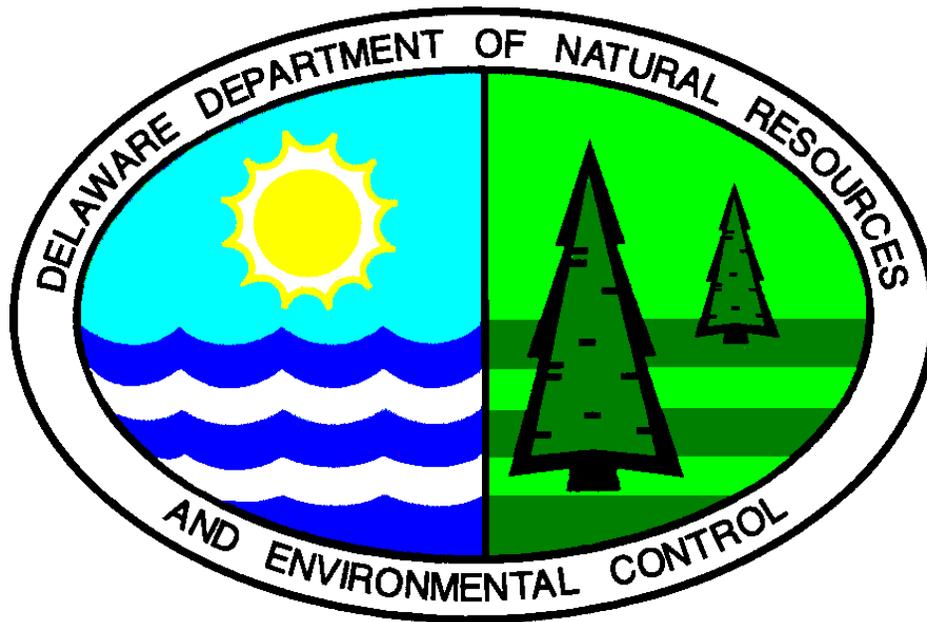


**FINAL PLAN OF REMEDIAL ACTION
FOR THE
NVF-NEWARK COMPANY SITE
NEWARK, DELAWARE**



May, 1999

DNREC Project DE-199

Prepared by:
Delaware Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch

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I INTRODUCTION

In April 1998, Environmental Alliance, Inc. (“Alliance”), on behalf of Commonwealth Management, Inc., conducted a Facility Evaluation (“FE”) and Focused Feasibility Study (“FFS”) of the National Vulcanized Fibers (“NVF”) Company facility in Newark, Delaware under the direction of the Hazardous Substance Cleanup Act (HSCA)-Voluntary Cleanup Program (VCP). The FE/FFS was conducted in accordance with the Delaware Regulations Governing Hazardous Substance Cleanup (“Regulations”) and the FE/FFS workplans previously approved by the Department of Natural Resources and Environmental Control, Site Investigation and Restoration Branch (“DNREC-SIRB”). The FE/FFS included the sampling of surface soil, subsurface soil, surface water, sediments, and groundwater at various locations throughout the facility.

The FE was completed in December 1998 and the FFS was completed in March, 1999.

II PURPOSE

This Final Plan of Remedial Action (“Final Plan”) is based on the FE/FFS completed by Alliance, on behalf of Commonwealth Management, Inc., and presents to the public the Department’s final selection of any remedial activities to occur at the NVF-Newark site, Newark, Delaware. This Final Plan is issued under the provisions of the Delaware Hazardous Substance Cleanup Act, 7 Del.C. Chapter 91, (HSCA”) and the Regulations Governing Hazardous Substance Cleanup (“Regulations”).

