

MINUTES

**INSTALLATION RESTORATION PROGRAM
RESTORATION ADVISORY BOARD MEETING
ABERDEEN PROVING GROUND, MARYLAND**

THURSDAY, 27 MAY 2004

7:00 p.m. – 9:30 p.m.

EDGEWOOD SENIOR CENTER

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING:

Mr. Butch Dye (Maryland
Department of the Environment)
Ms. Christine Grochowski (Community
Co-Chair)
Mr. Greg Kappler

Mr. Thomas G. McWilliams
Ms. Mary Moses (Harford County
Emergency Operations Center)
Mr. Ken Stachiw (Army Co-Chair)
Ms. Ruth Ann Young

RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING:

Mr. Kevin Barnaba
Ms. Glenda Bowling
Mr. Arlen Crabb
Mr. Roy Dietz
Ms. Mandi Elliott-Bird

Mr. Ted Henry
Mr. Dan Pazdersky
Mr. Frank Vavra (U.S. Environmental
Protection Agency)
Mr. Dennis Warwick

ENCLOSURES TO THESE MINUTES:

- 1: Roster of Meeting Attendees
- 2: Agenda
- 3: June 2004 Calendar of Events
- 4: Other Edgewood Areas Presentation Materials
- 5: Edgewood Areas Shoreline Assessment Presentation Materials

I. EXECUTIVE SUMMARY

Administrative Comments

Mr. Ken Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECRD)) reported that draft minutes of the Performance-Based Contracting (PBC) Subcommittee Meeting would be made available in the near future. RAB Members will be contacted to schedule a follow-up meeting to the Tier-3 Operations and Security (OPSEC) meeting. A boat tour of selected shoreline erosion points has been recommended, and RAB Members will be polled for potential tour dates. Public meetings regarding Graces Quarters and Carroll Island have been scheduled for June 10 and June 12, 2004. The U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) has been tasked to observe RABs nationwide, and CHPPM guests will be present at the June 2004 RAB meeting. Representatives of the IRP AAA Audit, which will be ongoing for the next six months, may contact and poll RAB Members in their efforts to evaluate the effectiveness of IRP management.

Perchlorate Detections Update

Mr. Stachiw stated that a map depicting results from the latest round of perchlorate sampling was not available, and would be provided to RAB Members with the May 2004 Executive Summary. A result of 0.7 ppb was reported for finished water. Mr. Stachiw stated that the installation of the ion exchange system at the City of Aberdeen Production (CAP) Well 9 is nearing completion, and consideration has been given to installing a system at CAP Well 3.

Other Edgewood Areas Study Area

Mr. Paul Miller (Waterways Experiment Station) provided an update on the Other Edgewood Areas Study Area, including Gun Club Creek, Wright Creek, Doves Cove, Maxwell Point, Western Shore, and Coopers Creek.

Gun Club Creek

Mr. Miller reported that sampling of the Wheeled Vehicle Facility volatile organic compounds (VOC) plume yielded high VOC concentrations. The results will be incorporated into the Remedial Investigation (RI) Report. Soil sampling results for the characterization of the Drum and Junk Dump Sites and the K-Field Demolition Ground led to the conclusion that soil is not the source of contamination. RI field activities are complete and data validation has been finalized for the Gun Club Creek investigation area. Risk assessments are currently underway, with a Draft RI expected in September 2004, and a Record of Decision (ROD) expected in fiscal year (FY) 2005.

Wright Creek

Mr. Miller reported that field activities have not detected any groundwater contamination plumes or contributing sources of contamination at the K-Field Pistol Range, G-Field Bunker Sites, and G-Field Real Time Analytical Platform Garage site. No further investigations are planned. An X-Ray Fluorescence (XRF) Survey to delineate metals concentrations was conducted in the K-Field Pistol Range. Ten confirmation samples were collected, and results are pending. RI field activities are complete. A Human Health Risk Assessment and Screening-Level Ecological Risk Assessment will be performed using soil, surface water, and sediment data. A Draft RI is scheduled for FY 2005.

Doves Cove

Mr. Miller reported that 18 of 36 direct push technology (DPT) samples at multiple depths at the C-Field Vibratory Facility Site had VOC detections. Trimethylenetrinitramine (RDX) was detected in low concentrations at Wilson's Point, in four of seven DPT locations. A monitoring well will be installed at the DPT location with the highest detection of VOCs, and a second well will be installed at the DPT location with the highest detection of RDX. A decision on the groundwater Risk Assessment is pending a review of validated data. An XRF Survey was conducted to delineate potential metal contamination in a barren area. Six confirmation samples will be collected in June 2004. A Human Health Risk Assessment and Screening-Level Ecological Risk Assessment will be performed using soil, surface water, and sediment data. A draft RI is scheduled for FY 2005.

Maxwell Point

Mr. Miller reported that soil samples collected from the Smoke Generator Debris Disposal Site indicated metals contamination in soils at concentrations above ecological risk screening criteria. Site characterization and soil removal is scheduled for Summer 2004. Site inspections and an XRF survey have identified metals contamination in the Building E7340/E7350 Test Site area. Test digs will be conducted during Summer and Fall 2004. Five additional monitoring wells will be installed to monitor the Maxwell Point groundwater plume. Seven monitoring wells and 20 prepacked wells will be sampled for VOCs and natural attenuation parameters during Fall 2004. XRF, soil, surface water, and sediment field activities for the RI are complete. A Draft RI is scheduled for FY 2007.

Western Shore

Mr. Miller reported that groundwater sampling is complete, and benzene, toluene, ethylbenzene, and xylenes (BTEX) data will be forwarded to the Maryland Department of the Environment (MDE). No other groundwater contamination plumes or contributing sources of contamination were detected, based on sampling in seven wells, and 29 DPT locations. A Human Health Risk Assessment and Screening-Level Ecological Risk Assessment will be performed using soil, surface water, and sediment data. Test digs and site characterizations are scheduled for Summer 2004. A Draft RI is expected for FY 2005.

Coopers Creek

Mr. Miller reported that mobilization has begun for the protection of 5,800 feet of shoreline. A Draft Final Design was completed in May 2004. Stockpiling and construction will begin during Summer or Fall 2004, with completion expected in Summer 2005.

Edgewood Area Shoreline Assessment

Mr. Robert Larson (Waterways Experiment Station) provided an update on the Edgewood Area Shoreline Assessment. A variety of Edgewood Area sandy clay shoreline banks and shore zones were discussed. These included high banks with large trees at the brink, grass covered low banks, wetlands, armored beaches, riprap shorelines, and sandy beach benches developed by stands of water level during high water retreat. All shorelines are affected by routine factors of erosion, such as rain, wind, freeze-thaw action, gravity, and tide and wave action. Bank height, slope angle, groundwater levels, gravity, and the shear strength of soils affect shore zone bank stability. Erosion and loss of bank stability have resulted in the toppling of trees, bluff and shoreline retreat, erosion control structure damage, and massive bank slump throughout Edgewood Area shorelines. Mr. Larson displayed several photographs depicting shoreline damage in Edgewood.

