United States Environmental Protection Agency, Region III
Corrective Action Program

FINAL RCRA SITE VISIT REPORT

DC Department of Corrections
Former Lorton Correctional Complex
EPA ID No. VAD 980 830 988
8515 Silverbrook Road
Lorton, VA 22079

Prepared for:

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RCRA SITE VISIT REPORT
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VAD 980 830 988
8515 Silverbrook Road
Lorton, VA 22079

1.0 PURPOSE

The purpose of this site report is to consolidate relevant information from the DC Department of Corrections regarding the Former Lorton Correctional Complex (Lorton) facility associated with United States Environmental Protection Agency (USEPA) ID Number VAD980830988. This information will be used to augment the existing facility information.

2.0 DOCUMENTATION REVIEW

Ms. Roxanne Clarke and Mr. Shivam Patel of Tetra Tech EC, Inc. (TtEC) reviewed documents at the Commonwealth of Virginia Department of Environmental Quality (VDEQ) Central Office in Richmond, Virginia, on October 27, 2008, and at the VDEQ Northern Regional Office (NRO) in Woodbridge, Virginia on October 28 and October 29, 2008. A similar file review was conducted at the USEPA Region III, Philadelphia Office on August 15, 2008. The purpose of these reviews was to identify known Areas of Concern (AOCs) and Solid Waste Management Units (SWMUs) at the Lorton facility prior to conducting a site visit.

3.0 SITE VISIT

An on-site meeting and a site visit were conducted on October 30, 2008, to discuss the Former Lorton Correctional Complex located at 8515 Silverbrook Road in Lorton, Virginia. A list of attendees at that site visit is as follows:

Name	Company/Agency	Telephone Number	E-mail Address
Roxanne Clarke	TtEC	215-702-4003	Roxanne.Clarke@tteci.com
Shivam Patel	TtEC	215-702-4115	Shivam.Patel@tteci.com
Richard J. Criqui, Jr.	VDEQ – Central	804-698-4013	rjcriqui@deq.virginia.gov
Denis Zielinski	USEPA Region III	215-814-3431	zielinski.denis@epa.gov
Bill Wentworth	USEPA Region III	215-814-3184	wentworth.william@epa.gov

Name	Company/Agency	Telephone Number	E-mail Address
Chris Caperton	Fairfax County Department of Planning and Zoning Laurel Hill Project Coordinator	703-324-1375	Chris.Caperton@fairfaxcounty.gov

4.0 MEETING SUMMARY

The meeting began at 2:00 pm on October 30, 2008, at the Former Lorton Correctional Complex where Mr. Denis Zielinski, USEPA Region III RCRA Project Manager, opened the meeting by reviewing the purpose and anticipated outcomes of the visit and the Resource Conservation and Recovery Act (RCRA) Corrective Action Program. Mr. Zielinski presented the facility with information regarding USEPA Region III's Corrective Action process, the Environmental Indicator Assessment Program, 20/20 Vision, the Facility Lead Program, and the policy driving this program.

Under this investigation, USEPA Region III is focusing on two interim Environmental Indicators to evaluate whether any unacceptable risk to human health and the environment is ongoing at the facility. The two indicators are determining if human exposures are controlled and if groundwater releases are controlled.

The Facility Lead Program, as described by Mr. Zielinski, allows facilities under RCRA Corrective Action to proactively implement measures that resolve Corrective Action Items without a Corrective Action Order or Permit. The Facility Lead Program eliminates administrative burdens and expedites the resolution of Corrective Action Items.

Mr. Zielinski also discussed Virginia's Brownfields Program in addition to the Virginia Clean Water Revolving Loan fund. The fund allows for the acquisition of low interest Brownfield loans for corrective actions that remediate or protect surface or groundwater in the Commonwealth of Virginia.

Mr. Caperton provided a brief description of the historic activities and environmental issues, corrective actions, and redevelopment efforts and then led a tour of the facility during which he answered questions regarding specific facility features. Photographs of select AOCs and SWMUs identified at the facility during the site visit were taken by TtEC with permission from Mr. Caperton and are included as Appendix A of this report.

Mr. Caperton, Laurel Hill Project Coordinator, is the primary Fairfax County contact for the former Lorton site and has been associated with the Lorton facility or Laurel Hill development project for approximately three years. Contact information for the current owner of the site is as follows:

Chris Caperton
Laurel Hill Project Coordinator
County of Fairfax
Department of Planning and Zoning
12055 Government Center Parkway, 7th Floor
Fairfax, Virginia 22035

5.0 LOCATION, SUMMARY OF OPERATIONAL AND MANAGEMENT HISTORY, AND DESCRIPTION OF WASTES GENERATED AT THE FACILITY

The Former Lorton Correctional Complex site was located at 8515 Silverbrook Road in Lorton, Fairfax County, Virginia and consists of approximately 2,700 acres (note that this was the address of the facility when it was active; since the property has been divided for several uses, this address no longer applies). The DC Department of Corrections site was assembled from 11 individual parcels of land with acquisitions taking place between 1910 and 1954. Prior to development as the Lorton Correctional Complex, the site was rural with farmland, woodland, and rural residential properties. Photograph No. 1 shows the entrance to the former Lorton Correctional Complex. The following Figures are provided in Appendix B of this RCRA Site Visit Report.

Figure 1 **Site Location Map**
Figure 2 **2000 Aerial View**
Figure 3 **Existing Land Use**
Figure 4 **Property Transfer Map**
Figure 5 **Comprehensive Redevelopment Plan**
Figure 6 **Conceptual Development Plan**
Figure 7 **Community Planning Sector Map**
Figure 8 **Site Layout Map**
Figure 9 **Investigated Areas of Environmental Concern During the Phase II ESA**

According to the Fairfax County website (http://www.fairfaxcounty.gov), the County received title to the former DC Department of Corrections facility at Lorton on July 15, 2002. The transfer was made possible through the Lorton Technical Corrections Act, which was passed by Congress in October 1998, and required the county to develop a Reuse Plan that would maximize use of land for open space, parkland, or recreation prior to the county acquiring the property.

In February 1999, the Fairfax County Board of Supervisors appointed a citizen task force to develop a Reuse Plan. The task force, in collaboration with the county's planning staff, began their work by reviewing the Comprehensive Plan language for the site, which had been adopted by the Board of Supervisors the previous year.

During the spring of 1999, the citizen task force completed a modified plan for the Lorton facility, which was adopted by the Board of Supervisors in July 1999 as the official Reuse Plan for the property. The Reuse Plan was included in an official report to Congress in January 2000.

Prior to the approval of the Reuse Plan, the General Services Administration (GSA), in cooperation with Fairfax County and the District of Columbia, initiated the environmental cleanup of the property and ensured the requirements of the National Historic Preservation Act were addressed.

The last prisoners were transferred from the Lorton facility in November 2001, and the facility was released from the District of Columbia to the GSA in April 2002. On July 15, 2002, after the property was surveyed and covenants established, 2,324 acres were transferred to Fairfax County for $4.2 million, the market value determined by GSA's appraiser. Areas of the property designated for a high school and a middle school (approximately 116 acres) were transferred at no cost on May 1, 2002.

Although referred to as Lorton, the Lorton Prison or the Lorton Reformatory for most of the 1900s, this site is now referred to as Laurel Hill in commemoration of the 18th century structure, which served both as home of William Lindsay, a revolutionary war patriot, and as the residence of the Superintendent of the Reformatory.

The District of Columbia Management Reform Act of 1997 mandated the closure of the Lorton Correctional Complex. The Lorton Technical Corrections Act of 1998 charged the GSA with the responsibility of disposing the Lorton Correctional Complex and transferring ownership of the property to public or private entities in accordance with the Fairfax County Reuse Plan and the best interest of the United States. The 1998 Act required the County to develop a Reuse Plan that would maximize use of the land for open space, parkland, or recreation prior to the acquisition of the property by Fairfax County. Closure activities associated with the GSA related transfer of the Lorton facility occurred over a several year period and ending in 2001.

At the time of this RCRA Site Visit Report, the majority of the property currently remains in public ownership by Fairfax County and is planned to be developed for recreational and open space, educational and cultural facilities, and historic preservation.

Approximately one-third of the original Lorton site was sold and developed with residential development, consisting primarily of single-family detached housing. Approximately 116 acres of the site has been developed into public schools.

In response to the Congressional mandate, the GSA submitted an initial Notification of Hazardous Waste Activity to the VDEQ on June 9, 2000 to obtain a temporary hazardous waste generator identification number for remedial and corrective action activities directed by GSA. According to this notification, the facility under the GSA would generate greater than 2,200 lbs/month of hazardous wastes (Hazardous waste numbers D001, D007, and D008). On June 13, 2000, a provisional USEPA identification number (VAP000014480) was issued to the GSA.

In correspondence dated October 15, 2002, the DC Department of Corrections notified the VDEQ that closure and remedial activities at the Lorton Correctional Complex had been completed. The final shipment of hazardous waste from the facility's hazardous waste management storage area took place on September 12, 2002. This letter also served as notification to the VDEQ that the DC Department of Corrections would no longer reside or conduct operations at the facility property. Therefore, the USEPA identification number VAD9800930988 would no longer be used.

During the redevelopment efforts, there have been numerous historic discoveries of environmental significance. These findings are described later in this report as they pertain to individual SWMUs and AOCs.

Since development in the early 1900s, the site included, but is not limited to, the following significant features and activities:

- ***District of Columbia (DC) Correctional Complex***

The Lorton Correctional Complex was established circa 1911 and included dormitories, cell blocks, residences, maintenance facilities, a large oil and coal-fired boiler house (steam plants), industrial facilities such as furniture manufacturing and repair facilities, vehicle repair centers, a hog farm, a dairy farm, a water treatment plant, and wastewater treatment plants.

The Correctional Complex consisted of several facilities including the following: Central Facility, Maximum Security Facility, Modular Facility, Occoquan Facility, Minimum Security Facility, Youth Facility, and Medium Security Facility. The following table summarizes these facilities.

FFF	Date	Location	Buildings	Size	Inmates
Central	1920	Silverbrook Road	83	647,028 ft^2	1,429
Maximum	1936	Silverbrook Road	20	143,894 ft^2	646
Modular	1986	Silverbrook Road	5	103,290 ft^2	800
Occoquan	1925-1930	Ox Road & Lorton Road	65	335,361 ft^2	1,099
Youth	1960	Furnace Road	29	242,394 ft^2	406
Medium	No information is available for this facility				
Minimum	1955	Furnace Road & Hooes Road	16	124,585 ft^2	1,012

Industrial operations primarily took place in the Central Facility, including wood furniture and upholstery furniture manufacturing and repair, printing operations, metal working and fabrication, clothing manufacturing, vehicle maintenance and repair, auto body work, an industrial laundry operation, and a large industrial boiler or steam plant for heating the Central Facility.

Within the Occoquan Facility, operations included landscaping, plumbing, carpentry, tractor repair, and blacksmithing. The Youth Facility also included shoe and metal fabrication. With the exception of the Modular Facility, various buildings within each inmate facility contained administrative offices, chapels, kitchens, laundry, health clinics, gymnasiums, educational centers, and boiler plants.

The DC Department of Corrections Industries began the shutdown operations in July 2001; the Furniture Shop, Metal Works, and Print Shops closed in September 2001. The Vehicle Maintenance Division and the entire prison facility shut down in December 2001.

- ***Nike Missile Battery***

A Nike Missile Battery and Nike Missile Control Center operated at two separate locations at the site between 1954 and 1974. The former Nike Missile Battery was later used as a Minimum Security Complex at the Lorton facility. The Nike Missile Battery was the location of the former underground missile silos, Nike missiles, and support facilities. The former Nike Missile Control Center was located approximately one mile from the Nike Missile Battery. The site was closed and decommissioned by the Department of Defense (DoD) in 1974.

- ***Landfill***

In 1972, a major landfill was established at the site. This landfill was commonly referred to as the I-95 Landfill.

- ***Energy/Resource Recovery Facility (E/RRF)***

This facility was constructed in 1989 or 1990 and consisted of several inter-connected buildings that housed refuse pits, furnaces, boilers, cooling towers, and ash residue pits.

The Lorton facility originally submitted a Notification of Hazardous Waste Activity on January 26, 1984, for the generation of hazardous waste (spent halogenated solvents, hazardous waste number F002). At that time, the DC Department of Corrections requested that USEPA issue a District/USEPA hazardous waste generator identification number for the facility. In a March 22, 1984 letter from the District of Columbia, it was noted that the site was actually located in Virginia and would be issued a Virginia/USEPA installation identification number. USEPA assigned the facility ID No. VAD980830988. As of November 4, 2002, the Lorton facility was no longer a generator of hazardous waste (RCRA Info).

A subsequent Notification of Hazardous Waste Activity was submitted on August 17, 1992. According to this notification, the facility generated greater than 2,200 lbs/month of hazardous wastes and was classified as a large quantity generator (LQG).

The facility generated and managed hazardous waste from the various manufacturing and industrial related activities including wood/upholstery furniture manufacturing/repair, printing operations, metal working and fabrication, vehicle maintenance and repair, and auto body work. The industrial laundry facility was also associated with the management and treatment of hazardous wastes. Hazardous wastes generated at the site primarily included ignitable wastes, halogenated solvents, non-halogenated solvents (D001, F001, F002, F003, and F005).

Historical review of the facility's information in RCRA INFO (USEPA's RCRA information database system), indicates the Lorton facility was cited on numerous occasions for a significant number of regulatory violations of the RCRA Regulations. (See Section 5.2 for further detailed discussion of hazardous waste management activities and regulatory violations at the site)

As a result of the frequency of the RCRA violations, the facility was issued two Enforcement Consent Orders (COs), which required the facility to address the violations and to come into compliance with the regulatory requirements. The first CO was signed between the facility and the Virginia Department of Waste Management (DWM) (predecessor to the VDEQ) and went into effect on July 17, 1987. The second CO was signed between the facility and VDEQ and went into effect on July 8, 1999.

The second issued CO required the facility to submit a Closure Plan, Contingent Closure Plan, and Contingent Post-Closure Plan for the laundry wastewater clarifier (also referred to as an ink pit) (SWMU No. 3) the facility reportedly operated the unit in violation of RCRA Regulations. The laundry wastewater clarifier was required to be closed in accordance with the closure requirements for surface impoundments of RCRA Regulations under 40 CFR § 264/265, subpart G, Closure and Post-Closure, and Subpart K, Surface Impoundments. The closure of the laundry clarifier under RCRA required the facility to demonstrate "clean-closure" for both soils and groundwater. The clarifier was reported to be associated with treatment or washing of rags at the industrial laundry facility, which were contaminated with F002/F003/F005 listed hazardous wastes (i.e., ink-soaked rags from the US Bureau of Printing and Engraving, the Government Printing Office, and laundry from the DC Morgue).

