St. Juliens Creek Annex Restoration Advisory Board Meeting Summary: November 17, 2010 Meeting

RAB Meeting Attendees:

Walter Bell	NAVFAC Mid-Atlantic
Robert Mann	RAB Community Co-chair
Kevin Lew	RAB Member
Glenn Manning	RAB Member
Robert Stroud	USEPA (Region III)
Karen Doran	Virginia DEQ
Barbara Brumbaugh	City of Chesapeake
Janna Staszak	CH2M HILL
Adrienne Jones	CH2M HILL
Katherine Landman	Shaw Environmental, Inc.
Craig Miller	Agviq

Location:	Major Hillard Library, Chesapeake, Virginia
Meeting Date:	November 17, 2010
From:	Adrienne Jones/CH2M HILL
Minutes Date:	May 17, 2011

Restoration Advisory Board Welcome and Introductions

At 7:00 PM Mr. Bell presented opening remarks and introductions to the Restoration Advisory Board (RAB). Mr. Bell explained that he is the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic Remedial Project Manager for St. Juliens Creek Annex (SJCA). The other RAB members and the guests introduced themselves. Handouts of all of the presentations were distributed.

Fiscal Year 2011 Goals

Mr. Bell reviewed the objectives of the presentation, which were to provide an overview of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process; provide an update of the Environmental Restoration Program (ERP) sites and Fiscal Year (FY) 2011 goals for the Installation Restoration Program (IRP) sites, Munitions Response Program (MRP) sites, and for facility-wide ERP activities; and answer any questions.

Mr. Bell provided an overview of the CERCLA process. Mr. Bell explained when and why goals are established for the base. Goals are established yearly to cover the FY, which starts on October 1 and ends on September 30. The goals serve as a budgeting tool for allocating funds, prioritization tool to determine sequencing of sites to be investigated and remediated based on their potential risk to human health and the environment, and scheduling tool to keep remediation projects on schedule. A figure was presented showing the status of the

ERP sites at SJCA; to date 54 sites have gone no further action and four are currently active in the ERP.

Mr. Bell provided the background and status of IRP Site 2 (Waste Disposal Area B). Site 2 is a 5.7-acre site that includes an unlined waste disposal area for construction debris, blast grit, waste ordnance, and solvents. The area was used for waste disposal from 1921 to 1942. A Remedial Investigation (RI) was conducted at the site and identified potential risk to human health and/or the environment from waste; chlorinated solvents, one polycyclic aromatic hydrocarbon (PAH), and one pesticide in the shallow aquifer groundwater; chlorinated solvents and metals in the surface water; and PAHs, pesticides, polychlorinated biphenyls (PCBs), and metals in the sediment and soil. A Feasibility Study (FS) developed and evaluated remedial alternatives to address the site's human health and environmental concerns and a Proposed Plan identifying the preferred remedial alternative [cover, excavation, enhanced reductive dechlorination (ERD), and monitored natural attenuation (MNA)] was presented to the public. The Record of Decision (ROD) documenting the selected remedy is currently undergoing the final stages of legal review and the Remedial Design is currently in progress. The FY11 goals established for Site 2 are to obtain signature of the ROD by December 31, 2010, and finalize the RD by March 31, 2011.

Mr. Bell provided the background and status of IRP Site 4 (Landfill D). Site 4 is an 8.3-acre landfill that operated from 1970 to 1981. An RI was conducted at the site and identified potential concerns from the waste; metals, PCBs, and PAHs in soil; and mercury in drainage sediment. Soil cover installation and drainage ditch sediment removal were completed in October 2005 in accordance with the ROD. Land Use Controls (LUCs) have been implemented to prohibit disturbance of the soil cover and residential use of the site. A Five – Year Review for the site, incorporating the results of voluntary groundwater monitoring conducted following completion of the Remedial Action (RA) to evaluate the site's impact on groundwater quality, was completed in 2010. The Five-Year Review report concluded that the remedy at Site 4 is protective of human health and the environment. LUCs (signs, fencing, survey plat, and annual inspections) are maintained at the site and Five-Year Reviews will be conducted. No FY11 goals were established for Site 4.