Mr. Larson stated that shoreline erosion occurs at different rates, and displayed maps depicting areas of different erosion rates and potential materiel exposure along Edgewood shorelines. Priority areas for shoreline protection of potential exposures and damaged areas have been established and ranked throughout Edgewood.

II. OPENING REMARKS AND ADMINISTRATIVE COMMENTS

The May 2004 U.S. Army Garrison Aberdeen Proving Ground (APG) Installation Restoration Program (IRP) Restoration Advisory Board (RAB) meeting was called to order by Mr. Kenneth Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECRD); Army Co-Chair) at 7:00 p.m. on Thursday, 27 May 2004. The meeting took place at the Edgewood Senior Center located at 1000 Gateway Road in Edgewood, Maryland.

Enclosure 1 to these minutes is a meeting attendance list. RAB Members in attendance received an agenda (Enclosure 2), a RAB calendar of events for June 2004 (Enclosure 3), a copy of the Other Edgewood Areas Study Area presentation (Enclosure 4), and a copy of the Edgewood Area Shoreline Assessment presentation (Enclosure 5).

Mr. Stachiw reported that the draft minutes for the Performance Based Contracting (PBC) Subcommittee Meeting held two weeks ago are in draft form, and will be distributed to RAB Members in the near future. The meeting addressed the suggestion of a roundtable discussion to evaluate the progress of PBCs, and whether they are successful at APG.

Mr. Stachiw expressed the desire to schedule a follow-up meeting to the Tier 3 Operations and Security (OPSEC) Meeting. Many issues have arisen as a result, and it is recommended that RAB Members who attended the first meeting also attend the second meeting, to discuss concerns that the Environmental Protection Agency (EPA) had raised after the local level resolution. Some items that were not previously allowed in documents may now be allowed. RAB Members will be contacted in the coming week to schedule a follow-up meeting.

Mr. Stachiw stated that Mr. Ted Henry (RAB Member) had recommended that a boat trip around APG shoreline erosion points be scheduled. Mr. Steve Wampler (DHSE ECRD) has announced that a shoreline tour can be arranged and tour dates will need to be established. RAB Members will be polled for potential dates and availability.

Mr. Stachiw reported that tours have been scheduled for Graces Quarters. Citizens and Senator Sarbane's office have raised concerns over APG's preference to pursue a less costly remediation alternative, rather than a more expensive one. Efforts are ongoing to resolve the issue. The tours will involve bus rides to the Graces Quarters site to allow people to see the site and scope of the project, and that the best value was selected.

Mr. Stachiw announced that guests from the Center for Health Promotion and Preventative Medicine (CHPPM) would be present at the June 2004 RAB Meeting. The CHPPM has been tasked to look at RABs nationwide and evaluate their progress. They will observe the APG RAB next month, and may ask questions and conduct some interviews.

Mr. Stachiw announced that an Army Audit Agency (AAA) Audit is ongoing to evaluate the effectiveness of program management and oversight for the IRP. The auditors have asked to speak to the RAB, and may contact RAB Members in the future. This study will be ongoing for the next six months, through November.

After confirming RAB Members had no further comments, Mr. Stachiw provided an update on the perchlorate detections in the Aberdeen Area of APG.

III. PERCHLORATE DETECTIONS UPDATE

Mr. Stachiw stated that a slide displaying perchlorate results for May 2004 was not available. The data will be provided via the Executive Summary, which will be mailed out to RAB Members in the near future. Mr. Stachiw recalled that approximate detections in the City of Aberdeen Production (CAP) Wells included 1.7 ppb of perchlorate in CAP Well 9, over 2.0 ppb in CAP Well 3, and a range of 0.7 to 1.0 ppb in CAP Wells 8 and 10. Perchlorate was detected at 0.7 ppb in finished water. May 2004 perchlorate results are reflective of previous monthly results.

Mr. Stachiw informed RAB Members that the installation of the ion exchange system at CAP Well 9 is nearing completion, and consideration has been given to installing a system at CAP Well 3. The City of Aberdeen may need some assistance, with regard to the other wells, for construction and land availability. Efforts to resolve the issue of further branching land easements to allow room for the installation of facilities needed to treat water have begun.

Mr. Stachiw stated that it might be possible to obtain research money for the treatment of soil in the area surrounding the CAP Wells. Nothing is firm yet, but some interest exists. The possibility of funding from a Strategic Environmental Research and Development Program (SERDP) source, which combines EPA, Army, and DOD efforts for research and environmental work, is being evaluated. Further information will be provided at the next RAB if interest continues and progress has been made. Information will be immediately provided to RAB Members should exceptional progress be made.

After confirming RAB Members had no further comments, Mr. Stachiw introduced Ms. Ruth Golding (DSHE ECRD Project Officer) to introduce the update on the Other Edgewood Areas (OEA) Study Area.

IV. OTHER EDGEWOOD AREAS STUDY AREA UPDATE

Ms. Golding displayed a map depicting APG environmental study areas, and pointed out the location of OEA. OEA is bordered on the western side by the Gunpowder River, and on the east by the Bush River and Chesapeake Bay. The study area covers 4,800 acres of land, and consists of 29 Defense Sites Environmental Restoration Tracking System (DSERTS) Clusters, approximately 81 sites, and 8 investigation areas. Following a range-based approach, sites have been combined to make them easier to investigate.

Ms. Golding introduced Mr. Paul Miller (Waterways Experiment Station) to provide the remainder of the OEA Study Area Update. Mr. Bob Larson (Waterways Experiment Station) will follow the OEA presentation with an update on the Edgewood Area Shoreline Assessment.

Mr. Miller reiterated that OEA is comprised of eight investigation areas. The Swaderick-Watson Creek and Boone Creek Investigation areas are still in the early planning stages. In June 2003, plans were briefed to install a number of DPT wells, and conduct soil, surface water, and sediment reconnaissance. Efforts are expected to be executed in the Summer of 2004.

Mr. Miller stated that three major groundwater contamination plumes have been identified in the OEA. A solvent plume is located in the Gun Club Creek Study Area, and covers approximately 20 acres. A second solvent plume is located at Maxwell Point, and a petroleum benzene, toluene, ethylbenzene, and xylenes (BTEX) plume is located in the Western Shore area.

Gun Club Creek Investigation Area

Mr. Miller displayed a slide depicting Gun Club Creek Investigation Area sites and features. The two areas of concern in Gun Club Creek are the Wheeled Vehicle Facility building, where the groundwater contamination plume is located, and the Drum and Junk Dump Sites, where site characterization has been performed.

Mr. Miller displayed a slide depicting the location of the Wheeled Vehicle Facility Volatile Organic Compound (VOC) plume, which is approximately 20 acres in size. Fieldwork for the plume has been completed. One well had a maximum VOC detection of approximately 26 parts per million (ppm), and a direct push technology (DPT) well had a maximum detection of approximately 46 ppm total chlorinated solvents. The groundwater data will be included in the Remedial Investigation (RI) report.