A number of environmental plans and Environmental Site Assessment (ESA) Reports were developed associated with the GSA's mandate to dispose and transfer the Lorton Correctional Complex to public and private entities. A listing of significant letters and reports identified in the research for this report that were associated with the closing of the Lorton facility include, but are not limited to, the following:

1. Hazardous Waste Management Plan, VDEQ, July 30, 1999
2. Phase I Environmental Site Assessment Report, AAS Environmental Inc., August 27, 1999
3. Phase II Environmental Site Assessment Report, AAS Environmental Inc., August 27, 1999
4. Hazardous Waste Determination Survey Report, AAS Environmental, Inc., October 12, 1999
5. Comprehensive Site Characterization and Remedial Action Plan for the Three Firing Ranges, AAS Environmental, Inc., February 25, 2000
6. Comprehensive Site Characterization and Remedial Action Plan for the Non-Permitted Landfill Areas, AAS Environmental, Inc., March 29, 2000
7. Disposal of the Lorton Correction Complex – Draft Environmental Assessment Report, Greenhorne and O'Mara Inc. and Heery International, September 2000
8. Survey Sheet for Inspection of Hazardous Waste Facilities, VDEQ, December 4, 2000
9. RCRA Inspection Report – DC Dept. of Corrections, VDEQ, January 16, 2001
10. Letter to VDEQ relating to the voluntary remediation of three firing ranges, the non-permitted landfill area, and the drum dumping area, AAS Environmental, Inc., March 21, 2001
11. Firing Range Remediation Closeout Report, AAS Environmental, Inc., May 1, 2001
12. Non-Permitted Landfill Closure Report, AAS Environmental, Inc., September 15, 2001
13. Survey Sheet for Inspection of Hazardous Waste Facilities, VDEQ, October 22, 2001
14. Letter to the VDEQ indicating that the Central Facility Industries Metal Fabrication, Auto body and Paint Shops have been permanently closed, AAS Environmental, Inc., October 22, 2001

15. RCRA Inspection – DC Dept. of Corrections, VDEQ, November 9, 2001
16. Notification to the VDEQ that all requirements under the Consent Order had been satisfied, AAS Environmental, Inc., June 19, 2002
17. Submission of 2001 Hazardous Waste Report, AAS Environmental, Inc., May 13, 2002.
18. Notification to the VDEQ that all requirements under the VDEQ issued Consent Order had been satisfied, AAS Environmental, Inc., June 19, 2002
19. Quarterly Monitoring Report No. 4 – Final Monitoring Event – Closure of the Laundry Wastewater Clarifier (Ink Pit), AAS Environmental Inc., July 12, 2002
20. Letter of cancellation of Consent Order as the requirements had been met, VDEQ, July 26, 2002
21. Letter to VDEQ describing history of the area where buried drums were discovered in the Pulte Homes Area of the Lorton site, Consolidated Engineering Services, April 7,2003
22. Letter to GSA documenting the buried drum clean up activities conducted in the Pulte Homes Area of the Lorton site, Consolidated Engineering Services, June 30, 2003

A water treatment plant (WTP) operated adjacent to the Occoquan Facility, which treated river water prior for use as drinking water at the site prior to the mid 1970s. In the mid-1970s, Fairfax County began supplying water from the public water supply (PWS) system.

According to the August 27, 1999 Phase I ESA, no active water supply wells have been identified at the Lorton facility complex. The area is currently serviced by the public water supply and local groundwater is not used as a drinking water source. In addition, the prior water treatment plant was noted to have treated river water (i.e., surface water) such that the presence of groundwater supply wells would not be expected.

A Wastewater (Sewage) Treatment Plant (WWTP) was previously located in the southern portion of the site. Sewage from the Lorton Correctional Complex was treated by extended aeration, chlorination, dechlorination, and alum flocculation. The treatment system also adjusted the pH with caustic soda. The treatment system was also reported to have included the use of lagoons. Treated water was discharged to Mills Creek, just above the confluence with the Occoquan River. During the operational period of this plant, it was cited by VDEQ for exceeding effluent discharge permit limits under VPDES Permit No. VA0030163. Sludge from the Sewage Treatment Plant was sent to Fairfax County's Lower Potomac Sewage Plant for further treatment.

5.1 Area Geology and Hydrogeology

Geology

Topography at the site varies from just under 10 feet above mean sea level (msl) at the southern end to just over 300 feet msl at the northern end. The site is largely comprised of gently rolling uplands and broad ridges, with slopes less than 15 percent. However, valleys bisect the uplands. Side slopes in these valleys are as much as 25 percent and locally can reach 100 percent.

The facility is located in Fairfax County, Virginia. This area is reportedly at the boundary of the Coastal Plain and the Piedmont geologic provinces. The majority of hilltops and upper slopes

are underlain by the Cretaceous Potomac Formation of the Coastal Plains Province. This unit is characterized by silty to gravelly sand. The maximum thickness present at the site is approximately 120 feet. In the vicinity of the Central Facility, Maximum Security Facility, and Occoquan Facility, the underlying geology consists of sand and gravel of the Tertiary or Quaternary Age with maximum thicknesses of approximately 30 feet. The valley bottoms are underlain by Occoquan Granite, Chopawamsic Formation (mostly gneiss), and Quantico Formation (mostly slate and phyllite).

According to the soil survey of Fairfax County, the Former Lorton Correctional Complex is underlain primarily by the Louisburg-Appling-Wosham and the Fairfax-Beltsville-Appling associations. The Louisburg-Appling-Wosham association consists of well-drained, excessively drained, and poorly-drained coarse-textured soils over granite gneiss. The Fairfax-Beltsville-Appling association is well-drained to moderately well-drained soils on high coastal plain terraces that have formed from fluvial material and from granite gneiss.

Hydrology and Hydrogeology

Several surface water bodies are present in close proximity to the Former Lorton Correctional Complex. To the northeast are Rocky Branch, South Run, and Pohick Creek; in the center is Giles Run; and Mills Run is to the south. Surface runoff is generally to these water features, which all ultimately discharge to the Occoquan River just to the south of the site. Depth to groundwater across the site is estimated to be between 5 and 40 feet below ground surface (bgs).

The National Wetlands Inventory shows no mapped wetlands at the site. However, small areas of wetlands may be present in the low-lying portions of the site and specifically along streams and ponds.

5.2 Wastes Generated at the Facility

Currently, there are no hazardous wastes generated at the Lorton site as it has been closed. Routine RCRA related site inspections have documented a long history of violations relating to hazardous waste generation, management, and storage. This inspection and violation history is summarized in detail further below under RCRA Inspections and Violations History. The facility was also issued two Enforcement COs for violations of RCRA Regulations.

According to RCRA INFO, the following hazardous wastes numbers or waste codes were generated and managed at the site under the RCRA Regulations over the period from 1984 until 2002:

- D001 - Ignitability
- D002 - Corrosivity
- D007 - Chromium
- D008 - Lead
- D009 - Mercury
- D018 - Benzene
- D035 - Methyl ethyl ketone

- F001 - Spent halogenated solvents used in degreasing
- F002 - Spent halogenated solvents
- F003, F004, F005 - Spent non-halogenated solvents

According to RCRA INFO, Biennial Report Information, the Lorton facility generated and managed hazardous wastes over specific 2-year periods as indicated below. The hazardous wastes generated were managed, and manifested or shipped off-site to treatment, storage, and disposal (TSD) facilities regulated under the RCRA for subsequent treatment and disposal in accordance with the RCRA as follows:

- 1989 Biennial Report Cycle – 16 tons
- 1991 Biennial Report Cycle – 24 tons
- 1993 Biennial Report Cycle – 14 tons
- 1997 Biennial Report Cycle – 7 tons
- 1999 Biennial Report Cycle – 163 tons
- 2001 Biennial Report Cycle – 20 tons

Records indicate the majority of the hazardous wastes shipped off-site were subsequently blended into fuel and subsequently burned or incinerated for energy recovery or were sent to a facility for solvent recovery. Some wastes generated in the 1999 Biennial Reporting cycle underwent neutralization, other treatment, and/or were sent to a landfill.

A summary of the hazardous waste management activity and related hazardous waste site inspections and resulting enforcement actions by the DWM and the VDEQ is provided below under RCRA Inspections and Violations History.

RCRA Inspections and Violations History

February 1987 Hazardous Waste Inspection

An inspection of the facility was conducted by the DWM for compliance with the Virginia Hazardous Waste Management Regulations (VHWMR) on February 27, 1987. A March 9, 1987 letter noted the facility was found to be in violation of virtually all generator requirements in the VHWMR. The most significant violations included:

- Improperly stored hazardous waste for approximately three years without a permit;
- Storage area inadequate (i.e., muddy area with standing liquid);
- Deteriorated drums in need of over packing prior to shipment; and
- Drums left open.

Additional recordkeeping and training violations were also noted during the inspection. The DWM requested a meeting to discuss possible enforcement alternatives. In an August 6, 1987, USEPA memo, it was noted the Commonwealth of Virginia was taking action to resolve the violations. An enforcement order was signed between the DWM and the facility representatives and went into effect on July 17, 1987, requiring the following from the DC Department of Corrections:

- Drums found to be in poor condition would be over packed, kept closed, and stored in the accumulation area.
- Properly label hazardous wastes and ensure adequate aisle space in accumulation area.
- Hazardous wastes will not be stored in excess of 90 days.
- Develop a training program within 60 days and a contingency plan within 90 days.
- Conduct hazardous waste inspections and otherwise comply with the VHWMR.

January 1992 Hazardous Waste Inspection

An inspection of the facility was conducted on January 22, 1992, and the facility was again found to not be in compliance with the VHWMR applicable to large quantity generators. The following specific violations were noted:

- Failure to notify the DWM of the exact location of existing accumulation areas;
- Failure to submit an annual report; and
- Numerous contingency plan deficiencies.

December 1996 Hazardous Waste Inspection

On December 12, 1996, a hazardous waste inspection was conducted to determine compliance with the VHWMR and to re-evaluate violations noted in the January 1992 inspection. The facility was returned to compliance with respect to the 1992 violations. However, the following new violations were noted:

- Failure to complete personnel training for hazardous waste management;
- Failure to maintain training records;
- Containers not clearly marked with accumulation date and/or "hazardous waste"; and
- Containers in satellite accumulation were in poor condition and left open.

In a March 7, 1997 letter, the DC Department of Corrections described the steps being taken to address these violations. The facility was in the process of developing a training program and updating their contingency plan. In addition, the satellite accumulation area was remediated. As of March 20, 1997, the facility had returned to compliance with respect to violations in the satellite accumulation area. However, the container marking, training, and recordkeeping violations remained. On May 13, 1997, the VDEQ referred this case to enforcement.

August 1997 Hazardous Waste Inspection

A subsequent hazardous waste inspection was conducted on August 5, 1997 during which the facility was noted to have returned to compliance for the container marking violations. However, the training and recordkeeping violations remained. The facility was informed the case had been referred to enforcement. Two problems encountered during the inspection were likely the result of inadequate employee training.

December 1997 Hazardous Waste Inspection

A follow-up inspection was conducted on December 5, 1997. Subsequent to this inspection and prior to issuing the final inspection report, DC Department of Corrections provided training

documentation. However, the December 17, 1997 training was conducted only for supervisors and inmate employees were not trained in hazardous waste operations. A notice of violation was issued on December 24, 1997. The training violations originally discovered in the December 1996 site inspection were still in effect. In addition, it was determined in the recent inspection that the facility had failed to determine that a transporter had a valid USEPA ID and Virginia Transporter Permit to transport hazardous waste. The VDEQ issued a notice of partial return to compliance on January 12, 1998. However, the following violations remained:

- Failure to complete personnel training for hazardous waste management; and
- New employees have not completed this training within six months of employment.

A Draft Consent Order was issued to the DC Department of Corrections on May 7, 1998 for the ongoing violations with respect to employee training. A $2,500 fine was proposed by VDEQ; a compliance schedule was also outlined. The DC Department of Corrections had until August 1, 1998 to submit documentation of hazardous waste training for all employees.

May 1998 Hazardous Waste Inspection

A hazardous waste inspection was conducted on May 12, 13, and 14, 1998. Numerous violations of state and federal regulations for ASTs, USTs, wastewater treatment, and hazardous and solid waste were noted. Subsequent to this inspection, an Administrative Complaint, Compliance Order, and Notice of Opportunity for Hearing was issued by the USEPA on July 31, 1998. The following two counts and proposed penalties were provided:

- **Count No. 1: Accumulation of hazardous waste for a period greater than 90 days without a permit – $58,700**

  Two 55-gallon drums labeled as "hazardous waste" were stored at the old saw mill near the Occoquan facility. Both drums showed an accumulation date of April 11, 1996.

- **Count No. 2: Hazardous waste determinations were not completed on the content of the ink pit or the drums throughout the facility – $27,500**

  One drum of waste paint, with a solvent odor, was noted by inspectors. One drum of unknown contents, also with a solvent odor, was noted. Numerous drums of liquid that appeared to be waste motor oil were also present. (It should be noted that the ink pit is also known as the laundry wastewater clarifier at the site.)

The VDEQ also issued a Notice of Violation on July 31, 1998, in relation to the same May inspections. It was determined that the facility was in violation of State Water Control Law (SWCL), the VHWMR, the Virginia Underground Storage Tank Regulations, and the Virginia Aboveground Storage Tank Regulations. The following VHWMR violations were noted:

- Waste paint and thinner from the paint booth are sprayed into the paint filters, which are disposed in the trash.
- The facility was unable to provide documentation of hazardous waste training and employees indicated they had not received training.

- The Hazardous Waste Contingency Plan for the facility did not include the Auto Body Shop.
- Several unattended drums were observed throughout the facility; some were in poor condition. The majority of drums or containers were unlabelled or the labels were illegible. Others were marked as "hazardous waste" and dated as far back as April 11, 1996.

In response to the violations noted in the May 1998 inspection, an Environmental Remediation Action Plan was developed for the Lorton Correctional Complex. The Action Plan outlined an environmental program to address the following key issues at the facility:

- USTs and ASTs — evaluate and upgrade all tanks to meet the applicable standards as of December 1998. Abandoned and non-essential tanks were to be properly closed. Implement corrective action to address leaking USTs.
- Revise the Spill Prevention Control and Countermeasure (SPCC) Plan for the facility.
- Prepare and implement an UST/AST Procedural Manual and provide training to personnel.
- Prepare and implement a Hazardous Waste Determination Plan (HWDP) as well as a Hazardous Waste Management Plan (HWMP) for the facility. Train personnel in these plans and their implementation.
- Characterize, remediate, and close the "ink pit."

