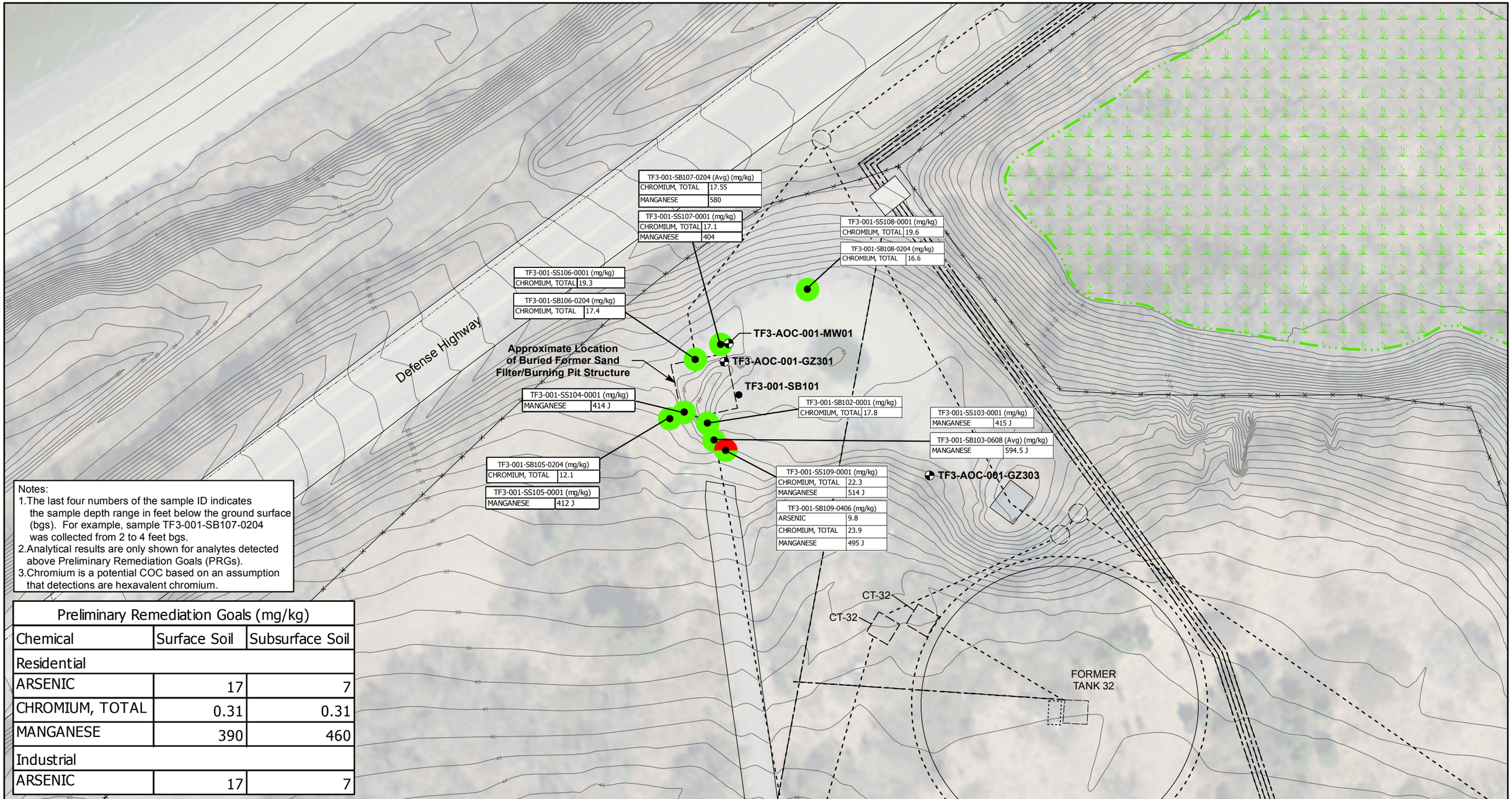
0 10 20

Scale in Feet

FIGURE 3
SOIL SAMPLE LOCATIONS - DECISION UNIT 3-1

SITE 11 - TANK FARM 3
NAVSTA NEWPORT, RHODE ISLAND

Path: P:\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Newport\GIS\Projects\Tank_Farm_3\FS\MXD\Fig_3_Site_11_TF3_Soil and GW Samples_DU3_1.mxd



Notes:
1. The last four numbers of the sample ID indicates the sample depth range in feet below the ground surface (bgs). For example, sample TF3-001-SB107-0204 was collected from 2 to 4 feet bgs.
2. Analytical results are only shown for analytes detected above Preliminary Remediation Goals (PRGs).
3. Chromium is a potential COC based on an assumption that detections are hexavalent chromium.

Preliminary Remediation Goals (mg/kg)		
Chemical	Surface Soil	Subsurface Soil
Residential		
ARSENIC	17	7
CHROMIUM, TOTAL	0.31	0.31
MANGANESE	390	460
Industrial		
ARSENIC	17	7

RESOLUTION CONSULTANTS

Drawn:	JB	04/06/2016
Approved:	MK	04/06/2016
Project #:	60268619	

Legend

- Monitoring Well Location
- Soil Sample Location (2013)
- Residential PRG Exceedance
- Industrial PRG Exceedance
- Site 11 Boundary
- Wetland
- Topographic Contour Line (NAVD 88)
- Petroleum Distribution (Remaining)
- Ring Drain/BSW Drainage (Remaining)

N

0 20 40
Scale in Feet

FIGURE 6
SOILS EXCEEDING PRGS
FOR METALS - DECISION UNIT 3-1

SITE 11 - TANK FARM 3
NAVSTA NEWPORT, RHODE ISLAND

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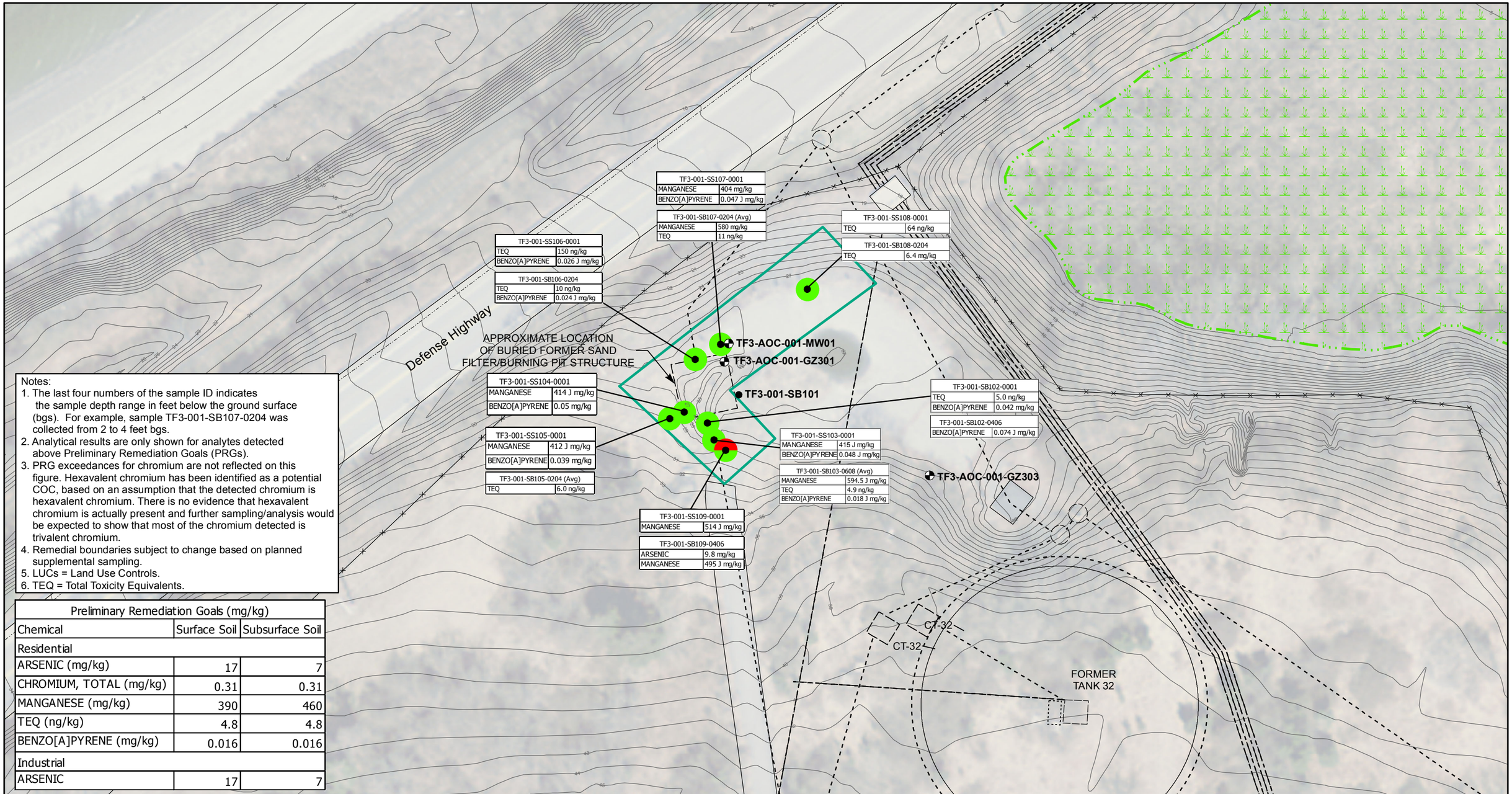


Notes:
1. The last four numbers of the sample ID indicates the sample depth range in feet below the ground surface (bgs). For example, sample TF3-001-SB107-0204 was collected from 2 to 4 feet bgs.
2. Analytical results are only shown for analytes detected above Preliminary Remediation Goals (PRGs).
3. PRG exceedances for chromium are not reflected on this figure. Hexavalent chromium has been identified as a potential COC, based on an assumption that the detected chromium is hexavalent chromium. There is no evidence that hexavalent chromium is actually present and further sampling/analysis would be expected to show that most of the chromium detected is trivalent chromium.
4. Remedial boundaries subject to change based on planned supplemental sampling.
5. LUCs = Land Use Controls.
6. TEQ = Total Toxicity Equivalents.