Mr. Miller displayed a slide depicting the location of 11 Drum and Junk Dump Sites, and the K-Field Demolition Ground. Most of the sites consisted of junk items that have been cleared, such as pipe, debris, wire, wood, etc. The only ordnance item recovered was a rocket fin assembly. Confirmation sampling has been conducted, and results are pending.

Mr. Greg Kappler (RAB Member, various groups) questioned what volume of material would be needed to create and constitute a solvent plume of 20 acres. Mr. Miller stated that only a small amount would be needed, as detected concentrations are at ppm levels in a limited area. Calculations made for the Western Boundary plume determined that five gallons or less of material had created a two-square mile plume.

Mr. Kappler asked if trichloroethene (TCE) had been used as a degreaser at the Wheeled Vehicle Facility. Mr. Miller stated that it is a possibility that TCE had been used as a degreaser, though that remains unconfirmed. Concentrations had existed in the area before the facility was built. Concentrations of 1,1,2,2-tetrachloroethane (TECA), used in a decontamination solution, have also been detected.

Mr. Kappler questioned what had historically existed at the site before the facility. Ms. Golding stated that drum disposal had occurred in the area, and the drums were later removed. During construction of the facility's foundation, workers complained of odors and fumes. Topsoil was removed in the area where the building would stand. Monitoring and sampling was conducted north of the facility, and concentrations of VOCs were detected around 1 part per billion (ppb). Currently, higher concentrations have been detected. Disposed drums in the area were removed prior to building construction. Ms. Golding added that previous training and decontamination activities conducted in the area likely resulted in the contamination.

Mr. Rich Isaac (U.S. Army Environmental Center (AEC)) asked if vapor testing had been conducted at the Wheeled Vehicle Facility. Mr. Miller stated that air sampling had not been conducted inside the facility. High levels of VOCs were detected north of the facility, in the groundwater. A similar situation has been observed in the Aberdeen Area.

Mr. Isaac asked if any changes have occurred in the plume due to the pump and treat system at the Canal Creek Groundwater Treatment Plant (GWTP). Mr. Miller stated that water levels have not been examined after the groundwater plant began operation, but water levels should not be affected by the system. Mr. Tom DeReamer (General Physics Corporation) stated that the groundwater plant was pumping water from a deeper aquifer, separated from the surficial aquifer by a clay layer, and would not affect the solvent plume water levels. Deep boring surveys were conducted to ensure that the plume is isolated.

Mr. Tom McWilliams (RAB Member) asked for the date of building construction. Ms. Golding stated that the building was constructed in 1988.

Mr. Miller stated that various sample results from the dumpsite ranged from above background levels to risk-based concentrations (RBCs). Data will be evaluated in the RI.

Mr. Miller displayed a slide depicting photographs of a typical dumpsite before and after characterization. A drum, iron pieces, and debris can be seen. Sites will be restored after materials are removed and samples are collected.

Mr. Miller displayed a slide listing the RI status and schedule for the Gun Club Creek Investigation Area. Field activities are complete, data validation is nearly finalized, and Risk Assessments are underway. A Draft RI is expected in September 2004, and a Record of Decision (ROD) is planned for fiscal year (FY) 2005.

Wright Creek Investigation Area

Mr. Miller displayed slides depicting the location of Wright Creek Investigation Area, Clusters 51 and 8, and the locations of various study sites and features. The locations of the K-Field Pistol Range, G-Field Bunker Sites, and the G-Field Real Time Analytical Platform (RTAP) Garage were pointed out.

Mr. Kappler asked if a need to collect samples below ground at the aquifer level at the Gun Club Creek drum dumpsite locations existed. Mr. Miller stated that sampling information was provided in notebooks provided to the RAB Members. Below ground sampling at the aquifer level was not conducted, and numerous DPTs have been installed in that area. Mr. Miller indicated a location on the map where VOCs were detected at a depth of 3 feet, in small concentrations. Related information will be included in the RI report.

Mr. Miller displayed a slide depicting the locations of recent groundwater activities. Methylphosphonic acid (MPA), a possible degradation product of nerve agents, was detected at a DPT location in the southern K-Field Pistol Range. VOCs were detected in the northern area of the pistol range, and at two other sites. Mr. Miller displayed a slide depicting DPT sample locations in the northern area of the pistol range. The primary analyte detected was tetrachloroethene (PCE), at a range of 2.2 to 33 ppb.

Mr. Miller stated that a meeting held with regulators in February 2003 resulted in decisions based on the current data presented for OEA. A decision was made that further groundwater studies need not be conducted in the northern area of the pistol range, as detections are limited, low level, and do not appear to constitute a plume.

Mr. Miller displayed a slide depicting DPT sampling locations in the southern area of the K-Field Pistol Range. A previous laboratory report with MPA detections has been rejected by data validators, as an incorrect method was used to derive the results. Twenty-four additional DPT samples were collected at multiple depths for MPA analysis, and all results were non-detections. No other history of other uses at the pistol range has been reported, and the alleged detection appears to be a lab error. No further investigations have been conducted in the area.

Mr. Miller displayed slides depicting the location of the G-Field Bunker Sites, and DPT sampling locations conducted in that area. VOCs were detected in small concentrations in two wells and one DPT sample. Carbon tetrachloride was detected at a range of 0.6 to 17 ppb, PCE from 1 to 2 ppb, and chloroform from 0.7 to 3 ppb. Well WGF-07 had the highest VOC detections. A plume does not appear to exist in the area, and no further investigations are planned.

Mr. Miller displayed slides depicting the location of the G-Field RTAP Garage, and DPT sampling locations conducted in that area. The garage is located 50 to 70 feet from the road. In the 1980's, DPTs conducted at well WGF-10 detected PCE at low concentrations (1 to 2 ppb). Two wells were installed to cover the vertical extent of the aquifer. Well sampling results have shown very low VOC concentrations, and no further characterization is planned for the area.

Mr. Miller displayed slides depicting an X-ray fluorescence (XRF) survey conducted at the K-Field Pistol Range to delineate metals concentrations previously detected in soil samples. Mr. Miller stated that the main area of contamination lies near the former location of sheds or buildings that had supported the pistol range. The highest metals concentration detected in the XRF survey was chromium, at 1,100 ppm. The survey detection limit for chromium varies between 50 to 200 ppm, and the concentration detected over that limit is the reported result. This result implies that between 1,000 and 1,500 ppm of chromium exists at one of the survey points. Soil sampling for laboratory analysis, which is much more precise, has been conducted to obtain a more accurate result, and results are pending.

Mr. Miller explained that blue triangles on the XRF survey map represent the locations of collected confirmation soil samples in areas where the XRF indicated elevated metals levels, and the green triangles represent reference soil samples collected in areas without elevated metals levels.