January and March 1999 Hazardous Waste Inspection

Hazardous waste inspections were conducted on January 12, 1999, and March 3, 1999. During the January inspection, seven violations were noted and a Notice of Violation was issued on January 29, 1999. A Special Order was issued to the DC Department of Corrections, with an effective date of July 8, 1999, for violations during the January 1999 inspection. This order included civil penalties of $33,000. According to a July 14, 1999, letter, the facility was returned to compliance for some of the seven violations:

- Hazardous waste generated by removing trash and paint related materials left in the Auto Body Shop was transported to the I-95 Landfill household hazardous waste collection area. The DC Department of Corrections does not have a transporter permit. In addition, the I-95 Landfill does not have a hazardous waste permit to treat, store, or dispose hazardous waste. Training was provided to address this violation.
- Paint-related waste (paint and thinner) was being stored in 1-gallon and 5-gallon containers outside the Auto Body Shop paint booth. This waste is now stored in a 55-gallon drum within a designated satellite accumulation area.
- The facility was missing copies of manifests for fluorescent tubes (mercury) and a Land Disposal for a separate shipment. Copies were since received.
- Two 30-gallon containers in the Auto Body Shop were used to accumulate hazardous waste. These drums were not closed. The contents were subsequently transferred to a 55-gallon closed top drum. In addition, training was provided to the Foreman.

Ongoing violations relating to hazardous waste training, associated recordkeeping, and contingency plan remained. These violations were addressed in a Consent Order that went into effect on July 8, 1999.

December 1999 Hazardous Waste Inspection

During this hazardous waste inspection, the facility was in compliance with the VHWMR. As of this inspection, operations at the facility generated the following waste streams:

Waste Code	Description	Amount Generated (per month)	Amount Accumulated (per month)
Furniture Shop			
D001/F002/F003	Sludge	4 drums	10 drums
D001/F002/F003	Sponges/PPE	<30 lbs.	110 lbs.
D001/D035/F005	Waste paint/thinner	<1 drum	1 drum
D001/D035/F003/F005	Paint filters	~50 lbs.	200 lbs.
Metal Shop			
D001	Waste paint/thinner	none	None
F003/F005	Rags	<1 drum	3 drums
Laundry			
F002/F003/F005	Ink pit sludge	6,882 gallons – liquid 51 yd^3 – solid	None

December 2000 Hazardous Waste Inspection

As of this inspection, operations at the facility generated the following waste streams:

Waste Code	Description	Amount Generated (per month)	Amount Accumulated (per month)
Furniture Shop			
F002/F003	Stripper sludge	4 drums	10 drums
F002	Sponges/rags/PPE	<30 lbs.	200 lbs.
D001/D035/F005	Waste paint/thinner	<1 drum	1 drum
D035/F005	Paint filters	~50 lbs.	200 lbs.
Metal Shop			
D001/D018/F003/F005	Waste paint/thinner	<1 drum	1 drum
D001/D018/F003/F005	Paint rags	<1 drum	3 drums

October 2001 Hazardous Waste Inspection

Hazardous waste generating operations had ceased and the facility was found to be in compliance with the VHWMR.

In a July 26, 2002 letter, the VDEQ determined the requirements of the July 8, 1999, Consent Order had been met. As such, this order was cancelled with an effective date of August 25, 2002.

6.0 DESCRIPTION OF AOCs AND SWMUs

The following is a description of SWMUs and AOCs identified during the file review for DC Department of Corrections at the USEPA Region III and the VDEQ offices in coordination with the October 30, 2008 Site Visit.

6.1 SWMU No. 1 – Facilities Management Complex Storage Area and the Industries Storage Area – Less than 90-day Hazardous Waste Accumulation Areas

As an LQG of hazardous waste, the Lorton facility was allowed to store hazardous waste in temporary storage areas known as the Less than 90-day Hazardous Waste Accumulation Areas without a permit (in accordance with the VHWMR and RCRA Regulations under 40 CFR § 262.34). It appears the Lorton facility may have used more than one hazardous waste storage area as Less than 90-day Hazardous Waste Accumulation Areas. The Facilities Management Complex Storage Area and the Industries Storage Area were used as Less than 90-day Hazardous Waste Accumulation Areas.

The Less than 90-day Hazardous Waste Accumulation Areas are considered hazardous waste management units under RCRA Regulations. These units are subject to closure requirements (i.e., decontamination) when operations cease at these units.

The Lorton facility shipped the hazardous wastes generated from these areas to the following facilities for subsequent treatment and disposal under RCRA Regulations:

- Safety-Kleen
- Petrochem Processing, Inc.
- North East Chemical Corporation
- Michigan Recovery

However, the most recent information indicated that hazardous wastes generated at the site were sent to Clean Ventures, Inc., Cycle Chem, Inc., and Ashland Chemical Company/Ashland Distribution Company.

General references to these areas were made in documents reviewed. Additional information is provided under SWMU No. 12.

No evidence of a spill or release was found during the site visit or in the files reviewed at the VDEQ or USEPA Region III offices. Site representatives are unaware of any spills or releases from this unit and had no information regarding any spills or releases in facility files.

6.2 SWMU No. 2 - Satellite Accumulation Areas

The Lorton facility stored hazardous waste in numerous temporary storage areas called Satellite Accumulation Areas (SAAs) throughout the Lorton facility complex at points of generation. Full waste containers from the SAAs were then moved to Less-than 90-day Hazardous Waste Accumulation Areas (SWMU No. 1) prior to manifesting or shipment of the hazardous wastes off-site to TSD facilities for subsequent treatment and disposal in accordance with RCRA Regulations.

Numerous SAAs were identified; the most specific information regarding the SAAs was provided for SWMU No. 12, the Central Facilities Industries Shops, which include the following identified SAAs:

- ***Satellite Accumulation Area #1*** (Metal Shop) – one 55-gallon container (D001/D035/F003/ F005)
- ***Satellite Accumulation Area #2*** (Metal Shop) – one 55-gallon container (F003/F005)
- ***Satellite Accumulation Area #3*** (Furniture Shop) – one 55-gallon container for waste paint/ thinner (D001/D035/F003/F005)
- ***Satellite Accumulation Area #4*** (Furniture Shop) – one 55-gallon container for paint filters (D001/D035/F003/F005)
- ***Satellite Accumulation Area #5*** (Furniture Shop) – one 55-gallon container for rags/ sponges/PPE (/F002/F003)
- ***Satellite Accumulation Area #6*** (Furniture Shop) – one 55-gallon container for sludge (D001/ F002/F003)
- ***Satellite Accumulation Area #7*** (Body Shop) – one 55-gallon container each for waste paint/ thinner and paper

SAAs were expected to exist throughout the Lorton site; however, documents reviewed indicate the most significant SAAs were concentrated in the Central Facilities Industries Shops and the industrial laundry.

No evidence of a spill or release was found during the site visit or in the files reviewed at the VDEQ or USEPA Region III offices. Site representatives are unaware of any spills or releases from this unit and had no information regarding any spills or releases in facility files.

6.3 SWMU No. 3 – Former Laundry Wastewater Clarifier (also known as Ink Pit)

Historically, ink contaminated rags were washed at the Lorton facility's industrial laundry, which was located in the Central Facility, the largest complex within the Lorton site. The 20,000-gallon laundry wastewater clarifier was constructed of reinforced concrete and brick and was located adjacent to the Central Facility's laundry. This 20,000-gallon unit was rectangular in shape and was approximately 24 feet by 15 feet. The unit was approximately 22 feet deep and tapered to a sump. The unit had three structures: the clarifier proper, a wet well, and an adjacent brick structure of unknown function. Photograph No. 2 shows the former location of this unit.

Since the 1940s, wastewater from the laundry operations in the Central Facility were routed to the Laundry Wastewater Clarifier, also known as the Ink Pit, which functioned as an oil/grit separator where solvent, oil, and grease floated to the top and the ink and suspended solids settled to the bottom. The clarifier was associated with treatment or washing of rags at the industrial laundry facility, which were contaminated with F002/F003/F005 listed hazardous wastes (i.e., ink-soaked rags from the US Bureau of Printing and Engraving, the Government Printing Office, and laundry from the DC Morgue).

This clarifier unit was taken off-line in November 1995 when the facility ceased industrial laundry operations. Subsequent to 1995, wastewater from domestic laundry operations bypassed the wastewater clarifier or ink pit and discharged to the sanitary sewer (See SWMU No. 20).

According to an April 1, 1998, VDEQ RCRA site inspection, the solids/sludge removal portion of the laundry wastewater clarifier was not operational. According to an April 1, 1998 inspection report, the failure of the sludge removal portion of the clarifier may have occurred 25 to 30 years prior to the site inspection. Failure of the solids/sludge removal mechanism had allowed the tank to fill up with solids to the level of the discharge pipe.

Investigation of this area was conducted as part of the 1999 Phase II ESA associated with decommissioning (closure) of the Lorton site under the GSA. At the time of the Phase II ESA, the DC Department of Corrections was in the process of closing this unit. As such, the Phase II ESA did not include sampling in the Laundry Wastewater Clarifier area.

Closure of the laundry wastewater clarifier unit was incorporated into the VDEQ issued Consent Order that went into effect on July 8, 1999. A Closure Plan, Contingent Closure Plan, and Post-Closure Plan were submitted to the VDEQ on April 2, 2001 for the Laundry Wastewater Clarifier (Ink Pit).

According to RCRA INFO and the VDEQ Comprehensive Environmental Data System (CEDS), the Closure Plan for the laundry wastewater clarifier was received by the VDEQ on November 5, 1999. A public notice of the Closure Plan was advertised in a local paper on October 27, 2000. Two Notices of Deficiency (NODs) were issued by the VDEQ for subsequent submittals of the Closure Plan on February 1, and February 28, 2001. RCRA INFO indicates the Closure Plan was approved for partial closure of the unit by the VDEQ on April 19, 2001. CEDS indicated a subsequent revised Closure Plan (reported to be related to groundwater) was approved by the VDEQ on August 17, 2001. CEDS indicated the VDEQ performed a closure verification inspection of the clarifier unit for soils on October 22, 2001 and that the Closure Report and closure certifications were received by the VDEQ on November 9, 2001. A revised Closure Report was received by the VDEQ on January 25, 2002, which addressed the demonstration of "clean closure" for groundwater. According to the CEDS database, additional information was needed for the Closure Report based on a conference call on February 11, 2002.

Prior to emptying, the Laundry Wastewater Clarifier was estimated to contain approximately 16,500 gallons of waste, which consisted primarily of sludge with smaller quantities of scum, oily liquid, and water. Waste characterization sampling determined that the oily liquid layer contained a mixture of solvents and plasticizers. The water layer was contaminated with solvents due to contact with the oily layer. The bottom sludge layer also contained solvents and plasticizers in addition to barium and lead. The wastes were removed between September and October 1999 and sent off-site as hazardous waste with the D001/F002/F003/F005 hazardous waste codes. The unit was temporarily covered with polyethylene sheeting and plywood to prevent accumulation of rainwater during the closure activities.

The Closure Plan required the facility to demonstrate clean closure for soils and groundwater for the unit. Soil samples were to be collected from the surrounding soil to determine potential impacts. In the event that impacts were not present, the unit would be abandoned in place through the use of flowable fill. A Contingent Closure Plan was also prepared in the event impacts to soil and groundwater were present. In this instance, the unit would be demolished and the underlying soil would be excavated.

The facility was able to demonstrate achievement of clean closure of the concrete pit and unsaturated soils to meet residential risk-based criteria and standards. Based on five quarters of groundwater sampling, this area had also demonstrated compliance with the clean closure performance standards for groundwater. According to RCRA INFO and CEDS, the clarifier unit was determined to be "clean-closed" according to the Closure Report and closure certifications for both soils and groundwater by VDEQ on May 6, 2002.

In a July 26, 2002 letter, VDEQ determined the requirements of the July 8, 1999 Consent Order had been met. As such, this order was cancelled with an effective date of August 25, 2002.

6.4 SWMU No. 4 – Former Underground Storage Tanks

A total of 32 out-of-service underground storage tanks (USTs) were identified in the 1999 Phase I and II ESA Reports (As part of the Phase II ESA, out-of-service USTs were located and removed from the site). During UST removal activities, these areas were assessed for potential impacts to soil and groundwater.

The Phase I and II ESA Reports provided the summary information below regarding the out-of-service USTs identified at the various Lorton facility complexes. It is unclear if the ESA Report information provided below was submitted to and reviewed by the VDEQ's Petroleum Storage Tank Program.

It should be noted that in Virginia, owners and operators of regulated USTs are required to report suspected or confirmed releases to the VDEQ Petroleum Storage Tank Program within 24 hours of discovering the release. Persons closing regulated USTs must report the following concentrations to VDEQ:

1. A total petroleum hydrocarbon (TPH) concentration in soil that is greater than or equal to 100 mg/kg.
2. A TPH concentration in water that is greater than or equal to 1 mg/l.
3. The concentration of any regulated substance that exceeds the detection limit for that substance.
    a. Persons closing Aboveground Storage Tanks (ASTs) having a capacity of greater than 660 gallons of oil must report the following concentrations immediately upon receiving analytical results.
    b. A TPH concentration in soil that is greater than or equal to 100 mg/kg. A TPH concentration in water that is greater than or equal to 1 mg/l.
    c. The concentration of any petroleum constituent (e.g. benzene) that exceeds the detection limit for that constituent.

If samples are collected at any time other than UST closure (i.e., environmental site assessments for property transfer), persons must report analytical results that are greater than the detection limit for any regulated substance.

For additional information on reporting requirements, persons should refer to Chapter 2 of the VDEQ Petroleum Storage Tank Program's *Storage Tank Program Technical Manual*. Under the VDEQ's Tank Program, clean-up levels or remedial endpoints are site-specific and risk-based. The reporting thresholds listed above are not remedial endpoints.

The following tanks were listed in reports reviewed; additional information is provided below in the following table.

