BEST MANAGEMENT PRACTICES PLAN – REVISION I FLORIDA CRUSHED STONE COMPANY FLY ASH RECYCLING BROOKSVILLE, FLORIDA

PREPARED FOR:

FLORIDA CRUSHED STONE COMPANY
Brooksville, Florida

PREPARED BY:

ECT
Environmental Consulting & Technology, Inc.
1408 North Westshore Boulevard
Suite 115
Tampa, Florida 33607
(813) 289-9338
(813) 289-9388 facsimile

Sandra Tippin
Staff Scientist

F.A. "Rick" Fetterly, P.E.
Associate Engineer

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PROFESSIONAL CERTIFICATION

The technical contents of this Best Management Practices Plan for The Florida Crushed Stone Company have been prepared in accordance with currently accepted practices. This report is for the sole use of The Florida Crushed Stone Company and the Florida Department of Environmental Protection.

Prepared by: Sandra Tippin

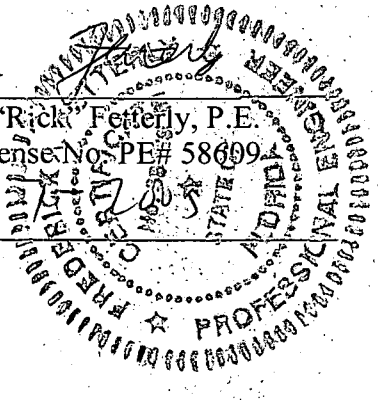
Sandra Tippin
Staff Scientist

1-17-03
Date

Reviewed by: F. A. Fetterly

Frederick "Rick" Fetterly, P.E.
Florida License No. PE# 58609

1-17-03
Date



1. INTRODUCTION

1.1 PURPOSE

This Best Management Practice (BMP) plan revision describes procedures and engineering controls that are used by the Florida Crushed Stone (FCS) Brooksville Facility to prevent pollution as a result of their recycling of industrial dredge and fly ash by-products materials specific to Tampa Electric Company (TEC) Gannon Station. The original BMP for this process, submitted in April 2001, addressed proposed procedures for the handling and storage of the fly ash material. This revision addresses storage and handling relative to actual site conditions and was created to address concerns raised during annual inspections conducted by the Florida Department of Environmental Protection (FDEP) in the fall of 2001 and 2002.

1.2 BEST MANAGEMENT PRACTICE PLAN REQUIREMENTS

BMPs are defined in Title 40 of the Code of Federal Regulation Chapter I-Part 1 22.2 (40 CFR Chapter I–Part 1 22.2) as a "schedule of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage."

1.3 MATERIAL ADDRESSED IN THIS BMP

Prior to shipment of the material to the FCS facility, eight composite samples were collected from the former industrial dredge and fly ash by-products storage area for analyses for metals including aluminum, antimony, arsenic, barium, boron, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, sodium, strontium, thallium, vanadium, and zinc using the synthetic precipitation leaching procedure (SPLP) analyses U.S. Environmental Protection Agency (EPA) Method 1312. These samples were also analyzed for fluoride, chloride and sulfate using EPA Method 300. A copy of the laboratory report is provided in **Appendix A.**

1.4 ACTIVITIES ADDRESSED IN THIS BMP

FCS has accepted into its facility approximately 196,199 tons of material originating at the TEC's Gannon Station. The material, in the form of dredge and fly ash by-product

materials, is for use in the cement manufacturing process to produce clinker, an aggregate used to produce Portland cement. This BMP revision details the procedures and facilities used by FCS to handle this material.

2. FACILITY BACKGROUND AND OPERATIONS

2.1 FACILITY LOCATION

The FCS Brooksville facility is a multipurpose industrial site, located in Hernando County, which contains a limestone mining, washing, and crushing facility; cement, power and lime production facilities; and various other operations. The FCS Brooksville facility is located on approximately 10,000 acres of land, owned by FCS, which is immediately northwest of the City of Brooksville, Florida. **Figure 1** presents a copy of the United States Geological Survey (USGS) Brooksville quadrant map showing the facility area. The active portion of the site is bounded by County Road (CR) 485 on the east, CR 491 on the west, and CR 476 on the north. The figure indicates the pile locations used for the material storage prior to its recycling. The figure also shows surface water drainage basins discussed later in this report.