Mr. Kappler asked why chromium would be associated with a pistol range. Mr. Miller stated that approximately five metals are screened for in the survey, including copper and lead. Mr. Stachiw stated that a correlation may not exist, and other undocumented activities may have occurred in the area to cause the contamination. Mr. Miller stated that the confirmation soil samples might indicate that concentrations are not as high as originally thought, and speculation should not be made until the results have been received.

Mr. Miller displayed a slide detailing the Wright Creek Investigation Area RI status and schedule. All field activities have been completed, and no groundwater contamination plumes or contributing sources of contamination have been detected. A Human Health Risk Assessment and Screening-Level Ecological Risk Assessment will be performed using soil, surface water, and sediment data. A Draft RI is expected for FY 2005.

Doves Cove Investigation Area

Mr. Miller displayed slides depicting the location of the Doves Cove Investigation Area, Clusters 30 and 39, and the locations of various study locations and features. VOCs have been detected at the C-Field Vibratory Facility, which has not been used for several years. Trimethylenetrinitramine (RDX) was detected at Wilson's Point, which still contains some bombproof structures, and was historically used as a firing point.

Mr. Miller displayed a slide depicting the location of the Vibratory Facility Site, and the locations of DPTs that were conducted around it. Low detections of VOCs were found around the site, with 1,1-dichloroethene (1,1-DCE) detected below the RBC and 1,1,1-trichloroethane (1,1,1-TCA) detected below the RBC and maximum contaminant level (MCL). A monitoring well will be installed at the DC-DPT-03 location, which had the highest 1,1-DCE concentration of 17 ppm.

Mr. Miller displayed a slide depicting DPT sampling locations at Wilson's Point. RDX was detected in four of seven DPT locations. A monitoring well will be installed at the DC-DPT-25 location, which had the highest RDX concentration of 3.2 ppm.

Mr. Isaac asked if any RDX source locations have been found. Mr. Miller stated that many DPTs have been installed in the investigation area, and no potential source locations have been identified. A large number of DPTs still need to be done in Doves Cove, Swaderick-Watson Creek, and Boone Creek.

Mr. Miller displayed a slide detailing remaining groundwater activities for the Doves Cove Investigation Area. Two wells will be installed at the DPT locations with the highest concentrations detected in the two study areas discussed. The wells will be installed mid-June 2004, as the eagle exclusion zone has restricted entrance and activities in the area during the nesting period. DPTs will be sampled four times in four months to obtain risk level data, as decided by the February 2004 Regulatory Meeting.

Mr. Miller displayed slides depicting the location and details of the XRF survey conducted at Doves Cove. The survey was conducted to delineate potential metals contamination in a barren soil area. Detections of copper at approximately 400 to 500 ppm triggered the XRF survey, which detected copper at 1,100 ppm, plus the detection limit. Confirmation samples will be collected in mid-June 2004 to obtain more accurate concentration results.

Mr. Miller displayed a slide detailing the Doves Cove Investigation Area RI status and schedule. Two monitoring wells will be installed in the investigation area to provide risk-level data, as decided upon in the February 2004 Regulatory Meeting. A decision on the groundwater Risk Assessment is pending the review of validated data. A Human Health Risk Assessment and Screening-Level Ecological Risk Assessment will be performed using soil, surface water, and sediment data. A Draft RI is planned for FY 2005.

Maxwell Point Investigation Area

Mr. Miller displayed slides depicting the location of the Maxwell Point Investigation Area, Cluster 29, and the locations of various study area features. Activities are ongoing with the groundwater plume investigation. Site characterization and debris removal will be conducted at the Smoke Generator Debris Site during Summer 2004. An XRF survey was conducted near the Building E7340/E7350 Test site.

Mr. Miller displayed a slide detailing the Smoke Generator Debris Site characterization. The photograph on the slide was taken in June 2003 during the planning stage for characterization, and provides an example of the debris that will be removed.

Mr. Miller displayed slides depicting the location and details of the XRF survey conducted at the Maxwell Point Investigation Area. Metals at Maxwell Point were detected at higher levels than in other investigation areas. Chromium was detected at 1,500 ppm plus the detection limit, and zinc was detected at 3,000 plus the detection limit. The potential exists for higher metals concentrations to be detected in the soil.

Mr. Miller stated that test structures had been located in the area, and historically grenade dropping may have occurred in the area. Chromium and zinc do not correlate with grenades, but a large amount of activities have been conducted in the area since World War II. Ten confirmation soil samples have been collected, and the results are pending.

Mr. Miller displayed a slide detailing and depicting the Maxwell Point groundwater plume and future activities. Limited DPTs have been conducted. Five additional 4-inch monitoring wells, and 20 half-inch prepacked wells will be installed. Sampling will be conducted at the five new wells for full suite chemical analysis, to better delineate the extent of the plume.

Mr. Miller stated that the highest VOC concentrations detected thus far include 1,1,2,2-TECA at 3,800 ppm, TCE at 250 ppm, and vinyl chloride at 140 ppm. VOC concentrations are not as high as those detected at Gun Club Creek. Porewater samples will also be collected along the edge of the Gunpowder River. Mr. Miller stated that the plume covers approximately 3.5 acres.

Mr. Isaac questioned if any VOCs have been detected in the Chesapeake Bay. Mr. Miller stated that no detections have been reported in the Bay, and indicated the location of the majority of surface water sampling. Porewater sampling will be conducted to evaluate if the plume is discharging into the river. The surface elevation of Maxwell Point is at 15 feet, and the aquifer begins approximately 10 to 12 feet below ground, and extends as deep as 45 feet. Plume contamination extends below the elevation of the Bay.

Mr. Isaac questioned if the possibility exists for VOCs to breakdown, and if sampling for breakdown products has occurred. Mr. Miller stated that the prepacked wells would be installed to monitor natural attenuation parameters and potential VOC breakdown products. Concentrations are not expected to be significant. Mr. DeReamer stated that speculation is difficult until natural attenuation parameters have been determined. Some degradation products have been detected, but the concentrations are unknown.

Mr. Stachiw noted that, in a similar situation at J-Field, large concentrations were not expected, but sampling results showed substantial concentrations.

Mr. Butch Dye (Maryland Department of the Environment (MDE)) noted that the emergence of cicadas might indicate the relative health or non-health of the ecosystem. Mr. Miller stated that cicadas had been heard in the general area, and the site appears to be healthy. Some barren soil areas exist and limited vegetation is stunted to some degree, but birds and fish appear to be abundant. Mr. DeReamer noted that Maxwell Point is a relatively open area, with a small amount of trees. An osprey nest has been seen in the area. Mr. Bob Larson (Waterways Experiment Station) stated that turkeys and foxes have been seen at Maxwell Point.

Mr. Miller displayed a slide detailing the Maxwell Point Investigation Area RI status and schedule. XRF, soil, surface water, and sediment field activities are complete. The site characterization of the Smoke Generator Debris Site is scheduled for Summer 2004. Test digs will be conducted at the E7340/E7350 Test Site during Summer or Fall 2004. Monitoring wells will be installed, and groundwater sampling will commence during Fall 2004. A Draft RI is scheduled for FY 2007.