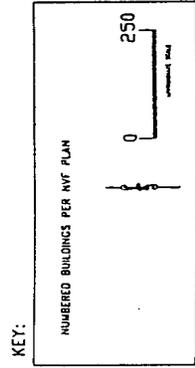
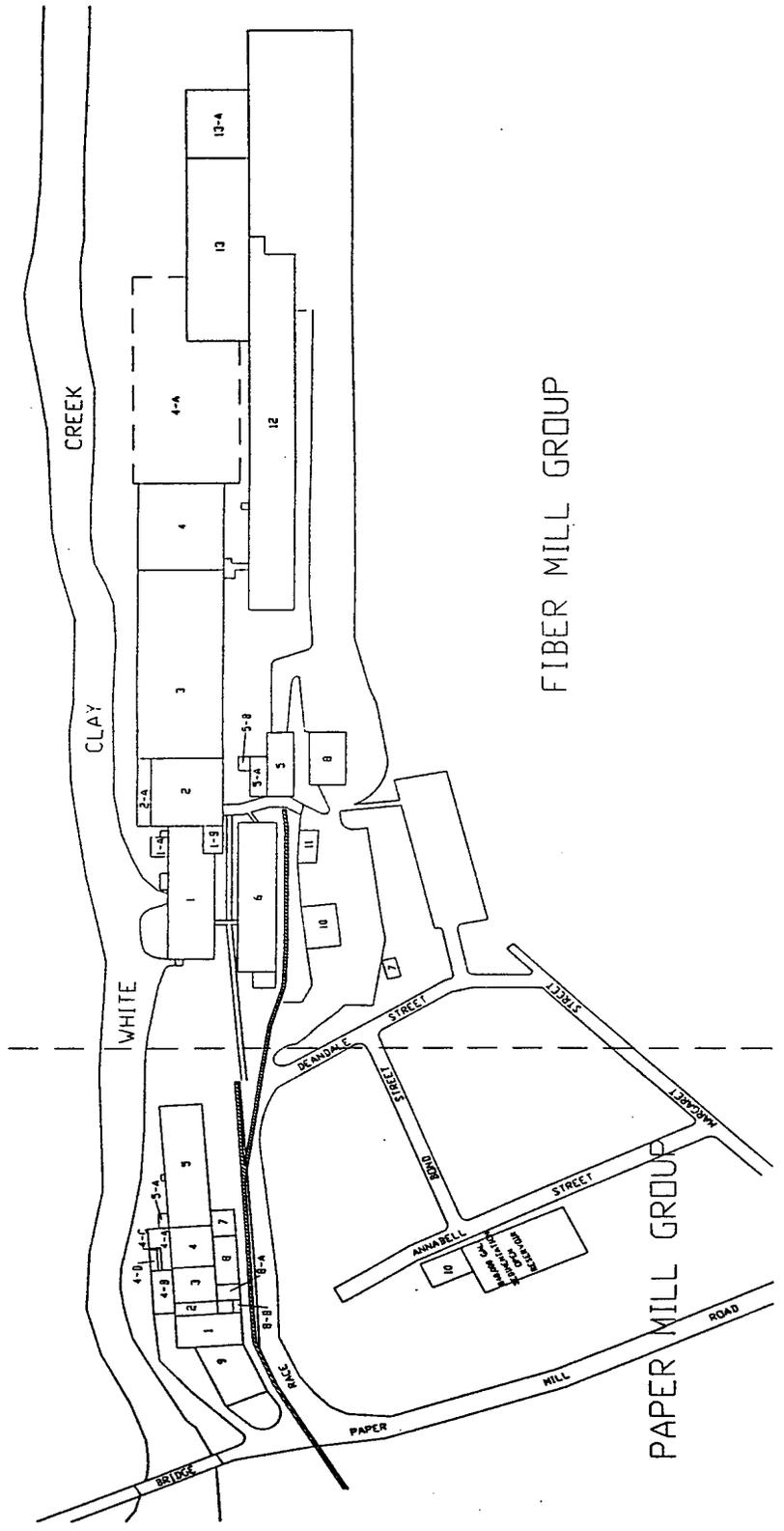
The Department provided public notice and opportunity to comment on the Proposed Plan in accordance with HSCA and Section 12 of the Regulations. At the conclusion of the comment period, the Department issues this Final Plan of Remedial Action, which designates the selected procedures and stipulations concerning current and future activities. The Proposed Plan, the comments received from the public, the Department’s responses to the comments, and all of the site documents form the basis for the Proposed and Final Plans will constitute the remedial decision record required for issuing the Final Plan.

Section II provides a site description for the NVF-Newark Site. Section III provides a description of the investigation results. Section IV presents the Proposed and Final Plans of Remedial Action. Section V discusses public participation requirements and Section VI presents the Director’s declaration.