Preliminary Remediation Goals (mg/kg)		
Chemical	Surface Soil	Subsurface Soil
Residential		
ARSENIC (mg/kg)	17	7
CHROMIUM, TOTAL (mg/kg)	0.31	0.31
MANGANESE (mg/kg)	390	460
TEQ (ng/kg)	4.8	4.8
BENZO[A]PYRENE (mg/kg)	0.016	0.016
Industrial		
ARSENIC	17	7

RESOLUTION CONSULTANTS

Drawn:	JB	04/04/2016
Approved:	MK	04/04/2016
Project #:	60268619	

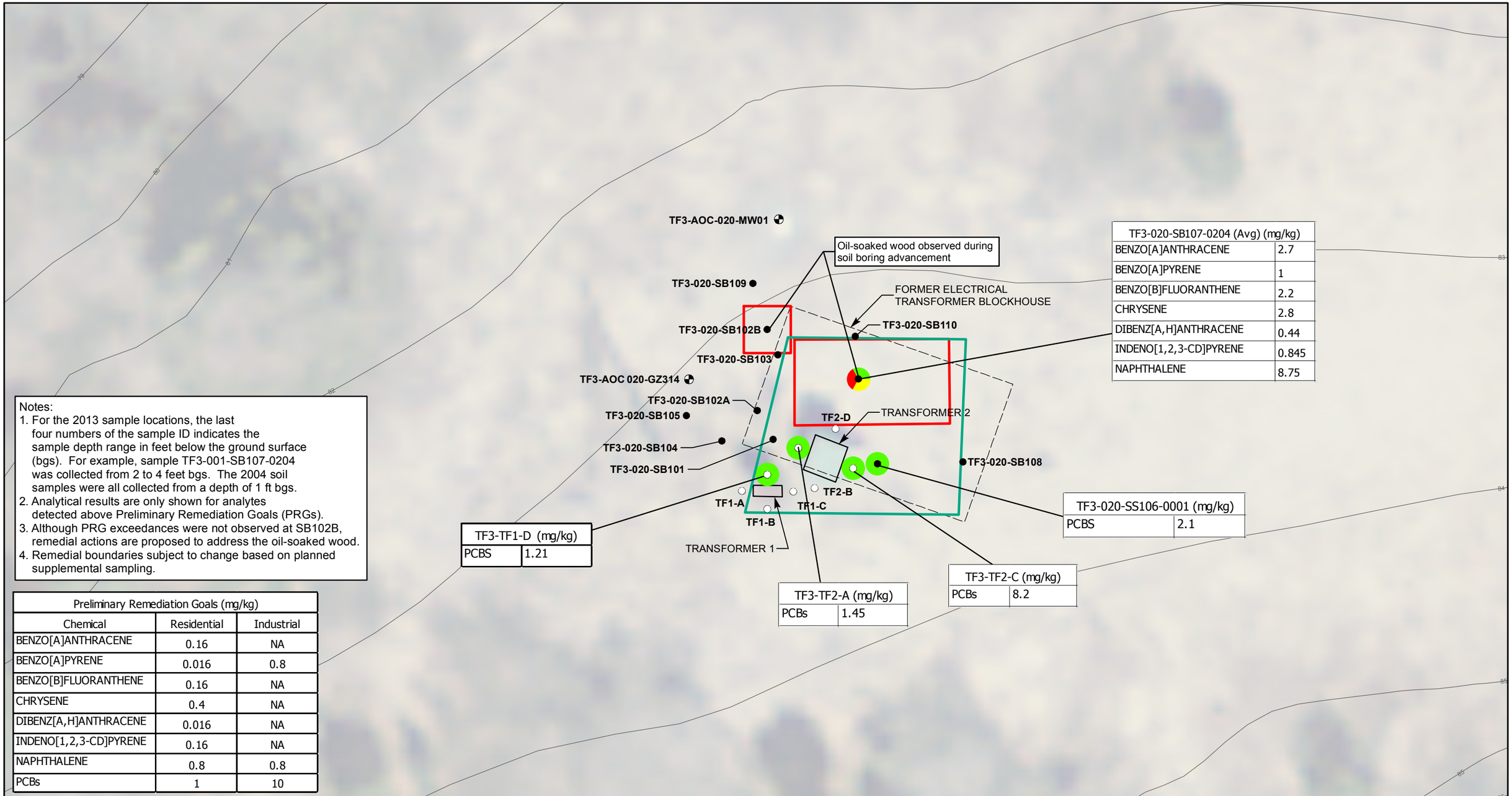
Legend
- Monitoring Well Location
- Soil Sample Location (2013)
- Residential PRG Exceedance
- Industrial PRG Exceedance
- Site 11 Boundary
- Estimated Extent LUCs
- Wetland
- Topographic Contour Line (NAVD 88)
- Petroleum Distribution (Remaining)
- Ring Drain/BSW Drainage (Remaining)

N
0 20 40
Scale in Feet

FIGURE 9
SUMMARY OF SOILS EXCEEDING RESIDENTIAL PRGS - DECISION UNIT 3-1

SITE 11 - TANK FARM 3
NAVSTA NEWPORT, RHODE ISLAND

Path: P:\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Newport\GIS\Projects\Tank_Farm_3\FS\MXD\Fig_9_Site_11_TF3_Summary_DU3_1.mxd



TF3-020-SB107-0204 (Avg) (mg/kg)	
BENZO[A]ANTHRACENE	2.7
BENZO[A]PYRENE	1
BENZO[B]FLUORANTHENE	2.2
CHRYSENE	2.8
DIBENZ[A,H]ANTHRACENE	0.44
INDENO[1,2,3-CD]PYRENE	0.845
NAPHTHALENE	8.75

TF3-020-SS106-0001 (mg/kg)	
PCBS	2.1

TF3-TF1-D (mg/kg)	
PCBS	1.21

TF3-TF2-A (mg/kg)	
PCBs	1.45

TF3-TF2-C (mg/kg)	
PCBs	8.2

Notes:
1. For the 2013 sample locations, the last four numbers of the sample ID indicates the sample depth range in feet below the ground surface (bgs). For example, sample TF3-001-SB107-0204 was collected from 2 to 4 feet bgs. The 2004 soil samples were all collected from a depth of 1 ft bgs.
2. Analytical results are only shown for analytes detected above Preliminary Remediation Goals (PRGs).
3. Although PRG exceedances were not observed at SB102B, remedial actions are proposed to address the oil-soaked wood.
4. Remedial boundaries subject to change based on planned supplemental sampling.

Preliminary Remediation Goals (mg/kg)		
Chemical	Residential	Industrial
BENZO[A]ANTHRACENE	0.16	NA
BENZO[A]PYRENE	0.016	0.8
BENZO[B]FLUORANTHENE	0.16	NA
CHRYSENE	0.4	NA
DIBENZ[A,H]ANTHRACENE	0.016	NA
INDENO[1,2,3-CD]PYRENE	0.16	NA
NAPHTHALENE	0.8	0.8
PCBs	1	10

RESOLUTION CONSULTANTS

Drawn:	JB	04/04/2016
Approved:	MK	04/04/2016
Project #:	60266436	

Legend

- Monitoring Well Location
- Sample Point Location (2004)
- Soil Boring Location (2013)
- RIDEM GA Leachability Exceedance
- Industrial PRG Exceedance
- Residential PRG Exceedance
- Estimated Extent of LUCs under Alternatives S-2 and S-3
- Estimated Extent of Excavation under Alternative S-2 and Impermeable Cap under Alternative S-3
- Topographic Contour Line (NAVD 88)
- Existing Structure

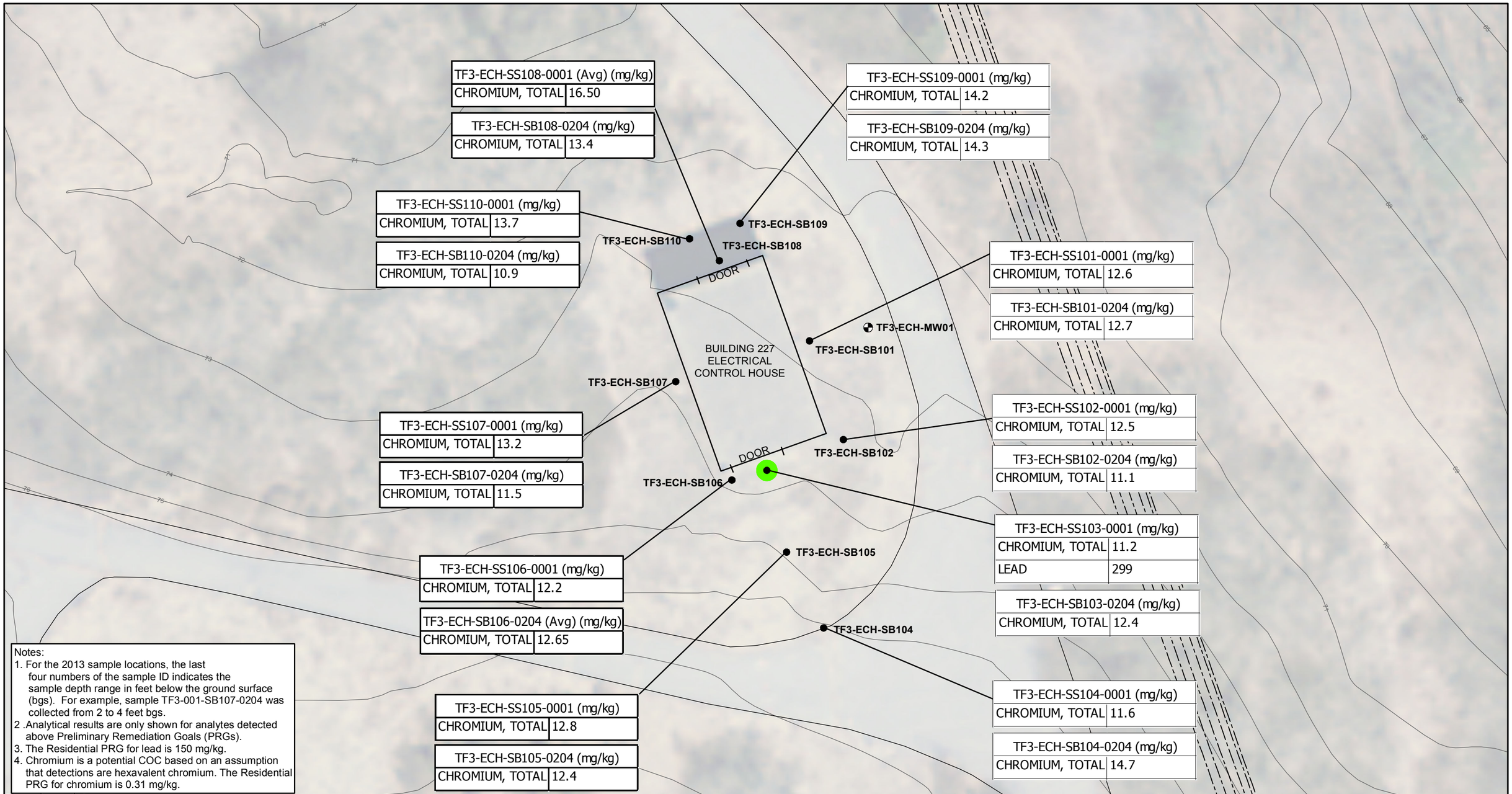
N

0 5 10
Scale in Feet

FIGURE 12
SUMMARY OF SOILS EXCEEDING PRGS - DECISION UNIT 3-2

SITE 11 - TANK FARM 3
NAVSTA NEWPORT, RHODE ISLAND

Path: P:\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Newport\GIS\Projects\Tank_Farm_3\FS\MXD\Fig_12_Site_11_TF3_Summary_DU3_2.mxd



Notes:
1. For the 2013 sample locations, the last four numbers of the sample ID indicates the sample depth range in feet below the ground surface (bgs). For example, sample TF3-001-SB107-0204 was collected from 2 to 4 feet bgs.
2 .Analytical results are only shown for analytes detected above Preliminary Remediation Goals (PRGs).
3. The Residential PRG for lead is 150 mg/kg.
4. Chromium is a potential COC based on an assumption that detections are hexavalent chromium. The Residential PRG for chromium is 0.31 mg/kg.