Figure 2 presents an aerial photograph map providing an overview of the FCS facility excluding Pile 3, which is located in a more remote area to the north. **Figure 3** depicts the location of Pile 3. Access to onsite facilities is provided by Cement Plant Road, the eastern end of which intersects CR 485 near Yontz Road and extends in a northwest direction through the center of the property, and Camp Mine Road, which parallels Cement Plant Road to the northeast.

2.2 FACILITY OPERATIONS

The principle onsite features related to the production of limestone include the north and south quarries (currently the only active quarries located onsite); and the Gregg plant limestone processing facility, located near the center of the site, which crushes, washes, and separates the stone by aggregate size prior to distribution. The Cement, Power and Lime (CPL) plant is located adjacent to Cement Plant Road, immediately southeast of the Gregg plant, and includes three separate operations, as the name indicates. The cement plant uses waste limestone fines produced by the Gregg plant and other raw materials to manufacture Portland cement. Excess heat generated during the manufacture of cement is integrated with the adjacent co-generation power plant, which generates about 125 megawatts of power that is sold to a local power company.

Other onsite operations include the Soft Rock plant and Dura Rock (soil cement) plant located just east of the north quarry, and three independent operations (Don Olson Truck Tire, Grubbs Construction Asphalt, and Cliff's Septic Tanks) which lease property from FCS and are located along Camp Mine Road. Onsite transportation and material handling are facilitated through a network of general use roads, haul roads, and rail lines. Onsite features dominating the landscape include a series of large settling ponds which store mine tailings that settle out of process water from the Gregg plant; cooling ponds that contain water that is continually recycled through the power plant; and active and abandoned quarries.

Raw materials used in the production of cement include limestone tailings ($CaCO_3$ and silica), limerock, fly ash, mill scale or bauxite and slag, which are all heated in a kiln to produce an aggregate product known as "clinker." Clinker is then ground into a powder and gypsum is added to produce cement. Tailings used in this process are dredged from the process flow channel located west of the Gregg plant, trucked and conveyed to the cement plant site, and stored in the A-frame covered storage area located on the north side of the CPL plant. The A-frame is also used to store limerock, which is trucked from the Gregg plant.

Material piles located on the north and east sides of the cement plant contain mill scale, slag, and used tires. Waste tires are used at the facility as an auxiliary fuel source for the cement kiln. Clinker is stored in a tarped material pile on the south of the power plant along Cement Plant Road.

2.3 SURFACE WATER DRAINAGE

Figure 1 delineates the surface water drainage basins of previously and currently active areas at the facility, as defined in the Site Water Management Plan (SWMP) prepared by others (PBS&J, March 2000) and submitted to the Florida Department of Environmental Protection (FDEP). As stated therein:

> *"there is typically no offsite discharge of land surface runoff from the [site.] The only exceptions would occur in the event of an emergency discharge of excess water from Settling Pond 7 and Cooling Pond 4..."*

These emergency spillways are also located on **Figure 1**. The SWMP further states:

> *"In these instances, the excess water would discharge in a westerly direction to a low-lying area located on the FCS property on the west side of CR 491. This low-lying area does not have a surface drainage outlet feature. Therefore, even in the event of an emergency discharge from [spillways on Figure 1], the excess water would remain on FCS property."*

These low-lying areas and other unused portions of the FCS property actually extend beyond the limits of the **Figure 1** USGS quad map of Brooksville.

2.4 RECYCLING AND STORAGE ACTIVITIES

The recycling of dredge by-product materials containing fly ash from the TEC Gannon Station required two storage areas, Pile 1 and Pile 3, and a staging area (near the cement plant). Piles 1 and 3 proved adequate for complete storage of all of the material obtained from the TEC Gannon facility and for this reason, proposed Pile 2, described in the original BMP was never created. The locations of storage areas and the staging area are depicted on **Figures 2 and 3**. The staging area facilitates the feeding of material into a hopper that feeds Silo 11. **Figure 4** depicts the layout of the staging area. Once in the hopper and silo, the material has entered existing permitted production processes in the cement plant.

As shown on **Figure 1**, the storage piles all lie within defined drainage basins. As stated in the SWMP drainage basin study, there is essentially no potential for runoff from facility areas on the FCS property. Moreover, as set forth in this BMP, the storage piles will be managed so as to minimize storm water contact with the recycled materials and, therefore, it is not anticipated that large amounts of contact storm water or leachate will be generated from the storage pile areas or staging areas.