Site Description and History

The NVF-Newark site is located in the northern portion of the City of Newark as shown in Figure 1. The site is bounded by Margaret and Race Streets and the White Clay Creek. The site (Figure 2) occupies approximately 20± acres, as reported by NVF. The Curtis Paper Mill is located approximately 0.1 miles to the northwest along Paper Mill

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| | |
|---------------------------------|---|
| REVISION DATE 8/25/98 | Environmental Alliance, Inc. 1812 Newport Gap Pike Wilmington, DE 19808 Phone: (302) 438-1100 Fax: (302) 438-1101 |
| DRAWN BY <i>RK</i> | FIGURE 2 FACILITY PLAN NYF-NEWARK FACILITY EVALUATION FOR COMMONWEALTH GROUP, INC. |
| CHECKED BY <i>APJ</i> | |

Road. This property is upstream of the NVF facility along White Clay Creek. Properties to the south and northeast of the NVF facility are primarily residential. The land directly across White Clay Creek to the north appears to be agricultural and undeveloped. A commercial automobile sales lot is adjacent to the southeastern part of the NVF facility.

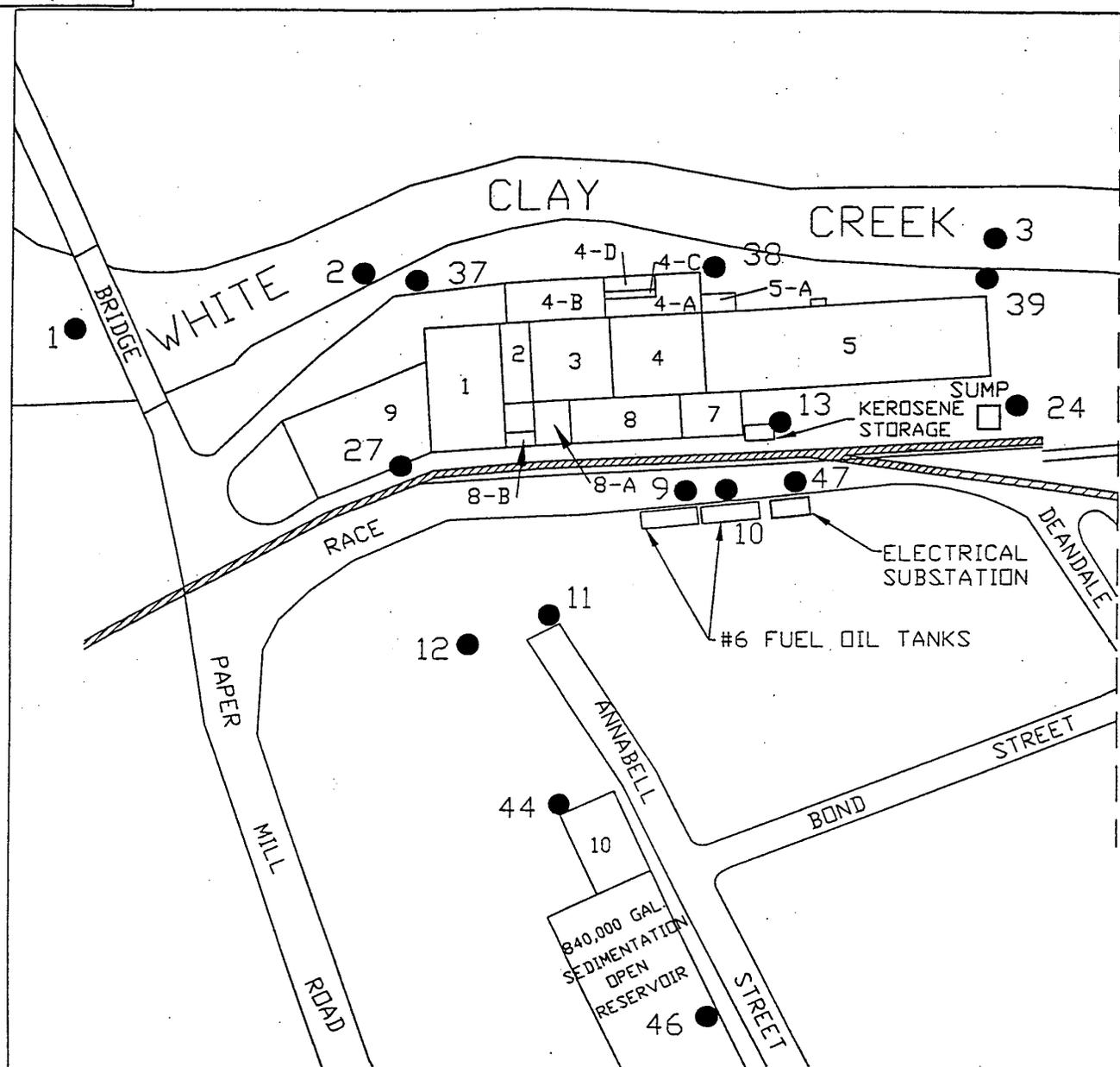
The site was used as a mill for fiber products since the late nineteenth century. The mill expanded and operated up to its closing in 1990. The facility was used for the production of waterleaf paper and vulcanized fiber products in the form of boards, sheet and tubes. Additionally, insulating fiber blocks were produced for the railroad industry. Cloth rags were the raw material used to create a pulp for these processes. Aluminum sulfate (alum) was used in the pulp digestion process to bring down the pH to 3.0. Zinc chloride was used in the laminating process. Zinc chloride solutions were used in wooden vats to treat fiber products. Pigment and dyes were also used in the process. Other material used included fuel oil, hydraulic oils, and solvents (mineral spirits) for plant operations. The primary waste generated by the plant was zinc chloride sludge.