RESOLUTION CONSULTANTS

Drawn:	JB	04/04/2016
Approved:	MK	04/04/2016
Project #:	60266436	

Legend
- Monitoring Well Location
- Soil Boring Location (2013)
- Residential PRG Exceedance
- Topographic Contour Line (NAVD 88)
- Petroleum Distribution (Remaining)
- Existing Structure

N

0 10 20
Scale in Feet

FIGURE 13
SOILS EXCEEDING RESIDENTIAL PRGS FOR METALS - DECISION UNIT 3-3

SITE 11 - TANK FARM 3
NAVSTA NEWPORT, RHODE ISLAND

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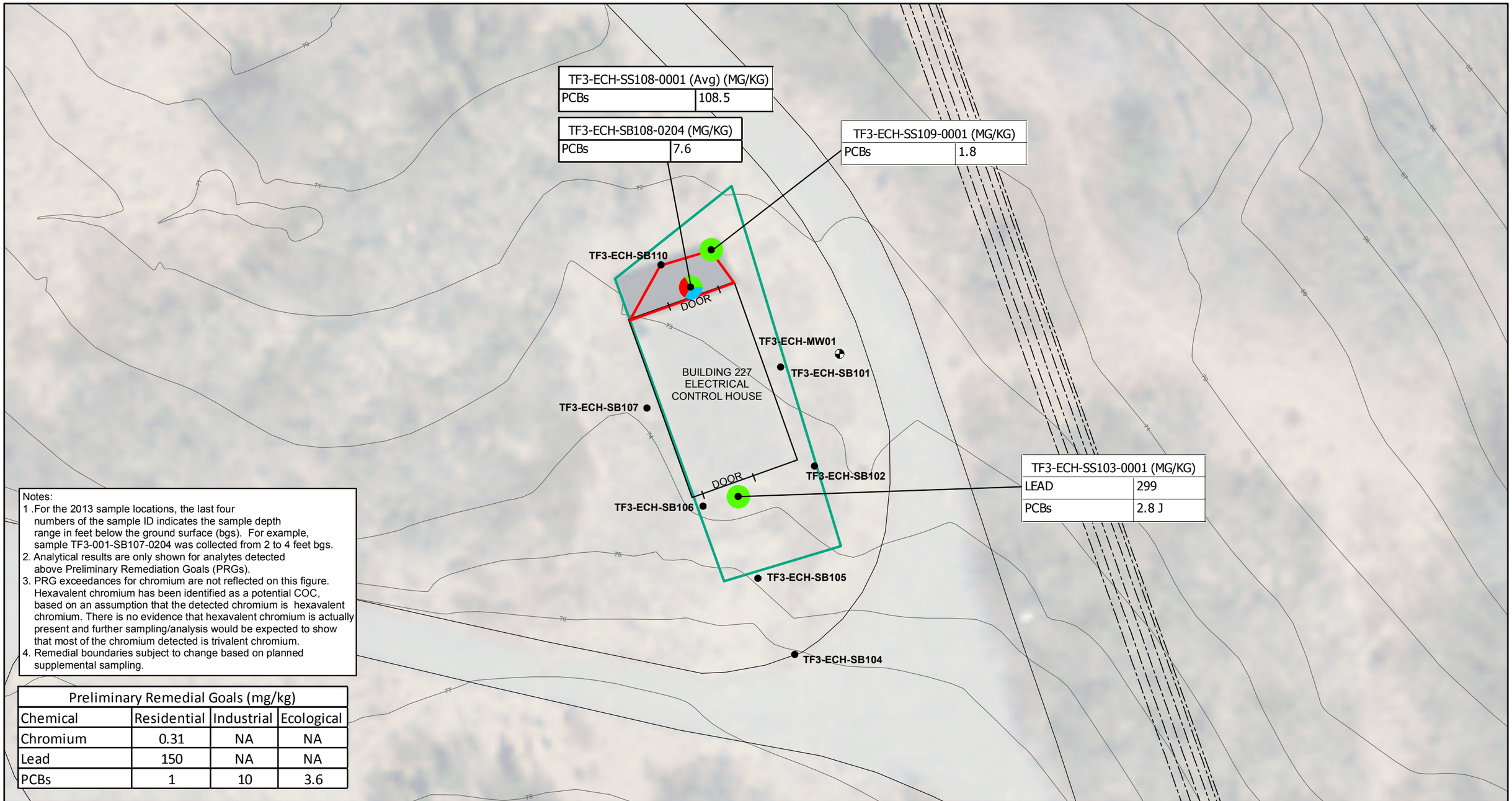

Notes:
1 .For the 2013 sample locations, the last four numbers of the sample ID indicates the sample depth range in feet below the ground surface (bgs). For example, sample TF3-001-SB107-0204 was collected from 2 to 4 feet bgs.
2. Analytical results are only shown for analytes detected above Preliminary Remediation Goals (PRGs).
3. PRG exceedances for chromium are not reflected on this figure. Hexavalent chromium has been identified as a potential COC, based on an assumption that the detected chromium is hexavalent chromium. There is no evidence that hexavalent chromium is actually present and further sampling/analysis would be expected to show that most of the chromium detected is trivalent chromium.
4. Remedial boundaries subject to change based on planned supplemental sampling.

Preliminary Remedial Goals (mg/kg)			
Chemical	Residential	Industrial	Ecological
Chromium	0.31	NA	NA
Lead	150	NA	NA
PCBs	1	10	3.6

RESOLUTION CONSULTANTS

Drawn:	JB	04/06/2016
Approved:	MK	04/06/2016
Project #:	60266436	

Legend
- Monitoring Well Location
- Soil Boring Location (2013)
- Ecological PRG Exceedance
- Industrial PRG Exceedance
- Residential PRG Exceedance
- Topographic Contour Line (NAVD 88)
- Petroleum Distribution (Remaining)
- Estimated Extent of LUCs under Alternatives S-2 and S-3
- Estimated Extent of Excavation under Alternative S-2 and Impermeable Cap under Alternative S-3
- Existing Structure

N

0 10 20
Scale in Feet

FIGURE 15
SUMMARY OF SOILS EXCEEDING PRGS- DECISION UNIT 3-3

SITE 11 – TANK FARM 3
NAVSTA NEWPORT, RHODE ISLAND

Path: P:\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Newport\GIS\Projects\Tank_Farm_3\FS\MXD\Fig_15_Site_11_TF3_Summary_ECH_Area.mxd

APPENDIX A.1 – HUMAN HEALTH PRG DEVELOPMENT

TABLE 12. HUMAN HEALTH PRELIMINARY REMEDIATION GOALS (PRGs) FOR SOIL
TANK FARM 3 CATEGORY 1 AREAS, NAVSTA NEWPORT, PORTSMOUTH, RHODE ISLAND

Media/ Scenario	Contaminant	Regulatory Criteria: RIDEM Rem. Regs [1] Leachability	I/C DEC	Res. DEC	Risk-Based PRGs[2]: ILCR 10^{-6}	10^{-5}	10^{-4}	HQ = 1	Site-specific Background Levels[3] Surface Soil	Subsurface Soil	TSCA[7]	RI Background[4]	Selected Surface Soil PRG[10]	Basis	Selected Subsurface Soil PRG[10]	Basis	Decision Unit Applicability[8] DU 3-1	DU 3-2	DU 3-3
Site-wide Soil - mg/kg (Hypothetical Residential Scenario)																			
	Benzo(a)anthracene	- -	NA	0.9	0.16	1.6	16	NA	- -	- -	- -	- -	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
	Benzo(a)pyrene	240	NA	0.4	0.016	0.16	1.6	NA	- -	- -	- -	- -	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	X	X	
	Benzo(b)fluoranthene	- -	NA	0.9	0.16	1.6	16	NA	- -	- -	- -	- -	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
	Chrysene[5]	- -	NA	0.4	NA	NA	NA	NA	- -	- -	- -	- -	0.4	Res. DEC	0.4	Res. DEC		X	
	Dibenzo(a,h)anthracene	- -	NA	0.4	0.016	0.16	1.6	NA	- -	- -	- -	- -	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	X	X	
	Indeno(1,2,3-cd)pyrene	- -	NA	0.9	0.16	1.6	16	NA	- -	- -	- -	- -	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	X	X	
	Naphthalene	0.8	NA	54	3.8	38	380	128	- -	- -	- -	- -	0.8	Leachabilty	0.8	Leachabilty	X	X	
	2,3,7,8-TCDD Equivalents	- -	NA	- -	0.0000048	0.000048	0.00048	0.000051	- -	- -	- -	- -	0.0000048	ILCR = 10^{-6}	0.0000048	ILCR = 10^{-6}	X		
	PCBs	10	NA	10	0.24	2.4	24	NA	- -	- -	1	- -	1	TSCA	1	TSCA		X	X
	Arsenic[6]	- -	NA	7	0.68	6.8	68	35	17	6	- -	7	17	Background	7	Res DEC	X		X
	Chromium[9]	- -	NA	390	0.31	3.1	31	235	--	--	- -	--	0.31	ILCR = 10^{-6}	0.31	ILCR = 10^{-6}	X		X
	Lead[5]	- -	NA	150	NA	NA	NA	NA	31	7.9	- -	13.91	150	Res. DEC	150	Res. DEC			X
	Manganese[5]	- -	NA	390	NA	NA	NA	NA	260	460	- -	- -	390	Res. DEC	460	Background	X		X
Site-wide Soil - mg/kg (Industrial Worker/Restricted Recreational Scenario)																			
	Benzo(a)pyrene[5]	240	0.8	NA	NA	NA	NA	NA	- -	- -	- -	- -	0.8	I/C DEC	0.8	I/C DEC		X	
	Naphthalene[5]	0.8	10000	NA	NA	NA	NA	NA	- -	- -	- -	- -	0.8	Leachabilty	0.8	Leachabilty		X	
	PCBs[5]	10	10	NA	NA	NA	NA	NA	- -	- -	- -	- -	10	I/C DEC	10	I/C DEC			X
	Arsenic[5,6]	- -	7	NA	NA	NA	NA	NA	17	6	- -	7	17	Background	7	I/C DEC	X		

Notes

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

NA - Not carcinogenic, or a carcinogen was not evaluated for potential non-carcinogenic effects; not applicable

AOC - Area of Concern

ECH - Electrical Control House

1. RIDEM Rem. Regs. - RIDEM Remediation Regulations, DEM-DSR-01-93, February 2004, Table 1 (Residential Direct Exposure Criteria [DEC] and Industrial/Commercial [I/C] DEC) and Table 2 (GA Leachability Criteria); - - = no criterion
2. Risk-based PRGs are developed based on risk results from the human health risk assessment and consider the ingestion, dermal and inhalation routes of exposure, as applicable. Noncancer PRGs are based on child exposure, while cancer PRGs are based on lifetime exposure. The only PRGs included were for those analytes which were concluded to be primary risk drivers; if the cancer or non-cancer effects were not shown to be primary risk drivers, a PRG was not presented (NA).
3. Site-specific background values generated in Appendix A.3
   - - = not detected
4. Arsenic background based on RIDEM Rem. Regs, February 2004. Other background values - statewide geometric mean provided in Background Levels of Priority Pollutant Metals in Rhode Island Soils, Rhode Island Department of Environmental Management Division of Site Remedation.
5. Analyte included only due to detections in exceedance of RIDEM Regulatory Criteria. As this analyte was not determined to be a risk driver in the Baseline Human Health Risk Assessment, risk-based PRG calculations are not included for this analyte/exposure scenario. Comparison of maximum detected concentrations to regulatory criteria presented in Tables 14, 15, and 16 of this attachment.
6. While the RIDEM DEC is set at Rhode Island background (7 mg/kg), additional guidance specific to arsenic remediation is provided in the RIDEM Remediation Regulations, DEM-DSR-01-93, February 2004, Section 12.0. Higher concentrations of arsenic are allowable, depending on other site conditions/actions.
7. TSCA - Toxic Substances Control Act; Section 761.61(c) of TSCA (see Appendix B for full citation) allows for risk-based cleanup of PCB remediation waste. EPA guidance on Remedial Actions for Superfund Sites with PCB Contamination (OSWER Directive #9355.4-01FS; EPA/540/G-90/007; August 1990) was utilized to develop the risk-based value presented. Written approval for the proposed risk-based cleanup must be obtained from the Director, Office of Site Remediation and Restoration, USEPA Region 1.
8. Decision Unit Applicability - While the risk assessment evaluated all three DUs together, the various analytes were analyzed/detected in specific DUs based on the conceptual site model. The PRGs are applicable to those specific DUs.

Notes Continued:

9. Chromium speciation has not been performed for this site. At this time, chromium has been assumed to be hexavalent chromium even though there is no current evidence that it would be this species. Further sampling/analysis is anticipated to show that most of the chromium detected is trivalent chromium. Upon confirmation of this assumption, chromium would no longer be a chemical of concern (COC) at this site.
10. For the contaminants listed above, selected PRGs were identified as the lower of the risk-based goals or ARAR (if available). If site-specific background values are available and applicable, the greater of the two values was selected as the PRG.

