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FIVE-YEAR REVIEW REPORT

First Piedmont Rock Quarry

Superfund Site


Danville, Virginia

Prepared by:

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Region III

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Region III
Hazardous Sites Cleanup Division
Five-Year Review Type I
First Piedmont Rock Quarry, (Danville, Virginia)

I. Introduction

Authority Statement and Purpose. EPA Region III conducted this review pursuant to CERCLA section 121(c), NCP section 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (May 23, 1991), and 9355.7-02A (July 26, 1994). It is a statutory review. The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become a part of the Site File. This review (Type I) is applicable to a site at which response is not ongoing.

Site Visit. On June 15, 1999 EPA visited the site to begin the 5 year review. The site visit included EPA's Remedial Project Manager, EPA's Biological Technical Assistance Group Coordinator, a representative from the U.S. Fish and Wildlife Service, and the chairman of the site steering committee. The site is covered with vegetation. Leachate is temporarily stored on-site in two 20,000 gallon storage tanks. Access to the Site is restricted by a perimeter fence.

Site Characteristics. The First Piedmont Rock Quarry Superfund Site (the Site) is located along Route 719 in Pittsylvania County, Virginia near the intersection with Route 360. It is approximately six miles north of the city of Danville.

The Site is an abandoned rock quarry located on a high ridge. The quarrying operation left a cut into the rock outcrop bounded on three sides by the quarry high walls. The fourth side of the cut is open and slopes to the west.

The majority of the land use in the immediate Site vicinity is open space/woodlands. Directly across Route 719 and south of the Site is a residential area, the Beaver Park community. The closest home is approximately 150 feet from the Site. All the homes in Beaver Park obtain residential water from either wells or springs. Approximately 455 people live within one mile of the Site; approximately 1,893 people live within a two-mile radius of the Site.

II. Discussion of Remedial Objectives

The Site was initially operated as a quarry for crushed stone. The four-acre property which comprises the Site consists of the abandoned quarry and the adjacent land. The Site was leased by the First Piedmont Corporation to be used as a landfill for industrial and agricultural waste from

April 1, 1970 to April 1, 1975. Wastes were disposed in the landfill from April, 1970 to July 1972, at which point the Virginia Health Department ordered waste disposal operations to cease due to a fire on the landfill.

The land filling operations were restricted almost exclusively to the two-acre quarry area. The quarry was not filled in a systematic fashion; no cells or segregated disposal areas were used for specific wastes. Hundreds of drums were buried in the landfill in random fashion with other solid waste. Upon arrival at the Site, wastes were generally dumped at the high wall along the eastern edge of the landfill, where the quarry is approximately 35 feet deep, and pushed down with a bulldozer. Wastes were not covered at the end of each day.

The landfill contained approximately 65,000 cubic yards of industrial and agricultural waste and approximately 3,000 cubic yards of soil used as a cover when the land filling stopped. The industrial wastes were generated by the Goodyear Tire and Rubber Company and Corning Glass Works; the agricultural wastes were generated by Southern Processors, Inc. The wastes from Goodyear consisted of tires, general plant refuse, scrap rubber, rubber buildup and approximately 15,000 gallons of a mixture of residual MS-20 (a floor degreaser), water, carbon black and detergent. The MS-20 contained ten percent by volume of tetrachloroethylene which is a listed hazardous waste under the Resource, Conservation and Recovery Act as amended, 42 U.S.C. 6901 et seq. (RCRA). The wastes from Corning Glass Works consisted of paper, glass, cardboard and off-specification batch materials which contained trace amounts of lead oxide. The wastes from Southern Processors, a tobacco processing company, consisted of soil removed from tobacco leaves, tobacco scrap, paper and wood.

Separate and apart from the landfill are two other areas of waste disposal on the Site associated with the land filling operation. These two areas were identified as the Carbon Black Pile (a reinforcement additive used in tire manufacturing that is comprised almost entirely of carbon) and the Waste Pile. The Carbon Black Pile consisted of approximately 100 cubic yards of carbon black and contaminated soils. Zinc oxide bags were reportedly observed in the pile during the construction of access roads for the Remedial Investigation. The Carbon Black Pile was approximately 150 feet from the most western edge of the landfill. The Waste Pile contained approximately 10 cubic yards of waste material consisting of steel and nylon cords, some glass, waste rubber strips and contaminated soil. The Waste Pile was located about 75 feet from the western edge of the landfill.

