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MCRD PARRIS ISLAND
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EMAIL OF TRANSMITTAL AND U S EPA REGION IV COMMENTS ON FINAL DRAFT
PROPOSED PLAN FOR SITE 3 CAUSEWAY LANDFILL MCRD PARRIS ISLAND SC
9/27/2010
U S EPA REGION IV

From: Llmas.Lila@epamail.epa.gov
To: timothy.j.harrington@usmc.mil; charles.cook2@navy.mil
Cc: AmickMS@dhec.sc.gov; bowersjb@dhec.sc.gov; frenchsl@dhec.sc.gov; [Annie Gerry](mailto:Annie.Gerry); kriegkm@dhec.sc.gov; [Donohoe Civ Lisa C](mailto:Donohoe.Civ.Lisa.C); mmcrae@TechLawInc.com; [Pat Franklin](mailto:Pat.Franklin); [Smith, Preston](mailto:Smith.Preston); [Reed, Sarah M CIV NAVFAC SE, JAX](mailto:Reed.Sarah.M.CIV.NAVFAC.SE); [Beverly, Stephen A CIV NAVFAC SE](mailto:Beverly.Stephen.A.CIV.NAVFAC.SE); [Sladic, Mark](mailto:Sladic.Mark); Buxbaum.David@epamail.epa.gov; Frederick.Tim@epamail.epa.gov; llamas.lila@epa.gov
Subject: EPA REDLINE RE: Parris Island Site 3 Proposed Plan
Date: Monday, September 27, 2010 3:17:25 PM
Attachments: [final draft MCRD-PP-Site 3 092010PS3 EPA REDLINE.doc](#)
Importance: High

Hi there,

Thanks for the chance for informal review. The revision came out fairly well, considering the extent of revisions. Attached you will find a redline Word file which still has the redlines from the Navy, but has EPA redlines and comments in response. Any Navy redlines which remain are acceptable to EPA. The other changes have been recommended to clarify and streamline the PP. The intent was to capture what was discussed at the meeting to the extent possible and to assist the Navy and MCRD in meeting their 9/30/2010 deadline. Sorry it took so long, but I was out most of last week and David just got back in today. Not sure if he is back in for good, or just temporarily.

Please make sure these changes get properly translated into the pdf version!

These may still be a little rough. So check it out closely and call me with questions. I will be happy to explain.

Lila
404-562-9969
(See attached file: final draft MCRD-PP-Site 3 092010PS3 EPA REDLINE.doc)

From: "Sladic, Mark" <Mark.Sladic@tetrattech.com>

To: "Cook, Charles CIV NAVFAC SE" <charles.cook2@navy.mil>, "AmickMS@dhec.sc.gov" <AmickMS@dhec.sc.gov>, Annie Gerry <GerryAM@dhec.sc.gov>, "bowersjb@dhec.sc.gov" <bowersjb@dhec.sc.gov>, "kriegkm@dhec.sc.gov" <kriegkm@dhec.sc.gov>, Donohoe Civ Lisa C <lisa.donohoe@usmc.mil>, Lila Llamas/R4/USEPA/US@EPA, "mmcrae@TechLawInc.com" <mmcrae@TechLawInc.com>, Pat Franklin <pat.franklin@mail.com>, "Reed, Sarah M CIV NAVFAC SE, JAX" <sarah.reed@navy.mil>, "frenchsl@dhec.sc.gov" <frenchsl@dhec.sc.gov>, "Beverly, Stephen A CIV NAVFAC SE" <stephen.beverly@navy.mil>, "timothy.j.harrington@usmc.mil" <timothy.j.harrington@usmc.mil>, "Smith, Preston" <Preston.Smith@tetrattech.com>

Date: 09/20/2010 03:53 PM

Subject: RE: Parris Island Site 3 Proposed Plan

Charles - Thanks for forwarding the Word version of the PP to the Team. Also, this just in - here is the PDF (fancy fact sheet version). The RTC and Tech Memo changes will follow shortly. This is necessary since the RTC and Tech Memo need to be consistent with the most recent PP revision. Thanks.

-----Original Message-----

From: Cook, Charles CIV NAVFAC SE [<mailto:charles.cook2@navy.mil>]
Sent: Monday, September 20, 2010 3:32 PM
To: AmickMS@dhec.sc.gov; Annie Gerry; bowersjb@dhec.sc.gov; kriegkm@dhec.sc.gov; Donohoe Civ Lisa C; Llamas.Lila@epamail.epa.gov; Sladic, Mark; mmcrae@TechLawInc.com; Pat Franklin; Reed, Sarah M CIV NAVFAC SE, JAX; frenchsl@dhec.sc.gov; Beverly, Stephen A CIV NAVFAC SE; timothy.j.harrington@usmc.mil
Subject: FW: Parris Island Site 3 Proposed Plan

TEAM,
Attached is the draft final proposed plan, red line version.

v/r
Charles Cook

NAVFAC SOUTH EAST , SOUTH CENTRAL IRP
PO BOX 30 , 135 AJAX DR,
Jacksonville, FL 32212
(904) 542-6409

-----Original Message-----

From: Sladic, Mark [<mailto:Mark.Sladic@tetrattech.com>]
Sent: Monday, September 20, 2010 15:15
To: Cook, Charles CIV NAVFAC SE
Subject: FW: Parris Island Site 3 Proposed Plan

From: Sladic, Mark
Sent: Monday, September 20, 2010 2:06 PM
To: Cook, Charles CIV NAVFAC SE
Cc: Smith, Preston; 'Reed, Sarah M CIV NAVFAC SE, JAX'
Subject: Parris Island Site 3 Proposed Plan

Hi Charles. Please see the newest revisions, following this morning's call with Steve Beverly. Please let us know if this is now OK to send to the Team. We'll start the PDF factsheet-look version. thanks.