The plant is constructed in part with wood and soil floors, which may have allowed spills of zinc chloride solutions to enter the soil. The cutting and grinding operations generated waste water and cellulose fibers. Process wastewater was pumped through an industrial waste force main to the county sewer system, while the dried cellulose fibers were placed in three on-site drying beds. Non-contact cooling water, used for the surface condensation (which concentrated zinc chloride sludge), was discharged into White Clay Creek. Surface water runoff from the exterior of the plant also discharged into White Clay Creek.

In February 1998, DNREC and Commonwealth Management, Inc., signed a VCP Agreement allowing EA, the consultant to Commonwealth Management, inc., to conduct a FE at the site. The FE was conducted to determine the type and source of contamination and whether cleanup at the site was necessary.

III INVESTIGATION RESULTS

In April 1998, the FE was conducted by Alliance at the NVF-Newark site in accordance with the Regulations and the FE/FFS workplan approved by DNREC-SIRB. The Department requested that the investigation determine the existence, or non-existence of contamination in site soils, groundwater, and surface water, and sediment of White Clay Creek adjacent to the northern portion of the site. The scope of work included 38 sampling locations for surface soil, 10 for surface water, 10 for sediment, 24 for subsurface soil, and 6 for groundwater (see Figure 3, 4 and 5). The samples were collected in accordance with procedures described in the approved Workplan and were screened by use of the DNREC Mobile Laboratory (DML). The DML screened solid matrix samples for metals, polynuclear aromatic hydrocarbons (carcinogenic), pesticides, and polychlorinated biphenyls (PCBs). Selected samples (i.e. no less than 10% of samples) were analyzed by Envirotech Research, Inc., a Delaware Certified HSCA laboratory, using Standard Operating Procedures for Chemical Analytical Programs (DNREC, 1997) procedures and methods.



KEY:

| | |
|---|-------------------|
|  | SAMPLING LOCATION |
|  | AST LOCATION |

NUMBERED BUILDINGS PER NVF PLAN

0 100
APPROXIMATE SCALE

REVISION DATE:
6/23/98

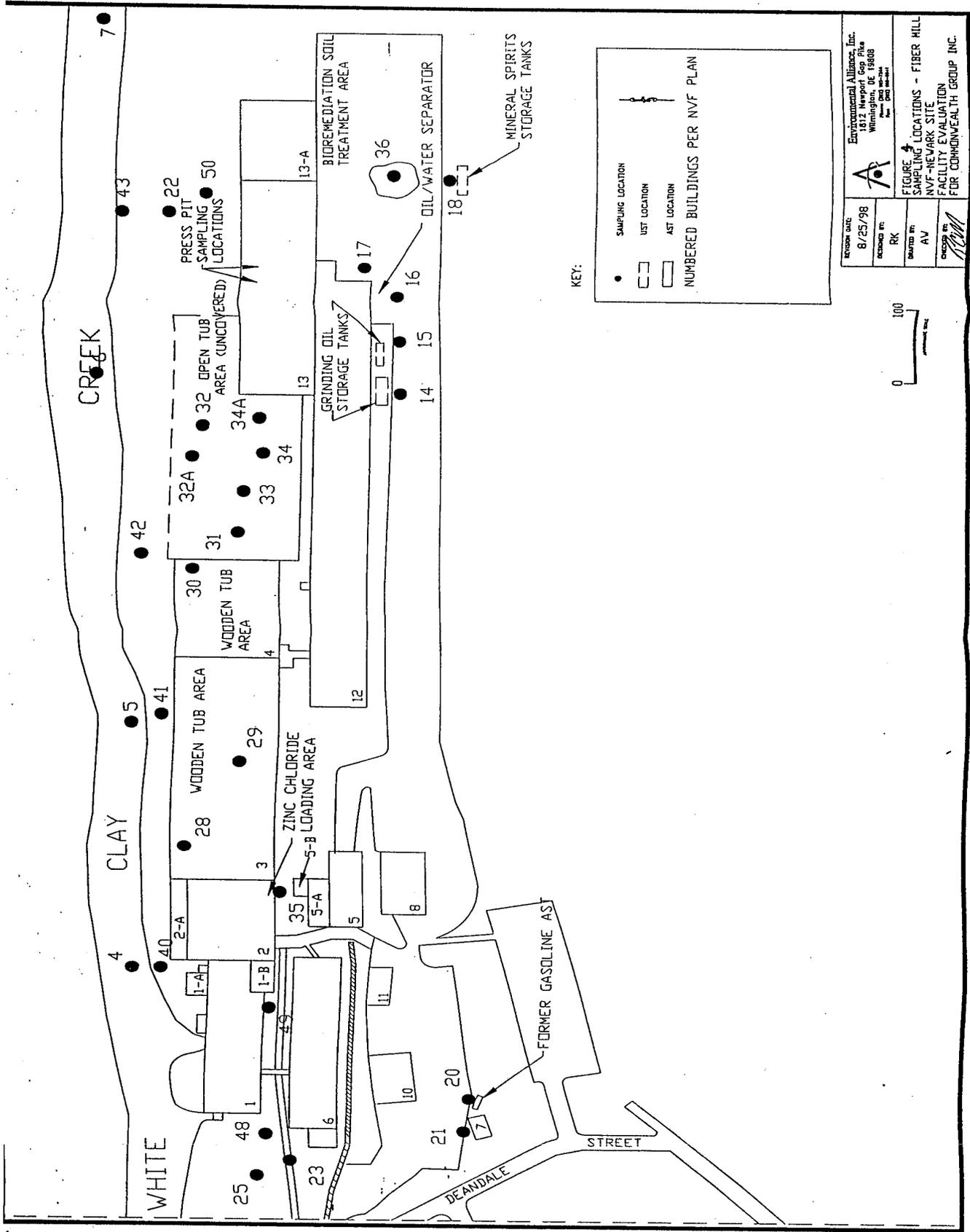
DESIGNED BY:
RK

DRAFTED BY:
AW

CHECKED BY:
RCM

 **Environmental Alliance, Inc.**
1812 Newport Gap Pike
Wilmington, DE 19808
Phone (302) 983-7544
Fax (302) 983-0841

FIGURE 3
SAMPLING LOCATIONS PAPER MILL GROUP
NVF-NEWARK SITE
FACILITY EVALUATION
FOR COMMONWEALTH GROUP INC.



