

MINUTES

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

THURSDAY, 24 JUNE 2004

7:00 p.m. – 9:30 p.m.

EDGEWOOD SENIOR CENTER

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING:

Mr. Kevin Barnaba	Mr. Ted Henry
Ms. Glenda Bowling	Ms. Mary Moses (Harford County Emergency Operations Center)
Mr. Arlen Crabb	Mr. Ken Stachiw (Army Co-Chair)
Mr. Roy Dietz	Mr. Frank Vavra (U.S. Environmental Protection Agency)
Mr. Butch Dye (Maryland Department of the Environment)	Mr. Dennis Warwick
Ms. Christine Grochowski (Community Co-Chair)	Ms. Ruth Ann Young

RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING:

Ms. Mandi Elliott-Bird	Mr. Thomas G. McWilliams
Mr. Greg Kappler	Mr. Dan Pazdersky

ENCLOSURES TO THESE MINUTES:

- 1: Roster of Meeting Attendees
- 2: Agenda
- 3: July 2004 Calendar of Events
- 4: Boundary and Shoreline UXO Issues Presentation Materials
- 5: Lauderick Creek Study Area Presentation Materials

I. EXECUTIVE SUMMARY

Administrative Comments

Mr. Ken Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECDR)) reported that a sign-up sheet for RAB Members was passed around to determine an agreeable time for a boat tour of selected shoreline erosion points. Representatives from the US Army Center for Health Promotion and Preventative Medicine (USACHPPM) were in attendance to observe the RAB meeting as part of their nationwide study of RABs.

Perchlorate Detections Update

Mr. Stachiw displayed a slide depicting results from the latest round of perchlorate sampling. The perchlorate detections reported from the City of Aberdeen 15 June 2004 sampling event ranged from non-detect to 1.8 parts per billion (ppb). A result of 0.44J ppb was reported for the finished water. Mr. Stachiw reported that the ion-exchange filter system was installed on City of Aberdeen Production (CAP) Well 9. Perchlorate levels detected before passing through the filter were above 1 ppb; and were non-detect after passing through the filter.

Boundary And Shoreline Unexploded Ordnance (UXO) Issues Update

Mr. Rurik Loder (DSHE ECRD) provided an update on outstanding issues with regard to the boundary and unexploded ordnance (UXO). Two boundary surveys have been completed in 2003 and 2004 including the Edgewood Area Northern Boundary Survey and the Edgewood Area Shoreline Survey. Based on findings of the Shoreline Survey, a removal action was initiated at J-Field.

Fieldwork for the Northern Boundary Survey was initiated in 2003 and completed in May 2004. A total of 581 grids were surveyed. The survey used electromagnetic (EM) equipment that measures the electromagnetism of an object by inducing a field. The equipment also records locations of the identified anomalies and can produce digital pictures of the anomalies. An Internal Draft Report is expected in July 2004. Based on findings in the Report, a determination will be made as to what anomalies need to be investigated, and which funding mechanism will be most appropriate.

The US Army Technical Escort Unit (TEU) and the Army Test Center (ATC) are conducting the Edgewood Shoreline Sweep. To date, 20 rounds have been discovered. Progress has been slowed due to access during low tides, Eagle nesting restrictions, and range activities. During the Shoreline Sweep, a burn pit was identified in J-Field. The removal action is approximately 60% complete, and expected to be finished within Fiscal Year (FY) 2004. Subject to funding availability, the Shoreline Boundary Sweep is expected to be completed during FY05.

Lauderick Creek Study Area

Mr. Don Green provided an update on the Lauderick Creek Study Area including Cluster 13 Draft Feasibility Study (FS) preliminary alternatives and costs, Cluster 9 groundwater sampling results, schedule for Cluster 5, Nike Southwest Landfill long-term monitoring and treatment system, and Nike groundwater operations and maintenance.

Cluster 13

Mr. Green reported that the Cluster 13 source areas of contamination include the Northern, Primary, Eastern, and Southeastern Sources. The Preliminary Remedial Alternatives and associated costs identified for Cluster 13 include no action (\$110,000); Technical Impracticability (TI) Waiver with long-term monitoring (LTM) and land use controls (LUCs) (\$1,257,000); dense non-aqueous phase liquid (DNAPL) source zone remediation employing bimetallic nanoscale particles with LTM and LUCs with a TI waiver contingency (\$4,708,000); DNAPL source zone remediation employing vitamin B12 with LTM and LUCs with a TI waiver contingency (\$5,107,000); hydraulic containment of a larger portion of the VOC plume and a larger portion of the DNAPL source areas with LTM and LUCs (\$11,181,000); and construction of an enhanced wetland, with alternate concentration limits (ACLs) with LTM and LUCs (\$1,938,000).

Cluster 9 Groundwater Investigation

Mr. Green stated that the Remedial Investigation (RI) Risk Assessment indicated acceptable industrial-use risk level from worker ingestion of groundwater. However, trichloroethene (TCE) and 1,1-dichloroethene (1,1-DCE) concentrations were detected at concentrations greater than the Maximum Contaminant Levels (MCLs) and the Environmental Protection Agency (EPA) indicated the need for further evaluation. A groundwater investigation was completed to obtain volatile organic compound (VOC) distribution data in the unsaturated zone and surficial aquifer to delineate potential VOC source areas, to obtain vadose zone permeability characteristics, and evaluate VOC mass estimates.

Results of soil gas and subsurface sampling indicate the presence of residual chlorinated VOCs within a vadose zone source area approximately 60 feet by 120 feet. The most commonly detected VOCs found in the groundwater included TCE, 1,1,1-trichloroethane, and 1,1-DCE. The VOC plumes within the upper and lower sections of the surficial aquifer are estimated at approximately 2.5 and 1.5 acres respectively. Soil vapor extraction could be successful in remediation of the vadose zone at Cluster 9 based on test conducted.

Cluster 5

Mr. Green reported that the Cluster 5 waste removal action was mobilized during the Spring 2003. Brush clearing and site reconnaissance was conducted during the Summer 2003. The field crew will be remobilized and waste recovery operations will commence during the Summer and Fall 2004. Waste recovery operations are expected to be completed within approximately six months of remobilization.

Former Nike Site Groundwater Plume Long-Term Monitoring and Treatment System Update

Mr. Green reported that, since January 2000, the Treatment System has 39,419 hours total run time at 93% efficiency. The 2,000 pounds of activated carbon were replaced in January 2004. The long-term monitoring program involves collection of quarterly groundwater samples at six sentry wells and eight extraction wells. Sampling results indicate a generally decreasing trend of TCE concentrations. Groundwater level measurements are taken quarterly at 67 wells. Levels indicate that the extraction well network is effectively containing the plume.