Tank ID	Installation Date	Location	Capacity (gallons)	Content	Releases
Central Facility					
FLD 452	1984	400 Man Modular	20,000	Diesel	Clean, previous release
FLD 507	1990	Old Maintenance Transport	10,000	Diesel	Clean
	Unknown	Old Maintenance Transport	~10,000	Diesel	Unknown
	Unknown	Old Maintenance Transport	~10,000	Gasoline	Unknown
LV-005	Unknown	Industries	550	Varsol	Clean
L2-025	Unknown	Culinary	1,000	#2 Fuel Oil	Clean
LD-001	Unknown	Gen. Site	5,000	Diesel	Known release
LD-021	Unknown	Electrical Supply	12,000	Diesel	Known release
LW-026	Unknown	Maintenance	1,000	Used Oil	Known release
LU-022	Unknown	Electrical Supply	12,000	Gasoline	To be abandoned
LW-027	Unknown	Old Maintenance Transport	10,000	Waste Liquid	Suspected release
Occoquan Facility					
LD-010	Unknown	Vehicles	10,000	Diesel	Clean Closure
FLD 534	Unknown	Diesel Shop	1,000	Diesel	Confirmed release
LU-028	Unknown	White Brick Building	550	Gasoline	Confirmed release
LU-011	Unknown	Vehicles	10,000	Gasoline	Confirmed release
Youth Facility					
LU-004	Unknown	Hospital	500	Gasoline	Clean
LU-002	Unknown	Shops	500	Gasoline	Previously removed
FLD 505	1960s	Genset	2,000	Diesel	Confirmed release
LU-003	Unknown	Control	500	Gasoline	Confirmed release
Minimum Security Facility					
L2-006	1950s – 1960s	Women's Annex	2,000	#2 Fuel Oil	Clean
L2-007	1950s – 1960s	Women's Annex	1,500	#2 Fuel Oil	Previously removed
FLD 536	1988	Minimum Security	550	Diesel	Confirmed release
Offices of Facilities Management					
LD-008	Unknown	NIKE Site	10,000	Diesel	Clean
LU-024	Unknown	Welding Shop	1,000	Gasoline	Clean
L2-012	Unknown	Payroll Office	1,500	#2 Fuel Oil	Confirmed release

Tank ID	Installation Date	Location	Capacity (gallons)	Content	Releases
L2-023	Unknown	Plan Room	1,500	#2 Fuel Oil	Confirmed release
Sewage Treatment Plant					
LD 009	Unknown	Sewage Treatment	2,000	#2 Fuel Oil	Clean closure
Lorton Dairy					
FLD 532	1960s	Dairy	1,000	Diesel	Clean
L2-029	Unknown	Slaughterhouse	Unknown	#2 Fuel Oil	Unknown
FL2-526	Unknown	Dairy	3,000	#2 Fuel Oil	Confirmed release

Note: Table shows 31 Tanks.

FLD 452

A release occurred from the piping associated with this tank in November 1991. Approximately 1,000 gallons of diesel was released during this incident. The piping was replaced and investigation and remediation were completed. Although details of these activities are unknown, VDEQ issued a closure letter on December 8, 1991, indicating that no further action was necessary. As part of the 1999 Phase II ESA, a sample of groundwater was collected from the center of the tank excavation. Results were below VDEQ's 1 mg/l action level for TPH.

LD-001

During the Phase II ESA, subsurface contamination was identified around the fill pipe and ancillary piping. At the fill pipe, TPH-Diesel Range Organics (DRO) was detected at a concentration of 2,000 mg/kg. The sample from beneath the ancillary piping contained reported TPH-DRO and TPH-Gasoline Range Organics (GRO) concentrations of 2,200 mg/kg and 1,100 mg/kg, respectively. Results from the remaining samples were below VDEQ's 100 mg/kg action level for soils. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH-DRO and TPH-GRO impacts around the fill pipe and ancillary piping. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for LD-001.

LD-026

Contamination was identified at this UST during the 1999 Phase II ESA. TPH was detected in one sample at a concentration of 3,300 mg/kg, which exceeds VDEQ's action level of 100 mg/kg for soils. In addition to the petroleum compounds, Polychlorinated Biphenyls (PCBs) were detected in this sample at a concentration of 0.9 mg/kg. Therefore, it was believed that this tank may have been used for the storage of PCB-contaminated oil. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH impacts. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for LDW-026.

LW-027

During a 1998 inspection, this tank was identified as a potential Leaking Underground Storage Tank (LUST) site. However, samples collected as part of the 1999 Phase I ESA detected TPH-GRO below VDEQ's action level of 100 mg/kg.

FLD-534

Contamination was identified during the 1999 Phase II ESA. TPH-DRO was detected in soil samples from the excavation at concentrations of 290 mg/kg and 1,900 mg/kg. Both of these detections exceed the 100 mg/kg action level established by VDEQ. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH impacts. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for FLD-534.

LU-028

During the 1999 Phase II ESA, subsurface contamination was identified in the excavation, based on exceedances of VDEQ's 100 mg/kg action level. TPH-GRO was detected in soil samples at concentrations of 320 mg/kg and 2,300 mg/kg. In addition, TPH-DRO was detected in one of the samples at a concentration of 720 mg/kg. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH-GRO and TPH-DRO impacts. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for LU-028.

LU-011

In April 1996 an unknown quantity of gasoline was released. The gasoline reportedly reached a storm drain that discharges to an unnamed tributary of the Occoquan River. At the time of the 1999 Phase II ESA, free product was known to exist in the vicinity of this UST. It was noted that DC Department of Corrections was in the process of implementing corrective action for this release and contamination. No additional information relating to the corrective action for LU-011 was found in USEPA Region III or VDEQ files.

FLD 505

Soil samples collected from the tank excavation and stockpile of excavated soil confirmed the presence of TPH above VDEQ's 100 mg/kg action level. TPH-DRO concentrations ranged between 180 mg/kg and 2,100 mg/kg in the three samples collected. In addition, TPH-GRO was detected in one sample at a concentration of 520 mg/kg. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH-GRO and TPH-DRO impacts. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for FLD 505.

LU-003

During the 1999 Phase II ESA, contamination was confirmed based on samples collected from the tank excavation and stockpile of excavated soil. The sample from the stockpile was found to contain TPH-DRO at a concentration of 140 mg/kg. However, the samples from within the excavation pit were all below the 100 mg/kg action level established by VDEQ. Therefore, it was believed the tank removal had addressed impacts in this area. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for LU-003.

FLD 536

Soil samples collected from the tank excavation as part of the 1999 Phase II ESA confirmed a release from this tank. TPH-DRO was detected at concentrations of 430 mg/kg and 730 mg/kg

while TPH-GRO was detected at concentrations of 2,300 mg/kg and 3,200 mg/kg. Each of these detections was above the VDEQ's 100 mg/kg action level. The release in this area was assigned a case number by VDEQ and further investigation was conducted for both soil and groundwater. VDEQ issued a closure letter on May 20, 1990 indicating that no further action was necessary.

L2-012

During the 1999 Phase II ESA, subsurface contamination was confirmed. TPH-DRO concentrations from this tank excavation ranged from 160 mg/kg to 5,100 mg/kg while TPH-GRO concentrations ranged from 820 mg/kg to 1,100 mg/kg. Each of these detections exceeds VDEQ's 100 mg/kg action level. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH-GRO and TPH-DRO impacts. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for L2-012.

L2-023

Subsurface contamination was identified during the 1999 Phase II ESA, based on exceedances of VDEQ's 100 mg/kg action level for TPH in soil. TPH-GRO was detected in soil samples at concentrations of 1,600 mg/kg and 13,000 mg/kg. In addition, TPH-DRO was detected at concentrations of 920 mg/kg and 1,000 mg/kg. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH-GRO and TPH-DRO impacts. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for L2-023.

FL2-526

Soil samples collected from the tank excavation as part of the 1999 Phase II ESA confirmed a release from this tank. TPH-DRO was detected at concentrations of 3,300 mg/kg and 3,500 mg/kg while TPH-GRO was detected at concentrations of 1,600 mg/kg and 3,500 mg/kg. Each of these detections was above the VDEQ's 100 mg/kg action level. It appears that no additional excavation was completed as part of the Phase II ESA to address the TPH-GRO and TPH-DRO impacts. However, the Phase II ESA concluded that this UST required further action by the VDEQ. It is unclear if follow up actions have been initiated for FL2 526.

Former In-Service Underground Storage Tanks

During a 1998 inspection, several oil, used oil, and fuel USTs were discovered at the facility. Some had been in place since the 1960s and others were installed after the May 8, 1986 deadline. None of these tanks were registered with the state and the facility was not in compliance with leak detection requirements. In addition, some USTs had been taken out of service and/or closed.

It should be noted that the UST closures were not completed with regulatory oversight and some tanks reportedly still contained product.

The 1999 Phase I ESA inventoried in-service storage tanks at the Lorton Correctional Complex Facility, which were used to store the following:

- #2 and #6 fuel oil for operating boilers and furnaces at individual buildings;
- Diesel fuel for vehicles, motorized equipment, and standby generators;
- Gasoline for vehicles and power equipment;
- Hydraulic oil for vehicle lifts;
- Antifreeze for vehicle maintenance;
- Motor oil for vehicle maintenance; and
- Used motor oil from vehicle maintenance.

A total of 25 in-service USTs were present in 1999, in addition to above listed out-of-service USTs and ASTs.

The following table summarizes the in-service ASTs and USTs identified in the ESA Reports.

Location	**In-Service**	**Out-of-Service**		**AST**	**Leaking UST**
		Removed	***Abandoned***		
Central Facility	5	11	1	8	6
Occoquan Facility	3	4	0	3	4
Youth Facility	1	5	0	3	2
Minimum Facility	0	3	0	2	1
Facilities Management	3	4	0	2	2
Vehicle Maintenance Facility	12	0	0	2	0
Sewage Treatment Plant	1	1	0	3	0
Lorton Dairy	0	3	0	0	1
Miscellaneous	0	0	0	12	0
TOTAL	**25**	**31**	**1**	**35**	**16**

As part of the subsequent 1999 Phase II ESA, the in-service USTs were inspected for compliance with regulatory requirements. The Phase II ESA Report summarized information for in-service USTs as follows (additional information is provided below this table):

Tank ID	**Installation Date**	**Location**	**Capacity (gallons)**	**Content**	**Releases**
Central Facility					
FLD 539	1989	200 Man Modular	2,500	Diesel	Passed tightness testing
FLD 531	1988	Genset 1A, 2A	5,000	Diesel	Passed tightness testing
FLD 537	1990	Genset 1B, 2B	5,000	Diesel	Passed tightness testing
FL2 504A	1975	Heating Plant	25,000	#6 Fuel Oil	Known release
FL2 504B	1975	Heating Plant	25,000	#6 Fuel Oil	Known release
Occoquan Facility					
FLD 504	1989	Genset	10,000	Diesel	Passed tightness testing
FL2 A	1996	Occoquan	25,000	#2 Fuel Oil	Release to containment
FL2 B	1996	Occoquan	25,000	#2 Fuel Oil	Release to containment

Tank ID	Installation Date	Location	Capacity (gallons)	Content	Releases
Youth Center Facility					
FL2 543	1986	Boiler Plant	15,000	#2 Fuel Oil	No indication of release
Offices of Facilities Management					
FL2 521	Unknown	Building #3	1,500	#2 Fuel Oil	No indication of release
FL2 522	Unknown	Building #4	1,550	#2 Fuel Oil	No indication of release
FL2 524	Unknown	Building #2	1,550	#2 Fuel Oil	No indication of release
New Vehicle Maintenance Facility					
FLD 502A	1995	Vehicle Maintenance	15,000	Diesel	No indication of release
FLD 502B	1995	Vehicle Maintenance	550	Diesel	No indication of release
FLU 502	1995	Vehicle Maintenance	10,000	Gasoline	No indication of release
FL-01A	1995	Vehicle Maintenance	10,000	Antifreeze	No indication of release
FL-01B	1995	Vehicle Maintenance	8,000	Motor Oil	No indication of release
FL-01C	1995	Vehicle Maintenance	1,000	Used Oil	No indication of release
LH-013	1995	Vehicle Maintenance	62	Hydraulic Oil	No indication of release
LH-014	1995	Vehicle Maintenance	62	Hydraulic Oil	No indication of release
LH-015	1995	Vehicle Maintenance	62	Hydraulic Oil	No indication of release
LH-016	1995	Vehicle Maintenance	62	Hydraulic Oil	No indication of release
LH-017	1995	Vehicle Maintenance	62	Hydraulic Oil	No indication of release
LH-018	1995	Vehicle Maintenance	62	Hydraulic Oil	No indication of release
LH 019	1995	Vehicle Maintenance	75	Hydraulic Oil	No indication of release
LH 020	1995	Vehicle Maintenance	75	Hydraulic Oil	No indication of release
Sewage Treatment Plant					
FL2 528	Unknown	Sewage Treatment	6,000	#2 Fuel Oil	No indication of release

FL2 504A and FL2 504B

A release of 200 gallons of #6 fuel oil occurred in March 1982. This release occurred while transferring fuel between FL2 504A and FL2 504B. The fuel reportedly reached a storm drain that discharges to Giles Creek. As part of the 1999 Phase II ESA, a soil sample was collected between the USTs and storm drain. Based on the analytical results of this sample and the time since the release, it was concluded that impacts were not present in this area as a result of the 1982 release.

FL2 A and FL2 B
During a 1998 inspection, oil was discovered in the secondary containment of the transfer piping associated with these tanks. Tightness testing identified a slow but constant leak in the primary piping. However, the oil was believed to be contained within the secondary piping with no release to the environment. A Notice of Violation was issued and these tanks were taken out of service but not abandoned.

6.5 SWMU No. 5 – Former Aboveground Storage Tanks

During a 1998 inspection, it was discovered the prison was operating a facility with ASTs having a maximum capacity greater than 25,000 gallons without an Oil Discharge Contingency Plan (ODCP). During the 1999 Phase I ESA, a total of 35 ASTs were inventoried. The majority of these tanks were small (i.e., <660 gallons) and used for storing fuel oil for backup generators. Photograph No. 3 depicts a former location of ASTs adjacent to the former Power Plant.

The ASTs evaluated as part of the Phase II ESA included the following information:

Tank ID	Installation Date	Location	Capacity (gallons)	Content
Central Facility				
FLD 539D	1989	200 Modular Genset Day Tank	100	Diesel
FLD 542A	1999	400 Modular Genset	1,500	Diesel
FLD 531D1A	1988	Genset 1A Day Tank	100	Diesel
FLD 531D2A	1988	Genset 2A Day Tank	100	Diesel
FLD 537D1B	1988	Genset 1B Day Tank	100	Diesel
FLD 537D2B	1988	Genset 2B Day Tank	100	Diesel
FLD 501D	Unknown	Dorm 26 Genset Belly Tank	300	Diesel
FLD 500D	1990	Industries Genset Belly Tank	100	Diesel
Occoquan Facility				
FLD 504D	1989	Genset Day Tank	200	Diesel
FLD 527A	Unknown	Blacksmith Shop	275	Diesel
FLD 527B	Unknown	Blacksmith Shop	275	Diesel
Youth Facility				
FLD 505D	Unknown	Genset Day Tank	200	Diesel
FLD 505A	1998	Genset	500	Diesel
FLD 505B	1998	Genset	500	Diesel
Minimum Security Facility				
FLD 536A	1999	Genset	500	Diesel
STOP 39	1988	Dorm 5 Genset Belly Tank	500	Diesel
Offices of Facilities Management				
FL2 520	Unknown	Silverbrook Road Payroll	1,000	#2 Fuel Oil
FL2 523	Unknown	Silverbrook Road Plans Room	550	#2 Fuel Oil
Sewage Treatment Plant				
FLD 528	1992	Genset	20,000	Diesel
FLD 528D	1992	Genset Day Tank	200	Diesel
FLD 528A	1992	Genset	8,000	Diesel
Miscellaneous Locations				
FL2 508A	Unknown	9301 Furnace Road	275	#2 Fuel Oil

Tank ID	Installation Date	Location	Capacity (gallons)	Content
FL2 508B	Unknown	9301 Furnace Road	275	#2 Fuel Oil
FL2 509	Unknown	9501 Furnace Road	275	#2 Fuel Oil
FL2 514	Unknown	Silverbrook Road (Religious Services)	275	#2 Fuel Oil
FL2 518A	Unknown	8900 Lorton Road (Environmental Services)	275	#2 Fuel Oil
FL2 518B	Unknown	9621 Ox Road (Special Needs)	275	#2 Fuel Oil
FL2 519	Unknown	Silverbrook Road (Medical Warehouse)	275	#2 Fuel Oil
FL2 525A	1995	Silverbrook Road (Medical Warehouse)	275	#2 Fuel Oil
FL2 525B	1995	8941 Lorton Road (Mental Health Services)	275	#2 Fuel Oil
FL2 512	Unknown	8943 Lorton Road (Health Services)	275	#2 Fuel Oil
FL2 513	Unknown	Laurel Hill House	500	#2 Fuel Oil

No evidence of a spill or release was found during the site visit or in the files reviewed at the VDEQ or USEPA Region III offices relating to this SWMU. Site representatives are unaware of any spills or releases from this unit and had no information regarding any spills or releases in their files.