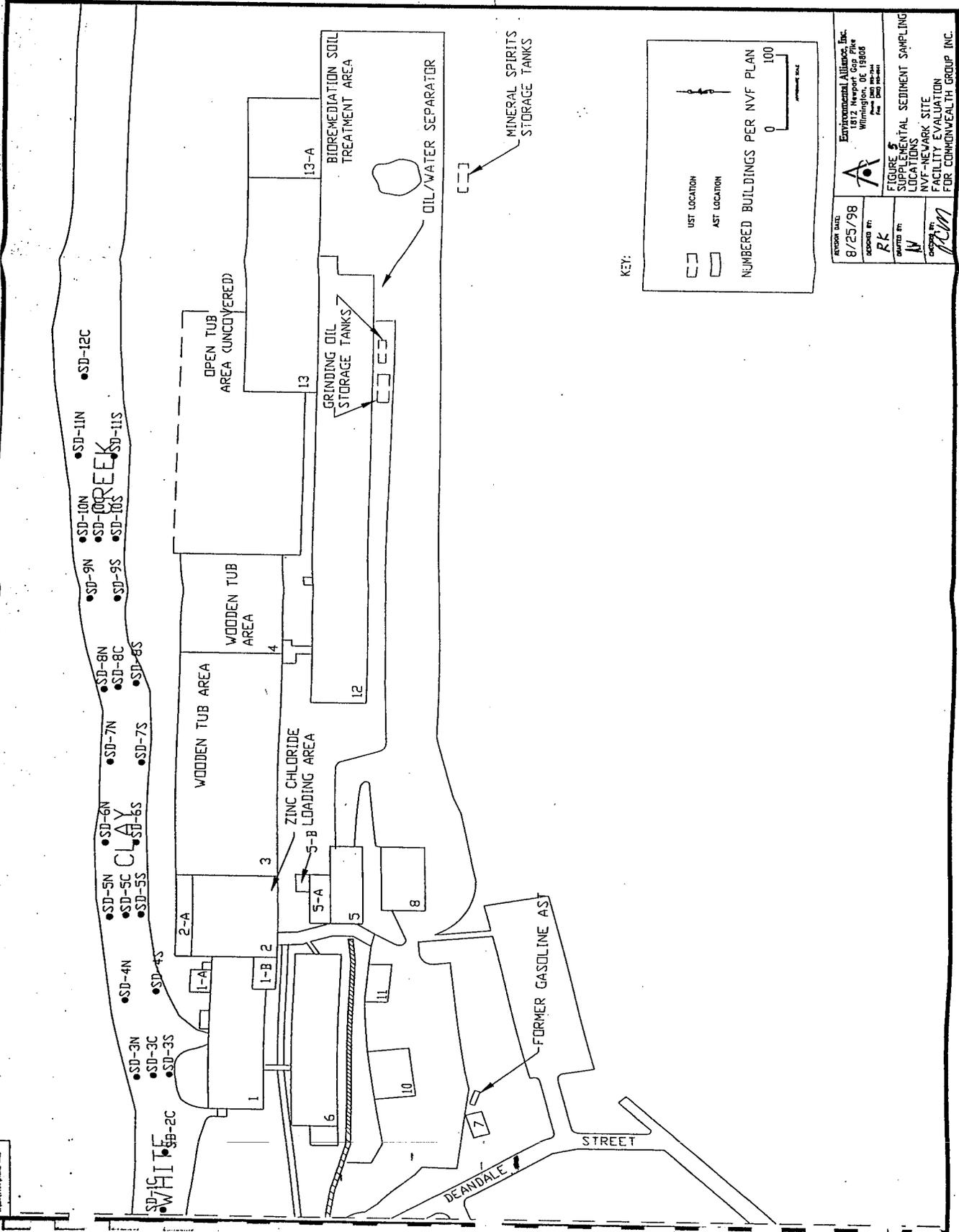
| | |
|-----------------------------------|---|
| REVISION DATE: 8/25/98 | Environmental Alliance, Inc. 1000 North Washington, DE 19808 Phone: 302-366-2344 Fax: 302-366-2341 |
| DESIGNED BY: RK | FIGURE 4 SAMPLING LOCATIONS - FIBER HILL NVF-HEAVY METALS SITE FACILITY EVALUATION FOR COMMONWEALTH GROUP, INC. |
| DRAWN BY: AV | |
| CHECKED BY: <i>[Signature]</i> | |

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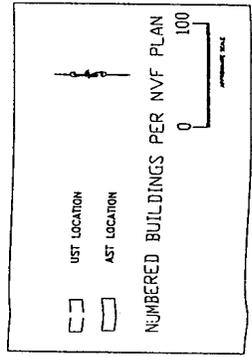
- SAMPLING LOCATION
- UST LOCATION
- ▭ AST LOCATION
- ▭ NUMBERED BUILDINGS PER NVF PLAN



SCALE: 1" = 100'