Nike Southwest Landfill Cap Operations and Maintenance

Mr. Green reported that groundwater samples were collected from three monitoring wells in April 2003. One monitoring well was located upgradient of the Landfill and two wells were located downgradient of the Landfill. The results did not show any groundwater contamination resulting from the Southwest Landfill. Vent gas samples were collected from two vents in October 2003. The results did not indicate a release of landfill gases to the atmosphere. The Spring inspection completed in April 2004 identified deficiencies including small animal encroachment, and ponding where the perimeter access road drains into a wooded area. Maintenance performed in 2004 included repairs of groundhog burrows, regrading of stone drainage areas, and the addition and regrading of topsoil to improve drainage from the access road

to the wooded area along the western side of the landfill. A fall inspection and additional vent gas monitoring is scheduled for October 2004.

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, 24 June 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 July 2004 (Enclosure 3), a copy of the Boundary and Shoreline Unexploded Ordnance (UXO) Issues presentation (Enclosure 4), and a copy of the Lauderick Creek Study Area presentation (Enclosure 5).

Mr. Stachiw stated that representatives from the Army Environmental Center (AEC) and Center for Health Promotion and Preventative Medicine (CHPPM) were present at the meeting. They have been tasked to look at RABs nationwide, and evaluate their progress. Mr. Stachiw introduced Ms. Judith Bradbury (Pacific Northwest National Laboratory (PNNL)).

Ms. Bradbury greeted RAB Members. PNNL was tasked by the AEC and CHPPM to conduct a study on several RABs across the nation, and APG was selected for the study. Representatives from PNNL will observe the RAB meeting, and would like to meet with RAB Members to gain their perspective on RAB experiences. The study will be published in the Fall 2004, and a draft will be sent to RAB Members for comments and corrections.

Mr. Stachiw reminded RAB Members that an Army Audit Agency (AAA) Audit to evaluate the effectiveness of program management and oversight for the IRP would be ongoing until November 2004. RAB Members should remember that each study has a different purpose and goal.

Mr. Stachiw questioned if a date had been established for a shoreline boat tour. Ms. Katrina Harris (General Physics Corporation) stated that a sign up sheet would be passed around to RAB Members during the meeting, to determine the number of people interested in the tour. A potential date and the number of boats needed will then be established.

Mr. Stachiw stated that tours of Graces Quarters and Carroll Island on June 10 and 12, 2004 were successful, with good attendance. The tour covered groundwater sites and shoreline protection activities in the area.

III. PERCHLORATE DETECTIONS UPDATE

Mr. Stachiw displayed a map of perchlorate detections at the City of Aberdeen Production (CAP) Wells. Detections ranged from non-detect (ND) to 1.4 parts per billion (ppb). A result of 0.44 J ppb was reported for finished water. CAP Well 9 is currently running, following completion of the ion exchange system installation. Perchlorate levels detected before passing through the filter were above 1 ppb; and were non-detect after passing through the filter. Results are encouraging.

Ms. Christine Grochowski (RAB Co-Chair) asked if perchlorate detection results were changing significantly, as a result of the ion exchange system. Mr. Stachiw stated that decreases did not appear to

be significant, though CAP Well 8 and finished water had decreased somewhat. An ion exchange system is also being considered for CAP Well 3. Ms. Ruth Ann Young (RAB Member) stated that systems are being considered for two more wells, but the systems are expensive.

Mr. Stachiw reiterated that results from the exchange system are encouraging. It is harder to achieve a decrease when dealing with smaller concentrations, rather than larger ones. For example, a 98 percent concentration removal from approximately 50 ppb to 2 ppb is easier to achieve than a decrease from 2 ppb to 0 ppb. It will be interesting to see how the system performs over time.

Mr. Ted Henry (RAB Member) questioned why a second concentration of 1.8 ppb was also listed for CAP Well 9. Mr. Stachiw stated that he is not certain why two results are listed.

Ms. Young stated that Mr. Randy Robertson should be contacted with regard to CAP Well 12. According to a note made in March 2004, CAP Well 12, not listed on the map, is currently online. It is located near CAP Well 3, and its operation should be verified. Mr. Stachiw stated that the operation of CAP Well 12 would be verified.

Mr. Stachiw stated that the Strategic Environmental Research and Development Program (SERDP), which may help with the remediation of perchlorate-contaminated soil located near the CAP wells, has been evaluating information on the site. The group provides funding for the Department of Defense (DOD) and possibly Department of Energy (DOE) to conduct strategic environmental research. An evaluation may be provided by August 2004 as to whether or not the site meets their remediation criteria.

After confirming RAB Members had no further comments, Mr. Stachiw introduced Mr. Rurik Loder (DSHE ECRD) to provide the update on Boundary and Shoreline UXO Issues.

IV. BOUNDARY AND SHORELINE UXO ISSUES

Mr. Loder stated that the Edgewood Northern Boundary Survey began approximately one year ago, following a previous survey whereby magnetometers were used to detect UXO within a grid. The Edgewood Northern Boundary Survey is a step beyond the original survey. The EA Shoreline Survey was instituted as a result of Hurricane Isabel and significant shoreline loss. Initial concerns centered on exposed materials, and thus initiated removal action at J-Field.

Mr. Loder displayed a slide depicting a map of the northern Edgewood Area. The survey does not cover a large portion of the Lauderick Creek Area, as it is considered relatively clean. The survey is focused on the central part of Canal Creek, extending to the Westwood area. The Westwood Landfill was not surveyed, as it is now closed.

Mr. Loder displayed a slide listing details of the Edgewood Northern Boundary Survey. Fieldwork was initiated in 2003, and was completed in May 2004. A total of 581 grids were surveyed. Grids that could not be covered by electromagnetic (EM) surveys due to Amtrak, railroad ties, or a fence were surveyed by magnetometers and site view. Ideally all work, including analysis, was expected to be completed by May 2004. However, several obstacles such as satellite loss, weather, and swamps, were encountered. Global Positioning System (GPS) satellite loss, caused by tree blockage and satellite shifts for the Iraq War, caused a four-to-five month delay.

Mr. Loder displayed a slide listing details of the previous UXO survey conducted in the Edgewood Area. The magnetometer survey involved rows of eight to ten people walking in a line while searching for

detections. However, in a magnetometer survey, the number and location of detections is not recorded. A request for a more comprehensive and documented survey was then made.

Mr. Loder displayed a slide detailing EM Survey abilities. EM Surveys have been used throughout APG to locate dump and pile sites. The EM Survey records the locations of anomalies, and can produce a digital picture of those anomalies. EM fieldwork is complete, data analysis will be completed in the near future, and an Internal Draft Report is expected in July 2004.

Mr. Loder displayed a slide depicting photographs of EM Survey techniques. Initial efforts involved mounting a GPS system on a person, who would then walk through the grid area while their location was recorded. This method experienced satellite loss in the vicinity of trees, and required a re-survey of those grids. Two different manufacturers were then tested in the search for a better technique. The first manufacturer technique involving a radio beacon, which triangulated position as a person walked through the woods, did not work. The second technique involves a unit containing a prism, and a separate unit at an established location that will track the prism with a laser as it moves, (Trimble system).