Another disposal area not associated with the land filling operations is located about 100 feet southwest of the Carbon Black Pile. This area, which is known as the "Old Disposal Area", contains miscellaneous refuse including bottles, cans and metal debris.

In a letter dated June 1, 1981, the Goodyear Tire and Rubber Company notified the First Piedmont Corporation that some of the wastes deposited at the First Piedmont Rock Quarry landfill were hazardous. The First Piedmont Corporation filed a "Notification of Hazardous Waste Site" form with EPA on June 5, 1981, listing solvents as one of the waste disposed of at the

landfill. The EPA Field Investigation Team subcontractor sampled the media in the landfill vicinity in July, 1983 to provide data in order for EPA to determine whether the landfill should be proposed for listing on the National Priorities List (NPL). Based on the results of this sampling, a Hazard Ranking Score (HRS) of 37.85 was calculated in 1985 for the Site. Based on comments received by EPA, the HRS was re-scored to 30.16. The Site was listed on the NPL on July 21, 1987, pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA).

Pursuant to Section 122 (e) of CERCLA, EPA sent Special Notice Letters on May 6, 1986 to initiate negotiations with the First Piedmont Corporation, Corning Glass Works, and The Goodyear Tire and Rubber Company (the Potentially Responsible Parties or PRPs) to perform a Remedial Investigation/Feasibility Study (RI/FS) for the Site. On December 31, 1987, EPA signed an Administrative Order by Consent (Docket No. III-88-13-DC) with the PRPs to undertake performance of the RI/FS for the Site. In February, 1988, Westinghouse Environmental and Geotechnical Services, Inc. was contracted by the PRPs to perform the RI/FS.

The Proposed Plan for the Site was released to the public in April, 1991. The remedy selected for the Site addressed all of the contaminated media at the Site and consisted primarily of excavation and off-Site disposal of the non-landfill wastes, off-Site disposal of the surface drums and debris, installation of a RCRA Subtitle C cap over the landfill, collection and treatment of leachate, ground water monitoring, and land use restriction. By instituting all of these components, the Site risks (exposure to leachate, source material, and quarry soil) would be reduced to within the EPA acceptable risk range. EPA issued a Record of Decision (ROD) for the Site on June 28, 1991. The Commonwealth of Virginia concurred with the selected remedy.

The following is a summary of the activities conducted at the site pursuant to the June 28, 1991 ROD.

- **Carbon Black Excavation.** Carbon black excavation began on September 8, 1994. Excavation and off-site disposal of an estimated 1,260 cubic yards of Carbon Black Pile soil was completed on October 4, 1994.
- **Waste Pile.** Soil and debris were removed from the waste pile on September 12, 1994. The volume of material that was removed and disposed of as a special waste was ninety five cubic yards.
- **Drum and Debris Removal.** Removal of drum and debris from the surface of the landfill began on September 21, 1994. Ninety six drums and one hundred cubic yards of tires and debris were removed from the site. The removal operation was completed on October 5, 1994.
- **Gas Venting Layer.** Placement of the gas venting layer began on October 26, 1994. Three gas vents were installed to release any build up of methane. Placement and grading of this

layer was completed on November 9, 1994.