Western Shore Investigation Area

Mr. Miller displayed slides depicting the location of the Western Shore Investigation Area, Cluster 12, and the locations of study sites and features. A number of areas of interest exist along the shoreline, and will be addressed in the future. The planning stage for the area is ongoing, and efforts should commence during Summer 2004. A BTEX plume has been detected in the area of H-Field Buildings.

Mr. Miller displayed a slide detailing recent groundwater field activities, and depicting the extent of the BTEX plume. No free phase petroleum products have been identified. The highest detection of BTEX was at a concentration of 49 ppm. Soil test results for Total Petroleum Hydrocarbons (TPH) were below the 230-mg/kg criteria. The discussion with regulators at the February 2004 meeting determined that the petroleum problem does not fall under the Defense Environmental Restoration Act (DERA), and must be addressed under the Maryland State regulations.

Mr. Miller displayed a slide detailing the Western Shore Investigation Area RI status and schedule. Groundwater sampling activities are complete, and BTEX plume data will be forwarded to MDE. No other groundwater contamination plumes or contributing sources of contamination have been located. A Human Health Risk assessment and Screening-Level Ecological Risk Assessment will be performed using soil, surface water, and sediment data. Remaining field activities, including test digs and site characterization, are scheduled for Summer 2004. A Draft RI is scheduled for FY 2005.

Coopers Creek Investigation Area

Mr. Miller displayed a slide detailing the location and activities of the Coopers Creek Investigation Area, and D-Field Area Shoreline Update. Approximately 5,800 feet of shoreline requires shoreline protection. The majority of access roads have been constructed, and stockpiling is scheduled to begin in mid-June 2005. Activities are scheduled for completion during Summer 2005, given adequate range access.

Mr. Stachiw stated that many other investigation areas exist, such as N-Field, but have not yet been funded, and were not covered in the presentation. Those sites, and their scheduled activities, will be reviewed during the closed-door session at the end of the meeting.

Mr. Miller reminded RAB Members that detailed sampling data had been provided in notebooks distributed to them. Any further detailed questions are welcome.

After confirming that no one present had any further questions, Mr. Stachiw introduced Mr. Larson to provide the Edgewood Area Shoreline Assessment presentation.

V. EDGEWOOD AREA SHORELINE ASSESSMENT

Mr. Stachiw stated that some shoreline damage and erosion had occurs along the Chesapeake Bay. Shoreline damage and erosion can result in the release of individual items into the Chesapeake Bay, such as the release of materiels at Kings Creek in 2003. Prior to Hurricane Isabel, a study on shorelines had been ongoing. The study evaluated shoreline locations that should be protected to prevent the release of materiels at any known locations or disposal sites into the Bush River, Gunpowder River, or Chesapeake Bay. The shoreline assessment evaluated shoreline damage from the hurricane, and prioritized and delineated areas that might pose a greater risk for materiel exposure and require further protection.

Mr. Larson informed RAB members that they had been provided with a report containing the photographs and information to be presented. The report includes a summary of priorities, and maps and photographs grouped by the different field areas. The presentation will provide a foot tour of the boat tour that will be scheduled for RAB Members.

Mr. Larson stated that RAB Members should remember to bring binoculars and maps on the boat tour, should they decide to attend. Several shallow areas exist along the shoreline, and boats will not be able to navigate close enough to the shoreline and bluffs for viewing without binoculars.

Mr. Larson displayed a slide depicting a shoreline bluff along the Chesapeake Bay. An area on the bluff, referred to as consolidated sediments because they can support a bluff, was pointed out. Many high bluffs support large trees, and many small benches are grass-covered areas.

Mr. Larson stated that in Maryland, rock formations have been affected by millions of years of erosion. The Susquehanna River has been moving across the valley, towards the southwest for over 10,000 years.

As the river moves across the valley, its slope or gradient is a function of sea level. Over the last two million years, the sea level has been 100 meters higher and lower than it is now.

Mr. Larson stated that three different fluctuations, or gradient levels, are reflected in the valley. Throughout the presentation, three different terraces will be referred to: the highest ranging from 60 to 70 feet at the northern Gunpowder Neck area called Terrace 3; Terrace 2 at 40 feet in D-Field; and Terrace 1 at 20 feet in E-Field.

Mr. Larson displayed a slide listing characteristics of the Edgewood Peninsula. The area consists of high and low banks of sandy clay deposits, large trees at the brink of high banks, low banks covered with grasses and small trees, wetlands, armored beaches, riprap shorelines and retaining walls, and beach zones with trees. Wetland areas contain phragmites vegetation, which had an influence on the high water levels created by Hurricane Isabel. Cobble-covered armored beaches are found in the Westwood area, giving grass and trees a stable foundation for rooting and retention of beach materials. Retaining walls have held up extremely well, and protected the shoreline. A variety of natural protection and natural vulnerability can be found in the Edgewood Area.

Mr. Larson displayed a slide containing photographs of a D-Field high bank and D-Field low bank. The high bank is an example of a string terrace deposit, known as Terrace deposit 2. It is almost impossible to differentiate the deposits, as the river has been flowing from the same source area, and spreading the material out into floodplains and sandbars. The low bank is an example of Terrace 1. Terrace 2 is located approximately 100 yards down the shoreline from Terrace 1.

Mr. Larson displayed a slide listing the routine factors of erosion that affect shorelines. Factors include rain, wind, freeze-thaw action, gravity, and tide and wave action. Mild to medium intensity storms will move material back and forth, depending on whether the storm occurs in the winter or summer. Material moves offshore and into sandbars during the winter, and onshore in the summer.

Mr. Larson displayed a slide depicting a weathered bluff. Typical bluff weathering would be exhibited by fallen debris. In 1999, some bluffs were pinned with 1-foot spikes. After a year, the spikes and bluff material were gone. Approximately 8 inches to 1 foot of material was lost. Bluff retreat has been observed, and the hurricane exemplified how an event could greatly affect shorelines.

Mr. Larson displayed a slide depicting wave action along a bluff. Wave action occurs at the base of bluffs. Undercutting and slumping of material in massive quantities, ranging from 2 to 3 feet, has been observed at D-Field. Material is then transported offshore by wave action, and deposited into bars.

Mr. Larson displayed a slide depicting bank collapse along a shoreline. Groundwater levels play an important role in bank stability, and are typical of the level depicted in the slide. Areas of perched groundwater may also be observed. Hurricane Isabel had a large influence on banks by raising water levels by 8 to 9 feet.

Mr. Larson displayed a slide listing factors that affect bank stability. Factors include bank height, slope angle, groundwater levels, gravity, and the shear strength of soils. Fallen trees and concave upward scarps where soils sheared from the bluff can be observed in the presentation photographs.