Mr. Loder stated that the Trimble system tracks well through trees, and signals for readjustment when a problem occurs. Once three satellites establish a location, the system will work independently of satellites, and is not affected by satellite loss. The Trimble system allowed for faster progress and completion, and is currently used throughout APG.

Mr. Loder displayed slides depicting a survey location in the Westwood area. The picture contains an anomaly, with a stream running through the area. Recorded data is processed through a computer program analyzing for anomalies that fit UXO criteria.

Mr. Loder stated that Northern Boundary Survey activities involved clearing the site, with 100 percent anomaly removal. Four sweeps of the survey area were conducted, with continued UXO discovery. The majority of anomalies were removed, and further sweeps and removal are needed.

Mr. Loder displayed a slide containing example output from a survey grid. Dots presented on the survey map correspond to northing and easting locations, listed with sensory and surface depths. The column J_Total pounds (lbs.) refers to magnetic strength, not anomaly weight. Items such as a thin wire are capable of producing a high, or strong, magnetic anomaly.

Ms. Grochowski asked what other materials could constitute a strong magnetic anomaly. Mr. Loder stated that a large number value for magnetic strength does not necessarily correspond to a large item.

Mr. Arlen Crabb (RAB Member) expressed confusion over the columns labeled 'anomaly depth from sensor' and 'anomaly depth from surface'. Mr. Crabb also questioned if the first anomaly was detected at a depth of approximately 4.5 feet, and if it is known what the item is. Mr. Loder stated that the item was detected approximately 4.5 feet from the surface, and it is unknown what the item is. The actual depths are unknown, as the survey provides only a rough estimate, and anomaly orientation in the ground could affect results. The actual depth of the item could range anywhere between 2 and 6 feet.

Mr. Crabb noted that information from Lauderick Creek UXO activities had been catalogued, and comparison with current removal activities would prove interesting. Mr. Loder stated that the EM survey is not an exact science, but does provide a close estimation for anomalies. AEC first used UXO cleanup technicians to retrieve every anomaly they could find. An EM survey on a vehicle platform (MTADS) was then conducted, and yielded roughly the same results relatively close to the majority of anomalies.

However, not all anomalies could be found at detected locations. A magnetometer sweep of those areas registered items such as rust flakes, though they were not at depth.

Mr. Loder displayed a slide detailing the next steps for the Edgewood Northern Boundary Survey. Report data will be evaluated to determine an approach to address detected anomalies. It is not possible to address all of the anomalies, and suggestions are welcomed. Possible approaches could include addressing areas of previously known UXO detections or training activities, statistically addressing a random number of anomalies, or conducting a combination of options.

Mr. Henry asked if ATC was responsible for the discovery of the o-chlorobenzylidenemalononitrile (CS) grenade. Mr. Loder stated that the CS grenade was discovered in a separate event.

Mr. Stachiw stated that the survey was conducted as a follow on to Lauderick Creek, with the hope of characterizing an area that appears to be a dumpsite. The boundary survey was thought to be the next best step for site characterization, as documented activities could provide relatively reproducible results, and an estimate of possible materials detected in grids. In previous years, a general surface sweep was conducted to evaluate types of rounds found along the boundary. Chemical warfare materiel (CWM) rounds were likely not uncovered, and previous data needs to be evaluated to determine what, if anything was found. Environmental Photographic Interpretation Center (EPIC) photographs were evaluated from a different perspective last year, and are currently being used to address concerns that CWM rounds or UXO may be present in the Canal Creek and Westwood areas.

Mr. Loder noted that the survey provides a beginning point to more proactive efforts. Once an approach has been determined, efforts to uncover and dispose of anomalies can commence.

Mr. Henry questioned who had conducted the surface sweep that uncovered the CS grenade in the Westwood Cluster 2 area. Mr. Stachiw stated that it might have been uncovered during remedial investigation (RI) and test dig activities. Information on who conducted the sweep can be provided to Mr. Henry. Mr. Loder noted that the information produced by the surface sweep could be used to skew the search for anomalies to the Westwood Cluster 2 Area.

Mr. Loder displayed a slide providing information on the Edgewood Shoreline Sweep. The sweep was conducted in response to the effects of Hurricane Isabel, and may be conducted on a yearly basis. The shorelines should be constantly monitored, as erosion problems will continue to occur until the shorelines are hardened and protected. Mr. Stachiw noted that Mr. Steve Hirsh (EPA) also highly recommended an annual shoreline sweep, prior to the hurricane.

Mr. Loder stated that the sweep was originally slated to search for munition piles and dumps, and to address concerns stemming from the discovery of glassware at Bush River. The sweep consisted mostly of a visual survey along the beach and bank, without the use of magnetometers. Twenty rounds have been uncovered thus far.

Mr. Loder stated that progress has been slowed due to high tides, eagle restriction zones, and vigorous range activities. It is preferable to conduct the sweep during the winter, as work should be conducted at low tide. All accessible areas have been covered, and previously inaccessible areas will be addressed. The eagle restriction zone has been lifted, and the Technical Escort Unit (TEU) will be mobilized to those areas.

Mr. Stachiw reminded RAB Members that June 15 is the provisional end date for the eagle nesting period at active nests. The date has passed, and restricted zones in a 500-meter diameter around the nests are now accessible.

Mr. Henry requested to be provided with information on eagles from Mr. Jim Pottie (DSHE ECRD). Mr. Stachiw stated that Mr. Pottie had provided an eagle fact sheet, which was distributed as an attachment to the 27 May 2004 RAB Meeting Minutes.

Mr. Loder displayed a slide containing a color-coded map of the Edgewood shoreline, with a list of UXO uncovered in each area. The majority of materials were uncovered in the Bush River area, with a small amount uncovered in the Gunpowder area. One 4.2-inch mortar was uncovered at Doves Cove, and two were found at Maxwell Point. The 75 mm shrapnel projectile and 4.2-inch mortar rounds were found at H-Field. One 90 mm heat round, 2.75-inch rocket, and 155 mm projectile were uncovered near I-Field. The locations of the Bush River site and uncovered 2.75-inch rocket warhead were pointed out. Uncovered items were found on different days, and some were easily spotted lying on the surface. Discovered rounds are disposed of immediately, and all rounds listed on the slide have been destroyed.

Mr. Henry questioned what the asterisk next to some of the listed rounds denoted. Mr. Loder stated that the asterisk was included as a reference for corresponding photographs, and should have been deleted.

Mr. Henry questioned if any of the destroyed rounds contained CWM. Mr. Loder stated that no rounds contained CWM. The 4.2-inch mortars contained holes, and no CWM. Any uncovered potential CWM would be handled in accordance with established response and operational procedures.