Mark Sladic, P.E. | Manager, Environmental Engineering Group

Direct: 412.921.8216 | Main: 412.921.7090 | Fax: 412.921.4040

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[attachment "Proposed Plan Site 3.pdf" deleted by Lila Llamas/R4/USEPA/US]

**PROPOSED PLAN FOR FINAL REMEDY
SITE / SWMU 3
Marine Corps Recruit Depot
Parris Island, South Carolina**

INTRODUCTION

This document presents the proposed final remedy for Site/Solid Waste Management Unit (SWMU) 3, [also known as the Causeway Landfill] at the U.S. Marine Corps Recruit Depot, Parris Island, South Carolina (MCRD Parris Island). For the remainder of this document, this Site/SWMU will be referred to simply as Site 3. Site 3 consists of the causeway (land bridge) located in the northwestern portion of MCRD which connects Horse Island to Parris Island (see Figure 1). Site 3 once served as the primary solid waste disposal area for wastes generated at the MCRD during most of the period between 1960 and 1972.

This Proposed Plan was developed by the MCRD Parris Island Partnering Team which includes representatives from the U.S. Department of the Navy including the U.S. Marine Corps (Navy), the U.S. Environmental Protection Agency (U.S. EPA) Region 4, and South Carolina Department of Health and Environmental Control (SCDHEC). The Navy is lead agency for this proposal in accordance with the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and National Oil and Hazardous Substances Pollution Contingency Plan (NCP) [Title 40, Code of Federal Regulations, Part 300 et. seq.]. U.S. EPA serves as lead support agency and SCHDEC also serves as a support agency in connection with this and all similar CERCLA based remedial activities at MCRD Parris Island. Representatives of the National Oceanic and Atmospheric Administration (NOAA), South Carolina Department of Natural Resources (SCDNR), and U.S. Fish and Wildlife Service (USFWS) also serve as natural resource trustees.

This document was developed in accordance with Section 117(a) of CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA), the Resource and Conservation Recovery Act (RCRA), as amended, and to the extent practicable, the NCP. This Proposed Plan highlights key information from investigations performed at Site 3 but is not a substitute for the reports that document these investigations. More detailed information regarding this Site is located in the Administrative Record for the facility.

The public is invited to review the Administrative Record and to comment on this Proposed Plan. As CERCLA lead agency, the Navy is required to publish this document to fulfill the public participation requirements of that law and the NCP. The Navy and U.S. EPA, in consultation with SCDHEC, will select the final remedy for Site 3 after all public comments have been considered. The Navy, in consultation with U.S. EPA and SCDHEC, may modify the final site remedy described in this Proposed Plan or select

another response action based on any new information that may become available during the public comment period.

The Navy is accepting formal public comments on this Proposed Plan from _____ to _____. You do not have to be a technical expert to comment. If you have a concern or preference, the Partnering Team wants to hear it before making a final decision. To comment formally, you can offer oral comments during the comment portion of the public meeting (see page ___ for details) or you can send written comments, postmarked no later than _____, 2010 to:

*Commanding General
Marine Corps Recruit Depot
Attn: Lisa C. Donohoe, NREAO
P.O. Box 19003
Parris Island, SC 29905-9003
Tel: 843-228-2779
E-mail comments by _____ 2010 to:
lisa.donohoe@usmc.mil*

AND

*South Carolina Department of Health and Environmental Control
Attn: Richard Haynes, Division Director
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201
Tel: 803-896-XXXX
E-mail comments by _____ 2010 to:
XXXXX@dhec.sc.gov*

The components of the final remedy being proposed for Site 3 are summarized below. Further details are provided in the *Scope and Role of the Proposed Remedy* section of this document. The final remedy is adopting earlier actions performed under the **Interim Record of Decision (IROD)** along with some modifications and some new **No Action** determinations. Some of these components have already been fully implemented as part of an **Interim Remedial Action (IRA)** which was completed at Site 3 in 2001 and was preceded by a **Proposed Plan for Soil Interim Remedial Action**. [The Proposed Plan and IROD](#) Both of these documents can be found in the Administrative Record for the facility.

**FINAL REMEDY PROPOSAL
SUMMARY**

- **ADOPTION OF THE INTERIM REMEDIAL ACTION (IRA) AS FINAL (with slight modifications).**

- Slope Stabilization and Erosion Control (Adopted/Completed)
- Placement of Soil Cover (Adopted/Completed)
- Roadway Construction/Sediment Testing (Adopted/Completed)
- Land Use Controls (LUCs) & Periodic Inspections (Adopted with Modifications)

- o Erection of Signs (providing notice of the use restrictions)

- No unauthorized intrusive activities (e.g. drinking water well installation; unauthorized groundwater extraction; soil cover penetration, etc.)

- No swimming or wading

- Fishing restrictions (Modified)

- o Update Base Master Plan, GIS and EMS on LUC boundaries and land use restrictions (i.e., no residential use, etc.) (Added)

- o Deed/lease restriction in the event of property transfer

- o Visual inspections to verify LUCs are effectively implemented.

- Long-Term Monitoring (Adopted with Modifications)

- o Inspect Cover Integrity (Modified)

- o Monitor Leachate from landfill with GW wells inside the unit boundary

- **MAINTAINANCE of the Soil Cover/Cap (New)**

- **NO ACTION for Sediments (New)**

- **NO ACTION for Surface Water (New)**

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Comment [EPA1]: In the PDF version, all three of these did not get properly indented to show as a subset of the Erection of Signs bullet. Please ensure the PDF is properly indented.