TABLE 13. HUMAN HEALTH PRELIMINARY REMEDIATION GOALS (PRGs) FOR SOIL - RESIDUAL RISK
TANK FARM 3 CATEGORY 1 AREAS, NAVSTA NEWPORT, PORTSMOUTH, RHODE ISLAND

Media/ Scenario	Contaminant	Regulatory Criteria: RIDEM Rem. Regs [1] Leachability	I/C DEC	Res. DEC	Risk-Based PRGs[2]: ILCR 10^{-6}	10^{-5}	10^{-4}	HQ = 1	Additional Information: Site-specific Background Levels[3] Surface Soil	Subsurface Soil	TSCA[7]	RI Background[4]	Selected Surface Soil PRG	Basis	Selected Subsurface Soil PRG	Basis	Residual Risk At PRG: Surface Soil Estimated ILCR	Surface Soil Estimated HQ	Subsurface Soil Estimated ILCR	Subsurface Soil Estimated HQ
Site-wide Soil - mg/kg (Hypothetical Residential Scenario)																				
	Benzo(a)anthracene	- -	NA	0.9	0.16	1.6	16	NA	- -	- -	- -	- -	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	1E-06	N/A	1E-06	N/A
	Benzo(a)pyrene	240	NA	0.4	0.016	0.16	1.6	NA	- -	- -	- -	- -	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	1E-06	N/A	1E-06	N/A
	Benzo(b)fluoranthene	- -	NA	0.9	0.16	1.6	16	NA	- -	- -	- -	- -	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	1E-06	N/A	1E-06	N/A
	Chrysene[5]	- -	NA	0.4	NA	NA	NA	NA	- -	- -	- -	- -	0.4	Res. DEC	0.4	Res. DEC	N/A	N/A	N/A	N/A
	Dibenzo(a,h)anthracene	- -	NA	0.4	0.016	0.16	1.6	NA	- -	- -	- -	- -	0.016	ILCR = 10^{-6}	0.016	ILCR = 10^{-6}	1E-06	N/A	1E-06	N/A
	Indeno(1,2,3-cd)pyrene	- -	NA	0.9	0.16	1.6	16	NA	- -	- -	- -	- -	0.16	ILCR = 10^{-6}	0.16	ILCR = 10^{-6}	1E-06	N/A	1E-06	N/A
	Naphthalene	0.8	NA	54	3.8	38	380	128	- -	- -	- -	- -	0.8	Leachability	0.8	Leachabilty	2E-07	5E-03	2E-07	5E-03
	2,3,7,8-TCDD Equivalents	- -	NA	- -	0.0000048	0.000048	0.00048	0.000051	- -	- -	- -	- -	0.0000048	ILCR = 10^{-6}	0.0000048	ILCR = 10^{-6}	9E-07	9E-02	9E-07	9E-02
	PCBs	10	NA	10	0.24	2.4	24	NA	- -	- -	1	- -	1	TSCA	1	TSCA	4E-06	N/A	4E-06	N/A
	Arsenic[6]	- -	NA	7	0.68	6.8	68	35	17	6	- -	7	17	Background	7	Res DEC	3E-05	5E-01	1E-05	2E-01
	Chromium[8]	- -	NA	390	0.31	3.1	31	235	--	--	- -	- -	0.31	ILCR = 10^{-6}	0.31	ILCR = 10^{-6}	1E-06	1E-03	1E-06	1E-03
	Lead[5]	- -	NA	150	NA	NA	NA	NA	31	7.9	- -	13.91	150	Res. DEC	150	Res. DEC				
	Manganese[5]	- -	NA	390	NA	NA	NA	NA	260	460	- -	- -	390	Res. DEC	460	Background	N/A	2E-01	N/A	2E-01
																	4E-05		**2E-05**	
Site-wide Soil - mg/kg (Industrial Worker/Restricted Recreational Scenario)																				
	Benzo(a)pyrene[5]	240	0.8	NA	NA	NA	NA	NA	- -	- -	- -	- -	0.8	I/C DEC	0.8	I/C DEC	3E-06	N/A	3E-06	N/A
	Naphthalene[5]	0.8	10000	NA	NA	NA	NA	NA	- -	- -	- -	- -	0.8	Leachabilty	0.8	Leachabilty	4E-08	1E-03	4E-08	1E-03
	PCBs[5]	10	10	NA	NA	NA	NA	NA	- -	- -	- -	- -	10	I/C DEC	10	I/C DEC	1E-05	N/A	1E-05	N/A
	Arsenic[5,6]	- -	7	NA	NA	NA	NA	NA	17	6	- -	7	17	Background	7	I/C DEC	6E-06	3E-02	2E-06	1E-02
																	2E-05		**1E-05**	

Notes

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

NA - Not carcinogenic, or a carcinogen was not evaluated for potential non-carcinogenic effects; not applicable

AOC - Area of Concern

ECH - Electrical Control House

1. RIDEM Rem. Regs. - RIDEM Remediation Regulations, DEM-DSR-01-93, February 2004, Table 1 (Residential Direct Exposure Criteria [DEC] and Industrial/Commercial [I/C] DEC) and Table 2 (GA Leachability Criteria); - - = no criterion
2. Risk-based PRGs are developed based on risk results from the human health risk assessment and consider the ingestion, dermal and inhalation routes of exposure, as applicable. Noncancer PRGs are based on child exposure, while cancer PRGs are based on lifetime exposure. The only PRGs included were for those analytes which were concluded to be primary risk drivers; if the cancer or non-cancer effects were not shown to be primary risk drivers, a PRG was not presented (NA).
3. Site-specific background values generated in Appendix A.3
   - - = not detected
4. Arsenic background based on RIDEM Rem. Regs, February 2004. Other background values - statewide geometric mean provided in Background Levels of Priority Pollutant Metals in Rhode Island Soils, Rhode Island Department of Environmental Management Division of Site Remedation.
5. Analyte included only due to detections in exceedance of RIDEM Regulatory Criteria. As this analyte was not determined to be a risk driver in the Baseline Human Health Risk Assessment, risk-based PRG calculations are not included for this analyte/exposure scenario. Comparison of maximum detected concentrations to regulatory criteria presented in Tables 14, 15, and 16 of this attachment.
6. While the RIDEM DEC is set at Rhode Island background (7 mg/kg), additional guidance specific to arsenic remediation is provided in the RIDEM Remediation Regulations, DEM-DSR-01-93, February 2004, Section 12.0. Higher concentrations of arsenic are allowable, depending on other site conditions/actions.
7. TSCA - Toxic Substances Control Act; Section 761.61(c) of TSCA (see Appendix B for full citation) allows for risk-based cleanup of PCB remediation waste. EPA guidance on Remedial Actions for Superfund Sites with PCB Contamination (OSWER Directive #9355.4-01FS; EPA/540/G-90/007; August 1990) was utilized to develop the risk-based value presented. Written approval for the proposed risk-based cleanup must be obtained from the Director, Office of Site Remediation and Restoration, USEPA Region 1.
8. Chromium speciation has not been performed for this site. At this time, chromium has been assumed to be hexavalent chromium even though there is no current evidence that it would be this species. Further sampling/analysis is anticipated to show that mo: chromium detected is trivalent chromium. Upon confirmation of this assumption, chromium would no longer be a chemical of concern (COC) at this site.

APPENDIX A.3 – BACKGROUND CALCULATIONS

Analytical Results
NS Newport
As Pb Mn BACKGROUND SURFACE

	Site	SITE 00002	SITE 00002	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND
	Location	BKG-SS03-NEB	BKG-SS09-NEB	BWBK-NE01	BWBK-NE02	BWBK-NE03	BWBK-NE04	BWBK-NE05
	Depth	0 - 1.6 ft	0 - 1.8 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
	Date	1/1/1900 00:00	1/1/1900 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00
	Matrix	SO	SO	SO	SO	SO	SO	SO
	Type	N	N	N	N	N	N	N
	Sample	BKG-SS03-NEB-0016	BKG-SS09-NEB-0018	BWBK-SS-NE01-0001	BWBK-SS-NE02-0001	BWBK-SS-NE03-0001	BWBK-SS-NE04-0001	BWBK-SS-NE05-0001
Analyte	**Units**							
Metals								
ARSENIC	mg/kg	**6.2 J**	**10.8 J**	**14.5**	**17.1**	**8.6**	**6.7**	**9.4**
LEAD	mg/kg	**44 J**	**15.2 J**	**19.7**	**16.5**	**12.3**	**11.6**	**17.4**
MANGANESE	mg/kg	**204**	**179**	**290**	**222**	**192**	**253**	**208**

Analytical Results
NS Newport
As Pb Mn BACKGROUND SURFACE

	Site	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND
	Location	BWBK-NE06	BWBK-NE07	BWBK-NE08	BWBK-NE09	BWBK-NE10	BWBK-NE101	BWBK-NE102
	Depth	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
	Date	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	3/27/2007 00:00	3/27/2007 00:00
	Matrix	SO	SO	SO	SO	SO	SO	SO
	Type	N	N	N	N	N	N	N
	Sample	BWBK-SS-NE06-0001	BWBK-SS-NE07-0001	BWBK-SS-NE08-0001	BWBK-SS-NE09-0001	BWBK-SS-NE10-0001	BWBK-SS-NE101-0001	BWBK-SS-NE102-0001
Analyte	**Units**							
Metals								
ARSENIC	mg/kg	**5.6**	**11.7**	**6.4**	**8.3**	**8.2**	**3.1**	**2.4**
LEAD	mg/kg	**9.8**	**24.2**	**11.3**	**17.4**	**26.3**	**8.2**	**12.7**
MANGANESE	mg/kg	**184**	**177**	**185**	**219**	**193**	**146**	**128**

Analytical Results
NS Newport
As Pb Mn BACKGROUND SURFACE

	Site	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND
	Location	BWBK-NE103	BWBK-NE104	BWBK-NE105	BWBK-NE106	BWBK-NE107	BWBK-NE108	BWBK-NE109
	Depth	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
	Date	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00
	Matrix	SO	SO	SO	SO	SO	SO	SO
	Type	N	N	N	N	N	N	N
	Sample	BWBK-SS-NE103-0001	BWBK-SS-NE104-0001	BWBK-SS-NE105-0001	BWBK-SS-NE106-0001	BWBK-SS-NE107-0001	BWBK-SS-NE108-0001	BWBK-SS-NE109-0001
Analyte	**Units**							
Metals								
ARSENIC	mg/kg	**2.8**	**2.4**	**2.2**	**2.3**	**2.3**	**2.4**	**1.7**
LEAD	mg/kg	**11.6**	**21.9**	**8.5**	**24.4**	**12.2**	**13.8**	**8.4**
MANGANESE	mg/kg	**104**	**133**	**119**	**130**	**164**	**129**	**119**

Analytical Results
NS Newport
As Pb Mn BACKGROUND SURFACE

	Site	BACKGROUND
	Location	BWBK-NE110
	Depth	0 - 1 ft
	Date	3/27/2007 00:00
	Matrix	SO
	Type	N
	Sample	BWBK-SS-NE110-0001
Analyte	**Units**	
Metals		
ARSENIC	mg/kg	**3**
LEAD	mg/kg	**17.8**
MANGANESE	mg/kg	**85.5**

Analytical Results
NS Newport
As Pb Mn BACKGROUND SUBSURFACE

	Site	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND
	Location	BWBK-NE01	BWBK-NE02	BWBK-NE03	BWBK-NE04	BWBK-NE05	BWBK-NE06	BWBK-NE07
	Depth	1 - 8 ft	1 - 9 ft	1 - 5 ft	1 - 10 ft	1 - 8 ft	1 - 9 ft	1 - 7 ft
	Date	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00
	Matrix	SO	SO	SO	SO	SO	SO	SO
	Type	N	N	N	N	N	N	N
	Sample	BWBK-SB-NE01-0108	BWBK-SB-NE02-0109	BWBK-SB-NE03-0105	BWBK-SB-NE04-0110	BWBK-SB-NE05-0108	BWBK-SB-NE06-0109	BWBK-SB-NE07-0107
Analyte	**Units**							
Metals	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**
ARSENIC	mg/kg	**5.2**	**5.8**	**5.5**	**4.6**	**5**	**4.9**	**5.2**
LEAD	mg/kg	**7.4**	**7.5**	**6.9**	**7.3**	**6.9 J**	**7**	**7.8**
MANGANESE	mg/kg	**359**	**634**	**301**	**344**	**325**	**319**	**300**