Mr. Crabb questioned where the 75 mm shrapnel round was uncovered, and expressed concern over the potential damage it could cause. The round could project shards outward over a 250-meter area. Mr. Crabb would like to be provided with more information regarding the 75 mm round and other types of projectiles discovered in shoreline sweeps. Mr. Loder indicated the location where the 75 mm round was uncovered on the map, and stated that the round was not the type to project shards outward. The round was destroyed because it was in poor condition. More information will be provided to Mr. Crabb. Mr. Henry expressed concern that the type of projectile rounds should be identified, as people may come into contact with them.

Mr. Stachiw questioned if it could be determined whether rounds had rolled onto the shoreline, or if they were exposed due to erosion. Mr. Loder stated that some rounds were found in Phragmites, and could have been either buried or not picked up after they were fired. Some rounds were found lying on the surface, and it is difficult to determine if they were buried, or had rolled to the shore. Mr. Henry clarified that rounds found lying on the surface were not similar to rounds discovered sticking out from banks.

Mr. Dennis Warwick (RAB Member) questioned if any consideration had been given to conducting a shoreline sweep of the Aberdeen Area. Mr. Loder stated that no consideration has currently been given to Abbey Point, as it is considered to be addressed. A shoreline sweep is more difficult to conduct in the Aberdeen Area, as Phragmites are more prevalent along the shoreline. Edgewood shorelines are characterized by high bluffs, and present a different situation.

Mr. Stachiw stated that the Aberdeen shoreline has been considered, and a sweep may be possible once funding issues have been evaluated and the Edgewood Shoreline Sweep has been completed. Mr. Loder stated that a preliminary discussion was held with ATC and others in the Aberdeen Area regarding a shoreline sweep. Abbey Point is a special case, as it is an open detonation site.

Mr. Henry expressed concern that items are present on the Aberdeen shoreline. Mr. Loder noted that there are items on the Aberdeen shoreline that need to be recovered.

Mr. Loder displayed a slide providing information on the J-Field burn pit removal. Progress has been slow, as work must be carried out during low tide, and scheduling conflicts related to mustard decontamination activities have occurred. Progress may increase as more people are brought in to help with activities. Completion is expected for fiscal year (FY) 2004.

Mr. Henry questioned what would entail the mustard decontamination issue. Mr. Loder stated that due to a manpower shortage, people have been shifted from the burn pit removal project to the decontamination project for the Non-Stockpile Program.

Mr. Loder displayed a slide detailing a schedule of activities for FY04 and FY05. The Edgewood Survey Report for the Edgewood Northern Boundary Survey will be reviewed, and potential targets for further investigation will be selected. Permission to investigate findings will be obtained, and funding will be determined. Attempts to obtain funding to conduct the survey on a yearly basis will be made.

Mr. Stachiw noted that funding appears to be moving toward the direction of the Military Munitions Response Program (MMRP), which is a Defense Environmental Restoration Account (DERA) item for UXO geared toward closed range studies. Other funding categories for UXO issues are possible, and some sites at Edgewood may qualify for them. Higher Headquarters will review Edgewood shoreline documentation, and may designate compliance money. Disputes over whether a range is truly closed, especially along the boundary line, may occur and could affect the type of funding obtained. For example, some Westwood areas are not considered to be open ranges, but are not technically closed either. Consideration must also be given to a proposal whereby military bases would be responsible for funding such projects themselves, separate from compliance and MMRP funding. Base funding for salaries alone is limited, but UXO cleanup would be a requirement, further utilizing base funds.

Mr. Stachiw stated that it is not certain where shoreline-UXO work fits into a list of priorities. More information can be provided as efforts progress, and as a focus is established. The focus could be more centered on pits, mixed waste, or UXO. Future efforts are currently uncertain, but a recommendation that funds be set aside for emergency purposes upon the discovery of UXO items will be made to the Commander. UXO discovery resulting from IRP activities would not present an issue. However, UXO discovery in locations not delineated as Defense Site Environmental Restoration Tracking System (DSERTS) sites will be problematic, especially in the Aberdeen area.

Mr. Henry questioned how long the funding confusion has existed, and if indications were made that compliance funding would not be available to address UXO shoreline issues. Mr. Stachiw stated that funding issues have been ongoing for the last few months. It is uncertain if compliance funding will be available for UXO shoreline issues, but it appears that funding may not be available.

Mr. Loder stated that Mr. Naren Desai (DSHE ECRD Project Officer) is evaluating the issue for the best method to obtain funding. Mr. Stachiw noted that Mr. Desai's efforts would be focused mainly on disposal pits, as opposed to rounds discovered on the shoreline.

Mr. Henry questioned if Mr. Desai's work is primarily focused on disposal pits. Mr. Stachiw stated that there are ongoing efforts to locate disposal pits.

Mr. Henry requested a general estimate for the cost of typical mobilization upon the discovery of munitions along the shoreline. Mr. Stachiw noted that such issues occur, at times independent of IRP

activities. People on construction sites, project sites, and out fishing have discovered UXO items. A response is required, and APG usually pays for the cost of removal. Further information will be provided to Mr. Henry.

Mr. Loder stated that 911 was called for the removal and disposal of UXO items discovered during the shoreline sweep. Technicians at 911 are required to remove the item if they are called. Mr. Henry expressed concern over what funding source would be required to pay for the 911 removal of UXO items.

Mr. Frank Vavra (EPA) reported that the Aberdeen Area EPIC Boundary Study Report has passed through Operations and Security (OPSEC), and is currently available.

After confirming that no one present had any further questions, Mr. Stachiw introduced Mr. Don Green (DSHE ECRD Project Officer) to provide the Lauderick Creek Study Area Update.

V. LAUDERICK CREEK STUDY AREA

Mr. Green stated that the presentation would cover the Cluster 13 Draft Feasibility Study (FS) preliminary alternatives and costs, Cluster 9 groundwater results, Cluster 5 activities, and updates on the Nike Landfill and Groundwater Treatment Facility.

Mr. Green stated that a surface sweep of the 0.25-mile boundary area along Graces Quarters and Carroll Island was conducted in 2000 and 2001. Metals items detected by magnetometers were removed. No UXO items were uncovered.

Cluster 13

Mr. Green displayed a slide depicting the location of Cluster 13 at APG. Cluster 13 is comprised of a 1,300-acre peninsula along the northern boundary of Edgewood, bounded by the Bush River and Lauderick Creek. It is located near the National Guard site, also known as School Fields I and II. The Army Chemical School used School Fields for training exercises between World War I (WWI) and WWII. Decontamination training exercises resulted in 1,1,2,2-tetrachloroethane (TeCA) groundwater contamination.

Mr. Green displayed a slide depicting a map of Cluster 13 volatile organic compound (VOC) source areas. The highest concentrations of TeCA in the Edgewood Area are located in Cluster 13. Carbon tetrachloride and trichloroethylene (TCE) have also been detected in this area. Blue areas on the map represent areas where VOC detections are greater than 10,000 ppb, and may contain Dense Non Aqueous Phase Liquid (DNAPL). Several source areas have been identified, and need to be addressed.