Mr. Bell presented the background and status of IRP Site 5 (Burning Grounds). The site consists of approximately 23 acres, a portion of which was used as a burning ground from the 1930s to the 1970s. Various wastes were reportedly disposed of, including solvents, paint sludge, pesticides, and refuse. An RI was conducted at the site and identified potential concerns from waste and metals, pesticides, and PAHs in the surface soil and drainage sediment. An Engineering Evaluation/Cost Analysis was conducted to develop a removal action to address the potential concerns. A Change in Scope of the Response and Ceiling Increase Action Memorandum is awaiting final signature. The removal action, initially delayed due to discovery of munitions and explosive of concern, is currently in progress but excavation is on hold until the Action Memorandum is signed. The FY11 goals established for IRP Site 5 are to draft the Construction Closeout Report for the removal action by September 30, 2011 and draft the Proposed Plan for the site by September 30, 2011.

Mr. Bell presented the background and status of IRP Site 21 (Industrial Area). Site 21 comprises an industrial area of the base. Historically, buildings were used as maintenance and electrical shops and munitions loading facilities, outdoor areas were used for equipment and chemical storage, and a former fuel service station was operated. An RI was

conducted at the site and identified potential concerns from chlorinated solvents in the shallow aquifer groundwater and indoor air. An Interim Proposed Plan identifying the preferred remedial alternative for addressing shallow aquifer groundwater concerns was presented to the public. An Interim ROD documenting the selected remedy for addressing shallow aquifer groundwater concerns, In Situ Chemical Reduction (ISCR) and ERD, has been signed. Mr. Bell explained that the Proposed Plan and ROD were "interim" because they only addressed the unacceptable risk from potable use of shallow groundwater while the potential risk to building occupants from vapor intrusion through the inhalation of indoor air was ongoing. Mr. Lew asked if the buildings included in the vapor intrusion investigation were selected for inclusion because they are currently occupied. Mr. Bell responded that occupancy was one factor and proximity to the groundwater plume was also considered. The RI and FS Addendum Report concluded there are no indoor air concerns as a result of chlorinated solvents in shallow aquifer groundwater. The interim RA to address the shallow aquifer groundwater concerns is currently ongoing and a work plan for monitoring vapor intrusion during the RA is in progress. The FY11 goals established for Site 21 are to finalize the LUC RD by March 31, 2011, draft the vapor intrusion work plan by June 30, 2011, and obtain signature on the ROD by September 30, 2011.

Mr. Bell presented the background and status of MRP Area UXO 1 (Wharf Area Sediments). MRP Area UXO 1 consists of approximately 2,230 linear feet of current or former wharf areas along the Southern Branch of the Elizabeth River. The northern wharf area was constructed in 1917 and used for loading and unloading ordnance, especially Mark VI mines, until the mid 1920s. The wharf is no longer present, with the exception of some pilings. The southern wharf area was constructed in 1898 and used for ordnance loading until the early 1970s. The wharf is still in use, but no longer used for ordnance loading or unloading. A Preliminary Assessment for the area was completed in 2009 and recommended further investigation. The Site Inspection report documenting a geophysical investigation conducted in 2010 recommended additional investigation to further assess geophysical anomalies. The work plan for investigating the anomalies is currently being developed. The FY11 goal established for MRP Area UXO 1 is to finalize the anomaly investigation work plan by December 31, 2010.

Mr. Bell explained that the facility-wide goal established for FY11 is to prepare a success story by September 30, 2011. The SJCA partnering team is planning for FY11 with an expected funding in the amount of 2.88 million dollars. This funding includes basewide support, Explosive Ordnance Disposal Technology Division (EODTECHDIV) support for the Site 5 removal action, Site 2 RA construction, first year of the Site 21 groundwater RA operation, site milestone documentation for Sites 5 and 21, and, if needed, an RI at Area UXO 1. In comparison, the FY10 budget was 6.5 million dollars and was allocated mainly for construction activities.

Mr. Bell presented some of the additional ERP successes at the base. He explained that some of the former ERP sites and areas of investigation have been turned back over to the base for beneficial land use. An area south of the northern wharf area of MRP Area UXO 1 is being considered for building oyster reefs. Additionally, training has been conducted at Sites 3 and 19, which have been closed with no further action required.