Analytical Results
NS Newport
As Pb Mn BACKGROUND SUBSURFACE

	Site	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND
	Location	BWBK-NE08	BWBK-NE09	BWBK-NE10	BWBK-NE101	BWBK-NE102	BWBK-NE103	BWBK-NE104
	Depth	1 - 4 ft	1 - 10 ft	1 - 7 ft	1 - 10 ft	1 - 10 ft	1 - 10 ft	1 - 10 ft
	Date	9/13/2006 00:00	9/13/2006 00:00	9/13/2006 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00
	Matrix	SO	SO	SO	SO	SO	SO	SO
	Type	N	N	N	N	N	N	N
	Sample	BWBK-SB-NE08-0104	BWBK-SB-NE09-0110	BWBK-SB-NE10-0107	BWBK-SB-NE101-0110	BWBK-SB-NE102-0110	BWBK-SB-NE103-0110	BWBK-SB-NE104-0110
Analyte	**Units**							
Metals	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**
ARSENIC	mg/kg	**4.4**	**4.3**	**3.8**	**3.2**	**2.6**	**2.4**	**2.1**
LEAD	mg/kg	**6.5**	**6.4**	**7.5**	**7.4 J**	**6.6 J**	**5.6 J**	**5.5**
MANGANESE	mg/kg	**255**	**306**	**249**	**243**	**229**	**209**	**176**

Analytical Results
NS Newport
As Pb Mn BACKGROUND SUBSURFACE

	Site	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND
	Location	BWBK-NE105	BWBK-NE106	BWBK-NE107	BWBK-NE108	BWBK-NE109	BWBK-NE110
	Depth	1 - 10 ft	1 - 10 ft	5 - 10 ft	1 - 10 ft	1 - 10 ft	1 - 10 ft
	Date	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00	3/27/2007 00:00
	Matrix	SO	SO	SO	SO	SO	SO
	Type	N	N	N	N	N	N
	Sample	BWBK-SB-NE105-0110	BWBK-SB-NE106-0110	BWBK-SB-NE107-0510	BWBK-SB-NE108-0110	BWBK-SB-NE109-0110	BWBK-SB-NE110-0110
Analyte	**Units**						
Metals	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**	**Metals**
ARSENIC	mg/kg	**3.7**	**2.6**	**1.9**	**2.2**	**2.2**	**2.6**
LEAD	mg/kg	**7.1 J**	**6.5 J**	**5.7 J**	**6.2 J**	**6.4 J**	**6.9**
MANGANESE	mg/kg	**322**	**247**	**200**	**207**	**214**	**244**

	A	B	C	D	E	F	G	H	I	J	K	L
1				Background Statistics for Uncensored Full Data Sets								
2		User Selected Options										
3		Date/Time of Computation		4/2/2016 4:55:09 PM								
4		From File		Y:\Projects\NavyCLEAN AECOM-EnSafe JV\Newport\CTO WE16 - TF FS, EECAs\TF3 FS\DF FS Report\Apper								
5		Full Precision		OFF								
6		Confidence Coefficient		95%								
7		Coverage		95%								
8		New or Future K Observations		1								
9		Number of Bootstrap Operations		2000								
10												
11	ARSENIC_SURFACE_SOIL											
12												
13	General Statistics											
14				Total Number of Observations		22			Number of Distinct Observations			19
15				Minimum		1.7			First Quartile			2.4
16				Second Largest		14.5			Median			5.9
17				Maximum		17.1			Third Quartile			8.525
18				Mean		6.277			SD			4.394
19				Coefficient of Variation		0.7			Skewness			0.963
20				Mean of logged Data		1.597			SD of logged Data			0.719
21												
22				Critical Values for Background Threshold Values (BTVs)								
23				Tolerance Factor K (For UTL)		2.349			d2max (for USL)			2.603
24												
25				Normal GOF Test								
26				Shapiro Wilk Test Statistic		0.873			Shapiro Wilk GOF Test			
27				5% Shapiro Wilk Critical Value		0.911			Data Not Normal at 5% Significance Level			
28				Lilliefors Test Statistic		0.22			Lilliefors GOF Test			
29				5% Lilliefors Critical Value		0.189			Data Not Normal at 5% Significance Level			
30				Data Not Normal at 5% Significance Level								
31												
32				Background Statistics Assuming Normal Distribution								
33				95% UTL with 95% Coverage		16.6			90% Percentile (z)			11.91
34				95% UPL (t)		14.01			95% Percentile (z)			13.5
35				95% USL		17.71			99% Percentile (z)			16.5
36												
37				Gamma GOF Test								
38				A-D Test Statistic		0.849			Anderson-Darling Gamma GOF Test			
39				5% A-D Critical Value		0.755			Data Not Gamma Distributed at 5% Significance Level			
40				K-S Test Statistic		0.216			Kolmogrov-Smirnoff Gamma GOF Test			
41				5% K-S Critical Value		0.188			Data Not Gamma Distributed at 5% Significance Level			
42				Data Not Gamma Distributed at 5% Significance Level								
43												
44				Gamma Statistics								
45				k hat (MLE)		2.239			k star (bias corrected MLE)			1.964
46				Theta hat (MLE)		2.803			Theta star (bias corrected MLE)			3.196
47				nu hat (MLE)		98.54			nu star (bias corrected)			86.43
48				MLE Mean (bias corrected)		6.277			MLE Sd (bias corrected)			4.479
49												
50				Background Statistics Assuming Gamma Distribution								
51				95% Wilson Hilferty (WH) Approx. Gamma UPL		15.47			90% Percentile			12.26
52				95% Hawkins Wixley (HW) Approx. Gamma UPL		15.84			95% Percentile			14.97

	A	B	C	D	E	F	G	H	I	J	K	L
53				95% WH Approx. Gamma UTL with	95% Coverage	20.57					99% Percentile	21
54				95% HW Approx. Gamma UTL with	95% Coverage	21.62						
55					95% WH USL	23.08					95% HW USL	24.54
56												
57						Lognormal GOF Test						
58					Shapiro Wilk Test Statistic	0.91			Shapiro Wilk Lognormal GOF Test			
59					5% Shapiro Wilk Critical Value	0.911			Data Not Lognormal at 5% Significance Level			
60					Lilliefors Test Statistic	0.196			Lilliefors Lognormal GOF Test			
61					5% Lilliefors Critical Value	0.189			Data Not Lognormal at 5% Significance Level			
62						Data Not Lognormal at 5% Significance Level						
63												
64						Background Statistics assuming Lognormal Distribution						
65				95% UTL with	95% Coverage	26.72					90% Percentile (z)	12.41
66					95% UPL (t)	17.49					95% Percentile (z)	16.11
67					95% USL	32.06					99% Percentile (z)	26.29
68												
69						Nonparametric Distribution Free Background Statistics						
70						Data do not follow a Discernible Distribution (0.05)						
71												
72						Nonparametric Upper Limits for Background Threshold Values						
73					Order of Statistic, r	22				95% UTL with	95% Coverage	17.1
74					Approximate f	1.158				Confidence Coefficient (CC) achieved by UTL		0.676
75				95% Percentile Bootstrap UTL with	95% Coverage	17.1				95% BCA Bootstrap UTL with	95% Coverage	17.1
76					95% UPL	16.71					90% Percentile	11.61
77					90% Chebyshev UPL	19.76					95% Percentile	14.36
78					95% Chebyshev UPL	25.86					99% Percentile	16.55
79					95% USL	17.1						
80												
81						Note: The use of USL to estimate a BTV is recommended only when the data set represents a background						
82						data set free of outliers and consists of observations collected from clean unimpacted locations.						
83						The use of USL tends to provide a balance between false positives and false negatives provided the data						
84						represents a background data set and when many onsite observations need to be compared with the BTV.						
85												
86	LEAD_SURFACE _SOIL											
87												
88	General Statistics											
89					Total Number of Observations	22				Number of Distinct Observations		20
90					Minimum	8.2				First Quartile		11.6
91					Second Largest	26.3				Median		14.5
92					Maximum	44				Third Quartile		19.23
93					Mean	16.6				SD		8.149
94					Coefficient of Variation	0.491				Skewness		1.93
95					Mean of logged Data	2.717				SD of logged Data		0.424
96												
97						Critical Values for Background Threshold Values (BTVs)						
98					Tolerance Factor K (For UTL)	2.349				d2max (for USL)		2.603
99												
100						Normal GOF Test						
101					Shapiro Wilk Test Statistic	0.825			Shapiro Wilk GOF Test			
102					5% Shapiro Wilk Critical Value	0.911			Data Not Normal at 5% Significance Level			
103					Lilliefors Test Statistic	0.169			Lilliefors GOF Test			
104					5% Lilliefors Critical Value	0.189			Data appear Normal at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
105	Data appear Approximate Normal at 5% Significance Level											
106												
107	Background Statistics Assuming Normal Distribution											
108				95% UTL with	95% Coverage	35.74				90% Percentile (z)		27.04
109					95% UPL (t)	30.94				95% Percentile (z)		30
110					95% USL	37.81				99% Percentile (z)		35.56
111												
112	Gamma GOF Test											
113					A-D Test Statistic	0.424	Anderson-Darling Gamma GOF Test					
114					5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level					
115					K-S Test Statistic	0.132	Kolmogrov-Smirnoff Gamma GOF Test					
116					5% K-S Critical Value	0.186	Detected data appear Gamma Distributed at 5% Significance Level					
117	Detected data appear Gamma Distributed at 5% Significance Level											
118												
119	Gamma Statistics											
120					k hat (MLE)	5.582				k star (bias corrected MLE)		4.851
121					Theta hat (MLE)	2.974				Theta star (bias corrected MLE)		3.422
122					nu hat (MLE)	245.6				nu star (bias corrected)		213.4
123					MLE Mean (bias corrected)	16.6				MLE Sd (bias corrected)		7.537
124												
125	Background Statistics Assuming Gamma Distribution											
126				95% Wilson Hilferty (WH) Approx. Gamma UPL		31.12				90% Percentile		26.69
127				95% Hawkins Wixley (HW) Approx. Gamma UPL		31.26				95% Percentile		30.62
128				95% WH Approx. Gamma UTL with	95% Coverage	38.02				99% Percentile		38.93
129				95% HW Approx. Gamma UTL with	95% Coverage	38.59						
130					95% WH USL	41.28				95% HW USL		42.11
131												
132	Lognormal GOF Test											
133					Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test					
134					5% Shapiro Wilk Critical Value	0.911	Data appear Lognormal at 5% Significance Level					
135					Lilliefors Test Statistic	0.115	Lilliefors Lognormal GOF Test					
136					5% Lilliefors Critical Value	0.189	Data appear Lognormal at 5% Significance Level					
137	Data appear Lognormal at 5% Significance Level											
138												
139	Background Statistics assuming Lognormal Distribution											
140				95% UTL with	95% Coverage	40.96				90% Percentile (z)		26.06
141					95% UPL (t)	31.9				95% Percentile (z)		30.39
142					95% USL	45.61				99% Percentile (z)		40.57
143												
144	Nonparametric Distribution Free Background Statistics											
145	Data appear Approximate Normal at 5% Significance Level											
146												
147	Nonparametric Upper Limits for Background Threshold Values											
148					Order of Statistic, r	22				95% UTL with	95% Coverage	44
149					Approximate f	1.158				Confidence Coefficient (CC) achieved by UTL		0.676
150				95% Percentile Bootstrap UTL with	95% Coverage	44				95% BCA Bootstrap UTL with	95% Coverage	44
151					95% UPL	41.35				90% Percentile		24.38
152					90% Chebyshev UPL	41.6				95% Percentile		26.21
153					95% Chebyshev UPL	52.92				99% Percentile		40.28
154					95% USL	44						
155												
156	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											