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SITE BACKGROUND

The boundaries of MCRD Parris Island are shown on Figure 1. The installation serves as the recruit training facility for the U.S. Marine Corps for enlisted men from states east of the Mississippi River and for enlisted women nationwide. The facility is located along the southern coast of South Carolina, within Beaufort County, approximately 1 mile south of the City of Port Royal and 3 miles south of the City of Beaufort, and occupies an area of approximately 8,047 acres. MCRD Parris Island was added to U.S. EPA's National Priorities List (NPL) in 1994.

Site 3 is a former landfill located in the northwestern portion of MCRD Parris Island which now serves as a causeway connecting Horse Island to Parris Island. From the 1960s until 1972, the causeway was gradually constructed using layers of solid waste, fill dirt, and other debris. Site 3 functioned as the major disposal area during that period for all solid wastes discarded via dumpsters located throughout the MCRD. Wastes disposed at the site reportedly included trash with small amounts of empty pesticide containers, oily rags, spent absorbent petroleum and chlorinated solvent sludge, perchloroethylene still bottoms, mercury amalgam and beryllium waste, polychlorinated biphenyl (PCB)-contaminated oil, and metal shavings. Waste disposal practices at the site resulted in residual contamination being found in surface soils and surrounding sediments at varying concentrations.

From 1986 to 1990 several preliminary studies were conducted at Site 3 which identified the site as having the potential to pose threats to human health and/or the environment. In 1998 and 1999, the first comprehensive investigation consisting of a **Remedial Investigation/Resource Conservation and Recovery Act Facility Investigation (RI/RFI)**, was performed that included analytical testing of surface soil, groundwater, sediment, and surface water at Site 3. A final RI/RFI report was issued by the Navy in November 1999 which summarized the nature and extent of contamination at Site 3 and characterized the risks posed to human health and the environment given known conditions at the time.

In early 2000, a **Feasibility Study (FS)/Corrective Measures Study (CMS)** was completed which developed and evaluated potential cleanup alternatives for the site. Based on an evaluation of site conditions, risks, and those regulatory requirements that were determined to be applicable or relevant and appropriate requirements (ARARs), remedial action objectives (RAOs) were developed. In July 2000, the Navy and U.S. EPA, with the concurrence of SCDHEC, made available for public comment a **Proposed Plan for Soil Interim Remedial Action** to support the planned undertaking of the IRA to address risks posed by those wastes and contaminated surface soils, and certain areas with more highly contaminated sediments at Site 3. Those sediment areas were designated as Areas 1, 2, 3 and 4. No public comments adverse to that proposal were received.

In September 2000, the Navy and U.S. EPA, with SCDHEC concurrence, issued the IROD which documented the decision to undertake the then proposed IRA for surface soils and more highly contaminated sediments in designated Areas 1, 2, 3 and 4. That IROD stipulated that follow-on actions, as necessary, would address those lesser contaminated sediments previously found adjacent to Site 3. The IRA is illustrated on Figures 2 and 3. Those actions comprising the documented interim remedy for Site 3 included Placement of a Soil Cover, Stabilization and Erosion Control, Placement of Sediment Cover, Application of Land Use Controls, and Landfill Leachate Monitoring. All IRA site construction activities were completed by July 2001. With the exception of human health risks generated by fish consumption (to be addressed by LUCs), which is related to sediments and/or surface water, the IRAs are meeting the Interim Remedial Action Objectives (ROAs) and this interim remedy is being accepted as final. More details are provided in the following sections titled Adoption of the Interim Action as Final and Remedial Action Objectives.

In late 2001 through May 2002, post-construction sediment samples were collected and analyzed to evaluate sediment conditions after completion of the IRA. From April 2003 through August 2003, a supplemental investigation was performed to further investigate sediments with elevated pesticide concentrations. The supplemental investigation determined that pesticide and metal concentrations had decreased to concentrations that did not result in an unacceptable human health or ecological risk other than that generated by fish consumption (to be addressed by LUCs). [Fish-contamination-is-related-to](#)

~~sediments and/or surface water.~~ Since construction was completed, some maintenance has occurred, such as the filling of small areas of erosion. In 2006, the constructed roadway capping the site was widened by several feet for the purpose of adding a bike/jogging path.

As a condition of the IROD, post-interim construction risk assessment(s) were performed on sediment. The sediment data included in the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) re-characterizations were collected in October 2001 by TtNUS and April 2003 by the United States Environmental Protection Agency (U.S. EPA). Fish tissue was collected from the 3rd Battalion Pond and a reference site in October 2009 by TtNUS. The results of both the HHRA and ERA are presented in the Technical Memorandum Post-Interim Construction Risk Assessment Site 3 – Causeway Landfill (Tetra Tech, 2010). The HHRA indicated that potential risks exist to the adult subsistence fisherman, child subsistence fisherman, child recreational fisherman, and U.S. EPA Region 4 default adult recreational fisherman. However, these risks are similar to, but exceed, those calculated for the local reference location. The results of the ERA indicate that negligible site-related risks to benthic invertebrates exist.

Although leachate contaminant concentrations below the landfill remain elevated, there currently is no unacceptable exposure because land use controls as part of the interim remedy restrict disturbance of the landfill cover and installation of groundwater wells from consumption because the groundwater is non-potable due to State restrictions regarding waste-in-place landfills. ~~Therefore, because of the waste-in-place restrictions, drinking water standards are not considered ARARs for this action and~~ Consistent with EPA and SCDHEC policy for landfill wastes managed-in-place the groundwater beneath the landfill will not be actively remediated but leachate monitoring will continue in order to evaluate landfill integrity. LUCs prohibiting any extraction of groundwater beneath the as typical for a landfill will be implemented as a part of the selected remedy to ensure protection of human health and the environment. ~~The leachate continues to be monitored to ensure landfill integrity.~~

SITE CHARACTERISTICS

The former gravel road at Site 3, which was constructed upon the solid wastes, fill dirt, and debris that was deposited at the site until 1972, is now an asphalt, two-lane road with an adjacent bike/jogging path. There are no buildings or other major physical improvements on the site. Geographically, this causeway connects Horse Island and Parris Island by cutting across Ribbon Creek and tidal marshes associated with the Broad River. The presence of wetlands was a major consideration in remedy selection.