6.6 SWMU No. 6 – Former Lorton Dairy

Several dairy facilities were present at the site, which included barns, sheds, and storage rooms (in the central portion of the site north of Lorton Road). Historic operations in this area included hog and turkey farms. Dairy farm operations ceased in 1997.

During a 1998 inspection, petroleum contamination was observed in soil in two areas in the Lorton Dairy. Saturated soil was noted around the dispenser and the fill area as well as the out-of-service fuel oil UST. As described in the first table under SWMU No. 4, three USTs were identified at this SWMU, FLD-532, L2-029, and FL2-526. Soil samples collected from the Tank FL-526 area during the 1999 Phase II ESA confirmed a release from this tank. TPH-DRO was detected at concentrations of 3,300 mg/kg and 3,500 mg/kg while TPH-GRO was detected at concentrations of 1,600 mg/kg and 3,500 mg/kg. Each of these detections was above the VDEQ's 100 mg/kg action level.

No further information was found in files reviewed.

6.7 SWMU No. 7 – Former Tear Gas Impact Sites

Chemical agent (i.e., tear gas) training was historically conducted in two portions of the site. The first area, known as the Old Chemical Training Area, is located in the northeastern portion of the site. It is south of Rocky Branch, along an abandoned road, and is approximately 200 feet wide. This area was reportedly used between approximately 1950 and 1988. The second Tear Gas

Impact Site was co-located with the Recent Firing Range, approximately 0.75 miles south of Facilities Management and 0.75 miles northwest of the Central Facility. This site had been used from approximately 1988 through the late 1990s.

During the site reconnaissance for the 1999 Phase I ESA, the majority of the Old Chemical Training Area was found to be naturally revegetated. However, a bare area was observed and it was believed to be affected by the former training operations. Several hundred spent tear gas canisters were also present on the ground in the Old Chemical Training Area. According to labels on these canisters the tear gas used in this area was manufactured with chloroacetophenone (CN) and chlorobenzalmalonitrile (CS), chemicals commonly used in crowd control (i.e., tear gas). A smaller number of canisters were also located in the surrounding woods.

During the site reconnaissance for the 1999 Phase I ESA, Tear Gas Training Site No. 2 was found to consist of a grass training field approximately 100 feet by 200 feet, a trailer, a bus, and a burn dumpster. The trailer and bus were used for obstacles during training exercises while the burn dumpster was used for confiscated fireworks. Similar to the Old Chemical Training Area, spent tear gas canisters were present at this site and in the surrounding woods.

As part of the Phase II ESA, the two Tear Gas Impact sites were assessed for potential impacts to soil and groundwater. Surface and subsurface soil samples were collected from the Old Chemical Training Area and Tear Gas Training Site No. 2. Attempts to obtain groundwater samples were unsuccessful in these areas. The soil samples were analyzed for Semi-Volatile Organic Compounds (SVOCs) and priority pollutant metals. Analytical results from both areas were non detect for SVOCs. Low level detections of chromium, copper, lead, nickel, and zinc were reported. However, the reported concentrations were considered consistent with background levels for soil in the United States. Based on these results, it was concluded that operations in these areas had not adversely impacted soil or groundwater.

According to information provided during the RCRA site visit in October 2008, the area of Tear Gas Training Site No. 2 was located within the footprint of the Golf Course that has been developed at the former Lorton site. The Golf Course comprises approximately 275 to 300 acres of the site.

6.8 SWMU No. 8 – Former Non-Permitted Landfill

There was an approximately 20-acre area northeast and east of the Silverbrook Road Firing Range that was used for the storage and possible disposal of vehicles and equipment. Based on reviews of aerial photographs, activity began earlier than 1953 and was significant by 1960. These storage and disposal activities appeared to peak between 1972 and 1984.

Two fill areas were present in this area. Between 1965 and 1990, the topography in this area was estimated to have changed as much as 30 feet. Filled Area No. 1 is just east of the Silverbrook Road Firing Range and Filled Area No. 2 is southeast of the unpaved access road to the Rocky Branch Range. Seepage from the toe of one of these filled areas was observed during the site

reconnaissance associated with the 1999 Phase I ESA. This seepage was noted to be feeding an intermittent stream along the northwestern edge of this area and contained "abundant iron oxide."

The 1999 Phase I ESA Report indicated the majority of surface debris (i.e., 740 tons of solid waste and 12 tons of tires) were removed from the Non-Permitted Landfill, formerly known as the Vehicle and Equipment Storage Yard, in 1992. However, scattered debris was observed during the site reconnaissance for the 1999 Phase I ESA. Observed debris included machinery pieces, automobile mufflers, rusted empty drums, coal ash, and empty paint containers. A total of 30 to 40 drums containing an "unidentified greenish-black slag-like material" were also present in the woods along the unnamed tributary of South Run, adjacent to this area. Ground surface staining was also present in the vicinity of the drums.

As part of the Phase II ESA, the Non-Permitted Landfill was investigated to determine if buried metallic and non-metallic waste was present in the fill areas. The investigative work also focused on whether hazardous chemicals were leaching from the area. A geophysical survey was conducted on three portions of the Non-Permitted Landfill with the following summary findings:

- Area I is an irregular grid approximately 400 feet in the east-west direction and 800 feet in the north-south direction and was investigated because of the reported burying of equipment This area was found to have large, buried metallic objects in a 3,000-ft2 area. It was believed that some objects may be buried at depths of 20 to 30 feet, which exceeds the capabilities of the detection techniques employed. The center portion of Area I was addressed in 1992 and was found to be free of anomalies during the 1999 Phase II ESA.
- Area II is approximately 300 feet to the east of Area I and was characterized by historic changes in topography. It is 350 feet in the east-west direction and 400 feet in the north-south direction. The geophysical survey identified a significant quantity of metallic and non-metallic objects in an approximate crescent shape. The most significant burial activities were noted in a 100,000 ft^2 portion of Area II. Similar to Area I; it was believed that some objects may be buried at depths of 20 to 30 feet.
- Area III is immediately northwest of Area I and is a small, rectangular area. The geophysical survey identified an elongated variance, typically of buried utilities, across this 60 feet by 250 feet area. In addition, several small variances were noted to potentially indicate small buried, metallic objects.

Based on the extent and significance of geophysical anomalies in Area II, the Phase II ESA included soil and groundwater sampling downgradient of the Non-Permitted Landfill to assess contaminant migration from this area. Samples were analyzed for Volatile Organic Compounds (VOCs), SVOCs, and priority pollutant metals. In addition, one groundwater sample was analyzed for pesticides and herbicides.

Soil results were generally found to be below detection limits for VOCs and SVOCs or within average concentrations found in the United States for metals. However, one soil sample, SB-01 (2'-4') revealed high concentrations for several metals. This sample was collected from an area

where a dark green colored sludge was present. The sampled material was noted to exhibit characteristics similar to lead-based paint. The following table summarizes the elevated detections in this sample and the average concentrations found in the United States.

Chemical	Detected Concentrations	Average Concentration in United States Soil
Antimony	1,700 mg/kg	1.0 mg/kg to 8.8 mg/kg
Chromium	17,000 mg/kg	1.0 mg/kg to 2,000 mg/kg
Lead	84,000 mg/kg	10 mg/kg to 700 mg/kg

Groundwater samples were collected from four locations. Similar to the soil results, VOCs and SVOCs were below detection limits. Two of the four groundwater samples also exhibited elevated metals detections. One of these samples, GW-01, was collected from the same location as SB-01. The following table summarizes the elevated detections in these samples and the drinking water standards.

Chemical	Detected Concentrations		Drinking Water Standard
	GW-01	***GW-04***	
Antimony	170 µg/l	< 5 µg/l	6 µg/l
Lead	530 µg/l	100 µg/l	15 µg/l

Based on the soil and groundwater samples collected as part of the 1999 Phase II ESA, the Non-Permitted Landfill had adversely impacted soil and groundwater at the site.

Subsequent to the Phase II ESA, a Site Characterization was undertaken as part of divesture of the Lorton Correctional Complex. This investigation was conducted between November 1999 and January 2000 and included hand augered and direct-push soil samples; Membrane Interface Probe (MIP) work, and groundwater monitoring at the Non-Permitted Landfill. The results of this investigation were documented in the March 2000 Comprehensive Site Characterization and Remedial Action Work Plan for the Non-Permitted Landfill Areas. The purpose of the investigation was to facilitate the development of a remedial approach for this area. Cleanup criteria selection was based on land use planning for low-density and medium-density single family housing in the landfill areas.

The following excavations were planned:

- **Area I**: Two areas of excavation are present in Area I, with depths ranging from 8 to 12 feet bgs. The first area was present in the northern portion of the Area I grid system and comprised 32,500 ft^2. The second excavation is located in the southern portion and covers an area of 62,500 ft^2. Within these areas, soils were impacted by metals above background concentrations. In addition, miscellaneous debris (i.e., brick, concrete, metallic objects, wood) were anticipated in these excavation areas.
- **Area II**: This area is approximately 125,000 ft^2 and excavation was planned to depths of 5 to 40 feet bgs. Soils with metal concentrations above background concentrations are present throughout Area II. Black ash was also located throughout the excavation area, reaching a thickness of approximately 30 feet in the east-northeastern portion of the site. Soils contaminated with petroleum products were present in the center of Area II.

Excavation was to be to a depth of 40 feet bgs in this area to remove free product as well as the impacted soil. Miscellaneous debris was also anticipated in Area II.

- **Area III**: No remedial action was planned in this area.
- **Area IV**: The planned excavation was 1,200 ft^2 with a depth ranging from 4 to 12 feet bgs. Soils with metal concentrations above background concentrations and miscellaneous waste were present in this area.
- **Area V**: This area is approximately 10,800 ft^2 and excavation was planned to depths of 2 to 10 feet bgs. Soils with metal concentrations above background concentrations were present throughout Area V. Black ash was also located throughout the excavation area, reaching a thickness of approximately 6 feet in the central portion of the site. Soils contaminated with petroleum products were present in the center of Area V. Miscellaneous debris was also anticipated in Area V.
- **Area VI**: The planned excavation was 11,900 ft^2 with a depth ranging from 1 to 4 feet bgs. Soils with heavy metal concentrations significantly above background concentrations were present in this area. Excavation of this material was anticipated to be RCRA hazardous waste. In addition, soil contaminated with petroleum products was present in the western portion of the excavation area.

Remediation of the Non-Permitted Landfill was completed between July 18, 2000, and September 10, 2001. Confirmatory compliance samples were collected to document that remaining residuals and soils concentrations were below actionable levels. A total of 187,435 tons of material was transported off-site for disposal in a RCRA Subtitle D facility. In addition, a total of 23,864 tons of this material required disposal as a hazardous waste in a RCRA Subtitle C TSD facility.

A summary of the excavations follows:

- **Area I**: A total of 4,466 tons of non-hazardous material was removed. The majority of waste was removed from 5 to 15 feet bgs.
- **Area II**: This was the largest area of excavation with a total of 121,393 tons of material removed. Approximately 18 percent of this material was considered hazardous waste.
- **Area III**: No material was removed from this area.
- **Area IV**: A total of 5,178 tons of material was removed. The majority of waste was considered non-hazardous miscellaneous solid waste and construction debris. A total of 26 tons of hazardous lead-based paint contaminated soil was removed from this area.
- **Area V**: A total of 52,620 tons of material was removed. The majority of the waste was considered non-hazardous petroleum-contaminated soil. The remainder of the waste was hazardous (80 tons) and non-hazardous (1,957 tons) black ash.
- **Area VI**: A total of 1,941 tons of lead-based paint contaminated soil was removed. Approximately 70 percent of this soil was classified as hazardous waste.

Following removal of waste from the Non-Permitted Landfill, four quarters of post-closure groundwater monitoring was completed. Quarterly Monitoring Report #4, Final Monitoring Event was submitted on July 12, 2002, and recommended no groundwater remediation and discontinuation of the groundwater monitoring.

6.9 SWMU No. 9 – Former Drum Dumping Area

During the 1999 Phase I ESA, a Drum Dumping Area (containing 30 to 44 drums) was identified along the banks of a small stream flowing eastward from the edge of the Non-Permitted Landfill. The 55-gallon drums were scattered along both banks of this tributary of South Run for several hundred feet. Dark green stains were visible on the drums and adjacent sediment.

The Drum Dumping Area was evaluated as part of the Phase II ESA in 1999. This assessment focused on potential impacts to soil and groundwater from leaking drums. Samples of the sediment/sludge and surface water were collected. Samples were analyzed for VOCs, SVOCs, and priority pollutant metals.

Soil results were generally found to be below detection limits for VOCs and SVOCs or within average concentrations found in the United States for metals. However, the soil/sludge samples reported high concentrations for antimony, chromium, lead, and mercury. The following table summarizes the elevated detections in this sample and the average concentrations found in the United States.

Chemical	**Detected Concentrations**		**Average Concentration in United States Soil**
	A-10-DW-01	***A-10-DW-02***	
Antimony	550 mg/kg	560 mg/kg	1.0 mg/kg to 8.8 mg/kg
Chromium	20,000 mg/kg	22,000 mg/kg	1.0 mg/kg to 2,000 mg/kg
Lead	85,000 mg/kg	94,000 mg/kg	10 mg/kg to 700 mg/kg
Mercury	24 mg/kg	25 mg/kg	0.01 mg/kg to 4.6 mg/kg

In the surface water sample, the only chemical detected above applicable water quality and/or drinking standards was lead. The detected concentration in the stream was 44 mg/l, which exceeds the 15 mg/l drinking water standard. Based on the sediment/sludge and surface water samples collected as part of the 1999 Phase II ESA, the Drum Dumping Area had adversely impacted this stream.