This document outlines BMPs and existing drainage features only for the storage and staging areas for the dredge by-product material containing fly ash.

3. DREDGE AND FLY ASH BY-PRODUCT CHARACTERISTICS

3.1 PHYSICAL PROPERTIES

The dredge materials consist of granular, unconsolidated materials, predominantly sands, generated during maintenance dredging operations. Fly ash is an uncombusted material collected in the electrostatic precipitator. This powdery by-product has a gray to gray-black color. Boiler and incinerator fly ash are commonly used as cement aggregate material. FCS obtained the dredge and fly ash by-product materials from the TEC Gannon Station for this purpose. Specifically, the fly ash by-product received from TEC Gannon was of particularly high moisture content. For this reason, generation of fly ash dust from the staging area or storage piles is extremely unlikely.

3.2 CHEMICAL CHARACTERISTICS

A material safety data sheet (MSDS) for bituminous coal fly ash material is presented in **Attachment B**.

4. OVERVIEW OF EXISTING FACILITY PERMITS, OPERATING PLANS, AND PROCEDURES

The mining and industrial operations which occur at the FCS Brooksville facility have required FCS to obtain a series of permits issued by the FDEP and the Southwest Florida Water Management District (SWFWMD). These permits include, but are not limited to the following:

FDEP Permits

a) Power Plant Siting Conditions of Certification (No. PA82-17).
b) Industrial Wastewater Permit (No. IO27-220264 (FLA012073).
c) City of Brooksville Sewage Treatment Plant (STP) Permit (No. DO27-195835). Treated STP effluent (0.375 million gallons per day [mgd]) is discharged to the FCS settling and cooling ponds.
d) FCS STP Permit (No. DO27-159048). Treated STP effluent (0.006 mgd) is discharged to FCS cooling ponds.
e) Waste Tire Handling Permit (WT27-268487). Waste tires are stored east of the Cement Plant and are fuel feed stock for the cement kiln.

SWFWMD Permits

f) Management and Storage of Surface Waters (MSSW) Permit for the Modification of Cooling Ponds 4 and 5 (No. MSW 403241.00)
g) MSSW Permit for the Construction of Cooling Pond 9 (No. MSSW 4510189.00).
h) Individual Water Use Permit (No. 200215-.07)

The facility-wide BMP, *Best Management Practices Plan, Florida Crushed Stone, Brooksville, Florida, April, 2000*, prepared by PBS&J and the SWMP dated March 2000 include numerous engineering controls and BMPs instituted by FCS under the permits conditions. The BMPs presented in this document address only the storage and staging of the dredge and ash products to be recycled. The BMPs presented herein will be integrated into this existing FCS management structure.

5. GENERAL FACILITY OPERATING PROCEDURES

5.1 MAINTENANCE AND HOUSEKEEPING

Good housekeeping is essential to the proper maintenance of the work place and is emphasized throughout the Brooksville facility. New employees are introduced to its importance during the "Safety and Health Orientation". This training is required for all new employees and is emphasized during regular safety meetings. Additionally, an annual "Environmental Training" session addresses the use of BMPs and the importance of good housekeeping. Regular schedules and assignments are developed by area supervisors to ensure safe, clean working conditions.

5.2 RECORDKEEPING

All facility personnel have been trained in proper recordkeeping requirements for their specific job functions. Each of the operating areas has operational recordkeeping requirements for the facility and its operations.

5.3 INSPECTIONS

All plant personnel have been trained to observe their surroundings during the course of their daily duties and to report anything that may contribute to releases of potentially harmful materials. The overall operating plans and permits previously summarized have an inspection component and recordkeeping requirements and specifically address inspection frequency. These inspections are in place as formalized procedures to minimize the risk of spills, releases and discharges from the Facility.

5.4 PLANT SECURITY

All access into and out of the facility is monitored and recorded by the facility security guard. The security guard is responsible for insuring that all outside contractors, consultants, and regulatory personnel are appropriately logged in and recorded. In addition, the security guard checks any outside contractor vehicles to insure that proper documentation is provided for all materials being brought into the facility, and that all loads are properly documented and restrained on the vehicle.