Site 3 is bounded to the northeast by the 3rd Battalion Pond and to the southwest by the marshes. Topographically, the causeway is approximately 14 acres in size and 4,000 feet long and ranges from 150 to 225 feet wide and rises 11 to 15 feet above mean sea level.

The wastes existing at Site 3 are those now capped solid wastes, some of which contained or were contaminated by smaller amounts of oils or other liquids, sludges, pesticide residues, chlorinated solvents, mercury, beryllium, and polychlorinated biphenyls (PCBs). Because the landfill was constructed over many years, the actual volume of wastes deposited [ratio of fill dirt to wastes] is unknown and cannot be reasonably estimated.

SCOPE AND ROLE OF THIS ACTION

MCRD Parris Island has thirty-seven (37) sites being investigated throughout the facility under the auspices of CERCLA and the Navy's Environmental Restoration (ER) Program. This Proposed Plan addresses only the final proposed remedy for Site 3. All remaining sites have been or are still in the process of being evaluated and addressed separately under the requirements of CERCLA, and to the extent practicable, the NCP.

A Federal Facilities Agreement (FFA) has been signed by the Department of the Navy (Navy), the U.S. Environmental Protection Agency (U.S. EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC), for MCRD; the FFA became effective March 31, 2006. Copies of the FFA have been placed in the Administrative Record for the Site and the Information Repository located in the Beaufort County Library. Although the Team does not use Operating Unit (OU) language and references on a routine basis, U.S. EPA is tracking work with the CERCLIS database by OUs. The FFA identifies Site 3 as OU3.

This proposed final remedy for Site 3 will play an important role in moving the ER program at MCRD Parris Island forward. Site 3 is one of the major CERCLA sites at this facility and extensive efforts by the MCRD Partnering Team have been devoted to achieving a remedy which will be protective of human health and the environment in both the short and long term.

SUMMARY OF SITE RISKS - SEDIMENT

Three months after the completion of the IRA, post-construction sediment sampling was performed to determine whether environmentally significant concentrations of contaminants remained in the exposed sediments. As part of this investigation, 20 sediment samples were collected at Site 3 (five samples collected on the marsh/southwestern side of the causeway and 15 collected in the pond/northeastern side) as shown on Figure 4.

Post-IRA Human Health Risks

Only the maximum concentration of arsenic [13.6 milligrams per kilogram (mg/kg)] exceeded a human health screening value (0.39 mg/kg). However, this concentration only slightly exceeded the arsenic background value of 12.2 mg/kg, indicating that this maximum concentration is likely the result of natural conditions. Furthermore, the average arsenic concentration found in Site 3 sediments (4.7 mg/kg) was less than the arsenic background value of 12.2 mg/kg. Because no other chemical concentration exceeded a human health screening criterion, all remaining uncapped Site 3 sediments were determined to not pose a threat to human health other than that generated by fish consumption (to be addressed by LUCs). [Fish contamination is related to sediments and/or surface water.]

Comment [EPA2]: Mention of this particular sentence once or twice is sufficient. You will see most others have been deleted.

While there were no other exceedances of human health screening values, detected concentrations of 4,4'-DDD, copper, lead, mercury, and zinc exceeded background/typical facility pesticide concentrations. Because fishing occurs in the 3rd Battalion Pond, numerical models were used to estimate the concentrations in fish tissue. The modeled fish tissue concentrations were then compared to U.S. EPA Recommended Screening Values (RSVs) presented in Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories (U.S. EPA, 2000). For those compounds detected in the sediment that do not have RSVs, the Regional Screening Level calculator [Oak Ridge National Laboratory (ORNL), September 2009] and the appropriate exposure assumptions presented in U.S. EPA (2000) guidance were used to calculate the RSVs. These comparisons indicated that 4,4'-DDD, copper, mercury, and zinc posed a potential risk from consumption of fish tissue to some receptors based on modeled fish tissue concentrations. However, a consensus regarding inputs into the model was not attained by the Partnering Team. Therefore, to reduce the uncertainty from fish tissue modeling inputs, fish tissue samples were collected and analyzed (October 2009) to more fully evaluate risks to human health associated with consumption of fish from the 3rd Battalion Pond. The results from this sampling are discussed in the section *Summary of Site Risks – Fish Tissue*.

Post-IRA Ecological Risks

An ecological risk assessment was performed in May 2002 to determine risks to the environment posed by Site 3 sediment under post-construction conditions. For ecological receptors, potential impacts were considered for benthic macroinvertebrates (e.g., insect larvae) and aquatic receptors (e.g., mink, heron, mummichog, red drum, and osprey). A "lines-of-evidence" analysis was used to evaluate the extent of potential risks posed by residual site chemical concentrations. Based upon this evaluation, the ecological risk assessment concluded that residual chemical concentrations found on the marsh side of the causeway and within Sediment Areas 1, 2, and 3 posed minimal risk to benthic invertebrates (e.g., insect larvae) and upper-level receptors (e.g., mink, osprey). However, it was determined that within the area just outside the cap at Sediment Area 4, concentrations of metals and pesticides could pose potential ecological risks. Thus, further sampling and data analysis was performed in Area 4.