	A	B	C	D	E	F	G	H	I	J	K	L
157	data set free of outliers and consists of observations collected from clean unimpacted locations.											
158	The use of USL tends to provide a balance between false positives and false negatives provided the data											
159	represents a background data set and when many onsite observations need to be compared with the BTV.											
160												
161	MANGANESE_SURFACE_SOIL											
162												
163	General Statistics											
164					Total Number of Observations	22				Number of Distinct Observations		21
165					Minimum	85.5				First Quartile		129.3
166					Second Largest	253				Median		178
167					Maximum	290				Third Quartile		201.3
168					Mean	171.1				SD		50.83
169					Coefficient of Variation	0.297				Skewness		0.431
170					Mean of logged Data	5.099				SD of logged Data		0.305
171												
172					Critical Values for Background Threshold Values (BTVs)							
173					Tolerance Factor K (For UTL)	2.349				d2max (for USL)		2.603
174												
175					Normal GOF Test							
176					Shapiro Wilk Test Statistic	0.968				Shapiro Wilk GOF Test		
177					5% Shapiro Wilk Critical Value	0.911				Data appear Normal at 5% Significance Level		
178					Lilliefors Test Statistic	0.137				Lilliefors GOF Test		
179					5% Lilliefors Critical Value	0.189				Data appear Normal at 5% Significance Level		
180					Data appear Normal at 5% Significance Level							
181												
182					Background Statistics Assuming Normal Distribution							
183					95% UTL with 95% Coverage	290.5				90% Percentile (z)		236.2
184					95% UPL (t)	260.5				95% Percentile (z)		254.7
185					95% USL	303.4				99% Percentile (z)		289.3
186												
187					Gamma GOF Test							
188					A-D Test Statistic	0.298				Anderson-Darling Gamma GOF Test		
189					5% A-D Critical Value	0.743				Detected data appear Gamma Distributed at 5% Significance Level		
190					K-S Test Statistic	0.13				Kolmogrov-Smirnoff Gamma GOF Test		
191					5% K-S Critical Value	0.185				Detected data appear Gamma Distributed at 5% Significance Level		
192					Detected data appear Gamma Distributed at 5% Significance Level							
193												
194					Gamma Statistics							
195					k hat (MLE)	11.73				k star (bias corrected MLE)		10.16
196					Theta hat (MLE)	14.59				Theta star (bias corrected MLE)		16.84
197					nu hat (MLE)	516				nu star (bias corrected)		447
198					MLE Mean (bias corrected)	171.1				MLE Sd (bias corrected)		53.67
199												
200					Background Statistics Assuming Gamma Distribution							
201					95% Wilson Hilferty (WH) Approx. Gamma UPL	271.1				90% Percentile		242.4
202					95% Hawkins Wixley (HW) Approx. Gamma UPL	273				95% Percentile		267.8
203					95% WH Approx. Gamma UTL with 95% Coverage	314.2				99% Percentile		320
204					95% HW Approx. Gamma UTL with 95% Coverage	318.6						
205					95% WH USL	334.1				95% HW USL		339.9
206												
207					Lognormal GOF Test							
208					Shapiro Wilk Test Statistic	0.975				Shapiro Wilk Lognormal GOF Test		

	A	B	C	D	E	F	G	H	I	J	K	L
209					5% Shapiro Wilk Critical Value	0.911	Data appear Lognormal at 5% Significance Level					
210					Lilliefors Test Statistic	0.146	**Lilliefors Lognormal GOF Test**					
211					5% Lilliefors Critical Value	0.189	Data appear Lognormal at 5% Significance Level					
212	**Data appear Lognormal at 5% Significance Level**											
213												
214	**Background Statistics assuming Lognormal Distribution**											
215				95% UTL with	95% Coverage	335.3				90% Percentile (z)		242.2
216					95% UPL (t)	280.2				95% Percentile (z)		270.5
217					95% USL	362.3				99% Percentile (z)		333
218												
219	**Nonparametric Distribution Free Background Statistics**											
220	**Data appear Normal at 5% Significance Level**											
221												
222	**Nonparametric Upper Limits for Background Threshold Values**											
223					Order of Statistic, r	22				95% UTL with	95% Coverage	290
224					Approximate f	1.158				Confidence Coefficient (CC) achieved by UTL		0.676
225			95% Percentile Bootstrap UTL with		95% Coverage	290				95% BCA Bootstrap UTL with	95% Coverage	290
226					95% UPL	284.5				90% Percentile		221.7
227					90% Chebyshev UPL	327				95% Percentile		251.5
228					95% Chebyshev UPL	397.6				99% Percentile		282.2
229					95% USL	290						
230												
231	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											
232	data set free of outliers and consists of observations collected from clean unimpacted locations.											
233	The use of USL tends to provide a balance between false positives and false negatives provided the data											
234	represents a background data set and when many onsite observations need to be compared with the BTV.											
235												

	A	B	C	D	E	F	G	H	I	J	K	L
1				Background Statistics for Uncensored Full Data Sets								
2		User Selected Options										
3		Date/Time of Computation		4/2/2016 4:57:18 PM								
4		From File		Y:\Projects\NavyCLEAN AECOM-EnSafe JV\Newport\CTO WE16 - TF FS, EECAs\TF3 FS\DF FS Report\Apper								
5		Full Precision		OFF								
6		Confidence Coefficient		95%								
7		Coverage		95%								
8		New or Future K Observations		1								
9		Number of Bootstrap Operations		2000								
10												
11	ARSENIC_SUBSURFACE_SOIL											
12												
13	General Statistics											
14				Total Number of Observations		20			Number of Distinct Observations			16
15				Minimum		1.9			First Quartile			2.55
16				Second Largest		5.5			Median			3.75
17				Maximum		5.8			Third Quartile			4.925
18				Mean		3.71			SD			1.314
19				Coefficient of Variation		0.354			Skewness			0.0793
20				Mean of logged Data		1.247			SD of logged Data			0.375
21												
22				Critical Values for Background Threshold Values (BTVs)								
23				Tolerance Factor K (For UTL)		2.396			d2max (for USL)			2.557
24												
25				Normal GOF Test								
26				Shapiro Wilk Test Statistic		0.907			Shapiro Wilk GOF Test			
27				5% Shapiro Wilk Critical Value		0.905			Data appear Normal at 5% Significance Level			
28				Lilliefors Test Statistic		0.201			Lilliefors GOF Test			
29				5% Lilliefors Critical Value		0.198			Data Not Normal at 5% Significance Level			
30				Data appear Approximate Normal at 5% Significance Level								
31												
32				Background Statistics Assuming Normal Distribution								
33				95% UTL with 95% Coverage		6.859			90% Percentile (z)			5.394
34				95% UPL (t)		6.039			95% Percentile (z)			5.872
35				95% USL		7.07			99% Percentile (z)			6.767
36												
37				Gamma GOF Test								
38				A-D Test Statistic		0.775			Anderson-Darling Gamma GOF Test			
39				5% A-D Critical Value		0.743			Data Not Gamma Distributed at 5% Significance Level			
40				K-S Test Statistic		0.195			Kolmogrov-Smirnoff Gamma GOF Test			
41				5% K-S Critical Value		0.194			Data Not Gamma Distributed at 5% Significance Level			
42				Data Not Gamma Distributed at 5% Significance Level								
43												
44				Gamma Statistics								
45				k hat (MLE)		7.936			k star (bias corrected MLE)			6.779
46				Theta hat (MLE)		0.468			Theta star (bias corrected MLE)			0.547
47				nu hat (MLE)		317.4			nu star (bias corrected)			271.1
48				MLE Mean (bias corrected)		3.71			MLE Sd (bias corrected)			1.425
49												
50				Background Statistics Assuming Gamma Distribution								
51				95% Wilson Hilferty (WH) Approx. Gamma UPL		6.434			90% Percentile			5.613
52				95% Hawkins Wixley (HW) Approx. Gamma UPL		6.504			95% Percentile			6.322

	A	B	C	D	E	F	G	H	I	J	K	L
53				95% WH Approx. Gamma UTL with	95% Coverage	7.732					99% Percentile	7.799
54				95% HW Approx. Gamma UTL with	95% Coverage	7.899						
55					95% WH USL	8.092					95% HW USL	8.292
56												
57						Lognormal GOF Test						
58					Shapiro Wilk Test Statistic	0.903			Shapiro Wilk Lognormal GOF Test			
59					5% Shapiro Wilk Critical Value	0.905			Data Not Lognormal at 5% Significance Level			
60					Lilliefors Test Statistic	0.181			Lilliefors Lognormal GOF Test			
61					5% Lilliefors Critical Value	0.198			Data appear Lognormal at 5% Significance Level			
62					Data appear Approximate Lognormal at 5% Significance Level							
63												
64					Background Statistics assuming Lognormal Distribution							
65					95% UTL with 95% Coverage	8.545					90% Percentile (z)	5.626
66					95% UPL (t)	6.761					95% Percentile (z)	6.447
67					95% USL	9.075					99% Percentile (z)	8.325
68												
69					Nonparametric Distribution Free Background Statistics							
70					Data appear Approximate Normal at 5% Significance Level							
71												
72					Nonparametric Upper Limits for Background Threshold Values							
73					Order of Statistic, r	20					95% UTL with 95% Coverage	5.8
74					Approximate f	1.053					Confidence Coefficient (CC) achieved by UTL	0.642
75				95% Percentile Bootstrap UTL with	95% Coverage	5.8					95% BCA Bootstrap UTL with 95% Coverage	5.8
76					95% UPL	5.785					90% Percentile	5.23
77					90% Chebyshev UPL	7.75					95% Percentile	5.515
78					95% Chebyshev UPL	9.58					99% Percentile	5.743
79					95% USL	5.8						
80												
81					Note: The use of USL to estimate a BTV is recommended only when the data set represents a background							
82					data set free of outliers and consists of observations collected from clean unimpacted locations.							
83					The use of USL tends to provide a balance between false positives and false negatives provided the data							
84					represents a background data set and when many onsite observations need to be compared with the BTV.							
85												
86	LEAD_SUBSURFACE_SOIL											
87												
88	General Statistics											
89					Total Number of Observations	20					Number of Distinct Observations	14
90					Minimum	5.5					First Quartile	6.4
91					Second Largest	7.5					Median	6.9
92					Maximum	7.8					Third Quartile	7.325
93					Mean	6.755					SD	0.661
94					Coefficient of Variation	0.0979					Skewness	-0.456
95					Mean of logged Data	1.906					SD of logged Data	0.101
96												
97					Critical Values for Background Threshold Values (BTVs)							
98					Tolerance Factor K (For UTL)	2.396					d2max (for USL)	2.557
99												
100					Normal GOF Test							
101					Shapiro Wilk Test Statistic	0.949			Shapiro Wilk GOF Test			
102					5% Shapiro Wilk Critical Value	0.905			Data appear Normal at 5% Significance Level			
103					Lilliefors Test Statistic	0.137			Lilliefors GOF Test			
104					5% Lilliefors Critical Value	0.198			Data appear Normal at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
105	Data appear Normal at 5% Significance Level											
106												
107	Background Statistics Assuming Normal Distribution											
108				95% UTL with	95% Coverage	8.34				90% Percentile (z)		7.603
109					95% UPL (t)	7.927				95% Percentile (z)		7.843
110					95% USL	8.446				99% Percentile (z)		8.293
111												
112	Gamma GOF Test											
113					A-D Test Statistic	0.439	Anderson-Darling Gamma GOF Test					
114					5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level					
115					K-S Test Statistic	0.149	Kolmogrov-Smirnoff Gamma GOF Test					
116					5% K-S Critical Value	0.193	Detected data appear Gamma Distributed at 5% Significance Level					
117	Detected data appear Gamma Distributed at 5% Significance Level											
118												
119	Gamma Statistics											
120					k hat (MLE)	106				k star (bias corrected MLE)		90.1
121					Theta hat (MLE)	0.0638				Theta star (bias corrected MLE)		0.075
122					nu hat (MLE)	4238				nu star (bias corrected)		3604
123					MLE Mean (bias corrected)	6.755				MLE Sd (bias corrected)		0.712
124												
125	Background Statistics Assuming Gamma Distribution											
126				95% Wilson Hilferty (WH) Approx. Gamma UPL		7.996				90% Percentile		7.682
127				95% Hawkins Wixley (HW) Approx. Gamma UPL		8.006				95% Percentile		7.967
128				95% WH Approx. Gamma UTL with	95% Coverage	8.475				99% Percentile		8.52
129				95% HW Approx. Gamma UTL with	95% Coverage	8.495						
130					95% WH USL	8.602				95% HW USL		8.625
131												
132	Lognormal GOF Test											
133					Shapiro Wilk Test Statistic	0.935	Shapiro Wilk Lognormal GOF Test					
134					5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level					
135					Lilliefors Test Statistic	0.152	Lilliefors Lognormal GOF Test					
136					5% Lilliefors Critical Value	0.198	Data appear Lognormal at 5% Significance Level					
137	Data appear Lognormal at 5% Significance Level											
138												
139	Background Statistics assuming Lognormal Distribution											
140				95% UTL with	95% Coverage	8.559				90% Percentile (z)		7.65
141					95% UPL (t)	8.037				95% Percentile (z)		7.935
142					95% USL	8.698				99% Percentile (z)		8.499
143												
144	Nonparametric Distribution Free Background Statistics											
145	Data appear Normal at 5% Significance Level											
146												
147	Nonparametric Upper Limits for Background Threshold Values											
148					Order of Statistic, r	20				95% UTL with	95% Coverage	7.8
149					Approximate f	1.053				Confidence Coefficient (CC) achieved by UTL		0.642
150				95% Percentile Bootstrap UTL with	95% Coverage	7.8				95% BCA Bootstrap UTL with	95% Coverage	7.8
151					95% UPL	7.785				90% Percentile		7.5
152					90% Chebyshev UPL	8.788				95% Percentile		7.515
153					95% Chebyshev UPL	9.709				99% Percentile		7.743
154					95% USL	7.8						
155												
156	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											