Site 21 Interim Remedial Action

Ms. Landman provided an overview of the site background. Figures showing the location and features of Site 21 were projected. Site 21 is located within a light industrial area of the facility. Historical activities at the site were associated with maintenance shops, ordnance loading, and a fuel service station. Current site activities include storage and maintenance. Building 1556 is the most active building, used for warehousing and office space. Many of the buildings shown on the site figure are no longer present and several others are scheduled for demolition. Contamination at the site consists of trichloroethene (TCE) and its breakdown products [1,1-dichloroethene (DCE), cis-1,2-DCE, and vinyl chloride] in the shallow aquifer groundwater. Figures showing the extent of the TCE, cis-1,2-DCE, and VC plumes were projected. Ms. Landman noted that TCE is already naturally breaking down based on the presence of its breakdown products.

Ms. Landman explained that an Interim ROD for the site was signed in 2009. The Interim ROD established the RA objectives of reducing contaminants in shallow aquifer groundwater to the maximum extent possible and preventing exposures until concentrations allow for unlimited use and unrestricted exposure. A table listing the maximum concentration of each contaminant of concern (COC) and its corresponding cleanup goal was projected.

Ms Landman explained the components of the selected remedy for the site. The remedy consists of ISCR and ERD. ISCR will be conducted through direct injection of zero valent iron (ZVI) into the shallow aquifer, which will cause a chemical reaction to break down TCE and its daughter products. The ZVI will be injected into single-use direct push injection points. ERD will be conducted through injection of emulsified vegetable oil (EVO) into the shallow aquifer in phases. Phase 1 consists of injection of EVO into horizontal wells installed under Building 1556 in order to access the portion of plume under the building. Phase 2 consists of direct injection into the shallow aquifer in the lower concentration areas of the site.

Ms. Landman reviewed the fieldwork schedule. Mobilization for the RA occurred this month. Twelve monitoring wells have been installed and baseline sampling is currently underway. Setup for installation of the horizontal wells has begun. The ZVI injections will begin in late November 2010 and continue through mid February 2011. Performance monitoring in the ZVI area will occur in March 2011. Phase 1 of the EVO injections will begin in April 2011 and Phase 2 will take place April through June 2011.

Ms. Landman provided further explanation of the injections. For the ZVI injections, the ZVI powder will be mixed with water and injected with pressure using nitrogen gas to help push it into the formation. The injections will be targeted to treat the lower portion of the aquifer. For the EVO injections, 60 percent vegetable oil will be mixed with water and a buffer. The EVO will enhance the naturally occurring biological activity in the aquifer and the buffer will counter the naturally low pH and create conditions favorable for the microbes to flourish. The EVO will be distributed through the permanent horizontal wells under the Building 1556 and through direct injection, similar to the ZVI injections.

Ms. Landman discussed performance considerations of the remedy components. Results from the ZVI injections are relatively fast; they can be seen within 3 to 4 weeks to 3 to 4 months and can remain active for a many years. EVO works more slowly, leading to

evidence of results within months to years. Performance monitoring will be conducted prior to injections in order to establish baseline conditions. Additionally, performance monitoring will be conducted following the ZVI and ERD injections to ensure COC concentrations continue to reduce. If contaminant concentrations level off, additional injections of EVO in targeted areas may be considered.

Mr. Lew asked if the EVO is injected under pressure like the ZVI. Ms. Landman responded that not as much pressure is needed to inject the EVO. She explained that ZVI is not very mobile, which makes it harder to distribute. Mr. Lew asked if ZVI is more of a slurry than EVO; Ms. Landman responded that it is. Mr. Lew asked if any precautions would be taken in association with the well spoils. Ms Landman responded that the soil cuttings from well installation would be containerized and sampled for characterization and disposed of appropriately. Ms. Brumbaugh asked what type of vegetable oil is used in the EVO injections. Ms. Landman responded that it is not specified. Mr. Lew asked how much EVO is injected into each well. Ms. Landman responded that she is unsure of the exact number, but hundreds of gallons of diluted substrate are added to each well.