Subsequent to the Phase II ESA, a Site Characterization was undertaken as part of divesture of the Lorton Correctional Complex. This investigation was conducted between November 1999 and January 2000 and included hand augered and direct-push soil samples; MIP work; and groundwater monitoring at the Drum Dumping Area. The results of this investigation were documented in the March 2000 Comprehensive Site Characterization and Remedial Action Work Plan for the Non-Permitted Landfill Areas. The purpose of the investigation was to facilitate the development of a remedial approach for this area.

Remediation of the Drum Dumping Area was included in the remedy for the Non-Permitted Landfill (SWMU No. 8) as the Drum Dumping Area is collocated with Area VI noted above. Following remediation of the Non-Permitted Landfill, which includes the Drum Dumping Area, four quarters of post-closure groundwater monitoring was completed. Quarterly Monitoring Report #4, Final Monitoring Event was submitted on July 12, 2002, and recommended no groundwater remediation and discontinuation of the groundwater monitoring.

6.10 SWMU No. 10 – Former Buried Drum Area – Pulte Homes Area

During redevelopment efforts in 2003, an area of buried drums was encountered by Pulte Homes while installing a stormwater outfall. This 80-foot by 80-foot by 14-foot deep burial area was located between the former rail line (i.e., the Greenway) and the side spur used to switch rail cars. It was believed the 55-gallon drums may have been buried in the late 1960s and had been from the vehicle maintenance activities conducted at the Lorton Correctional Complex. A VDEQ inspection following drum discovery estimated that 20 to 25 drums may have been buried in this area. Some drums were found to be punctured and leaking.

Cleanup of this area was conducted in April 2003 and consisted of waste characterization; removal of buried drums and impacted soil; and off-site disposal. A sludge sample collected from one drum was found to be hazardous (D008) with a lead concentration of 45 mg/l in the leachate. Samples of material in the drums indicated the presence of TPH, at concentrations as high as 950,000 mg/kg, as well as xylenes, toluene, and naphthalene. With the exception of the one hazardous drum, the remainder of the waste streams (i.e., impacted soils, scrap drum waste, and liquid waste) were determined to be non-hazardous, petroleum-impacted material.

Confirmatory soil samples were collected from the sidewalls and bottom of the excavation following drum removal. Analytical results indicated the excavation had successfully addressed contamination in the lateral extent but that vertical excavation would be necessary. Based on discussions with regulatory agencies, the final approach to address impacted soil was agreed to include direct-push borings to define the horizontal extent of impacts. A grid system was established over the 80’ by 80’ excavation with a total of 18 grid squares that each corresponded to a direct-push boring. Samples were collected at 4’ intervals and analyzed for TPH-DRO and TPH-GRO. Results were used to target grids for additional excavation.

The calculated average compliance sample concentration was 34 mg/kg TPH-DRO in soil in this area. This is well below the VDEQ’s Petroleum Tank Program action level or performance standard of 100 mg/kg and below the clean fill criteria of 50 mg/kg.

A groundwater sample collected from a temporary well point was non-detect for both TPH-DRO and TPH-GRO. The cleanup efforts conducted for this SWMU are summarized as follows:

- 149.5 tons of non-hazardous scrap drum waste was removed;
- 6,040.2 tons of impacted soil was removed;
- 6,112 gallons of liquid was removed;
- One drum of hazardous material was removed; and
- Seven loads of scrap metal (e.g., debris, engine blocks, and axles) were removed.

The above waste materials were shipped or manifested off site for treatment and or disposal to appropriate TSD facilities either regulated under RCRA Subtitle D, Subtitle C, or recycled as applicable, under the VDEQ’s oversight.

A letter from Consolidated Engineering Services, June 30, 2003, to GSA documented the buried drum clean up activities conducted in the Pulte Homes Area.

6.11 SWMU No. 11 – Former Occoquan Blacksmith / Tractor Repair Shop

To the east of the Occoquan Facility was a Blacksmith/Tractor Repair Shop. The Occoquan Blacksmith/Tractor Repair Shop is an L-shaped building with a tractor bay, storage shed, and an access road. During the site reconnaissance associated with the 1999 Phase I ESA, black stained soil was noted on the brick driveway south of the building.

As part of the Phase II ESA, the Occoquan Blacksmith/Tractor Repair Shop was assessed for potential impacts to soil and groundwater from prior operations. Suspected contaminants included petroleum products, solvents, PCBs, and metals. Therefore, soil and groundwater samples were collected from this area and analyzed for VOCs, SVOCs, PCBs, TPH, pesticides, and priority pollutant metals.

Analytical results were non-detect for VOCs, SVOCs, PCBs, and pesticides. Low level detections of chromium, copper, lead, nickel, selenium, and zinc were reported. However, the reported concentrations were generally considered consistent with background levels for soil in the United States. The only metal to exceed background concentrations was selenium, which was detected at a concentration of 36 mg/kg. As no known source for the selenium is present in this area, it was believed to be naturally occurring.

Elevated TPH was detected in one soil sample, SB-02-1, which was collected from a location with visible, black stains and signs of stressed vegetation. This area was between the building and brick driveway so it was believed that it may have been used to store containers. TPH in this boring was as high as 430 mg/kg in the surface. However, the subsurface sample contained TPH at a concentration below VDEQ's 100 mg/kg action level. This area of contamination was estimated to be 4 feet by 4 feet by 2 feet deep.

Groundwater concentrations in the Occoquan Blacksmith/Tractor Repair Shop were generally below primary and secondary drinking water standards. The exceptions were lead at a concentration of 84 µg/l and selenium at a concentration of 140 µg/l. Based on the lack of apparent source and the slightly elevated nature of these detections, the presence of lead and selenium in groundwater was not considered significant.

Based on the soil and groundwater samples collected as part of the 1999 Phase II ESA, the Occoquan Blacksmith/Tractor Repair Shop had adversely impacted soil in the 4' by 4' area of staining and stressed vegetation. It is unclear what remedial actions, if any, were initiated to address the impacted soil.

6.12 SWMU No. 12 – Central Facilities Industries Shops

Several light industrial shops were present in the Central Facility involved in furniture manufacturing and repair, printing, metal fabrication, and auto body work. Hazardous wastes, including waste paints, thinners, solvents, strippers, ink waste, and other chemical waste, were generated in this area. Several areas were used as temporary storage locations for hazardous wastes prior to off-site disposal. These storage areas included a Less than 90-day Hazardous

Waste Accumulation Area (SWMU No. 1) and Satellite Accumulation Areas (SWMU No. 2). A list of the SAAs and the 90-day accumulation area follows:

- ***Satellite Accumulation Area #1*** (Metal Shop) – D001/D035/F003/ F005 waste
- ***Satellite Accumulation Area #2*** (Metal Shop) – F003/F005 waste
- ***Satellite Accumulation Area #3*** (Furniture Shop) – D001/D035/F003/F005 waste
- ***Satellite Accumulation Area #4*** (Furniture Shop) – D001/D035/F003/F005 waste
- ***Satellite Accumulation Area #5*** (Furniture Shop) – F002/F003 waste
- ***Satellite Accumulation Area #6*** (Furniture Shop) – D001/F002/F003 waste
- ***Satellite Accumulation Area #7*** (Body Shop) –waste paint/thinner and paper
- ***Industries Storage Area*** (Furniture Shop) – 90 day storage

Safety-Kleen in New Castle, Kentucky, Petrochem Processing, Inc., North East Chemical Corporation, and Michigan Recovery had been used for disposal. However, the most recent information indicated that wastes were sent to Clean Ventures, Inc., Cycle Chem, Inc., and Ashland Chemical Company/Ashland Distribution Company. The final shipment of hazardous waste from the Industries Storage Area took place on July 24, 2001.

As part of the Phase II ESA, the Central Facilities Industries Shop was assessed for potential impacts to soil and groundwater from prior operations. The VDEQ had recently cited these operations for deficiencies in the management of hazardous wastes. Samples of soil and groundwater were collected and analyzed for VOCs, SVOCs, and priority pollutant metals. The sampling locations were selected, as they were known staging and temporary storage locations for 55-gallon drums.

Soil results were generally found to be below detection limits for VOCs and SVOCs or within average concentrations found in the United States for metals. However, one sample exhibited elevated metals concentrations. This sample was collected on the north side of the Furniture Repair Shop. The following table summarizes the elevated detections in this sample and the average concentrations found in the United States.

Chemical	Detected Concentration	Average Concentration in United States Soil
Copper	3,300 mg/kg	1 mg/kg to 700 mg/kg
Lead	2,700 mg/kg	10 mg/kg to 700 mg/kg
Zinc	7,900 mg/kg	5 mg/kg to 2,900 mg/kg

Groundwater concentrations in the Central Facilities Industries Shop were generally below primary and secondary drinking water standards, the exception being lead at concentrations of 42 µg/l and 130 µg/l.

Based on the soil and groundwater samples collected as part of the 1999 Phase II ESA, operations in the Central Facilities Industries Shop had adversely impacted soil and groundwater. It is unclear what remedial actions, if any, were initiated to address the impacted soil and groundwater

6.13 SWMU No. 13 – Former Vehicle Maintenance Facilities Central Facility

A Vehicle Maintenance Facility was also located in the Central Facility on Silverbrook Road that was constructed in 1995. The Vehicle Maintenance Facility included two buildings that housed administrative offices, storage areas, and a repair shop for vehicles and equipment. Also located in this area was a fire station.

A total of 12 USTs and 2 ASTs were present in this area for the storage of diesel fuel, gasoline, antifreeze, motor oil, used oil, and hydraulic oil (SWMU Nos. 4 and 5). The Phase II ESA noted that there had been no known releases of product to the environment associated with the USTs and ASTs at the Vehicle Maintenance Facility. As a result, no soil or groundwater samples were collected from this area during the Phase II ESA.

An Old Vehicle Maintenance Facility was also present in the northeast corner of the Central Facility, just north of the NIKE Missile Complex. This area was used prior to opening the New Vehicle Maintenance Facility in 1995. The Old Vehicle Maintenance Facility included a storage area where 50 transformers were located during the site reconnaissance for the 1999 Phase I ESA. It was also reported that vehicle batteries were stored outside on the west side of the building.

The Old Vehicle Maintenance Facility was included in the subsequent Phase II ESA to determine if operations had impacted soil and groundwater. Surface and subsurface soil samples were collected from the Old Vehicle Maintenance Facility. Attempts to reach groundwater were unsuccessful in this area. The soil samples were analyzed for VOCs, SVOCs, priority pollutant metals, and pH.

Analytical results from the Old Vehicle Maintenance Area were non detect for VOCs and SVOCs. The reported pH levels were within an acceptable range for soils. Low level detections of metals were found in soil samples in this area. However, the reported concentrations were considered consistent with background levels for soil in the United States. Based on these results, it was concluded that operations in this area had not adversely impacted soil or groundwater.

6.14 SWMU No. 14 – Former Firing Range Sites

The Lorton Correctional Complex included several firing range sites as follows:

- ***Rocky Branch Firing Range – Firing Range No. 1***

  This smallest abandoned small arms firing range was located at the end of an unpaved road in the woods northeast of Silverbrook Road, next to Rocky Branch. It was the oldest firing range, having operated prior to 1960. This area is also known as Firing Range No. 1 and included railroad timbers, stacked approximately 4 feet high and 30 feet wide, with metal target frames and no backstop. During the site reconnaissance for the 1999 Phase I ESA, this area was noted as a 200-foot long cleared area with a low barrier at the target end. Remnants of pop-up targets were also observed.

- ***Silverbrook Road Firing Range – Firing Range No. 2***

  This abandoned small arms firing range was a one-acre area present in the woodlands northeast of Silverbrook Road. This range, also known as Firing Range No. 2, appeared to have operated between 1960 and 1986. It consisted of a building, gravel parking, concrete barrier wall, firing lanes, and natural soil backstop. During the site reconnaissance for the 1999 Phase I ESA, this area was cleared and graded. The earlier building had been demolished. A berm was located along the east side of this firing range and the north side is an excavated embankment.

- ***Recent Firing Range – Firing Range No. 3***

  The Recent Firing Range, also known as Firing Range No. 3, was present in the north-central portion of the site, east of Hooes Road. This area was opened in 1988 to replace Firing Range No. 2. It had both indoor and outdoor firing areas and was used through May 1999 as a training range for small arms. This is also the location of Tear Gas Impact Site No. 2 (SWMU No. 7). A shotgun range was also present to the east of the tear gas training area. The entire area is surrounded by an earthen berm and total approximately 6.5 acres.

As part of the Phase II ESA, the three Firing Range Sites were assessed for potential impacts to soil and groundwater. The primary environmental concern at the Firing Ranges was lead. For Firing Range No. 1, the highest concentrations were found in the 30 feet by 90 feet area in front of the stacked timbers. Outside this area, lead concentrations returned to background concentrations. Lead at Firing Range No. 2 and Firing Range No. 3 appeared to be contained in the backstops and upper 6 inches of soil in the firing lanes. In addition, elevated lead concentrations were detected in samples from the backstop at the Shotgun Range.

The following table summarizes lead concentrations that exceeded applicable standards in each of the Firing Range Sites. All concentrations are reported in mg/kg.

Sample	Detected Concentration	Average Concentration in United States Soil	Bare Residential Soil with Child Contact	Bare Residential with Minimal Child Contact	Maximum Bare Residential Soil
Firing Range Site #1					
A-06-SS-01	770	10 – 700	400	2,000	5,000
A-06-SS-02	640				
A-06-SS-03	420				
Firing Range Site #2					
A-23-SS-01	520	10 – 700	400	2,000	5,000
A-23-SS-02	940				
A-23-SS-06	18,000				
A-23-SS-07	6,000				
A-23-SS-09	870				
A-23-SB-03	720				

Sample	Detected Concentration	Average Concentration in United States Soil	Bare Residential Soil with Child Contact	Bare Residential with Minimal Child Contact	Maximum Bare Residential Soil
Firing Range Site #3					
A-66-SS-03	4,500	10 – 700	400	2,000	5,000
A-66-SS-04	10,000				
A-66-SS-06	4,900				
A-66-SS-07	30,000				
Shotgun Range Site					
A-66-SS-01	480	10 – 700	400	2,000	5,000
A-66-SS-02	1,800				

Elevated lead concentrations were also reported in groundwater samples collected from Firing Range No. 2 and Firing Range No. 3. The following table summarizes lead concentrations that exceeded drinking water standards in each of the Firing Range Sites.