- ***Installation of Landfill Cap.*** Placement of a Geosynthetic Clay Liner (GCL), began on November 26, 1994. Panels were laid out so that the length of the panel were parallel to the slope of the gas venting layer. The liner placement was completed on January 9, 1995.
- ***Leachate Collection System.*** Construction of a leachate collection system began on October 17, 1995 and it took approximately two weeks to complete. The leachate collection system collects leachate in a collection trench excavated below the top of bedrock at the western edge of the landfill. The leachate in the trench collects in a 4" slotted polyvinyl chloride (PVC) pipe, which is surrounded by select fill material, and flows into the leachate collection sump at the southern end of the trench. Leachate is then pumped from the leachate collection sump to primary and secondary 20,000 gallon storage tanks. The two storage tanks are used to temporarily store leachate on-site. The leachate is sampled quarterly and disposed of at Danville's publicly owned treatment works (POTW).
- ***Wetland Monitoring.*** The remedial action included the planting of vegetation and berry-producing shrubs in the disturbed portion of the Northern Drainage Area (NDA). The Operation and Maintenance plan calls for an annual "walk-through" inspection by a qualified biologist for the first five years following the completion of the 1994-1995 remedial work. The biologist checks the NDA for evidence of plant and vegetation succession. The biologist makes recommendations regarding maintenance or corrective action as required.
- ***Ground Water Monitoring.*** Ground water monitoring is conducted at existing wells up-gradient and down-gradient of the landfill. Ground water monitoring is to be conducted as long as leachate is collected at the Site, or for 30 years, whichever is longer.
- ***Site Use Restrictions.*** Appropriate Site use restrictions will be placed for future use scenarios to ensure protection of public health and the environment. EPA is in the process of implementing Site use restrictions (see Recommendations).

III. Data Review

In the April 1991 Proposed Plan (page 3), the report states that the carbon black pile is believed to be the source of high levels of zinc and other metals found in the southern drainage. The Proposed Plan further states that although not quantified in bioassay tests, the zinc contamination in the southern drainage could also be considered an environmental risk, since the levels detected in the southern drainage exceed water quality criteria. The 1991 Record of Decision (ROD) states that the carbon black pile was considered the source of the zinc and

cadmium in the southern drainage. The presence of these metals in soil near the carbon black pile confirms this source.

As indicated on page 14 of the ROD, a thorough ecological risk assessment was not conducted for the site. Toxicity tests were conducted to determine the need for remediation in the wetland areas around the northern drainage and Lawless Creek (page 14 of the ROD). The results indicated significant decreases in the growth among fathead minnows, *Pimephales promelas*, and reproduction in daphnids, *Ceriodaphnia dubia*, at concentrations above 30% dilution. Page 15 of the ROD states that "although environmental risks are assumed to be occurring in the southern drainage because the data greatly exceed the Virginia water quality standard, the extent of the toxicity in the southern drainage is not known because toxicity tests were not performed on the water or sediments."

The Biological Technical Assistance Group (BTAG), which consist of representatives from the EPA, the U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration (NOAA), has had concerns regarding the elevated level of metals in sediments from the southern drainage area. Additionally, the surface water in the southern drainage area had metal levels as high as 110,000 micrograms per liter ($\mu\text{g/L}$) of zinc, 5.8 $\mu\text{g/L}$ of lead, 27.3 $\mu\text{g/L}$ of copper, and 105 $\mu\text{g/L}$ of cadmium. Based on the levels of these contaminants, the BTAG recommended toxicity testing on the surface water and sediment from the southern drainage. The ROD also specified on page 27 that "an assessment must be made of the removal of the carbon black piles and waste piles on the reduction of the zinc levels in the southern drainage, including sampling and bioassays." Therefore, Central Virginia Laboratories and Consultants (CVLC) performed the toxicity testing for the site on sediment and surface water collected from the southern drainage outfall and an upstream reference point. The bioassay test were performed on February 26, 1997.

The toxicity tests can be summarized as follows:

- Results from the 8-day *C. dubia* test for the surface water from the southern drainage outfall showed a high survival percentage (90-100%) of test organisms exposed to controls and the two lowest concentrations of outfall sample (6.25 and 12.5), indicating that the test was properly conducted, and that the outfall sample was not toxic to test animals at these lower concentrations. However, there was 0% survival of test animals exposed to the highest concentrations of outfall sample (100, 50, and 25), indicating significant toxicity.
- Results from the 7-day *P. promelas* test for the surface water collected from the southern drainage outfall showed a high survival percentage (90-100%) of test organisms exposed to controls and the lowest concentrations of outfall sample (5.25, 12.5, and 25), and a low survival percentage (18% and 0%) at the highest concentrations of outfall sample (50 and 100, respectively).
- Results from the 14-day *Chironimus tentans* test for the sediment from the southern

drainage and reference point showed a high survival percentage (95% and 80%, respectively) of test organisms exposed to the control and reference point samples, and a low survival percentage (40%) of test organisms exposed to the undiluted southern drainage sample. Results from this test indicated that the test was properly conducted and that sediments from the southern drainage area were toxic to *C. tentans*.