Mr. Larson displayed a slide detailing the characteristics of the shear strength of soils. Strength is affected by geotechnical exposure to normal and shear stresses. Soil strength is the maximum shear stress that soil can sustain. Inter-grain water is free pore water or adsorbed water. An example of free pore water is the stickiness of clay, and its loss of cohesion with the addition of water. Adsorbed water is

tightly held to grains. Retained moisture in soils disturbs cohesion, affects lubrication, and increases material mass.

Mr. Larson displayed slides depicting bank saturation and slump or shear scars. Water levels increased by 8.5 feet, precipitation infiltrated sediments, and high Bay water intruded into bank scarp faces with the arrival of Hurricane Isabel. Soil shear strength was greatly affected, and some trees toppled and slumped into the shore zone.

Mr. Larson displayed a slide depicting a fallen tree on a raised beach. Wave action had reworked sediment into secondary benches along the shoreline. Historically, many trees would fall into the water. Trees could be observed lying perpendicular to and 100 feet out from the shoreline at O-Field a few years ago. A study to conduct tree borings to determine the year of tree death, when it had fallen, and retreat rate could not be carried out before Hurricane Isabel.

Mr. Larson displayed a slide demonstrating the weight burden of a tree. It is widely believed that wind stress on trees does not play a major role in slump effects. A 50-foot Ponderosa Pine, with 64.4 cubic feet of wood for lumber and lacking its crown, would weigh approximately 2 tons. Hardwood trees with a greater mass than the Ponderosa can be found at the brink of bluffs, and do contribute to slump factors. However, tree mass may not have as large a contribution to slump as originally thought, as the root mass supports the tree in the bank.

Mr. Larson displayed photographs of armor stone beaches in the Westwood area. A natural cobble stone beach that protects the area and allows vegetation to grow can be observed.

Mr. Larson displayed several photographs of the shoreline throughout the Westwood area, which contains vegetation and trees in the shore zone. Hurricane Isabel had a large impact on the bluff section, which eroded by 5 feet. In areas of low relief along the Westwood shoreline, stormwater pushed sand inland, built a sandbar, and trapped water that slowly retreated to the Gunpowder River. Lowland areas likely experienced an accretion of sand, and lowland areas with bluffs lost material.

Mr. Larson stated that a narrow gage railroad line exists in Westwood, and many of the blocks from that facility protected the shoreline by serving as a riprap zone. Bluff retreat occurred in the central area of Westwood.

Mr. Larson stated that a 'No Trespassing' sign atop a small 3-foot bench had been severely damaged by the hurricane. The signs sit approximately 8 to 10 feet back from the bluff brink, but the storm caused the bluff to retreat back to the support for the sign. Moving towards Reardon Inlet, the loss of sediment from tree root masses can be observed. Trees will topple with the further loss of sediment load, and mild storm erosion. Water levels near Reardon Inlet are at an approximate depth of 4 feet.

Mr. Larson stated that massive bluff collapse had occurred near a Drill Rig Warehouse in Westwood. Standing trees were present in the shore zone. Slump material was built into a series of secondary beaches, as water receded.

Mr. Larson stated that the separation of bluff material blocks, held in place by tree roots, could be observed. Fallen trees, which have rotated and still cling to banks by their roots, can also be observed. Those trees will eventually slump into the lower part of the beach. In one photograph, fallen trees and concrete materials can be seen. The concrete materials did not cause the slump, but may have been placed as an attempt to protect the bluff.

Mr. Stachiw informed RAB Members that if they are not familiar with the location of study areas, they should refer to a previous slide containing an Edgewood Area map, for a frame of reference.

Mr. Larson stated that moving further eastward along the Westwood shoreline, a bluff and roadway collapse can be observed near the Canal Creek Study Area. The bluff line retreated by 8 to 10 feet in that specific pocket, and by approximately 3 feet in the general area.

Mr. Larson displayed several slides of a stone retaining wall at the Cluster 19 Cantonment Area. Hurricane Isabel raised water levels several feet above the retaining wall. Retreating water collected behind the wall, and eroded away soil through missing stones or around the edges of the wall. Drainage pipes in the wall, which allow for water drainage, may have leaked water through the wall and loosened stones through freeze-thaw action. Hurricane Isabel then likely dislodged the stones, which can be observed along the water's edge.

Mr. McWilliams asked for the original purpose of the stone retaining wall. Mr. Larson stated that the wall served as shoreline retention, bank protection for buildings, and provided aesthetic value.

Ms. Ruth Ann Young (RAB Member) asked for the age of the retaining wall. Mr. Stachiw stated that the wall had been present since at least 1972, and it is likely older. The wall may have been rebuilt since 1972.

Mr. Larson stated that a high water mark is visible behind the retaining wall, and bluff retreat occurred above the wall. A section of the wall has been made into gabion wall. The wall was lined with chain link fence cages filled with stone. Damage occurred to the wall, and may or may not have been a result of the hurricane. Holes can be observed in the gabion.

Mr. Larson stated that the high water mark could be observed approximately 2 to 3 feet higher than the retaining wall, and to the right in a photograph. Erosion pockets, removed stones, fallen stones, and vegetation growing within the structure can be observed.

Ms. Christine Grochowski asked if the structure to the left of the retaining wall is a sidewalk. Mr. Stachiw stated that the structure is a sidewalk, located near the Officer's Club, pool, and General's housing. Mr. Isaac noted that the wall appears to have been built at the approximate time of houses in the nearby area, as the materials appear to be similar.

Mr. Larson displayed several photographs of shoreline along the Lauderick Creek Study Area. Lauderick Creek shoreline consists of extremely eroded lowland Terrace 3. Erosion pockets and a large amount of phragmites can be observed in the area. The phragmites and low elevations allowed increased hurricane water levels to dissipate its energy along trees and phragmites.

Mr. Larson identified the approximate locations in Lauderick Creek where some of the photographs were taken. Between prominent points in Lauderick Creek accretion zones occur, where sand carried by long-shore currents create a wetlands barrier bar. Water in the wetlands will eventually grow high enough to seep and drain out of the area.

Mr. Larson stated that shoreline retreat has occurred along one such prominent point in the Lauderick Creek area. Old and recent trees toppled by the undercutting of support material could be observed in the northeast Lauderick Creek area. Some bluffs appear to have been so steep that sediment support was removed, causing a tree ball slump-rotation.

Mr. Larson displayed a slide containing photographs of the K-Field shoreline. The K-Field Pistol Range has experienced erosion problems during small storms. Hurricane Isabel toppled a 'Do Not Trespass' sign along the shoreline, which was in jeopardy two years ago. The shoreline retreated by several feet, and one DPT site is now gone. The photograph of erosion and blown down trees at the Pistol Range was taken at the location of K-Field contamination testing. The main focus of the photograph is on the high water mark and debris in the Pistol Range.

Mr. Larson displayed a slide containing photographs of the south side Maxwell Point shorelines. Much of the northern and southern sides of Maxwell Point consist of riprap, construction material, and natural quarried stone shorelines. A section of shoreline between the point and quarried stone wall not protected by stone and riprap had retreated by approximately 70 feet.