Mr. Warwick questioned what VOC concentrations were previously reported for Cluster 13, and if present day concentrations are significantly different. Mr. Green stated that a contamination map from a few years ago would be similar to a present day map. Contamination at the site dates from the 1940s and 1950s, and the concentrations have been present for 50 years. A large subsurface solvent source must still be present, and significant concentration decreases will not be observed for hundreds of years. The Waterways Experiment Station (WES) used a computer model to estimate the amount of solvent discharged to surface water at approximately 35 gallons per year.

Mr. Green displayed slides listing Cluster 13 preliminary remedial alternatives. Considered alternatives for the FS include No Action, Technical Impracticability (TI) Waivers with long-term monitoring (LTM) and land use controls (LUCs), and DNAPL source zone remediation through bimetallic nanoscale particle

(nano-iron) with LTM, LUCs, and TI waiver contingency. The TI Waiver alternative would be implemented if clean up were deemed impossible.

Mr. Green explained that DNAPL remediation requires a strongly reducing groundwater condition. Iron filings would be successful for the remediation of TCE, but a stronger reducing condition is needed to remediate TeCA. Microscopic particles of iron are coated with palladium, hence bimetallic, injected into the groundwater, and circulated to remove TeCA. Bench scale studies have shown nano-iron to be successful, but it is unknown if it will be successful *in situ*.

Mr. Green stated that other remedial alternatives include DNAPL source zone remediation through vitamin B12 injection with LTM, LUCs, and a TI waiver contingency, hydraulic containment of a larger portion of the VOC plume and DNAPL source areas with LTM and LUCs, and construction of an enhanced wetland with alternate concentration limits (ACLs), LTM, and LUCs. Vitamin B12 is planned for use at Graces Quarters, and is known to be successful for TeCA remediation. Hydraulic containment would involve a pump and treat system, similar to the one at Canal Creek, to prevent contaminant discharge to Lauderick Creek.

Mr. Green stated that the United States Geological Survey (USGS) has shown that wetlands provide successful bioremediation for TeCA and other VOCs. VOC breakthroughs, especially at groundwater seeps, and detections of high concentrations flowing into the creek have been observed in the Lauderick Creek area. Coordination with the EPA and Biological Technical Assistance Group (BTAG) has yielded the opinion that bioremediation would not present an ecological problem; as such a small area would be affected. Increasing the size of the wetlands could further enhance wetland remediation.

Mr. Henry questioned if the plume currently passes through an already existing wetland, and the depth of the source areas. Mr. Green stated that the wetland already exists, but is not currently remediating all of the VOCs due such high concentrations passing through. The source areas range from 20 to 30 feet deep.

Mr. Green displayed a slide listing estimated costs for preliminary remedial alternatives. The No Action alternative is estimated at \$110,000, for paperwork costs. Estimates include the TI Waiver with LTM and LUCs at \$1,257,000 for 30 years, Nano-iron at \$4.7 million, Vitamin B12 at \$5.1 million, hydraulic containment at \$11.1 million for 30 years, and wetland construction at \$1.9 million. The cost for hydraulic containment is for 30 years, but could be infinite if containment is required for hundreds of years. The combination of alternatives is also possible, such as implementing Nano-iron in one location and Vitamin B12 in another.

Mr. Stachiw questioned if the costs were estimated for remediation of the entire plume, instead of partial areas of the plume. Mr. Green stated that costs were estimated for the entire plume, and reiterated that combinations could be implemented.

Mr. Henry questioned if multiple aquifers are located in the Cluster 13 area, and noted that the contamination plume is only 30 feet deep. Mr. Green stated that there is one aquifer in the area, and the plume is located at the highest point in the Edgewood Area. The land and cliffs drop down steeply from the upland area to the creek.

Mr. Vavra stated that the EPA has been asked to assist in funding evaluation for several different plumes at APG. Remedial alternative combinations and recommendations can be made for almost all groundwater plumes at APG, with the exception of Cluster 13 and Southern Bush River. The Cluster 13 plume covers a large area, and contains high concentrations of VOCs and DNAPL. Even the implementation of a large amount of aggressive work would not be capable of quickly cleaning up the

area. The EPA is still struggling over possible remedial recommendations for Cluster 13. Mr. Green noted that Cluster 13 is a site where remediation costs may be high, since contaminant concentrations are still thousands of times greater than established drinking water levels.

Mr. Henry noted that modeling data on the volume of contaminant discharged to water bodies each year had not been provided at previous RAB Meetings. Mr. Henry requested information on how modeling is conducted to estimate the volume of a plume contaminant discharged into a body of water each year. Mr. Henry also requested an estimate on the amount of contaminant discharged into rivers and the Chesapeake Bay each year. Mr. Green stated that modeling data was provided almost five years ago, and the calculation for contaminant discharge is relatively simple. Further information can be provided, with an update at a RAB Meeting if needed.

Cluster 9 Groundwater Investigation

Mr. Green displayed a slide depicting the location of Cluster 9 at APG. The location of the Nike Launch Site was indicated along the boundary area. Groundwater in that area is contaminated with TCE. Additional contamination has been discovered in the Launch Control Area, where the radar control tower, Nike missile silos, and electronic shops were located.

Mr. Green displayed a slide listing additional Cluster 9 groundwater investigation rationale. The RI risk assessment indicated an acceptable industrial risk level from worker ingestion of groundwater. However, TCE and 1,1-dichloroethene (1,1-DCE) were detected at concentrations greater than Maximum Contaminant Levels (MCLs). The EPA has indicated a need for further evaluation of the site.

Mr. Green displayed a slide detailing additional groundwater investigation objectives for Cluster 9. VOC distribution data from the unsaturated (vadose) zone and surficial aquifer were obtained to delineate potential VOC source areas. The VOCs of particular interest are TCE and TeCA. Vadose zone permeability characteristics were obtained to evaluate VOC mass estimates. The vadose zone is the unsaturated subsurface area above the groundwater level, which may still contain contaminants.

Mr. Green displayed slides detailing Cluster 9 field activities. Soil gas surveys were conducted at a total of 75 points, over a 3.5-acre area. Three mobilizations of stratigraphic electronic logging and direct push testing (DPT) groundwater sampling at a total of 34 locations were conducted. Thirty-four groundwater samples from the upper section, and 36 samples from the lower section of the surficial aquifer were collected for VOC analysis. The Cluster 9 area contains one aquifer, divided into upper and lower sections by a clay divider.

Mr. Green stated that 12 vadose zone soil samples were collected for VOC analysis from four locations within the identified soil gas source area. Five monitoring wells were installed in the upper section of the surficial aquifer, based upon DPT groundwater results. Natural attenuation and VOC groundwater sampling was performed on five new and three existing monitoring wells.

Mr. Green stated that three rounds of water level measurements were collected from all existing monitoring wells. As part of a pilot study, six soil vapor extraction wells were installed within an identified soil gas source area. TCE may be present in the soil, and not yet have reached the groundwater. Soil vapor sampling and permeability testing were performed to evaluate if TCE removal from the soil is practical. TCE can be removed from soil through a vapor extraction system.