5.5 EMPLOYEE TRAINING

All new employees receive initial training by the Safety Supervisor. This training covers chemical hazards in the work areas, location of the MSDS manuals, the health and safety procedures manual, lock-out and tag-out procedures, respiratory protection, hearing protection and employee right-to-know.

Employees routinely receive 40 to 50 hours of training annually covering health, safety, environmental programs and compliance, employee responsibilities, identification of environmental incidents, management and reporting of chemical and petroleum spills, waste management, dams and dikes, and storm water control. The training program will now inform all involved personnel of the components and goals of this BMP. All training sessions are properly documented with the subject of the training, the name of the trainer, the names of the participants and the date the training was performed.

5.6 MATERIAL SAFETY DATA SHEETS

MSDSs for all chemicals utilized in the facility are maintained by the facility safety staff. The safety staff ensures that updated versions of the MSDSs are available in various areas of the facility. Operation manuals and protocols involving the use of chemicals specifically reference the MSDSs. MSDSs are available to all employees for reference prior to handling any chemical in the facility. The MSDS for the fly ash is included in the facility documentation. **Appendix B** includes a copy of the MSDS.

6. BEST MANAGEMENT PRACTICES FOR RECYCLING PROCESS

This section includes a description of each step in the storage and transfer of the dredge and fly ash by-product materials at the FCS Brooksville facility. This section details the drainage features, practices, and procedures to be used as the BMP for each stage of material handling.

6.1 MATERIAL STORAGE AREAS

Two areas have been developed for the storage of the piles of dredge and fly ash containing material. The dimensions and shape of Piles 1 and 3 are irregular due to the moisture content of the material at the time of its receipt at the FCS facility. A silt fence was in place during the construction of the piles and the placement of the tarp. The silt fence was removed following pile covering.

A total of 196,199 tons was received at the FCS facility. During the January 3, 2003 site visit by ECT, Pile 1 contained 99,915 tons and Pile 3 contained 72,774 tons of the materials to be recycled. The storage pile areas were cleared and graded prior to pile construction to provide a suitable working surface and to divert upland runoff away from and around the storage piles, thus reducing potential for contact.

The piles are covered with a tarp with ballasts to prevent exposure to rain and prevent the material from contacting storm water. Existing drainage features will prevent uncontrolled runoff from leaving any of the pile areas or their respective sub-basins, located within the FCS property.

6.2 DRAINAGE FEATURES

It is not anticipated that there will be any storm water coming into contact with the dredge and fly ash by-product which is stored under rain cell covers as set forth herein. Therefore, any storm water runoff from the pile storage areas will be limited to "non-contact storm water" that flows off the impervious rain covers and onto the adjacent land surface. Runoff from the land surface areas adjacent to the storage piles presently drains to existing ditches, flumes, ponds and drainage basins.

Visual inspections and walk-through surveys of the pile areas were conducted by Environmental Consulting & Technology, Inc. (ECT) engineers on April 2, 2001 and on January 3, 2003. Apparent runoff flow directions are indicated on **Figures 2 and 3**. General drainage patterns within and between the associated drainage sub-basins are indicated at Exhibit A (Facility Site Plan) of the SWMP (By PBS&J, March 2000). Based on that inspection, and on review of that facility site plan, construction of additional drainage features for upland flow diversion or downstream runoff capture and control does not appear to be necessary. The existing drainage basins and storm water management features appear adequate to handle all of the non-contact storm water runoff from the pile areas.

6.3 IMPERVIOUS PILE COVER

Each storage area will consist of one covered pile containing the dredge by-product materials containing fly ash. As illustrated in **Figure 5**, the piles are covered with a high-density polyethylene (HDPE) tarp. The tarps will be repaired and/or replaced as necessary to maintain the integrity of the cover and prevent leachate production during the time in which the material is stored prior to recycling.

6.4 TARP ANCHORAGE

Figure 5 presents a cross sectional view of the tarp anchorage for each pile. The liner extends beyond the pile and is anchored using ballast bags and tires as ballast to hold down the edges of the tarp. The tarp edges are folded inward past the tires or simply bunched up to dissipate energy in the runoff flowing off the pile side slope. This anchorage prevents the liner from shifting due to high winds. This arrangement will allow for easy access to the piles for inspection by FCS staff while greatly reducing the possibility of introducing the fly ash material into the storm water runoff.