KEY:



| | |
|--------------------------|--|
| REPORT DATE: 8/25/98 | Environmental Alliance, Inc. 100 Corporate Center Wilmington, DE 19808 Phone: 302-439-2244 Fax: 302-439-2244 |
| REPORT BY: RK | FIGURE 5 SUPPLEMENTAL SEDIMENT SAMPLING LOCATIONS |
| DATE BY: NY | NVF-NEWARK SITE FACILITY EVALUATION |
| SCALE BY: [Signature] | FOR COMMONWEALTH GROUP, INC. |

As a result of the completion of the FE, contaminants of concern requiring remedial actions were identified in site soils and stream sediments. These include soils containing zinc, and soils containing lead that leaches when subjected to the Federal Resource Conservation and Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) extraction (the TCLP test mimics the conditions found in a municipal landfill, where materials are exposed to acidic leachates). In addition, soil surrounding several underground storage tanks (USTs) were found to be contaminated by Total Petroleum Hydrocarbons (TPHs) which will require remedial action. Finally, stream sediment, in a localized area of the White Clay Creek adjacent to the former production area (SED -5), has been found to contain zinc at concentrations exceeding state Uniform Risk Standards (URS) for Protection of the Environment (see Table 1). Sediment sample SED-32A was not collected from White Clay Creek, but rather from a localized drainage area in the open tub area on the eastern portion of the site. Contaminants detected in this sampling location (SVOC's) will be addressed as per the zinc-contaminated soil.

According to HSCA regulation 8.4(1) remedial action objectives must be established for all Plans of Remedial Action. The remedial action is evaluated utilizing both the Qualitative and Quantitative Objectives. The following considerations were taken into account in the development of the Qualitative and Quantitative Objectives:

- The site will be developed into residential and commercial property, and
- The site is located adjacent to the White Clay Creek.

The Qualitative Objectives for this site are:

- Prevent human contact with contaminants of concern; and
- Eliminate ecologic receptor contact with elevated zinc concentrations in the sediments of the White Clay Creek.

Based on the qualitative objectives, the quantitative objectives that the DNREC-SIRB determined will meet the qualitative objectives include:

- Prevent human contact with soils contaminated with zinc over 5,000 mg/kg.
- Eliminate potential future exposure to soil that leaches lead at a concentration in excess of 5 mg/l when subjected to TCLP extraction, and lead containing soils in excess of 400 mg/kg,
- Complete the UST and associated TPH contaminated soil removals to the satisfaction of the DNREC-Underground Storage Tank Branch and DNREC-SIRB Branch. The DNREC-SIRB URS Cleanup Standard is 100 mg/kg for C-5 through C-8 aliphatic hydrocarbons, 1000 mg/kg for C-9 through C-18

Table 1
Constituents Identified in Sediment Analysis - Comparison to Criteria

| Constituent Detected | No. of Detects Above Criteria/Total | Max. Concentration Identified/Location | ** Geometric Mean | Criteria (Critical Water Use Area, Unrestricted Use) |
|----------------------------|-------------------------------------|--|-------------------|--|
| <i>Metals (mg/kg)</i> | | | | |
| Barium | 1/1 | 91.1 / SED-5 | - | 20 URS PE |
| Copper | 1/1 | 34.7 / SED-5 | - | 34 URS PE |
| Zinc | *** 14/27 | 3720.0 / SED-5 | 261.4 | 150 URS PE |
| <i>BNAs (ug/kg)</i> | | | | |
| Phenanthrene | 1/2 | 5500 / SED-32A | 741.6 | 900 URS PE |
| Anthracene | 2/2 J | 1700J / SED-32A | 193.4 | 0.3 URS PE |
| Flouranthene | 1/2 | 16000 / SED-32A | 2561.2 | 3000 URS PE |
| Benzo(a)anthracene | 2/2 J | 5100 / SED-32A | 814.2 | 100 URS PE |
| bis(2-Ethylhexyl)phthalate | * 0/2 | < 4800 / SED-32A | 332.3 | 1000 URS PE |
| Benzo(a)pyrene | 2/2 J | 4500J / SED-32A | 734.8 | 100 URS PE |

URS PE - Uniform Risk Based Standard for Protection of the Environment
 No Standard for URS HH (Human Health)

* Detection limit was greater than URS HH (or PE), so some of the samples could be greater than the URS HH (or PE).