Mr. Stachiw informed RAB Members that the locations of Maxwell Point and K-Field could be found on a map in the Other Edgewood Areas presentation.

Ms. Grochowski noted that more storm action could potentially erode Maxwell Point into an island. Mr. Larson stated that, following the high water levels caused by Hurricane Isabel, Maxwell Point had temporarily become an island. The high water level filled in the area just beyond the location of the XRF survey at Maxwell Point.

Mr. Larson displayed a slide containing photographs of erosion scarps at M-Field Point. A small bench is located along the beach line, and relief is relatively low. The high water mark extended over the bench, and wave energy dissipated into the trees. Trees in the area are relatively small. Old tree losses have been pushed parallel to the shoreline, and may provide some shoreline protection.

Mr. Larson displayed a slide containing photographs of the O-Field shorelines, which experience the worst shoreline retreat. A 'No Trespassing' sign support structure can be seen hanging over the edge of a bluff. Shorelines retreated by 10 to 15 feet in some areas, and some older trees had been lost out in the water. At the very southern edge of O-Field, the shoreline had retreated by 20 feet, but a resistant bench still remains standing, creating a 4-foot drop. Riprap areas protect the shoreline just north of the resistant bench. North of the riprap area is an area of extremely high erosional bank retreat.

Ms. Grochowski asked if the storm surge had caused all the shoreline damage at O-Field. Mr. Larson stated that bank saturation, which destroyed the shear strength of the soils, coupled with wave energy against the bank and undercutting resulted in the slump and damage. Mr. Larson stated that damage was caused by the water surge and other indirect factors.

Mr. Larson displayed a slide containing photographs of the H-Field shoreline, located south of O-Field. Pockets of resistant benches can be seen throughout the area. The right hand picture depicts relatively stable clay material, and compacted hard clays that support a secondary bench. Mr. Larson displayed a photograph of new and old tree falls in western H-Field. The old trees were originally located 100 feet offshore, and have been pushed back onshore. Newer trees located on the edge of the shore zone have fallen over, and erosion in the area can be observed. The trees along the shoreline will likely protect the bluff from erosion caused by a moderate storm.

Mr. Larson displayed several photographs of J-Field shorelines, located south of H-Field. Toppled trees can be seen in photographs of northwestern and southwestern J-Field. Mounds have formed among trees in a southwestern J-Field shoreline, and shoreline protection will be implemented in this area. Mr. Larson stated that riprap and concrete construction material riprap zones characterize the eastern side of the J-Field shoreline. A beach zone is located north of the riprap zones, and south of Boone Creek. The

majority of erosion in this area occurred along the shore zone bench, which stands a couple feet high. The shoreline has retreated by several feet, and some of the major tree blow-downs have occurred in the shoreline end section depicted in a photograph. Tree root balls and the bluff that retreated by several feet are depicted in another photograph.

Mr. Larson displayed a slide containing photographs of the I-Field shoreline. I-Field is characterized by lower relief benches, and experienced less retreat than other shorelines as wave energy was dissipated above the benches. Shoreline retreat in eastern I-Field was by approximately 8 feet. A low bench, Terrace 1, can be observed in the photographs.

Mr. Larson displayed a slide containing photographs of the E-Field shoreline. Resistant short bench erosion and clumps of vegetation that retained soil offshore can be observed in the area. The maximum observed shoreline erosion was by 8 feet, in pockets.

Mr. Stachiw asked if the shoreline of Boone Creek could be seen in the photographs. Mr. Larson stated that the photograph was taken just north of Boone Creek.

Mr. Larson displayed a slide containing photographs of large-scale bank retreat at D-Field, just north of Sandy Point. Some of the more massive shoreline retreats occurred in D-Field. The retreat of a high bank, approximately 8 feet in height, occurred in the magnitude of 15 feet. A secondary beach in the area retreated by 10 to 12 feet. Mr. Jason Ebrite (General Physics Corporation) can address questions regarding the future installation of an engineering structure to protect the D-Field shoreline.

Mr. Larson displayed a slide containing photographs of medium height bank retreat at D-Field. Retreat was less than the adjacent high banks, and slumping can be observed. In some areas, banks have retreated by 10 feet, resulting in a shoreline located within 4 to 5 feet of a groundwater monitoring well with protection posts.

Mr. Larson displayed a slide containing photographs of bluff retreat at D-Field, looking northward toward Briery Point. It is not a hard-fast rule that only higher bluffs covered with large trees experience the most slumps. Seepage has been ongoing over the years at a high bluff in D-Field. Collapses of wet, muddy, clay materials have been observed. Further slumping occurs when fallen material is removed from the area, and the bluff has retreated significantly.

Mr. Larson displayed a slide containing photographs of the northernmost shoreline at D-Field, at Briery Point. The area is characterized by a sand dune section, and shoreline bluff retreat by approximately 6 feet. The bluff is a north-facing surface, and retreat beaches can be observed. Bank slump occurred in an area near Coopers Creek, and a series of fallen trees resulting from bluff retreat by 6 to 8 feet can be observed.

Mr. Larson displayed a slide containing photographs of the L-Field shoreline, just south of Doves Cove. The same type of geology as O-Field can be observed, whereby the bottom of the bank slope is covered with a blocky clay material. Erosional effects are the same, and retreat by 8 to 10 feet, with moderate tree collapses, has occurred.

Mr. Larson displayed a slide depicting a map of the Edgewood Area of APG, with erosion rates along shorelines classified. Retaining wall damage is depicted in purple, high rates in red, moderate rates in yellow, and low rates in green. The map is subjective, as rates were assigned based on a walk around the shoreline and evaluation of geology.

Mr. Larson displayed a slide depicting a map of the Edgewood Area of APG, with erosion rates at areas of potential material exposure classified. Erosion rates in the Westwood area were pointed out. An old landfill in Westwood, likely related to old cabins, served as a landfill for local people, and contains material that could be potentially exposed. There is a high potential of exposure near Reardon Creek. Kings Creek has low to moderate erosion rates in areas of potential exposure. There are moderate erosion rates near the Eastern Chemical Depot, with concerns for exposure.

Mr. Larson stated that priorities have been assigned to shorelines, and are either shore zone priorities or facility structure (FS) priorities.

Ms. Grochowski questioned what materials at the Reardon Inlet could potentially be exposed. Mr. Larson stated that he had spoken to DSHE Project Officers, and asked for areas they considered significant for erosion and concerns. Ms. Cindy Powels (DSHE ECRD Project Officer) provided information that material could be exposed at Reardon Inlet, and presents a concern. Mr. Stachiw stated that Ms. Powels would have to be contacted. A landfill is not known to be present in the area, but small pockets of material have been identified.