Site 2 Remedial Design

Ms. Staszak reviewed the purpose of the presentation, which was to explain the rationale for RA implementation; provide a description of the remedy to be implemented at Site 2; discuss the schedule for the RD and RA; and solicit questions or comments. Ms. Staszak provided an overview of the site background. Potential risks identified in the FS consisted of human health risks from metals and waste and environmental risks from semivolatile organic compounds (SVOCs), pesticides, PCBs, metals, and waste in soil and sediment; human health risks from volatile organic compounds (VOCs), naphthalene, and heptachlor epoxide in shallow aquifer groundwater; and environmental risks from VOCs and metals in surface water. A Proposed Plan presenting the preferred RA to the public was finalized in July 2010. A graphical representation of the conceptual site model, depicting site characteristics such as contaminated media and exposure routes, was projected.

The ROD documenting the selected remedy is awaiting final signature. The selected remedy consists of cover installation over the waste, soil, and sediment; excavation of the impacted St. Juliens Creek sediment (the creek is connected to the site inlet by a culvert); ERD within the high-concentration target area of shallow aquifer groundwater; monitored natural attenuation (MNA) within the low-concentration VOC, naphthalene, and heptachlor epoxide target areas of shallow aquifer groundwater; and LUCs. The LUCs will be implemented to maintain the soil cover to prevent exposure to waste and contaminants in soil and sediment and to prevent direct exposure to and/or potable use of shallow aquifer groundwater. A figure depicting the components of the selected remedy was projected. Ms. Staszak explained that although risk associated with surface water was identified, there is no remedial component for surface water because the selected remedy will remove surface water as a media at the site when the cover is installed. A permeable reactive barrier (PRB) is included in the remedy as a contingency measure in the event that the groundwater flow direction changes following installation of the cover and creates the potential for migration of contaminated shallow aquifer groundwater off the facility.

Ms. Staszak explained that the RD has been developed into phases. Phase 1 consists of the preparatory construction components. Unexploded ordnance support will be needed during

construction activities because of the potential for unexploded ordnance at the site. A building foundation in the northern portion of the site and debris on the site surface will be demolished. The above-grade components of the foundation will be removed. The surface debris will be reduced in size as necessary and the inert materials will be recycled on site to the extent practicable. Storm water and drainage modifications will need to be made. Drainage will be re-routed around Site 2 and will manage water during the RA construction and provide permanent storm water management capacity for the facility for the loss of the Site 2 storage capacity. A figure showing the conceptual storm water and drainage modifications was projected. Ms. Staszak explained that the contours on the figure show the proposed change in grading which will result in the site looking like a hill. The drainage will be rerouted around the site and into a new sediment retention area across Cradock Street. Compensatory wetland mitigation will be conducted in order to offset the permanent loss of the Site 2 wetland resulting from installation of the cover. The Navy is working with the EPA to include wetland mitigation for the Atlantic Wood Industries property in the compensatory mitigation wetland plan being prepared. A figure showing the location of the compensatory mitigation wetland area was projected. Former IRP Site 19, which was removed from the ERP with no land use restrictions, has been selected as the compensatory mitigation wetland area. Figures depicting the compensatory mitigation wetland restoration plan and cross section were projected. Ms. Staszak noted that the soil excavated from Site 19 to create the compensatory mitigation wetland will be used in the cover at Site 2 instead of disposing of it offsite.

Phase 2 of the RD consists of the cover system components. The limits of the cover are currently defined by sample locations where soil and sediment COCs do not exceed cleanup levels and the limits of waste defined during the RI/FS. The boundary will be refined through upcoming waste delineation activities. The final cover system will consist of site clearing, monitoring well management, subgrade preparation, a grading fill layer, a vegetative support layer, and topsoil. A cross section of the cover system, showing the difference in the existing grade and proposed cover grade, was projected.

Phase 3 of the RD consists of the St. Juliens Creek sediment excavation components. The horizontal limits of excavation are currently defined by sample locations where COCs do not exceed cleanup levels. A figure showing the sediment excavation area was projected. The excavation will consist of erosion and sediment controls; sediment excavation, transportation, and offsite disposal; and restoration. A dewatering service (e.g., Portadam®) will be the primary erosion and sediment control.