** Samples whose concentrations are less than the specified detection limit were assigned a value equal to half their detection limit to determine the geometric mean. More than one sample is necessary to calculate geometric mean.

*** - Includes supplemental sediment sampling results.

To qualify as a detect, value must be greater than the URS HH or PE.

Constituents below criteria (and ones for which no standard has been determined) are not listed on chart.

B - Compound also present in blank.

J - Estimated value. Concentration is less than the practical quantitation limit.

- aliphatic hydrocarbons, and 2,500 mg/kg for C-19 through C-36 aliphatic hydrocarbons, and:
- Remove the sediments along the southern portion of the White Clay Creek above a zinc concentration of 410 mg/kg and contain the sediments within Building 3 consistent with the development of the property.

Three remedial alternatives were evaluated to address the RAOs. The alternatives for surface and sub-surface soils are as follows:

Alternative 1: No action. The site would be developed without any DNREC-SIRB requirements to remedy any soil and sediment.

Alternative 2: Excavation of zinc, and lead impacted soil above the quantitative RAO standards. Placement of zinc and lead impacted soil under a building footprint. Placement of a deed restriction that prohibits excavation greater than a depth of 3 feet in areas of concern identified on a property map without DNREC-SIRB approval (i.e. under the building footprint). Removal of sediments from the White Clay Creek in exceedence of a zinc concentration of 410 mg/kg with either on-site storage and containment or off-site disposal.

Based on public comment during the Proposed Plan of Remedial Action stage, the Department shall require enhancement of the southern streambank of the White Clay Creek, along the vicinity of the elevated "mid-bank", with a geo-textile fabric ("Typor") and rip-rap stone in order to stabilize the bank. Excavation, removal and off-site disposal of TCLP lead failing soil and soil contaminated by hydrocarbons in excess of the DNREC URS Standards listed as quantitative remedial action objectives. Performance of a supplemental biological assessment on the White Clay Creek at the completion the of remedial action.

Alternative 3: Excavation, removal and off-site disposal of all contaminated soils and sediments that exceed the quantitative RAO's.

The details of each remedial alternative are conveyed in the Alliance FFS for the site.

The alternative for the impacted stream sediments is further explained below:

Zinc concentrations, above the URS screening criteria, were found in sediment samples collected from the White Clay Creek in the area immediately adjacent to the Fiber Mill buildings. The principal contaminant of concern at the NVF-Newark site is zinc. An assessment of the benthic organisms in the sediments (DNREC Rapid Bioassessment Project (RBP, December 1998)) concluded that a mild toxicity condition exists in the sediments that contain zinc above the screening concentration. A cleanup standard of

410 mg/Kg for zinc has been established in association with medium level effects (effects range-medium, ERM) developed by the National Oceanic and Atmospheric Administration (NOAA). Thus, the alternative for the sediments is to remove the sediments along the southern portion of the creek above a zinc concentration of 410 mg/Kg and containment of sediments within Building 3 consistent with the development of the property or off-site disposal.

IV PROPOSED AND FINAL PLAN OF REMEDIAL ACTION

Based upon the information and results of the investigation performed at the NVF Company facility in Newark, Delaware, the DNREC-SIRB recommended plan of remedial action is Alternative 2. Alternative 2 meets or exceeds all the criteria utilized in the evaluation of remedial alternatives that is conveyed in Subsection 8.5 of the Regulations and is the most cost effective remedy. Additional information regarding the evaluation of the remedial criteria is contained in the Alliance FFS for the site

V PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the Proposed Plan of Remedial Action and welcomed opportunities to answer questions. A Public meeting on the Proposed Plan was held at Newark High School on April 13, 1999 to present to the public the Department's Proposed Plan.

The comment period began on April 5, 1999 and ended at the close of business (4:00 p.m.) on April 30, 1999. Three (3) comment letters, containing numerous public comments, were received at the DNREC office prior to the close of the comment period. These comments were addressed in "Departmental Response to Public Comments on Proposed Plan of Remedial Action (DE-199) and was completed on May 26, 1999.

VI DECLARATION

This Final Plan of Remedial Action for the NVF-Newark site is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

William W. Hill
Acting Director

Date