In April 2003, three sediment samples were collected near the 2001 sediment sample PAI-03-SD-59 near Area 4 by a contractor retained by U.S. EPA. The locations of the sediment samples are shown on Figure 5. Samples were analyzed for mercury, lead, arsenic, DDD, DDE, and DDT.

Analytical test results indicated that two samples [PAI-03-SD-61-01 and PAI-03-SD-62-01] were in excess of ecological screening values (ESVs) for the pesticides DDE, DDD and DDT. Another sample [PAI-03-SD-63-01], taken approximately 59 feet northeast of the causeway's riprap bank, had DDE, DDD, and DDT concentrations less than ESVs. Mercury, lead, and arsenic analysis of the three sediment samples indicated no exceedances of applicable sediment ESVs. Sediment analytical results exceeding such ESVs are illustrated in Figure 5.

Because all pesticide containing sediment samples which exceeded ESVs did so only slightly and all were significantly less than typical facility pesticide concentrations, the May 2002 quantitative numerical risk assessment was not further revised because, based on the ESV comparisons, a qualitative assessment was now adequate to indicate no remaining ecological risk from exposure to sediment.

Post-IRA Sediment Risk Conclusions

Although pre-IRA sediment concentrations indicated potential ecological risk, analysis of sediment after the IRA showed that chemical concentrations continued to decrease. After evaluation of the data, the determination was made During the August 2003 meeting of the MCRD-Parris Island Partnering Team, the Partnering Team agreed that no unacceptable human health risk or ecological risk remained in the sediment at the 3rd Battalion Pond other than that generated by fish consumption (to be addressed by LUCs). Fish contamination is related to sediments and/or surface water. The interim remedy which included capping waste on the landfill and adjacent sediments was designed to prevent migration of contaminants from the landfill and sediments. Therefore a determination was made that no additional active remediation of sediments is necessary. Thus, the Navy has proposed No Action with respect to previously identified contaminated sediments lying outside of those sediment areas known as Areas 1, 2, 3, and 4.

SUMMARY OF SITE RISKS – SURFACE WATER

An RFI/RI, encompassing both RCRA and CERCLA requirements, was conducted in 1998 and 1999 (TiNUS, November 1999). The RFI/RI field investigation was conducted from May 1998 to September 1998 and included sampling and analyses of 20 surface water samples in addition to soil, sediment, and groundwater samples. The field investigation also included a tidal study and aquifer tests and the

establishment of background concentrations. Human health and ecological risk assessments were conducted for the surface water data collected as well as the other media sampled.

The evaluation of surface water samples collected during the RFI/RI investigation [was reviewed in the Technical Memorandum Post-Interim Construction Risk Assessment Site 3 – Causeway Landfill \(Tetra Tech, 2010\) and results](#) indicated that human health and ecological risks posed by surface water COPCs were negligible, ~~other than that generated by fish consumption (to be addressed by LUCs). The interim remedy which included capping waste on the landfill and adjacent sediments was designed to prevent migration of contaminants to the surface water. Therefore and a determination was made that no active remediation of surface water is necessary. remediation of the surface water is not needed for protection of these receptors.~~ ~~The MCRD Parris Island Partnering Team has concurred on this finding.~~ Thus, the Navy has proposed No Action for surface water.

SUMMARY OF SITE RISKS – FISH TISSUE

As previously noted, certain species of game fish were collected in October 2009 from the 3rd Battalion Pond and fish tissues analyzed for certain chemicals for use in a HHRA. That effort was undertaken primarily because of both higher than background concentrations in sediments and the fact that one individual had been identified whom it appeared was engaged in subsistence fishing from various water bodies on the facility including the 3rd Battalion Pond. Collected fish tissues were analyzed for 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dioxin-like PCBs congeners, mercury, and copper. This analysis included 4,4'-DDE and 4,4'-DDT (because of their similarity to 4,4'-DDD) and dioxin-like PCBs.

Information collected during an interview conducted by MCRD personnel of the specific individual identified to the Partnering Team as a possible subsistence fisherman resulted in significant uncertainty regarding that individual's actual consumption level of fish from the 3rd Battalion Pond. This included, among other things, whether the level of consumption as may have occurred in the past was likely still occurring given a change in that individual's personal circumstances (i.e., recent employment). Nonetheless, the Partnering Team concluded that she could represent a "highly exposed individual" per U.S. EPA risk assessment guidance, ~~indicating that the weight of fish consumed per year (yearly fish ingestion rate) and the total number of years of expected consumption could be higher than default CERCLA established individual fish ingestion rates and lifetime duration would adequately take into account.~~ Consequently, the Team decided to look to those rather more conservative ingestion rate assumptions found in U.S. EPA's [Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories](#) (U.S. EPA, 2000) to calculate potential human health risks for individuals who may be consuming fish from the 3rd Battalion Pond as part of the Site 3 HHRA. While reliance upon that particular guidance was not mandated by CERCLA, its use was deemed prudent by the Partnering Team

to assess potential unacceptable human health risk scenarios from fish consumption possibly occurring at the 3rd Battalion Pond.

As is presented in the Navy's Technical Memorandum Post-Interim Construction Risk Assessment Site 3 – Causeway Landfill (Tetra Tech, 2010), the HHRA undertaken at Site 3 indicates that potential risks do exist to adult subsistence fisherman, child subsistence fisherman, child recreational fisherman, and U.S. EPA Region 4 default adult recreational fisherman. However, it was also found that those risks were / are similar to, but exceed, those calculated for the local reference location from which fish were also sampled.