6.5 MATERIAL TRANSFER

An active face is present at Pile 1 to allow access to the material to be recycled. The material is transferred from the active end of the storage pile to the staging area. The active portion of the pile is surrounded by a silt fence. The silt fence is constructed just beyond a small earthen berm that has been constructed around the active face. This prevents the material from leaving the active face of the storage area. The light color of the native soil at the Pile 1 and Pile 3 storage areas and the black color of the material contrast sharply. Any material that may be transferred from the pile would be contained by the silt fence. The light color of native soils will allow FCS to recover any of the black material back to the pile or to the staging area as part of its routine active face maintenance and housekeeping.

The material from the working face of the storage area is transported in 50-cubic-yard off-road dump trucks to the staging area. The off-road dump trucks will not require a tarp as the short distance between the storage and staging area, the slow speed at which the dump trucks travel, and the brief time in which the material will be in the off-road truck will minimize any release. The FCS facility routinely waters the roads within the plant to minimize dust. Any material which happens to be released during transfer on the plant roads would be kept wet to prevent dust and then also swept and reintroduced into the cement plant processes. The material will not be transferred from the storage area to the material processing and screening area during rain, which will prevent the formation of any leachate.

Material recycling rates are determined by FCS based upon the moisture content of the material. The working face will also provide for some drying of the material through evaporation. The optimal moisture content for feed to the cement plant is 10 percent. 23,510 tons have been recycled as of ECT's January 3, 2003 site visit.

6.6 STAGING AREA

The staging area is located adjacent to the CPL plant and is also within the area of the plant that has a storm water management and recycling plan. The staging area is located near the feed hopper, as shown on **Figures 2, 3 and 4**. An area about 100 feet by 60 feet constructed of a concrete pad with concrete retaining walls on three sides has been

constructed to ensure adequate containment of the material prior to being fed into the hopper. This area is used as a staging area for the material. The material will not be covered when it is in the staging area awaiting use within the process. Any runoff generated from the staging area is incorporated into the existing storm water management system. According to FCS as a part of this BMP, only ash containing material that is ready to use and to be used will be staged for feed to the hopper.

In order to expedite use of the remaining material on site, FCS proposes construction of a second staging area at the location shown in **Figure 2**. This second staging area will be adjacent to the conveyer belt that feeds materials into the A-frame storage area. Once inside the A-frame storage area, the fly ash material will be mixed with other rock materials stored in the A-frame storage area and incorporated into the cement process. The proposed second staging area is proposed to be constructed with a concrete pad floor and retaining walls on three sides similar to the construction of the existing staging area. The size of the proposed staging area is approximately one-half of the size of the existing staging area.

6.7 USAGE OF MATERIAL

As demand warrants, the material will be fed into the hopper from the staging area using a front-end loader. The hopper will feed the material via conveyor into Silo #11 (**Figures 2 through 4**). From there, the ash material will be introduced into the cement production process stream, which is already addressed in the SWMP, facility-wide BMP plan, and existing permits.

FCS may modify the feed of the material to bypass the conveyor into Silo #11 with a direct feed into cement production. This potential change would not alter the use of the staging area.

7. INSPECTIONS AND RECORDKEEPING

7.1 INSPECTIONS

The storage piles and the staging area will be inspected weekly by cement plant operations group personnel. The cement plant operations group personnel will record the time and date of each inspection and the general conditions of the storage piles, active portion of the pile, and the staging area. The piles will be inspected for spillage, erosion, and integrity of the cover. The working face of the active pile will be inspected to evaluate the integrity of the silt fence, the earthen berm, and for the presence of the material beyond the active face of the pile. The staging area will be inspected for the condition of its concrete pad and retaining walls. Results of the weekly inspections will be kept in a log to be inspected periodically by the cement plant manager.

7.2 RECORDKEEPING

No further material is being accepted from TEC. A total of 196,199 tons was accepted at the FCS facility and is being recycled. The ash containing material was weighed at the TEC Gannon plant prior to transport to the FCS facility. Weigh tickets prepared by Quicksilver Recycling were provided to FCS. Records will be maintained to provide information on the amount of material received, stored and used at the FCS facility. Material processing and usage logs will be maintained at FCS and presented in the FCS Annual Operating Reports that are submitted to FDEP.