Mr. Green displayed a slide depicting soil gas TCE results. The location of the well that previously exceeded the MCL for TCE (5 ppb) with a concentration of 50 ppb was indicated. Concentrations of

TCE up to 500 ppb were discovered upon the installation of additional wells in the area. The highest concentrations appear to be located along a fence line and road. Additional testing is needed.

Mr. Green displayed a slide listing a summary of soil gas and subsurface soil sampling results. Subsurface soil results showed TCE concentrations up to 90 micrograms per kilogram ($\mu\text{g}/\text{kg}$), 1,1,1-trichloroethane up to 17 $\mu\text{g}/\text{kg}$, and 1,1-dichloroethene up to 5 $\mu\text{g}/\text{kg}$. Soil gas and subsurface sample results indicated the presence of residual chlorinated VOCs within a vadose zone source area of approximately 60 feet by 120 feet.

Mr. Green displayed a slide depicting the locations of Cluster 9 subsurface soil sampling results. Total VOC (TVOC) results are presented on the map. Concentrations vary with depth in areas of soil vapor. A soil profile of SB-02 yielded TVOC results of ND at 3 feet, and 128 ppb at 6 feet. Other sampling locations yielded different soil profiles. A location with significant TCE levels was identified. TCE in that area will gradually leach into the groundwater, providing a source of groundwater contamination if not cleaned up.

Mr. Henry questioned if the locations depicted on the map indicate subsurface soil results, and not soil gas extraction results. Mr. Green stated that the results depicted are from subsurface soil sampling results. Soil gas extraction results are not shown.

Mr. Green displayed slides depicting groundwater TVOC results in the upper and lower surficial aquifers. TCE was detected up to 550 ppb in the upper surficial aquifer at a DPT site located near the fence line. TCE concentrations were detected up to 120 ppb in the lower surficial aquifer.

Mr. Green displayed a slide listing a summary of DPT logging and groundwater sampling results for Cluster 9. The Cluster 9 surficial aquifer can be broadly divided into upper and lower sections. The upper section is approximately 10 to 15 feet thick, and the lower section is approximately 30 feet thick. Discontinuous silt and clay layers separate the upper and lower sections. The most commonly detected VOCs in the groundwater include TCE, 1,1,1-trichloroethane, and 1,1-DCE. The VOC plumes within the upper and lower sections of the surficial aquifer are estimated at an approximate size of 2.5 and 1.5 acres, respectively.

Mr. Green displayed a diagram depicting the upper and lower portions of the surficial aquifer. The topsoil, silt and clay layers, upper section, and lower section were identified. Evaluation of groundwater flow showed that the majority flowed toward the southeast. However, there is an area where a portion of the groundwater flows toward the northwest.

Mr. Green displayed a slide depicting a Cluster 9 surficial aquifer groundwater contour map. Mr. Green reiterated that general groundwater flow is toward the southeast, with a portion of the flow moving toward the northwest. Evaluation of the soil gas TCE results map shows a detection of TCE in the northwest corner of the sampling area. It is uncertain if the northwest groundwater flow is pushing contamination into that area, or if a separate source area is present. Further sampling is needed to define the area.

Mr. Henry questioned what the red dots forming geometric shapes represented on several of the maps presented. Mr. Green stated that the shapes represented former solid waste management units (SWMUs) that were located in the vicinity. An underground storage tank (UST), electrical shop area, and bunker were once located in the area. Mr. Gary Nemeth (General Physics Corporation) stated that the far left geometric shape was a septic system area, the circular area was a bunker site that has since been removed, and the large rectangle is an area where dry wells were located. It is uncertain what the right-hand shape

represents, but it may be where a building once stood. Mr. Green noted that all those areas have been investigated.

Mr. Henry questioned if there are any current activities ongoing in or around Cluster 9. Mr. Green stated that National Guard training activities are ongoing. Mr. Henry asked if the activities area strictly outdoor, and if the National Guard still utilizes a nearby lot. Mr. Green stated that the location Mr. Henry was referring to is located toward the other end of Cluster 9, near a repelling tower.

Mr. Green displayed a slide depicting the soil vapor sampling and permeability testing approach. Six vapor wells were installed between 8 and 12 feet below the ground surface, 20 feet apart, within the perceived vadose zone source area. Soil vapor extraction (SVE) tests were conducted to determine the VOC mass, vapor permeability, and vapor stratification in the vadose zone. SVE test activities include installing a vacuum blower on wells, extracting as much air as possible, and measuring TCE concentrations in the extracted air.

Mr. Green displayed a slide providing a summary of monitoring well VOC sampling results. The detection of 500 ppb was found at a DPT location, not in a monitoring well.

Mr. Green displayed a slide depicting the locations of Cluster 9 groundwater and vapor wells. The location where the SVE tests were conducted along the fence line, with the highest VOC detections, was indicated. The locations of the vapor extraction and groundwater sampling wells were also indicated.

Mr. Green displayed a slide depicting a SVE diagram. Air is extracted from the vapor extraction well by a vacuum, and passes through a vacuum control valve, pressure gauge, and sampling port. Air emissions are treated with granular activated carbon, to ensure that VOCs are not vented to the atmosphere. TCE concentrations in the extracted air can be measured to determine the amount of TCE removed from the soil.

Mr. Green stated that there are two techniques for the SVE process. In the first technique, a vacuum blower is used to extract soil vapor from the ground, and capture TCE as it volatilizes. In the second technique, compounds such as methane are injected into the ground to strip TCE from the groundwater, and draw concentrations into the vapor extraction well. The use of methane or similar compounds will also create redox conditions that affect the concentration of oxygen in the groundwater, and promote the bacterial metabolism of TCE.

Mr. Green displayed a slide of a vapor extraction well used in a SVE test. The extraction pipe running into the well can be seen.

Mr. Green displayed slides detailing SVE test results. Vapor extraction points VP-05 and VP-06 contained the highest initial ambient VOC concentrations at 1,095 and 6,238 $\mu\text{g}/\text{Liter}$ ($\mu\text{g}/\text{L}$), indicating that their screened intervals are within the most VOC-impacted vadose zone soil. VP-01 and VP-04 contained the lowest initial ambient VOC concentrations at 0 and 247 $\mu\text{g}/\text{L}$, per volume. The VOC extraction rate from all six vapor wells operating at a combined total volume of 48 cubic feet per minutes would remove approximately 5 pounds of VOCs per day. The VOC extraction rate should significantly decrease within the first 1 to 2 months of SVE operation.

Ms. Grochowski questioned if the type of contamination observed at Cluster 9 exists at other locations in APG. Mr. Green stated that similar contamination was observed at the fire training area. Contamination at Cluster 9 stems from the Nike site, and was caused in the 1950s and 1960s. The majority of other solvent contamination at APG occurred in the 1930s, and has already reached the groundwater. Vadose

zone solvent contamination has not been detected at other locations in APG. Mr. Nemeth noted that vadose zone contamination at fuel sites has been observed. The majority of other sites consist of shallow groundwater levels, while the Cluster 9 groundwater level is deeper.