Although unacceptable risks to the aforementioned receptors was identified, because exposure point concentrations for the dioxin-like PCBs (the primary risk drivers) did not exceed reference area concentrations by more than a factor of 2, it is possible that dioxin-like PCBs identified in fish at both the reference location and the 3rd Battalion Pond are anthropogenic background rather than that resulting from any Site 3 related release(s). However, potential unacceptable risks were still generated by COCs, including mercury, which were detected in sediments above background, and these COCs could not be eliminated from consideration based on reported waste disposal practices for the landfill. Therefore, the landfill cannot be eliminated as the source for these contaminants.

It is the Navy's current judgment that the Preferred Alternative identified in this Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

ADOPTION OF THE INTERIM ACTION AS FINAL

Those actions comprising the documented interim remedy for Site 3 are summarized as follows:

- Placement of a Soil Cover – Up to 2 feet of soil was placed over the top and sides of the causeway to prevent human and ecological exposures to residual wastes and contaminated surface soils. A two-lane asphalt road was also constructed on top of the causeway.
- Roadway Construction/Sediment Testing - A paved road has been constructed that will reduce precipitation infiltration into the waste and reduce erosion of cover material.
- Stabilization and Erosion Control – The causeway was stabilized to prevent the sides of the causeway from eroding and possibly collapsing. Stabilization and erosion control was achieved by regrading, adding riprap, and planting vegetation along the sides of the causeway.
- Placement of Sediment Cover – The aforementioned more highly contaminated sediment areas (designated Areas 1, 2, 3, and 4) were covered with 1 foot of soil, a layer of cover fabric, and 1 foot of riprap to prevent future human and/or ecological exposures to residual contamination in sediments.

- Application of Land Use Controls – MCRD Parris Island has applied certain land use controls (LUCs) to the site in the form of prohibitions on: future residential uses; uncontrolled site excavations; swimming or wading in, or any subsistence fishing from, the 3rd Battalion Pond adjacent to the causeway; or extraction of site groundwater. The intention was that these restrictions prevent the creation of exposure pathways to residual contaminants of concern (COCs) in those surface soils and sediments placed beneath the landfill cover system. These conditions have been completed, implemented, or slightly modified. ~~These controls include the following:~~

●
Signs are attached to all utility poles at Site 3 that state "Notice: No Digging. Contact NREO Ext. 3423 For Info" to prohibit any excavation, construction, or intrusive activity within the landfill unless authorized in advance by the MCRD environmental department and will remain. ~~Separate signs will be posted prohibiting swimming or wading in the 3rd Battalion Pond adjacent to the causeway and access to the wetlands within 200 feet of the landfill's boundaries although there is currently a sign which states "Danger: Alligators. No Swimming or Wading". The number, size, location and the language to appear on the sign(s) will be agreed upon by MCRD, U.S. EPA and SCDHEC as part of the LUC remedial design.~~

~~The Site 3 location and LUC boundaries, prohibitions against unauthorized excavation, construction or intrusive activities, residential development or groundwater extraction or use, and the requirement for MCRD environmental department approval of any such activities will be annotated in the installation's Master Plan.~~

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~~The Site 3 location and LUC boundaries, prohibitions against unauthorized excavation, construction or intrusive activities, residential development or groundwater extraction or use, and the requirement for MCRD environmental department approval of any such activities will be annotated in the installation's geographical information system (GIS).~~

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- ~~Site 3 LUCs will be included in a Depot Order currently under development governing ground disturbing activities across the facility.~~

- Monitoring of Landfill Cap integrity – Periodic monitoring will occur to ensure the integrity of the landfill cap including visual inspections. Monitoring will be in accordance with a Long Term Monitoring Work Plan (LTM WP) for Site 3 once developed and approved.

- Landfill Leachate Monitoring - Four monitoring wells which had been installed in 1998 to support the Navy's RI/RFI investigation were removed and abandoned in 2000 in preparation for IRA related site

work. The wells were replaced with new wells in December 2001 because of the Navy's commitment in the IROD to monitor landfill leachate annually for at least five years. The new wells were placed on the shoulder of the asphalt roadway on the marsh side of the causeway in positions hydraulically down gradient from the landfill material. The wells have been monitored since early 2002. All leachate samples have been analyzed for Target Compound List (TCL) organic compounds and Target Analyte List (TAL) inorganic compounds. This condition has been implemented. Hazardous constituents will remain in leachate beneath capped waste materials. Monitoring wells inside the landfill will continue to be sampled to assess landfill integrity. Monitoring will be in accordance with a Long Term Monitoring Work Plan (LTM WP) for Site 3 once developed and approved.

- Re-characterization of sediment after implementation of the IRA (completed).

These actions have been completed and are serving to be protective of human health and the environment other than ~~that generated by for~~ fish consumption (to be addressed by LUCs). ~~Fish contamination is related to sediments and/or surface water.~~

REMEDIAL ACTION OBJECTIVES

The IROD developed several Interim Remedial Action Objectives (RAOs) which included:

- Control human exposure (the existing maintenance worker, the future construction worker, and the recreational user) to chemicals of concern (COCs) in surface soil at concentrations in excess of remedial goal options (RGOs).
- Control exposure of ecological receptors to COCs in surface soil at concentrations greater than RGOs.
- Eliminate the migration of COCs from the fill material to sediment, surface water, and groundwater.
- Comply with chemical-specific, location-specific, and action-specific federal and state ARARs.

Additionally, the following RAO has been developed since the implementation of the IROD:

- Control human exposure to COCs in fish via consumption.

The Interim RAOs identified in the IROD have been met by the construction and maintenance of the landfill cap, as well, as the implementation of LUCs. These conditions have been evaluated in the aforementioned risk assessments. Therefore, these RAOs are being adopted as the final RAOs. An action in the form of a modified LUC is being taken to address the control of human exposure to COCs via fish consumption.