	A	B	C	D	E	F	G	H	I	J	K	L
157	data set free of outliers and consists of observations collected from clean unimpacted locations.											
158	The use of USL tends to provide a balance between false positives and false negatives provided the data											
159	represents a background data set and when many onsite observations need to be compared with the BTV.											
160												
161	MANGANESE_SUBSURFACE_SOIL											
162												
163	General Statistics											
164					Total Number of Observations	20				Number of Distinct Observations		20
165					Minimum	176				First Quartile		225.3
166					Second Largest	359				Median		252
167					Maximum	634				Third Quartile		319.8
168					Mean	284.2				SD		97.88
169					Coefficient of Variation	0.344				Skewness		2.503
170					Mean of logged Data	5.607				SD of logged Data		0.284
171												
172					Critical Values for Background Threshold Values (BTVs)							
173					Tolerance Factor K (For UTL)	2.396				d2max (for USL)		2.557
174												
175					Normal GOF Test							
176					Shapiro Wilk Test Statistic	0.753				Shapiro Wilk GOF Test		
177					5% Shapiro Wilk Critical Value	0.905				Data Not Normal at 5% Significance Level		
178					Lilliefors Test Statistic	0.188				Lilliefors GOF Test		
179					5% Lilliefors Critical Value	0.198				Data appear Normal at 5% Significance Level		
180					Data appear Approximate Normal at 5% Significance Level							
181												
182					Background Statistics Assuming Normal Distribution							
183					95% UTL with 95% Coverage	518.7				90% Percentile (z)		409.6
184					95% UPL (t)	457.6				95% Percentile (z)		445.1
185					95% USL	534.4				99% Percentile (z)		511.8
186												
187					Gamma GOF Test							
188					A-D Test Statistic	0.712				Anderson-Darling Gamma GOF Test		
189					5% A-D Critical Value	0.742				Detected data appear Gamma Distributed at 5% Significance Level		
190					K-S Test Statistic	0.156				Kolmogrov-Smirnoff Gamma GOF Test		
191					5% K-S Critical Value	0.194				Detected data appear Gamma Distributed at 5% Significance Level		
192					Detected data appear Gamma Distributed at 5% Significance Level							
193												
194					Gamma Statistics							
195					k hat (MLE)	11.87				k star (bias corrected MLE)		10.12
196					Theta hat (MLE)	23.93				Theta star (bias corrected MLE)		28.06
197					nu hat (MLE)	474.9				nu star (bias corrected)		405
198					MLE Mean (bias corrected)	284.2				MLE Sd (bias corrected)		89.3
199												
200					Background Statistics Assuming Gamma Distribution							
201					95% Wilson Hilferty (WH) Approx. Gamma UPL	450.2				90% Percentile		402.9
202					95% Hawkins Wixley (HW) Approx. Gamma UPL	449.9				95% Percentile		445.2
203					95% WH Approx. Gamma UTL with 95% Coverage	525.7				99% Percentile		531.9
204					95% HW Approx. Gamma UTL with 95% Coverage	527.9						
205					95% WH USL	546.4				95% HW USL		549.5
206												
207					Lognormal GOF Test							
208					Shapiro Wilk Test Statistic	0.906				Shapiro Wilk Lognormal GOF Test		

	A	B	C	D	E	F	G	H	I	J	K	L
209					5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level					
210					Lilliefors Test Statistic	0.141	**Lilliefors Lognormal GOF Test**					
211					5% Lilliefors Critical Value	0.198	Data appear Lognormal at 5% Significance Level					
212	**Data appear Lognormal at 5% Significance Level**											
213												
214	**Background Statistics assuming Lognormal Distribution**											
215				95% UTL with	95% Coverage	537.2				90% Percentile (z)		391.6
216					95% UPL (t)	450				95% Percentile (z)		434.1
217					95% USL	562.2				99% Percentile (z)		526.7
218												
219	**Nonparametric Distribution Free Background Statistics**											
220	**Data appear Approximate Normal at 5% Significance Level**											
221												
222	**Nonparametric Upper Limits for Background Threshold Values**											
223					Order of Statistic, r	20				95% UTL with	95% Coverage	634
224					Approximate f	1.053				Confidence Coefficient (CC) achieved by UTL		0.642
225			95% Percentile Bootstrap UTL with		95% Coverage	634				95% BCA Bootstrap UTL with	95% Coverage	634
226					95% UPL	620.3					90% Percentile	345.5
227					90% Chebyshev UPL	585					95% Percentile	372.8
228					95% Chebyshev UPL	721.3					99% Percentile	581.8
229					95% USL	634						
230												
231	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											
232	data set free of outliers and consists of observations collected from clean unimpacted locations.											
233	The use of USL tends to provide a balance between false positives and false negatives provided the data											
234	represents a background data set and when many onsite observations need to be compared with the BTV.											
235												

Appendix C

Cost Estimates

Planning Cost Estimate Summary

Alternative: S-1 No Action

Site: DU 3-1, 3-2, and 3-3 at Site 11 - Tank Farm 3, NAVSTA Newport
Location: Portsmouth, Rhode Island
Phase: FS
Date: September 2015

Description: This alternative consists of no remedial action as a baseline comparison.

PERIODIC COSTS

Description	QTY	UNIT	UNIT COST	Total	Notes
No costs are estimated for this No Action alternative.					
SUBTOTAL				$0	
TOTAL PERIODIC ANNUAL COSTS				$0	

PRESENT VALUE ANALYSIS

Cost Type	Total Cost per Year	Discount Factor	Present Value	Notes
Capital Cost	0		$0	
O&M Cost	0		$0	
Periodic Cost	$0		$0	
Total Present Value of Alternative			$0	

Planning Cost Estimate Summary

Alternative: S-2 Limited Soil Excavation with Land Use Controls

Site: DU 3-1, 3-2, and 3-3 at Site 11 - Tank Farm 3, NAVSTA Newport
Location: Portsmouth, Rhode Island
Phase: FS
Date: September 2015

Description: Under this alternative, limited soil excavation and off-site disposal would be performed at DU 3-2 and 3-3 to remove soils exceeding the Industrial PRGs (including RIDEM GA Leachability Criteria) and Ecological PRGs (applicable to DU 3-3 only). LUCs would also be implemented at DU 3-1, 3-2, and 3-3 is to prevent residential use of the property.

CAPITAL COSTS

Description		QTY	UNIT	UNIT COST	Total	Notes
Land Use Control Remedial Design (LUC RD)						
Prepare LUC RD (4 iterations)		1	LS	$15,000	$15,000	Estimated
					$15,000	
Delineation Soil Sampling						
HASP		1	LS	$7,000	$7,000	
Work Plan/UFP SAP		1	LS	$30,000	$30,000	
Direct push drill rig and operator		8	day	$2,000	$16,000	Assumes 61 soil borings with average depth to 5 ft
Labor to record and collect samples		16	person-days	$1,500	$24,000	Assume 12-hr field day
Laboratory analyses:						
	PAHs	144	EA	$120	$17,280	See Backup for sampling and analysis
	Lead	10	EA	$20	$200	assumptions. Quantities include field
	Manganese	90	EA	$20	$1,800	duplicates.
	Arsenic	10	EA	$20	$200	
	Hexavalent Chromium	6	EA	$65	$390	
	Dioxins	90	EA	$450	$40,500	
	PCBs	35	EA	$60	$2,100	
Travel		16	person-days	$200	$3,200	
Field supplies and equipment		1	EA	$1,500	$1,500	Allowance
Data Validation		50	HR	$100	$5,000	Allowance
Surveying		1	LS	$2,000	$2,000	Sample locations, contours, surface features
Tech Memo (2 iterations)		60	HR	$100	$6,000	Allowance
					$157,170	
Site Preparation and Management						
RA Contractor Work Plan		1	LS	$20,000	$20,000	
HASP		1	LS	$7,000	$7,000	
Equipment mobilization		1	LS	$2,500	$2,500	
Temporary facilities		1	LS	$500	$500	
Erosion control measures		100	LF	$4	$400	
Clearing and grubbing		325	SF	$8	$2,600	
					$33,000	
Excavation						
Excavate soil		60	CY	$15	$900	Based on 5 foot depth and areas shown on Figures 12
Dust control and air monitoring		1	LS	$500	$500	and 15
Clean fill testing		1	EA	$830	$830	Estimate for VOCs, SVOCs, PCBs, pesticides, TPH, metals
Furnish common fill		72	CY	$15	$1,080	Cost to backfill excavation footprint
Install clean fill		72	CY	$15	$1,080	
Regrade excavation footprint		325	SF	$1	$325	
Seeding		325	SF	$5	$1,625	
					$6,340	
Soil Disposal						
Waste Characterization		1	EA	$830	$830	Estimate for VOCs, SVOCs, PCBs, pesticides, TPH, metals; 1 per 500 CY
T&D non-haz soil		90	Ton	$75	$6,750	
					$7,580	
Post-Construction						
Contractor Completion Report		75	HR	$100	$7,500	
Remedial Action Completion Report		150	HR	$100	$15,000	
(2 iterations)					$22,500	
SUBTOTAL					$241,590	
Contingency	30%				$72,477	Scope (15%)+ Bid(15%)
SUBTOTAL					$314,067	
Project Management	6%				$18,844.02	
Remedial Design	4%				$12,562.68	
Construction Management	6%				$18,844.02	
TOTAL CAPITAL COSTS					$364,318	