Ms. Grochowski asked if the other area of shoreline concern in Westwood is at the landfill. Mr. Larson stated that small old bottles, medicine bottles, and eyedropper bottles were observed during a walk of the shoreline. The bottles appeared to have been deposited by local people using the area as a landfill. Mr. Stachiw stated that small metals concentrations have been detected in small pockets, and are not indicative of a major landfill, such as the Westwood Area Landfill that covers 10 acres.

Ms. Grochowski stated that she has two concerns. The Westwood area shoreline classified with a low retreat rate in an area of potential material exposure is located closest to the community, and to boaters who do not always follow boating rules. Mr. Stachiw stated that the Westwood Study Area would be presented at the July 2004 RAB Meeting. Ms. Powels could then address any concerns.

Ms. Grochowski stated that her concerns also extend to the moderate shoreline retreat areas depicted on the map, near the Eastern Chemical Depot. Mr. Larson stated that the area was classified due to erosion encroaching within 4 to 5 feet of a secure, fenced in area. Mr. Stachiw stated that a number of dump sites are located in that area.

Mr. Kappler asked if ordnance or other materials, other than the small bottles, were visible during the shoreline walk. Mr. Larson stated that he tried to walk on top of banks, and along shorelines where possible. No other materials, besides the bottles, were seen in that area. The only other exposed materials seen during a walk of the entire shore zone included six to eight expended rounds, nothing to be considered active. Shoreline areas appeared to be surprisingly clean.

Mr. Kappler asked if a count was made of the toppled trees. Mr. Larson stated that an overall count had not been conducted. In D-Field, where the pinned bank was located also had tagged witness trees. All but one of the witness trees are now gone. A year later at O-Field, trees at the brink of bluffs were spray painted with one dot, and trees 8 to 12 feet from the brink were painted with a few dots. The only painted trees remaining in the highland areas number just a few, and were originally painted 8 to 12 feet away from the brink. They are now close to toppling from the edge.

Mr. Kappler asked if toppled trees could become boating hazards. Mr. Larson acknowledged that the possibility exists, though most areas are classified with shallow waters that would prohibit boats from moving in close to shorelines. Boats have not been seen close to shore, near the trees, and subsequent storms may push the trees closer to shore. Most trees have a strong root mass, and will remain near the

shoreline, until the mass decays and buoyant trees are pushed inland by storms. Mr. Stachiw noted that a good point had been raised.

Mr. Kappler expressed concern that trees may break free from the shoreline, and present boating hazards. Mr. Stachiw stated that a count has not been conducted. The Safety Office could be involved with such concerns, and be aware of the potential problem.

Mr. Larson informed RAB Members that the number of pictures presented in the slide show represent less than one fourth of the photographs contained in the distributed report. Dead trees have not been observed away from shorelines.

Mr. Larson displayed a map depicting northern Edgewood Area shoreline protection priorities. Priorities are divided into shore zone priorities and FS priorities. Some of the priorities depicted on the map are already being addressed. The retaining wall previously discussed may require maintenance repairs. Erosion control is planned for Kings Creek. The location of planned wetland development was pointed out.

Mr. Stachiw asked if shorelines classified with the most significant priorities are areas of significant concern, or possess the potential to release hazardous materials into the water. Mr. Larson stated that shore zone priorities involve a potential to release materials into the water. FS priorities involve structures that are physically in jeopardy, such as the encroachment of shoreline too close to structures.

Mr. Stachiw noted that the mention of concerns at the Old O-Field Groundwater Treatment Facility (GWTF). Mr. Larson stated that the shoreline around the GWTF is a heavy riprap area, and in good shape. Just south of the riprap zone is an area of shore zone concern.

Mr. Stachiw stated that Project Officers evaluated the presented maps, and did not express any issues with them. The AEC will also review the maps. The maps do present Mr. Larson's opinion on shoreline conditions, and are not a formal statement on those conditions. Disagreement on presented shoreline priorities can be presented and evaluated. The presentation does provide a comprehensive study on overall shoreline protection, how it relates to the IRP, and presents boater safety issues.

Ms. Young stated that the presentation was very helpful, and questioned how the root strength of a live tree would compare to the root strength of a dead tree. Mr. Larson stated that is unknown if studies comparing tensile strength in live and dead roots has been conducted. Photographs provided in the report show a tree about to fall with an apparently dead root mass. That root mass is still adequate to support the tree mass.

Ms. Young asked if signs damaged by erosion had been replaced. Ms. Golding stated that some signs may not have been replaced as of yet, due to eagle exclusion zone restrictions. Mr. Stachiw stated that the replacement of damaged signs could be verified once the nesting season had ended.

Ms. Young asked if the construction of a stone retaining wall at present day would utilize different engineering technology than the retaining wall depicted earlier in the presentation. Mr. Stachiw stated that engineering technology would likely be different. The retaining wall presented was likely constructed for aesthetic and protective purposes, and may be expensive to maintain. The retaining wall may not even work for protective purposes, and other solutions are being evaluated. Some structures constructed for shoreline protection actually shift erosional problems further up shore, and solutions must be effective without transferring the problem to other areas.

Mr. McWilliams noted that good and effective solutions are not easy to find. Tributary group meetings have presented ecological reasons against the use of bulkheads. Riprap protection for shorelines was popular, as it is effective for preventing erosion, but has recently raised ecological concerns over problems it may cause for animals. Large trees standing at the brink of bluffs tend to pull down a large amount of material with them when they topple. All of the pros and cons for shoreline protective measures need to be evaluated before a decision is made.

Mr. Kappler asked how eroded portions of the shoreline where glass bottles had been exposed have fared. Mr. Larson stated that Kings Creek was not badly affected by the hurricane, and experienced only 1 foot of retreat. A large amount of organic material stabilized the bank.

Mr. Kappler asked if the location was characterized as a hardened riprap area. Mr. Stachiw stated that the riprap was temporary, but the shoreline remained relatively intact.

Mr. Dye asked if any modeling had been conducted to predict how the next storm event, such as a 100-year storm or Category 5 hurricane, might contribute to erosion. Hurricane Isabel did not travel up the Chesapeake Bay as predicted, but did create a water surge. Mr. Miller stated that the WES conducts that type of modeling, but it is uncertain if it has been conducted for such a situation.

VI. INTERMISSION

At 8:30 p.m., after confirming that no one present had further questions, Mr. Stachiw requested a 15-minute break. At 8:45 p.m. the meeting resumed.

VII. INSTALLATION ACTION PLAN DISCUSSION

A discussion of the Installation Action Plan for the Other Edgewood Areas sites was held. Meeting attendees included RAB Members, Mr. Stachiw, and Ms. Golding. Anyone wishing to obtain information regarding the details of the discussion should contact Mr. Stachiw.

VIII. CLOSING REMARKS

At 9:50 p.m., after confirming that no one present had further questions, Mr. Stachiw adjourned the meeting. The next APG IRP RAB Meeting will be held on Thursday, 24 June 2004 at 7:00 pm in the Edgewood Senior Center. The topic of discussion will be the Lauderick Creek Study Area.