LUC OBJECTIVES

The follow LUC objectives will be achieved through implementation of the proposed final remedy:

- To prohibit unauthorized excavation, construction, or intrusive activities;
- To prohibit residential development of the Site. Prohibited uses shall include, but are not limited to any form of housing, child-care facilities, pre-schools, elementary and secondary schools, or playgrounds;
- To prohibit disturbance of the cover over marsh sediments;
- To prevent ingestion of contaminants in fish tissue;
- To prohibit the extraction or any use of the groundwater beneath the site.

PREFERRED FINAL REMEDY

~~Because sediment and groundwater sampling data obtained after construction of the landfill cover system for Site 3 indicate that the response activities undertaken to date are adequately protective of human health and the environment, the Navy is proposing that no further on-site remedial actions be undertaken. The IRA was the best alternative to contain the buried waste and continues to be the best remedy considering the addition of the maintenance component, along with continued/modified LUCs and landfill leachate monitoring to protect human health and the environment. Figure 6 shows the boundaries of the LUCs.~~

The specific components of the proposed final remedy at Site 3 are as follows:

- **ADOPTION OF THE INTERIM REMEDIAL ACTION (IRA) AS FINAL.** As discussed above in the section titled "Adoption of the Interim Action as Final", the combined fill dirt, asphalt, cover fabric, riprap, and vegetative cover placed on site is successfully precluding unacceptable human and ecological exposures from capped wastes, surface soils, and sediments. The Navy's proposal adopts and incorporates the interim actions including LUCs as the final site remedy component for surface

soils and sediments and will continue to visually monitor landfill cap integrity and collect and analyze landfill leachate samples to assess landfill integrity as well. Figure 6 shows the boundaries of the LUCs.

- **NO ACTION FOR SEDIMENTSfor Sediments.** Although pre-IRA sediment concentrations indicated potential ecological risk, analysis of sediment after the IRA showed that chemical concentrations continued to decrease. These investigations conducted since completion of the landfill's cover system demonstrate that there are no unacceptable human or ecological risks associated with residual contamination found in sediments Areas 1, 2, 3, and 4 adjacent to the cap other than that generated by fish consumption (to be addressed by LUCs). Fish contamination is related to sediments and/or surface water. Further details regarding site risks may be found in the *Summary of Site Risks* section of this document.
- **NO ACTION FOR SURFACE WATERfor Surface Water.** The Site 3 Feasibility Study determined that capping of wastes, surface soils, and sediments should contain the source(s) of surface water contamination, which should result in a decrease in concentration of the contaminants in the surface water. No site-related risks to human health or the environment from surface water were identified during the RFI/RI and no risks should occur other than that generated by fish consumption (to be addressed by LUCs). Fish contamination is related to sediments and/or surface water. Therefore, no additional remedy has been selected for surface water.
- **MAINTAINANCE OF THE LANDFILL COVERof the Landfill Cover.** Maintenance of the landfill will occur as necessary agreed upon in a post-ROD document such as the LUC remedial design (RD). Any erosion will be mitigated and measures such as removing woody vegetation will be implemented to ensure landfill integrity.
- **MODIFICATION OF LAND USE CONTROLof One Land Use Control - SIGNAGERegarding Fish Consumption.** The Navy is proposing to modify one of the LUCs previously applied to the site. This control (posted signs) should help preclude potential unacceptable human health exposures to known contamination even though as previously noted in this Proposed Plan uncertainty exists as to whether some of that contamination is actually traceable to prior releases of hazardous substances from wastes buried at the former Site 3 landfill. These current land use control signs located on the two piers at the 3rd Battalion Pond which currently state - "Notice: No Subsistence Fishing" will be replaced with signs that say the following: "MCRD Parris Island Notice: No Fishing." Additional information will be available if questions or comments are received. Additionally, signs will be posted prohibiting swimming or wading in the 3rd Battalion Pond adjacent to the causeway and access to the wetlands within 200 feet of the landfill's boundaries although there is currently a sign which states "Danger: Alligators. No Swimming or Wading". The number, size, location and the language to appear on these sign(s) will be agreed upon by MCRD, U.S. EPA and SCDHEC as part of the LUC RD.

Comment [EPA4]: Since the "No Fishing" restriction will apply to the whole pond, the line drawn in Figure 6 are inconsistent with the fishing restriction. However, the other restrictions apply to the area noted by the line (i.e. no disturbance of soil and sediment cover, no well installation, etc.) So this needs to be clarified. EPA suggests use of two separate lines, one for "no fishing" which encompasses federal property surrounding the pond, and the one as-is for the remainder of the LUCs. If this is not agreeable by all parties, in order to meet the September 30th, 2010 deadline, remove the boundary from the PP and its reference. This issue can be worked out and agreed to by the team at a later point in time. However, agreement will need to be reached prior to issuance of the ROD, as identification of LUC boundaries are a ROD requirement and must be included in the ROD.

Comment [EPA5]: This change is recommended since we are not currently sure where and how maintenance requirements will be addressed or in what specific document. The revised text here allows for more flexibility in the future.

Comment [EPA6]: No need to address uncertainty here. This was already previously explained in the text.

Comment [EPA7]: EPA agrees with the text, but reiterates that any prepared materials need to be reviewed and approved by EPA and SCDHEC to ensure consistency with Tech Memo and PP language.