Mr. Henry requested that a discussion on the value of conducting ambient air monitoring in the Cluster 9 area be held at a future RAB Meeting. People still train and work in that area, and findings are showing that even low concentrations of TCE present a great risk. TCE has been unexpectedly detected in homes in California, as well as in the ambient outdoor air. Given the estimated concentrations in the vadose zone, Mr. Henry would like to hear the position the IRP, EPA, and MDE take on ambient air detections in this area. Mr. Stachiw stated that the situation could be evaluated.

Mr. Butch Dye (MDE) questioned what happens to the VOCs once they are extracted from the ground. Mr. Green stated that the VOCs are stripped out of the air by a granular activated carbon filter, which is then disposed of as hazardous waste. The workplan was evaluated by MDE, to ensure that air emission standards were met.

Cluster 5

Mr. Green displayed a slide depicting the location of Cluster 5 at APG. A Record of Decision (ROD) was nearly signed for Cluster 5 in 2003. Due to LUC issues, the Army signed the ROD without LUCs, and the EPA refused to sign until the issue was resolved. Presently, all LUC issues have been resolved, and the ROD should be signed in the near future.

Mr. Vavra confirmed that the EPA has commented on the ROD, suggested changes, and moved into the signature stage. Delays in ROD signatures have occurred due to a lawsuit by the National Resources Defense Council (NRDC) over perchlorate issues and the freedom of information.

Mr. Henry questioned if this ROD stipulated a LUC, and the AEC refused to permit the LUC. Mr. Green stated that the Army had contested that LUCs could not be permitted, as enforcement authority had not been established with the EPA.

Mr. Henry questioned how the situation had been resolved to allow the ROD. Mr. Green stated that LUCs are mentioned in the ROD, but the specifics are provided in the remedial design. Mr. Vavra confirmed that general LUCs are included in the ROD, but the details will be included in another report.

Mr. Green displayed a slide depicting Cluster 5 sites and features. The area was a test site for smokes and pyrotechnic munitions in the 1950s and 1960s, resulting in a large amount of waste push-outs and dumpsites. Many waste piles and areas of soil contamination have already been addressed.

Mr. Green displayed a photograph of a Cluster 5 waste test materials mound. The mounds are currently covered with topsoil and vegetation, and consist of a solid mass of testing elements such as old test equipment and munitions pieces. White phosphorus, thermal rounds, and triethylene may also be present in the mounds. Future activities will involve UXO clearance and disposal.

Ms. Grochowski questioned the approximate size of the mounds. Mr. Green stated that the three mounds are approximately 8 feet high and 20 feet long. A few other smaller mounds exist as well.

Mr. Henry questioned if clean up of the mounds was included in the ROD. Mr. Green stated that the ROD included cleanup of the mounds and push-out areas. Mr. Green indicated the location of the push-out areas, concrete slabs, and contaminated soil areas on a previously displayed map.

Mr. Henry questioned if significant groundwater contamination was present under the mounds. Mr. Green stated that no significant groundwater contamination exists. A thick clay layer lies under the area, and several monitoring wells have been installed. Contamination has been detected in sediments, and efforts to remediate lead, chromium, and silver concentrations will be implemented.

Mr. Henry questioned if the detection of contaminants in the soil was expected, and if soil sampling was conducted. Mr. Green stated that solvents were not detected in the soil, and soil sampling was conducted.

Mr. Dye questioned if Mr. Jason Ebrite (General Physics Corporation) would be responsible for remediation of the site. Mr. Green stated that General Physics was awarded the contract for Cluster 5, and Mr. Ebrite would act as the project manager.

Mr. Green stated that long-term site monitoring would also be conducted in the Cluster 5 area, as specified by the ROD. Dr. Dennis Burton (University of Maryland Wye Research and Education) will collect samples and conduct bioassays on a quarterly basis.

Mr. Green displayed a slide depicting Cluster 5 remedial action locations. Future waste removal and excavation sites were indicated. Surface waste will be removed from the entire area.

Mr. Green displayed a slide detailing a timeline for Cluster 5 activities. Site mobilization began in Spring 2003, followed by brush clearing and site reconnaissance in Summer 2003. Delays resulted through Spring 2004, due to the eagle restriction zones, and activities will recommence in the near future. All site work plans and health and safety plans have been approved for Summer and Fall 2004 waste recovery operations. Vegetation clearance is finished, and waste recovery operations are expected to last for approximately six months.

Former Nike Site Groundwater Plume Long-Term Monitoring and Treatment System Update

Mr. Green displayed a slide depicting the location of the former Nike Site groundwater plume. Groundwater contamination is located in the former launch area. A ROD for this area dictates that the groundwater must be cleaned up to the TCE MCL of 5 ppb. Gray areas depicted on the map are locations that have exceeded the 5 ppb MCL. One gray area depicted on the map runs under the Amtrak rail, and stops just short of a private property boundary. The area of higher VOC detections, up to 300 ppb, was indicated.

Mr. Green stated that a pump and treat system has been constructed to contain the majority of the groundwater plume at the Nike Site. The extension of the groundwater extraction system to the southeast area of the Nike Site was not possible, as it would have required the construction of a 300-yard long extraction trench. The construction of such a trench would create many UXO concerns, and prove very problematic. Natural attenuation appears to be the best solution for groundwater cleanup in that area, as studies have shown that contamination is biodegrading before it reaches the creek. Efforts are ongoing on an Explanation of Significant Difference (ESD) that would allow for monitored natural attenuation in the southeast area, versus extending the groundwater treatment system there.

Mr. Green displayed slides depicting photographs of the Nike Site groundwater treatment system. Water is pumped from eight extraction wells into a large equalization tank, depicted in the photograph. Water then passes through a bag filter, which can be automatically switched over to a backup bag filter once groundwater particulate pressure becomes too great. Water then moves from the bag filter into a series of activated carbon filtration units, which act as cleaning and polishing stages. Contaminant concentrations are monitored throughout the system, before water is discharged into Monks Creek.

Mr. Green displayed a slide providing Nike Site treatment system operational data. System startup began in January 2000, with currently 36,419 hours of total run time, and 93 percent efficiency. System downtime has resulted from chemical or electrical failures due to thunderstorms. A 2,000 pound activated carbon unit was replaced in January 2004, due to TCE breakthrough. Unit #2, the polishing unit, is currently running in the lead position.

Mr. Green displayed a slide depicting the location of average TCE concentrations detected during the 2003-operating year. Detections do not exceed 5 ppb near the boundary line. TCE hotspots up to 100 ppb were detected south of the boundary line, and have decreased in the southeast area.