- Results from the 10-day *Hyallela azteca* test for the southern drainage and reference point areas showed a high survival percentage (80% and 94%, respectively) of test organisms exposed to the control and reference point samples, and a low survival percentage (15%) of test animals exposed to the undiluted southern drainage sample. Results from this test indicate that the test was properly conducted, and that sediments from the southern drainage area were toxic to *H. azteca*.
- Zinc concentrations in water samples collected from the upstream reference point and southern drainage areas were 0.014 and 0.814 milligrams per liter (mg/L), respectively. The chronic freshwater ambient water quality criteria (AWQC) for zinc is 0.110 mg/L.

Therefore, the water sample collected from the southern drainage area exceeds the chronic freshwater AWQC.

The results from the toxicity tests indicate that both surface water and sediment collected from the southern drainage were acutely toxic to all organisms tested. The results from recent sampling also show that the concentration of zinc in surface water in the southern drainage exceeds both the freshwater acute (0.120 mg/L) and chronic (0.110 mg/L) AWQC for the protection of aquatic organisms. The surface water toxicity tests confirm the acute toxicity of the surface water collected from the southern drainage. These results also indicate that the removal of the carbon black pile significantly reduced the levels of zinc in surface water, and that the carbon black pile was the primary source of metals to the drainage. However, the elevated zinc concentrations currently found in surface water from the southern drainage indicate that a secondary source may still exist at the site. The investigation of a secondary source may be warranted.

While the surface water monitoring in the southern drainage will monitor the status of any current sources of metals to the southern drainage, it does not address the past loading of metals in the sediment of the southern drainage and Lawless Creek. The BTAG is concerned that metal contaminated runoff from the carbon black pile has been contaminating sediment within the southern drainage and portions of Lawless Creek for many years. Even though the source has been removed, the metals in sediment may still remain at significant levels. Toxicity tests confirm that sediment collected from the southern drainage is acutely toxic to aquatic organisms, which suggests that loading in the sediment may have occurred.

While the ROD specified on page 27 that "an assessment must be made of the removal of the carbon black piles and waste piles on the reduction of the zinc levels in the southern drainage,

including sampling and bioassays," it does not specify what will be done if levels found in surface water and sediment in the southern drainage still result in significant toxicity to aquatic organisms following the removal.

IV. Summary

Sediments in the southern drainage and portions of the Lawles Creek may have significant levels of metals. Metal contaminated runoff from the carbon black pile, which has been removed from the site, contaminated the sediments in the southern drainage and portions of the Lawless Creek. These areas have never been fully investigated.

V. Recommendations

EPA will require the responsible parties to perform additional investigations to further delineate the nature and extent of metal contamination in sediment of the southern drainage and Lawless Creek from past loading. The small amount of sediment found in the southern drainage indicates that many of the metals detected in surface water may have migrated directly to Lawless Creek. In addition, the investigation of a secondary source of metals to the southern drainage is warranted given the exceedances of both acute and chronic AWQC. These additional investigations will be performed to further characterize the potential ecological risk in these creeks and evaluate if additional remediation is warranted.

If the investigations result in significant or fundamental changes to the ROD, EPA will decide if these changes will be documented in an Explanation of Significant Differences (ESD) or a ROD amendment.

EPA will work with the PRPs to develop land use restrictions to prohibit residential development of the Site.

VI. Statement on Protectiveness.

The remedy is not at this time protective of the environment. As discussed above, EPA is taking steps to make the remedy protective.

V. Next Five-Year Review.

The next five-year review will be completed no later than September 2004.