Planning Cost Estimate Summary

Alternative: S-2 Limited Soil Excavation with Land Use Controls

O&M COSTS

Description		QTY	UNIT	UNIT COST	Total	Notes
Annual LUC Site inspections (through year 30)		1	each	$3,500	$3,500	Estimated; See attached worksheet
SUBTOTAL					$3,500	
Contingency	0%				$0	
Project Management	10%				$350	
TOTAL O&M ANNUAL COSTS					$3,850	

PERIODIC COSTS

Description	QTY	UNIT	UNIT COST	Total	Notes
Five Year Review (through year 30)	6	each	$5,000	$30,000	Assume one component of base-wide 5-yr review
SUBTOTAL				$30,000	
TOTAL PERIODIC ANNUAL COSTS				$5,000	

PRESENT VALUE ANALYSIS

Cost Type	Year	Total Cost	Total Cost per Year	Discount Factor at 1.5%	Present Value	Notes
Capital Cost	0	$364,318	$364,318	1	$364,318	Discount rate of 1.5% is based on the 30-Year Real Interest Rate in Appendix C of the White House Office of Management and Budget (OMB) Circular A-94, Revised December 2014.
O&M Cost	1 to 30	$115,500	$3,850	24.0158	$92,461	
Periodic Cost	5	$5,000	$5,000	0.9283	$4,642	
	10	$5,000	$5,000	0.8617	$4,309	
	15	$5,000	$5,000	0.7999	$4,000	
	20	$5,000	$5,000	0.7425	$3,713	
	25	$5,000	$5,000	0.6892	$3,446	
	30	$5,000	$5,000	0.6398	$3,199	
Total Present Value of Alternative					$480,086	

Planning Cost Estimate Summary

Alternative: S-3 Containment with Land Use Controls

Site:	DU 3-1, 3-2, and 3-3 at Site 11 - Tank Farm 3, NAVSTA Newport	Description:	Under this alternative, an impermeable cap would be placed over soil in excess of the Industrial PRGs (including RIDEM GA Leachability Criterion) at DU 3-2 and 3-3. The cap would also cover soils exceeding the Ecological PRG at DU 3-3. LUCs would be applied to the DU 3-2 and 3-3 that restrict cover disturbance and require maintenance of the impermeable caps as well as perform associated inspections, groundwater monitoring, and reporting. LUCs would also be applied to DU 3-1, 3-2, and 3-3 that prevent residential and unrestricted recreational use.
Location:	Portsmouth, Rhode Island		
Phase:	FS		
Date:	September 2015		

CAPITAL COSTS

Description		QTY	UNIT	UNIT COST	Total	Notes
Land Use Control Remedial Design (LUC RD)						
Prepare LUC RD (4 iterations)		1	LS	$15,000	$15,000	Estimated
					$15,000	
Delineation Soil Sampling						
HASP		1	LS	$7,000	$7,000	
Work Plan/UFP SAP		1	LS	$30,000	$30,000	
Direct push drill rig and operator		8	day	$2,000	$16,000	Assumes 61 soil borings with average depth to 5 ft
Labor to record and collect samples		16	person-days	$1,500	$24,000	Assume 12-hr field day
Laboratory analyses:						
	PAHs	144	EA	$120	$17,280	See Backup for sampling and analysis
	Lead	10	EA	$20	$200	assumptions. Quantities include field
	Manganese	90	EA	$20	$1,800	duplicates.
	Arsenic	10	EA	$20	$200	
	Hexavalent Chromium	6	EA	$65	$390	
	Dioxins	90	EA	$450	$40,500	
	PCBs	35	EA	$60	$2,100	
Travel		16	person-days	$200	$3,200	
Field supplies and equipment		1	EA	$1,500	$1,500	Allowance
Data Validation		50	HR	$100	$5,000	Allowance
Surveying		1	LS	$2,000	$2,000	Sample locations, contours, surface features
Tech Memo (2 iterations)		60	HR	$100	$6,000	Allowance
					$157,170	
Site Preparation and Management						
RA Work Plan		1	LS	$20,000	$20,000	
HASP		1	LS	$7,000	$7,000	
Equipment mobilization		1	LS	$5,000	$5,000	
Temporary facilities		1	LS	$2,500	$2,500	
Erosion control measures		100	LF	$4	$400	
Clearing and grubbing		325	SF	$8	$2,600	
					$37,500	
Construct Impermeable Cover						
Dust control and air monitoring		1	LS	$1,000	$1,000	
Regrade cap area		325	SF	$1	$325	
Clean fill testing		1	EA	$830	$830	Estimate for VOCs, SVOCs, PCBs, pesticides, TPH, metals
Furnish sub-base material		8	CY	$15	$120	A minimum of 6 inches of clean sub-base material will be
Install sub-base material		8	CY	$15	$120	installed prior to installation of asphalt pavement
Install asphalt pavement		4	CY	$375	$1,500	Cost to have asphalt to be poured 4" over 300 SF
Survey to document final cover elevations		1	LS	$2,000	$2,000	
					$5,895	
Post-Construction						
Contractor Completion Report		75	HR	$100	$7,500	
Remedial Action Completion Report		150	HR	$100	$15,000	
(2 iterations)					$22,500	
SUBTOTAL					$238,065	
Contingency	30%				$71,420	Scope (15%)+ Bid(15%)
SUBTOTAL					$309,485	
Project Management	6%				$18,569.07	
Remedial Design	6%				$18,569.07	
Construction Management	6%				$18,569.07	
TOTAL CAPITAL COSTS					$365,192	

Planning Cost Estimate Summary

Alternative: S-3 Containment with Land Use Controls

O&M COSTS

Description		QTY	UNIT	UNIT COST	Total	Notes
Allowance for maintenance		1	each	$500	$500	Allowance for misc. needs
Annual LUC Site inspections (through year 30)		1	each	$3,500	$3,500	Estimated; See attached worksheet
SUBTOTAL					$4,000	
Contingency	0%				$0	
Project Management	10%				$400	
TOTAL O&M ANNUAL COSTS					$4,400	

PERIODIC COSTS

Description	QTY	UNIT	UNIT COST	Total	Notes
Five Year Review (through year 30)	6	each	$5,000	$30,000	Assume one component of base-wide 5-yr review
SUBTOTAL				$30,000	
TOTAL PERIODIC ANNUAL COSTS				$5,000	

PRESENT VALUE ANALYSIS

Cost Type	Year	Total Cost	Total Cost per Year	Discount Factor at 1.5%	Present Value	Notes
Capital Cost	0	$365,192	$365,192	1	$365,192	Discount rate of 1.5% is based on the
O&M Cost	1 to 30	$132,000	$4,400	24.0158	$105,670	30-Year Real Interest Rate in Appendix C
Periodic Cost	5	$5,000	$5,000	0.9283	$4,642	of the White House Office of Management
	10	$5,000	$5,000	0.8617	$4,309	and Budget (OMB) Circular A-94, Revised
	15	$5,000	$5,000	0.7999	$4,000	December 2014.
	20	$5,000	$5,000	0.7425	$3,713	
	25	$5,000	$5,000	0.6892	$3,446	
	30	$5,000	$5,000	0.6398	$3,199	
Total Present Value of Alternative					$494,168	

Planning Cost Backup Worksheet

Alternative: S-2 Limited Soil Excavation with Land Use Controls

Site: DU 3-1, 3-2, and 3-3 at Site 11 - Tank Farm 3, NAVSTA Newport
Location: Portsmouth, Rhode Island
Phase: FS
Date: September 2015

Assumptions:

DU 3-1 Soil Sampling (not including QA/QC)
Sampling and analysis to delineate contamination and assess whether hexavalent chromium is present above the PRG or if it should be eliminated as a COC
Assume resampling of 5 previous locations TF3-001-SS102, TF3-001-SS106, TF3-001-SS107, TF3-001-SS108, and TF3-001-SS109 that had total chromium in excess of the PRG for hexavalent chromium.
Assume 30 surface soil samples and 45 subsurface soil samples will be collected and analyzed for dioxins, PAHs, and manganese.
Assume 10 soil samples will be collected and analyzed for arsenic.
DU 3-2 Delineation Soil Sampling (not including QA/QC)
Sampling and analysis to delineate overall extent of PCBs and PAHs
Assume 6 surface soil samples and 3 subsurface soil samples will be collected and analyzed for PCBs.
Assume 15 surface soil samples and 30 subsurface soil samples (2 depth intervals) will be collected and analyzed for PAHs.
DU 3-3 Delineation Soil Sampling (not including QA/QC)
Sampling and analysis to delineate overall extent of PCBs and lead
Assume 8 surface soil samples and 12 subsurface soil samples will be collected and analyzed for PCBs
Assume 4 surface soil samples and 4 subsurface soil samples will be collected and analyzed for lead

Work Statement:
Annual Land Use Control (LUC) Inspections and Reporting

Description	QTY	UNIT	UNIT COST	Total	Notes
Travel	1	LS	$200	$200	
Labor for Inspection	24	HR	$100	$2,400	
Report	8	HR	$100	$800	
Misc	1	LS	$100	$100	
TOTAL COST PER ANNUAL INSPECTION				$3,500	

Source of Cost Data:
Engineering Estimate
Cost Adjustment Factor:

FACTOR:		NOTES:
H&S Productivity (labor & equip)		Level D
Escalation to Base Year		
Area Cost Factor		
Subcontractor Overhead & Prof.		
Prime Contractor Overhead & Prof.		

Planning Cost Backup Worksheet

Alternative: S-3 Containment with Land Use Controls

Site: DU 3-1, 3-2, and 3-3 at Site 11 - Tank Farm 3, NAVSTA Newport
Location: Portsmouth, Rhode Island
Phase: FS
Date: September 2015

Assumptions:

DU 3-1 Soil Sampling (not including QA/QC)

Sampling and analysis to delineate contamination and assess whether hexavalent chromium is present above the PRG or if it should be eliminated as a COC
Assume resampling of 5 previous locations TF3-001-SS102, TF3-001-SS106, TF3-001-SS107, TF3-001-SS108, and TF3-001-SS109 that had total chromium in excess of the PRG for hexavalent chromium.
Assume 30 surface soil samples and 45 subsurface soil samples wil be collected and analyzed for dioxins, PAHs, and manganese.
Assume 10 soil samples wil be collected and analyzed for arsenic.
DU 3-2 Delineation Soil Sampling (not including QA/QC)
Sampling and analysis to delineate overall extent of PCBs and PAHs
Assume 6 surface soil samples and 3 subsurface soil samples will be collected and analyzed for PCBs.
Assume 15 surface soil samples and 30 subsurface soil samples (2 depth intervals) will be collected and analyzed for PAHs.
DU 3-3 Delineation Soil Sampling (not including QA/QC)
Sampling and analysis to delineate overall extent of PCBs and lead
Assume 8 surface soil samples and 12 subsurface soil samples will be collected and analyzed for PCBs
Assume 4 surface soil samples and 4 subsurface soil samples will be collected and analyzed for lead

Work Statement:
Annual Land Use Control (LUC) Inspections and Reporting

Description	QTY	UNIT	UNIT COST	Total	Notes
Travel	1	LS	$200	$200	
Labor for Inspection	24	HR	$100	$2,400	
Report	8	HR	$100	$800	
Misc	1	LS	$150	$100	
TOTAL COST PER ANNUAL INSPECTION				$3,500	

Source of Cost Data:
Engineering Estimate

Cost Adjustment Factor:

FACTOR:		NOTES:
H&S Productivity (labor & equip)		Level D
Escalation to Base Year		
Area Cost Factor		
Subcontractor Overhead & Prof.		
Prime Contractor Overhead & Prof.		