Sample	Detected Concentration	Drinking Water Standards
Firing Range Site No. 2		
A-23-GW-01	280 µg/l	15 µg/l
A-23-GW-02	1,600 µg/l	
A-23-GW-03	440 µg/l	
Firing Range Site No. 3		
A-66-GW-01	24 µg/l	15 µg/l
A-66-GW-02	440 µg/l	
A-66-GW-03	270 µg/l	
A-66-GW-04	1,300 µg/l	

Based on the soil and groundwater samples collected as part of the 1999 Phase II ESA, it appears that firing range activities had impacted both soil and groundwater at the site. Contamination was primarily located near the natural soil berm backstops.

Subsequent to the Phase II ESA, additional site characterization was undertaken as part of divesture of the Lorton Correctional Complex.

The investigations were conducted between November 1999 and January 2000 and included hand augered soil samples and groundwater monitoring at the three Firing Range Sites. The purpose of the investigation was to delineate areas of lead in excess of 400 mg/kg for remediation.

Based upon the investigations findings, a Comprehensive Site Characterization and Remedial Action Plan for the Three Firing Ranges was developed by AAS Environmental, Inc., dated February 25, 2000.

The following areas of soils excavation were proposed:

- ***Rocky Branch Firing Range – Firing Range No. 1***
  An area of approximately 20 feet by 20 feet was recommended for excavation to a depth of one foot bgs. The total quantity of soil to be removed from this area was approximately 135 yd^3.

- ***Silverbrook Road Firing Range – Firing Range No. 2***
  Two areas of excavation were proposed in this area with a total volume of soil to be removed of approximately 10,000 yd^3. The first area was approximately 385 feet by 280 feet to a depth of one foot bgs and the second was approximately 385 feet by 105 feet to a depth of 4 feet bgs.

- ***Recent Firing Range – Firing Range No. 3***
  Three areas of excavation were proposed in this area with a total volume of soil to be removed of approximately 5,000 yd^3. The first area was approximately 30,000 ft^2 to a depth of one foot bgs; the second area was approximately 25,000 ft^2 to a depth of 2 feet bgs; and the last area was approximately 15,625 ft^2 to a depth of 3 feet bgs.

Remediation of the Firing Range Sites was initiated on May 23, 2000 and completed on September 29, 2000. During this timeframe, a total of 19,021 tons of non-hazardous lead-contaminated soil was removed from the three ranges and sent off-site for disposal to a RCRA Subtitle D Landfill. Approximately 2,490 tons of the contaminated soil was initially considered hazardous and required on-site treatment (i.e., cement stabilization) prior to off-site disposal. Waste minimization strategies resulted in the recovery and recycling of 96,160 pounds of lead shot.

A letter was submitted to VDEQ by AAS Environmental, Inc. relating to the voluntary remediation of three firing ranges, the non-permitted landfill area, and the drum dumping area on March 21, 2001. A Firing Range Remediation Closeout Report was also issued by AAS Environmental, Inc., on May 1, 2001 for these three sites.

A February 1, 1991 Finding of Fact letter from the USACE indicates there was no evidence of any contamination resulting from DoD use of the property. The letter noted the Corrections Department as the site owner and that for a time (ending in 1969) the Air Force and DC Corrections Department jointly used the site for small arms training.

The USACE reported that it did not have any files indicating sampling or remediation had taken place relating to this SWMU. USACE files did not indicate if other activities took place at the site (such as weapons cleaning and maintenance [cleaners, oils] or building and grounds maintenance [e.g., lead-based paints, other paints, cleansers and solvents, pesticides]).

According to information provided during the RCRA Site Visit in October 2008, the area of Firing Range No. 3 was located within the footprint of the Golf Course that has been developed at the former Lorton site. The Golf Course comprises approximately 275 to 300 acres of the site.

6.15 SWMU No. 15 – Former Agricultural Areas (Herbicides/Pesticides Area)

Open portions of the site have been used for agricultural purposes and likely were applied with pesticides and/or herbicides. As the prison was initially designed and intended to be self-sufficient, they cultivated hay, corn, and other crops for their own use. A portion of the Lorton facility was used as pastureland for the Lorton Dairy. Aerial photograph review during the 1999 Phase I ESA also identified a 150 acre area of orchards in the middle of the site, near the intersection of Furnace Road and Lorton Road. These orchards were visible as a rectilinear pattern of trees on aerial photographs between 1937 and 1953.

As part of the Phase II ESA, the Agricultural Areas were assessed for potential impacts to soil and groundwater from prior pesticide and/or herbicide applications. Subsurface soil samples were collected from the orchard area and pesticides, herbicides, and priority pollutant metals. Analytical results from this area were non-detect for all analytes. Based on these results, it was concluded that operations in this area had not adversely impacted soil.

6.16 SWMU No. 16 – Former Facilities Management PCB Storage Shed

Based on the age of construction of the buildings at the site, fluorescent light ballasts may have contained PCBs. According to a 1992 PCB Abatement Report, all PCB-containing equipment was removed from the Lorton Correctional Complex. However, additional PCB-containing equipment was identified at the facility subsequent to the abatement. This equipment included two PCB-filled capacitors that were internal to switchgear and one 100-kV electrical transformer. This transformer was noted to have a hole in the bottom. However, it is unclear if it may have leaked PCB-containing oil. No documentation of investigation or disposal was identified in USEPA or VDEQ files pertaining to the above equipment. However, the 1999 Phase I ESA noted that all electrical switchgear had been replaced since 1992 and the PCB-containing equipment had presumably been removed from the site.

In addition to the PCB-containing equipment throughout the facility, a small storage shed in the northwestern portion of Facilities Management was labeled as a “PCB Storage Shed”. This shed was adjacent to Building N-9, the Welding Shop. The 1999 Phase II ESA included assessment in this area to determine if soil and groundwater had been impacted by PCBs. Analytical results for both soil and groundwater were below detection limits for PCBs. Based on these results, it did not appear that soil or groundwater were impacted by operations at the PCB Storage Shed.

6.17 SWMU No. 17 – Former NIKE Missile Complex

The Phase I ESA identified a Former NIKE Missile Complex (later referred to as a Minimum Security Complex at the Lorton facility). This SWMU was located under the Minimum Security Complex (See SWMU No. 24). The former NIKE Missile Complex consisted of a missile launch site and a radar/control site. The Former NIKE Missile Complex reportedly operated between 1954 and 1974. This facility was used to store missiles and may have stored part of a reactor from Fort Belvoir according to an employee of the Correctional Facility interviewed

during the 1999 Phase I ESA. Requests for information made during preparation of the Phase I ESA were unable to confirm or deny storage or disposal of the reactor at the NIKE Missile Complex.

According to interviews conducted as part of the Phase I ESA, operations at the Former NIKE Missile Complex were secretive and work was routinely conducted at night. Once per year, the missiles were reportedly raised into their launch formation, cleaned, and returned to their underground storage location. Although documentation of decommissioning activities is not available, interviews at the time of the Phase I ESA noted that the missiles would have been removed as a matter of national security.

After the NIKE Missile Complex was closed, the area was locked and fenced for access control. The elevator doors were welded shut. Access to the underground complex was further limited as the stairwells and vaults filled with water. Prior to constructing the Minimum Security Facility over the Former NIKE Missile Complex, the elevators were capped with concrete and metal plates were welded over the access doors.

This complex also consists of several small buildings built during the 1950s as part of the control area. After the NIKE Missile Complex was decommissioned by the DoD, these buildings were used as Facilities Management offices for the Lorton Correctional Complex. Construction plans for the NIKE Missile Complex had included four USTs: two 10,000 gallon fuel oil tanks and two 1,000 gallon gasoline tanks.

As part of the Phase II ESA, the NIKE Missile Complex was assessed for potential solvent, acid, or other hazardous chemical impacts to soil and groundwater from prior activities. Contaminants typically associated with NIKE Missile Sites include carbon tetrachloride, trichloroethene (TCE), 1,1,1-trichloroethane (TCA), nitric acid, alcohols, dimethyl hydrazine, battery acid, petroleum products, waste oils, and other solvents and degreasers. Soil and groundwater samples collected from the NIKE Missile Complex were analyzed for VOCs and petroleum hydrocarbons.

Analytical results were generally below detection limits. However, TCE, cis-1,2-dichloroethene, carbon tetrachloride, and chloroform were detected in the groundwater. TCE was the only contaminant detected at concentrations above applicable standards. The following table summarizes the elevated detections in these samples and the drinking water standards.

Chemical	**Detected Concentrations**					**Drinking Water Standard**
	GW-02	***GW-04***	***GW-05***	***GW-06***	***GW-07***	
Trichloroethene		6 µg/l	8 µg/l	24 µg/l	21 µg/l	5 µg/l

Soils in the NIKE Missile Complex did not appear to be impacted by earlier operations. As groundwater at the site is not used as a drinking water source, it was also noted that TCE was not detected at levels that would require remediation.

The former NIKE Missile Complex facility falls under the FUDS list and further information and documentation has been requested pertaining to the nature and extent of decommissioning of this NIKE Missile Complex by the DoD in an e-mail request from Mr. Richard Criqui to Mr. Edward Hughes, USACE, dated February 13, 2009.

At this time, the VDEQ's available information pertaining to this FUDS site is limited and includes information from July 2008 e-mails. The USACE reports their files include an early 1990s Fact Finding Letter recommending a determination that DoD had accomplished restoration of the site before vacating the premises. It appears various materials of concern were discarded at the site, including petroleum products; "tetrachloride" (Most likely carbon tetrachloride); TCE; TCA; nitric acid; alcohols; battery acid; other oils, solvents, and degreasers; dimethyl hydrazine; and nuclear products. Correspondence between VDEQ and USACE, note that a "PCB pad" had been removed.

No sampling data was found in the files reviewed.

6.18 SWMU No. 18 – Former Miscellaneous Dumping Areas

During the 1999 Phase I ESA, trash and debris were found along roadsides and in adjacent wooded areas throughout the site. The majority was noted to be general trash (i.e., bottles, cans, paper, and other objects discarded from vehicles). In addition, cans and bottles were present along streams and ponds. These objects were presumably left by recreational users at the site.

Significant dumping was noted along Pohick Road and unpadded dead end roads into the woods between Pohick Road and South Run. This dump site contained debris (e.g., wallboards, floor tile, asphalt shingles, concrete blocks, bricks, sinks, toilet bowls, rugs, furniture, toys); household appliances (e.g., refrigerators, stoves, washing machines); automotive parts (e.g., tires, mufflers, engine blocks, bumpers); and empty cans and bottles (e.g., paints, solvents, petroleum products). In addition, there was the potential for some of the material to contain asbestos. However, these areas were not further assessed in the 1999 Phase II ESA.

6.19 SWMU No. 19 – Former Central Facilities Boiler House and Occoquan Facilities Boiler House and Coal Piles

Prior to conversion to natural gas or fuel oil, coal had been used to fire boilers at the Central Facilities Boiler House and the Occoquan Facilities Boiler Houses. These Boiler Houses are also referred to as Steam Plants. Photograph Nos. 5 through 7 depict the Central Facilities Boiler House.

During the site reconnaissance associated with the 1999 Phase I ESA, a large coal pile was noted to remain at the Occoquan Boiler House. Although the pile was on a concrete pad, there was concern over the potential for runoff to impact groundwater and/or surface water. It was recommended that the surplus coal pile be removed and properly sent off-site for re-use or disposed of as part of the closure process for the Lorton Correctional Complex. Site representatives indicated that approximately 1,200 tons of coal had been removed from the coal storage areas.

During the 2008 RCRA Site Visit, it appeared that half of the Central Facilities Boiler House boilers were converted to burn fuel oil, while it appeared that half of the boilers were capable of using coal.

During the RCRA Site Visit in October 2008, approximately 100 tons of coal remained within the large indoor steel hopper inside the Central Facilities Boiler House. The County representative was informed that if the coal was considered to be abandoned, then it would be considered to be a solid waste and subject to the Virginia Solid Waste Management Regulations (VSWMR). The County representative was encouraged to find a potential source for the beneficial use of the coal and to have the coal removed from the site. It was noted that the VDEQ and the USEPA may have information databases available under Pollution Prevention Offices to help find a beneficial end user of the coal.

According to information provided during the RCRA Site Visit in October 2008, steam line tunnels and related steam line infrastructure currently exists at the Lorton facility. Many of these steam line tunnels were built using older construction methods, were often vaulted, and were bricked tunnels.

As part of the subsequent Phase II ESA in 1999, the In-Service USTs were inspected for compliance with regulatory requirements. The Phase II ESA Report provided summary information for in-service USTs as discussed under SWMU No. 4. The Phase II ESA identified two, 25,000 gallon USTs for storage of fuel oil in both the Central Facility's Boiler House (Heating Plant) and the Occoquan Facility's Heating Plant. The Central Facility Boiler House stored No. 6 fuel oil, while the Occoquan Facility stored No. 2 fuel oil. Excerpted information from the Phase II ESA Report summarizes information associated with the USTs associated with the Boiler Houses and is as follows:

Tank ID	Installation Date	Location	Capacity (gallons)	Content	Releases
Central Facility					
FLD 539	1989	200 Man Modular	2,500	Diesel	Passed tightness testing
FLD 531	1988	Genset 1A, 2A	5,000	Diesel	Passed tightness testing
FLD 537	1990	Genset 1B, 2B	5,000	Diesel	Passed tightness testing
FL2 504A	1975	Heating Plant	25,000	#6 Fuel Oil	Known release
FL2 504B	1975	Heating Plant	25,000	#6 Fuel Oil	Known release
Occoquan Facility					
FLD 504	1989	Genset	10,000	Diesel	Passed tightness testing
FL2 A	1996	Occoquan	25,000	#2 Fuel Oil	Release to containment
FL2 B	1996	Occoquan	25,000	#2 Fuel Oil	Release to containment

6.20 SWMU No. 20 – Former Wastewater and Water Treatment Plants

A Wastewater (Sewage) Treatment Plant was previously located in the southern portion of the site. Sewage from the Lorton Correctional Complex was treated by extended aeration, chlorination, dechlorination, and alum flocculation. The treatment system also adjusted for pH through the use of caustic soda. It was also reported to include the use of lagoons. Treated water was discharged to Mills Creek, just above the confluence with the Occoquan River. During the

operational period of this plant, it was cited by VDEQ for exceeding their effluent discharge permit limits under Permit No. VA0030163.Sludge from the Sewage Treatment Plant was sent to Fairfax County's Lower Potomac Sewage Plant.

The exact construction date for the Sewage Treatment Plant is unknown. However, upgrades were reported in 1982, which would indicate it predates the 1980s. The closure date for this facility is also unknown. However, it was noted during the October 30, 2008 site visit that this facility has been abandoned and associated piping sealed. All that remains is a foundation.