• **ADDITION ~~OF~~ ADMINISTRATIVE LAND USE CONTROLS.** The Site 3 location and LUC boundaries, prohibitions against unauthorized excavation, construction or intrusive activities, residential development or groundwater extraction or use (except as directed by SCDHEC or U.S. EPA for monitoring wells), and the requirement for MCRD environmental department approval of any such activities will be annotated in the installation's Environmental Management System. The Environmental Management System is a centralized tool for the dissemination of information critical to making appropriate decisions regarding the management of resources, compliance with environmental regulations and ensuring that site-specific use limitations are complied with. This will include updating the Base Master Plan, ~~installation's geographical information system (GIS)~~GIS and any deed/lease restrictions in the event of property transfer. ~~Site 3 LUCs will be included in a Depot Order currently under development governing ground disturbing activities across the facility. || Signs will be posted prohibiting swimming or wading in the 3rd Battalion Pond adjacent to the causeway and access to the wetlands within 200 feet of the landfill's boundaries although there is currently a sign which states "Danger: Alligators. No Swimming or Wading". The number, size, location and the language to appear on these sign(s) will be agreed upon by MCRD, U.S. EPA and SCDHEC as part of the LUC RD.~~

Comment [EPA8]: This text was moved to the bullet above to be more specific to the use restrictions indicated by signs. See insertion above. Also see previous comment pertaining to LUC Boundaries.

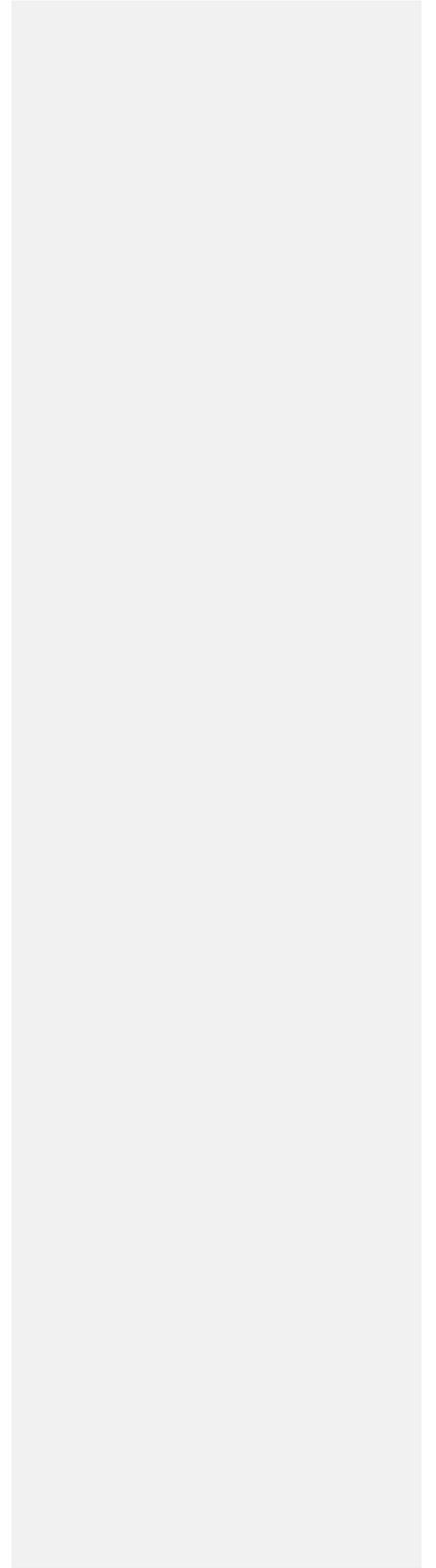
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The Navy is responsible for implementing, maintaining, reporting on, and enforcing the LUCs. A LUC ~~remedial design (RD)~~, as part of the Final Remedial Design or document memorializing Remedial Action Completion (primary documents under the FFA) that addresses how these LUCs will be implemented, maintained, monitored (including periodic inspections), enforced and reported on, will be prepared and submitted by the Navy per the approved Site Management Plan (SMP) schedule to U.S. EPA and SCDHEC for review and approval. Once the Final Remedial Design or document memorializing Remedial Action Completion (including the LUC remedial design) is approved by U.S. EPA, it shall supersede any Land Use Control Implementation Plan (LUCIP) already developed for Site 3, as well as any conditions related to Site 3 LUCs in the LUC Memorandum of Agreement (also termed the Land Use Control Assurance Plan) executed between the Navy, U.S. EPA, and SCDHEC. As the actual LUCs are somewhat different than those stated in the LUCIP, the LUCIP will be superseded by the LUC RD after issuance of the final ROD.

Because hazardous substances will remain at the site above levels that allow for unlimited exposure and unrestricted use, the Navy will review the final remedial action no less than every five (5) years per CERCLA Section 121(c) and the NCP at 40 CFR300.4309f(4)(ii). If results of the five-year reviews reveal that remedy integrity is compromised and protection of human health is insufficient, then additional remedial actions will be evaluated by the Navy, U.S. EPA, and SCDHEC.

COMMUNITY PARTICIPATION

[Text box from previous draft Site 3 PP]



ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
COC	Contaminants of Concern
ER	Environmental Restoration
ESV	Ecological Screening Value
FFA	Federal Facilities Agreement
FS	Feasibility Study
HQ	Hazard Quotient
IRA	Interim Remedial Action
IROD	Interim Record of Decision
LUC	Land Use Control(s)
LUC RD	Land Use Control Remedial Design
MCRD	Marine Corps Recruit Depot
mg/kg	Milligrams per kilogram
NA	Not Available
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No-Observed-Adverse-Effect Level
NPL	National Priorities List
OU	Operating Unit
PCB	Polychlorinated Biphenyl
PRG	Preliminary Remediation Goal
PP	Proposed Plan
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SCDHEC	South Carolina Department of Health and Environmental Control
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TDS	Total Dissolved Solids
U.S. EPA	United States Environmental Protection Agency
μg/kg	Microgram per kilogram