Phase 4 of the RD consists of the groundwater treatment components. The ERD treatment consists of injection of EVO into permanent injection wells located in the high concentration-shallow aquifer groundwater target area. The EVO will stimulate the degradation of chlorinated VOCs by naturally-occurring microbes. Following establishment of reducing conditions, a bioaugmentation agent will be injected into the shallow aquifer groundwater to aid the process. The injection layout consists of a series of rows placed perpendicular to groundwater flow. A figure showing the injection layout was projected. As groundwater flows across the site it will flow through the injection points and be treated. MNA will be conducted in the low-concentration chlorinated VOC, naphthalene, and heptachlor epoxide shallow aquifer groundwater target areas to confirm concentrations are decreasing and aquifer conditions are conducive to further concentration reductions. Baseline groundwater

sampling will be conducted prior to injections in the high-concentration areas. MNA will be conducted concurrently with the ERD performance monitoring. Additional treatment may be necessary if contaminant concentrations stop decreasing.

Phase 5 of the RD is an optional phase and consists of the PRB component. A PRB may be installed if placement of the cover changes shallow aquifer groundwater flow, resulting in potential offsite migration of shallow aquifer groundwater COCs. The PRB implementation trigger is based on groundwater concentrations adjacent to St. Juliens Creek and a calculated dilution attenuation factor, which estimates the instantaneous dilution which occurs within the mixing zone between groundwater and surface water. The contaminant concentrations would be compared to applicable surface water criteria. The PRB details cannot be established at this time because the conditions at the time of implementation must be considered. A separate PRB RD or RD Addendum will develop the PRB details closer to the time of implementation if the PRB is necessary.

Ms. Staszak reviewed the site schedule. The 30% RD package is currently being reviewed. The 90% RD package will be submitted in December 2010 and the final RD package will be submitted in spring 2011. The RA will be initiated in the spring or summer of 2011.

Ms. Brumbaugh asked to what depth the ERD injection wells will be installed. Ms. Staszak responded that they will be installed to the top of the confining unit, approximately 17 feet below ground surface, in order to target the bottom of the shallow groundwater aquifer. Ms. Brumbaugh asked if the ERD will be a one-time treatment. Ms. Staszak responded that the ERD will be injected through permanent wells because multiple injections are expected. Mr. Lew asked what a Portadam® is. Ms. Staszak responded that it is a light weight dam structure with an impermeable membrane over a frame; water is pumped from the excavation area over the Portadam® and the weight of the water holds the dam in place. Mr. Lew asked how big a Portdam® is. Ms. Staszak responded that they come in various sizes and the size is selected in accordance with the depth of the water in the area; the water is shallow in the St. Juliens Creek sediment excavation area. Ms. Brumbaugh asked what type of soil cover will be installed at Site 2. Ms. Staszak responded that it will be vegetated, consisting of native grasses. Mr. Bell noted that the ultimate use of the site is still being considered. Mr. Bell noted that Site 2 is a very complex site and numerous remedial alternatives were evaluated to ensure a variety of options were considered and that he feels confident that the best remedial option has been selected.

Roundtable / Q & A

Mr. Bell presented Mr. Lew and Mr. Manning with RAB appreciation shirts in association with the 10-year RAB anniversary.

Mr. Bell asked if anyone had general questions or comments that they would like to discuss. Mr. Manning discussed the history of the facility and vicinity. Mr. Lew asked how long it will take to complete the RA for Site 2. Ms. Staszak responded that it will take approximately six to eight months to get the remedy into place. Mr. Lew asked when remediation for the entire facility will be complete. Mr. Bell responded that it will depend on the results of the Area UXO 1 anomaly investigation, which should be completed by fall 2011. Mr. Bell noted that if remediation or removal at Area UXO 1 is needed, the funding to complete that work will not be available for several years from now. Mr. Manning noted that he expects ordnance to be present adjacent to the wharfs.

Next Meeting:

Mr. Bell noted that the next RAB meeting will be in approximately 6 months, and has tentatively been scheduled for May 11, 2011. Mr. Bell asked if there were any topics that the RAB members would be interested in. Ms. Jones suggested providing the RAB with an overview of the SJCA public website. The RAB agreed to add that as an agenda topic. Mr. Manning asked if satellite images of the facility can be provided and/or posted on the website. Ms. Bell responded that he will work with the Navy Public Affairs Office to determine what can be posted on the website. No additional agenda items were suggested.

Meeting Adjourned.