In 1994, an In-Plant Control Evaluation was conducted for the Sewage Treatment Plant. A June 1994 sample determined the effluent from the Sewage Treatment Plant was chronically toxic. Based on the results of this study and earlier studies, it was determined the laundry facility was the main source of toxicity to the sewage treatment plant. Earlier studies had shown the Sewage Treatment Plant was capable of handling the toxic loading to the treatment plant, providing the plant was operating as designed and the toxicity level in the influent did not increase. To ensure compliance with VDEQ under the VPDES Permit Regulations, it was recommended that the ink pit functionality be restored or that a pre-treatment program be implemented in the laundry facility to reduce or eliminate the toxicity of the wastewater. The toxicity problems were noted to have ceased between 1994 and 1995 when industrial laundering was stopped and the ink pit became an open, flow through, tank. Therefore, the recommended actions of the In-Plant Control Evaluation were not implemented.

A water treatment plant had also operated at the site for the treatment of Occoquan River water. It was located adjacent to the Occoquan Facility. This plant was used to treat the river water for drinking water use prior to the mid 1970s. In the mid 1970s, Fairfax County began supplying water to the Lorton facility through the POTW System. The former WTP facility has been abandoned and associated piping sealed. Similar to the Sewage Treatment Plant, all that remains is a foundation.

6.21 SWMU No. 21 – Former Occoquan Greenhouse Storage

The Occoquan Greenhouse is located immediately north of the Occoquan Facility and east of the main parking lot. Pesticides and herbicides used at the Lorton Correctional Complex were stored in the Occoquan Greenhouse Storage area. As a result, this area was included in the 1999 Phase II ESA. Soil samples were collected from this area and analyzed for pesticides, herbicides, and priority pollutant metals. In addition, a groundwater sample was collected and analyzed for TPH-GRO in addition to benzene, toluene, ethylbenzene, and xylenes (BTEX) due to this area's proximity to a UST with known contamination.

Analytical results from this area were non detect for pesticides and herbicides. Detections of metals were generally below applicable standards. The one exception was lead in GW-01 (270 µg//l), which exceeded the drinking water standard (15 µg/l). TPH-GRO was also detected in GW-02, but at a concentration below the drinking water standard. Based on these results, it was concluded that operations in this area had not adversely impacted soil. However, it was noted that the nearby UST (SWMU No. 4) had apparently impacted groundwater in this area.

6.22 SWMU No. 22 – Former Old Line Shop, Facilities Management Buildings N-7 and N-8

Pesticides and herbicides used at the Lorton Correctional Complex were also stored in the Old Line Shop. This area may have also been used to store PCB-containing equipment. As a result, this area was included in the 1999 Phase II ESA with samples collected and analyzed for pesticides, herbicides, and PCBs. Analytical results for herbicides and PCBs were below detection limits. Pesticides were detected in soil from the Old Line Shop, at concentrations below RCRA action levels. The 4,4'-DDE concentration of 77 µg/kg and 4,4'-DDT concentration of 130 µg/kg were considered an indication of residual contamination and not an environmental concern.

6.23 SWMU No. 23 – Former Chicken Coop Area

The Former Chicken Coop Area was reportedly used for the storage of herbicides. Storage may have included several dozen drums at a time. This structure was demolished prior to the 1999 Phase I and Phase II ESA. However, a long rectangular garage existed where the Former Chicken Coop had been located. This garage may have been used for the storage of herbicides.

This area was included in the Phase II ESA with soil samples collected for pesticide, herbicide, and lead analysis. Herbicides were not detected in these samples. Similar to the Old Line Shop, the 4,4'-DDE (230 µg/kg) and 4,4'-DDT (120 µg/kg) concentrations were considered indicative of residual contamination and not an environmental concern. Elevated lead concentrations were noted in this area, presumably due to peeling lead-based paint from the building. The detected concentrations ranged from 210 mg/kg to 1,300 mg/kg. These concentrations were below the guidelines for bare residential soil with minimal or no child contact (i.e., 2,000 mg/kg). However, two of these concentrations were above the guideline for bare residential soil with child contact (i.e., 400 mg/kg).

6.24 SWMU No. 24 – Former Minimum Security Facility, Dormitory #4

An area in the northwest corner of the Minimum Security Facility was reportedly used to store out-of-service transformers and other electrical equipment. In addition, a spill of 50 to 100 gallons of PCB-containing oil had occurred in this area. As such, Dormitory No. 4 of the Minimum Security Facility was included in the 1999 Phase II ESA. Analytical results for both soil and groundwater were below detection limits for PCBs. Based on these results, it did not appear that soil or groundwater were impacted by either storage of PCB-containing equipment or the reported spill. This SWMU is located over the Former Nike Missile Complex (SWMU No. 17)

See the August 27, 1999 Phase I and Phase II ESA Reports by AAS Environmental Inc., for further information.

6.25 SWMU No. 25 – Former I-95 Landfill

In November 1971, an interim landfill was established on a 20+ acre wooded site in the southwestern portion of the Lorton Correctional Complex. This landfill was established in response to an agreement between the District of Columbia and the Metropolitan Washington Waste Management Authority. Although the landfill was intended to be operational for a one year period, DC Department of Corrections made 800 acres of the Lorton Correctional Complex available to the DC Department of Environmental Services in 1972 for the development of the I-95 Resource Recovery, Land Reclamation and Recreation Complex. This complex included 400 acres for public recreation, 290 acres for landfill operations, and 110 acres for a resource recovery facility.

Occoquan Regional Park was officially established in June 1978 in cooperation with the Northern Virginia Regional Park Authority. Ownership of the park, which is located south of the I-95 Landfill, was transferred to the Fairfax County Department of Public Works in 1982, and is presently owned by the Fairfax County Board of Supervisors.

The I-95 Landfill began operation in 1973 in the location of the interim landfill and included municipal waste landfill areas, an ash monofill area, public recycling areas, maintenance and storage sheds, a scale house, and an administration building. This landfill operated under a Memorandum of Understanding (MOU) which allowed for the acceptance of:

- 2,327 tons/day of commercial and residential refuse
- 600 tons/day of incinerator ash residue from the E/RRF
- 200 tons/day of dewatered sludge

This MOU also included provisions for reducing these quantities as the permanent recycling and resource recovery operations were developed at the site. It is unclear if any solid waste landfill permits were issued for the I-95 Landfill, either by the Virginia Department of Health or the Virginia Department of Waste Management.

No hazardous wastes were reported to have been disposed of in the I-95 Landfill based on some documentation; however, VDEQ RCRA Site Inspection documentation indicates that some hazardous wastes may have been inadvertently disposed in this SWMU (See Section 5.2, January and March 1999 Hazardous Waste Inspection).

Between 1987 and 1989, gas extraction wells were installed along the perimeter of the landfill. These wells were monitored on a regular basis for the migration of methane gas. In addition, the structures at the landfill were equipped with gas detection equipment and audible alarms. Methane at the I-95 Landfill was used by Michigan Cogeneration Systems, located at 9850 Furnace Road for the generation of electricity or burned in flares throughout the landfill. It is unclear whether this gas extraction and management system is still operational at the site.

On December 31, 1995, the I-95 Landfill stopped accepting municipal waste and was scheduled for closure. According to the Phase I ESA, capping of approximately 70% of the municipal

waste landfill had been completed. The final capping stage was scheduled for completion in 2000. However, detailed information relating to closure activities was not located in VDEQ or USEPA Region III files.

In accordance with regulatory requirements under the VSWMRs, a groundwater monitoring network was established for the I-95 Landfill. This network includes 23 monitoring wells and 10 piezometers. The Fairfax County Health Department samples 16 of these points on a quarterly basis. In 1997, the Fairfax County Division of Solid Waste Disposal and Resource Recovery completed a risk assessment to evaluate receptors and associated risks related to the I-95 Landfill operations. The Phase I ESA concluded that risks to human health and the environment from groundwater at the I-95 Landfill were within acceptable limits.

6.26 SWMU No. 26 – Energy / Resource Recovery Facility

The Energy Resource Recovery Facility (E/RRF) was constructed in the late 1980s and began operation in 1990. It is a privately owned facility that occupies approximately 23 acres of the I-95 Resource Recovery, Land Reclamation and Recreation Complex, discussed above under SWMU No. 25. The E/RRF is owned by Ogden Martin Systems.

Common refuse and wastewater treatment sludge from Fairfax County and the District of Columbia are burnt at this facility to produce electricity. The E/RRF operates four furnaces that have a total burning capacity of 3,000 tons of waste per day. At full capacity, the E/RRF generates 83 megawatts of electricity that is sold to Virginia Power Company or used to power the E/RRF itself. As of 1999, ash from the E/RR Facility was disposed of within the ash monofill area at the I-95 Landfill (SWMU #25). It is unclear if this is still the practice or if ash is sent to another landfill facility.

The E/RRF continues to serve as one of the largest waste-to-energy facilities in the country. A total of 1.1 million tons of municipal waste is processed in this facility to generate enough electricity to power over 75,000 homes.

The E/RRF operates under the following permits and licenses:

- Small Power Production Facility, issued by the Federal Regulatory Commission
- Stack Obstruction, issued by the Federal Aviation Administration
- Ash Residue, issued by Fairfax County
- Prevention of Significant Deterioration (PSD), issued by the Commonwealth of Virginia, Department of Air Pollution Control
- Solid Waste Management, issued by the Commonwealth of Virginia, Department of Waste Management
- Wastewater Discharge Permit, issued by Fairfax County Department of Public Works
- Hazardous Use, issued by the Alexandria Fire Department

No evidence of a spill or release was found during the site visit or in the files reviewed at the VDEQ or USEPA Region III offices. Site representatives are unaware of any spills or releases from this unit and had no information regarding any spills or releases in facility files.

7.0 DESCRIPTION OF EXPOSURE PATHWAYS FOR ALL RELEASES OR POTENTIAL RELEASES

7.1 Air

The Lorton facility is currently inactive and has no air emission sources. Prior to redevelopment efforts at the site, the primary source for air emissions was the incinerator at the E/RR Facility.

It should be noted that Fairfax County has air quality monitoring stations in the vicinity of the site and data from 1987 through 1998 indicated no adverse impacts based upon the August 27, 1999 Phase I and II ESA Reports .

Surrounding land use to the north, east, and west is primarily residential, commercial development, and undeveloped land. The Occoquan Regional Park, formerly part of the Lorton Correctional Complex, is located south of the facility. Redevelopment of the site includes residential properties, with basements.

7.2 Surface Water

During operational periods of the Lorton facility, sewage was treated on-site and discharged to Mills Branch. However, there are no current wastewater treatment discharges to surface water at the facility the site.

The Lorton facility is currently inactive and has no VPDES Permits or wastewater discharges. Redevelopment projects and facilities that have been developed at the former Lorton site are serviced by public sanitary sewer systems and are connected to the POTW systems. Potable water is provided to the developed portions of the former Lorton facility by the County's PWS.

Several surface water features are present at or adjacent to the Lorton Correctional Complex. To the north is South Run while the Occoquan River is south of the site. Several streams and ponds are present throughout the site.

Storm water is discharged by surface runoff to a number of adjacent surface water features. The southern portion of the site discharges to the Occoquan River while the northern portion of the site discharges to Pohick Bay via South Run and Pohick Creek. An area of seepage was noted near the Former Equipment Storage and Disposal Area, during the site reconnaissance for the 1999 Phase I ESA. The seepage water was noted to contain iron oxide and adjacent rusting drums appeared to be leaching an unidentified solid slag-like material. Further investigation was recommended to determine the affects on local surface water and/or groundwater. This area was remediated during the decommissioning of the Lorton site (August 27, 1999 Phase I and II Reports (SWMU Nos. 8 and 9).

7.3 Groundwater

The facility does not discharge any materials to surrounding groundwater. At the time of facility closure in 2001, impacted groundwater was identified in several portions of the site. The facility

and surrounding area is served by the public water supply. Groundwater at the I-95 Landfill is monitored on a quarterly basis by the Fairfax County Health Department.

7.4 Soil

There are no active SWMUs at the site. All permitted units were closed under the oversight of various VDEQ Programs.

In addition, the Former Lorton Correctional Complex has been subject to corrective action during closure of the facility and transfer of the property in accordance with the Fairfax County re-use plan. Corrective actions have focused on leaking USTs, closure of the Laundry Wastewater Clarifier, Non-Permitted Landfill, and Firing Ranges.

It should be noted that in excess of 215,000 tons of contaminated soil, solid waste, debris, and hazardous waste has been removed during implementation of closures and corrective action or remediation measures at the former Lorton site.

Current operations at the site (i.e., mix of residences, recreational space, and open land) are anticipated to have a low release potential.

8.0 EXPOSURE PATHWAY CONTROLS AND RELEASE CONTROLS INSTITUTED AT THE FACILITY

8.1 Site Access

In early years of operation, access to the site was controlled consistent with its use as a correctional facility. The Former Lorton Correctional Complex was surrounded by secure fencing, including guard towers and razor wire. Since the transfer of property, the razor wire has been removed, but access to the former Reformatory and Penitentiary is restricted. Some areas owned by the Fairfax County Park Authority are now open to the public. The Workhouse at Lorton, an arts center at the former Occoquan Workhouse at the Lorton site opened to the public in 2008.

Approximately 30 percent of the original site is developed for residential purposes.

8.2 Air

The facility is currently inactive with no air emission sources.

8.3 Surface Water

Currently there are no industrial discharges to surface water from the site. The facility previously maintained a VPDES Permit for wastewater discharges. Effluent from the Sewage Treatment Plant was discharged to Mills Creek. In the early 1990s, testing of the effluent determined it to be toxic, primarily due to the loading from the laundry operations. An

evaluation of pre-treatment options was completed but not initiated as industrial laundering services ceased.

Stormwater from the site ultimately discharges to the Occoquan River, through runoff to local surface water bodies.

8.4 Groundwater

The facility does not discharge any materials to surrounding groundwater. At the time of facility closure in 2001, impacted groundwater was identified in several portions of the site. The facility and surrounding area is served by the public water supply. Groundwater at the I-95 Landfill is monitored on a quarterly basis by the Fairfax County Health Department under a VSWM Permit.

8.5 Soil

As the former Lorton facility is currently inactive, there is no potential for ongoing contamination of soil at the site. During closure of this facility, a large quantity of impacted soil was removed. This material was transported to off-site treatment and disposal facilities permitted to accept these wastes.

9.0 FOLLOW-UP ACTION ITEMS

The USEPA Region III and the VDEQ will decide if additional information or sampling at the facility is required to determine whether the environmental indicators have been met or if corrective action is required at the facility.

The facility will be provided with the opportunity to pursue RCRA corrective action utilizing the Facility Lead Program Agreement by USEPA.