Mr. Henry questioned if data presented on a previously displayed map was obtained in 2000. Mr. Green stated that the previous map displayed data obtained in 1999, before system operation began, and the current map presents data from 2003. Plume size and concentrations have decreased since operation began, with some hotspots remaining.

Mr. Green stated that pumping is ongoing at the majority of on-post and off-post wells. Previously, one off-post well located near the boundary line was shut off in an attempt to increase contamination containment at the other extraction wells. The effort functioned as expected, but the well was turned back on to decrease plume concentrations below the method detection limit (MDL) in that area.

Mr. Henry questioned what type of wells NMB55A and NMB53A are, and if contamination is still detected in them. Mr. Green stated that NMB55A and NMB53A are monitoring wells.

Mr. Green displayed slides depicting TCE concentrations at Nike Site wells, before and after operation of the pump and treat system. Well NMB07B had detections up to 270 ppb, before system operation. TCE concentrations have decreased over time in all wells, except in well NMB07B at the missile silo area. Well NMB07B contains the highest concentrations, which fluctuate over time. Many of the boundary wells, including NMB55A, are currently below the MCL. Detections in the southeastern area have gradually decreased from 19 ppb to 7.5 ppb. The decreasing trend in the southeast area is due to the pump and treat system, and natural attenuation.

Mr. Green reiterated that the ROD requires treatment of the contaminated groundwater to levels below the MCL. Pumping at the boundary area wells will continue until sampling results are below the MDL. Boundary area wells will then be monitored to ensure that concentrations do not rebound.

Mr. Henry questioned how deep the Nike Site plume is. Mr. Green stated that the plume begins approximately 10 to 15 feet below the surface, and extends to a depth of approximately 40 feet.

Mr. Green displayed a slide detailing the Former Nike Site Groundwater Long-Term Monitoring Program. Groundwater levels are measured quarterly at 67 wells, and the extraction well network is effectively containing the plume.

Mr. Green displayed a Nike Site groundwater contour map for May 2004. Areas with circular patterns, called cones of depression, indicate a transition from high to low groundwater levels around the extraction wells. Groundwater contaminant capture was successful in these areas. The locations of several cones of depression were indicated. Arrows depicted on the map indicated the direction of groundwater flow towards extraction wells.

Mr. Green stated that the pump and treat system appears to be functioning well. It is difficult to estimate the amount of time needed to remediate the plume. Original estimates projected approximately 15 years

of operation for site clean up to required levels. Current projections estimate cleanup completion in another 10 to 12 years, following the previous 3.5 years of operation.

Mr. Vavra questioned the levels detected in the southern area of the plume. Mr. Green stated that TVOC levels were approximately 25 ppb before operation, and are currently approximately 10 ppb.

Mr. Henry requested that a discussion on the Nike Site be included with the discussion on ambient air monitoring at Cluster 9. Mr. Stachiw stated that the two discussions could be scheduled.

Nike Southwest Landfill Cap Operations and Maintenance

Mr. Green displayed a photograph of the Nike Southwest Landfill Cap in the spring. The landfill contains waste, drums, and potential chemical munitions. A cap containing blast-proof soil, and a venting system with charcoal canisters to prevent a chemical release were installed on the site. Based on discussions with the EPA, the cap has been naturalized with vegetation, versus maintained mowing.

Mr. Green displayed a slide depicting the location of Nike Southwest Landfill Cap monitoring wells. Two down gradient and one up gradient monitoring wells were installed to confirm that contamination has not escaped from the hazardous materials landfill.

Mr. Green displayed slides detailing the Nike Southwest Landfill Cap 2003 and 2004 operating year activities. Sampling results for 2003 do not indicate that groundwater contamination has resulted from the Southwest Landfill. Vent gas samples for 2003 do not indicated the release of landfill gases to the atmosphere. Preliminary 2004 groundwater samples also do not show groundwater contamination. Mr. Green noted that reports were issued to MDE and the EPA containing 2003 and 2004 sampling results for the Nike Southwest Landfill Cap.

Mr. Green stated that the spring inspection conducted in April 2004 identified some site deficiencies. Small animals, such as groundhogs, had encroached into the area and burrowed into the landfill cap. Drainage ponding has occurred where the perimeter access road drains to a wooded area. Maintenance activities for 2004 included the repair of groundhog burrows and stone drainage gradients. Topsoil has been added to the cap and regraded to improve drainage from the access road to a wooded area along the western side of the landfill. A fall inspection and vent gas monitoring are scheduled for early October 2004.

Mr. Green displayed a photograph of vegetation at the Nike Southwest Landfill Cap during mid-June 2004. Black-eyed Susans are growing abundantly. Vegetation is allowed to grow, and woody vegetation is removed once a year.

Mr. Henry questioned if the site vegetation would increase small animal encroachment. Mr. Green stated that groundhogs appear to prefer mowed areas, and avoid high grass areas. Groundhogs may not be able to see potential predators in high grass.

Mr. Green displayed a map depicting the Bush River Radioactive Material Disposal Facility Aerial Radiological Survey, requested at a previous RAB Meeting. Digital data from the aerial survey was plotted in more detail on geographic information systems (GIS) maps, using GPS locations obtained in an over flight. Detections below 80 counts per second, outside of the blue line, are background levels. The 22nd Street Landfill is contoured by a brown line, and exists at background levels. Higher detections than 140 counts per second are located within the purple line. The aerial survey coordinates with the surface survey results. The location of a sewer line running to a sump, which is expected to contain some radiological material, was indicated, and will be investigated.

Mr. Vavra noted that Dr. Cal Baier-Anderson had requested a map of the aerial survey, to provide more data on the disposal facility. Dr. Green noted that previous maps had depicted an amorphous shape containing radiological detections. The aerial survey is not as accurate as the land survey, and elevations must be considered.

Mr. Henry questioned the margin of error and accuracy of the aerial map. Mr. Green stated that the map is based on actual digital data, and the accuracy is uncertain. The distribution of increasing detections between the 80 and 140 counts per second lines is uncertain, but the highest radiological detections are located in the radiological yard. Mr. Vavra stated that the aerial data corresponds well to the land survey data.

Mr. Green indicated the location of arsenic contamination on the map. Cleanup requirements will be above background levels, and below MDLs. Requirements for the Nuclear Regulatory Commission (NRC) will need to be satisfied before site closure.

VI. INTERMISSION

At 8:45 p.m., after confirming that no one present had further questions, Mr. Stachiw requested a 15-minute break. At 9:00 p.m. the meeting resumed.

VII. INSTALLATION ACTION PLAN DISCUSSION

A discussion of the Installation Action Plan for the Lauderick Creek Study Area was held. Meeting attendees included RAB Members, Mr. Stachiw, and Mr. Green. Anyone wishing to obtain information regarding the details of the discussion should contact Mr. Stachiw.

VIII. CLOSING REMARKS

At 9:20 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, 29 July 2004 at 7:00 pm in the Edgewood Senior Center. The topic of discussion will be the Westwood Study Area.