FCS will maintain records of the storage piles and staging area inspections in the plant's files.

FIGURES

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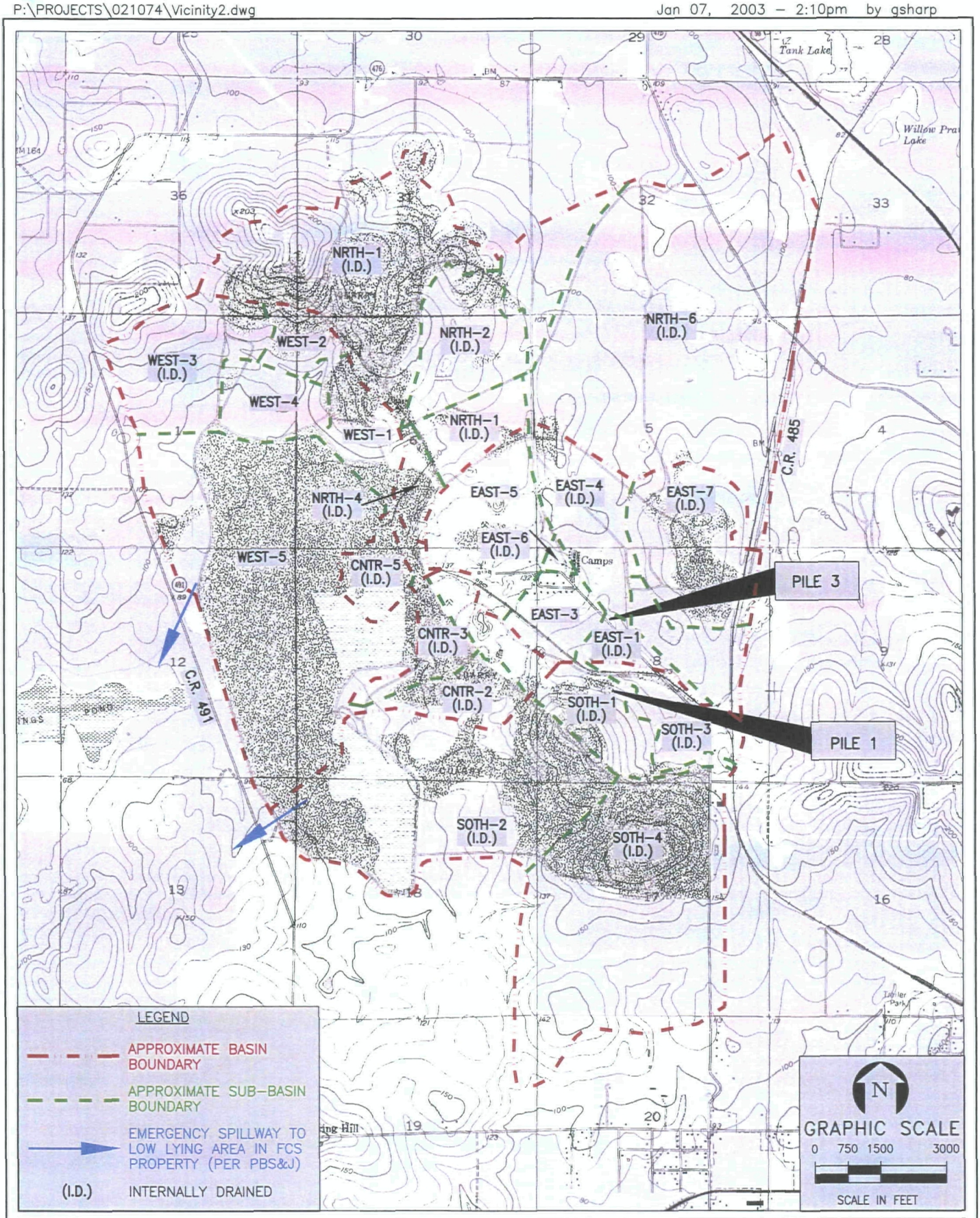

FIGURE 1.
SITE VICINITY MAP WITH DRAINAGE BASINS
FLORIDA CRUSHED STONE
BROOKSVILLE, FLORIDA

Sources: USGS Quad Map of Brooksville, Fl., 1988; PBS&J, 2000; ECT, 2003.

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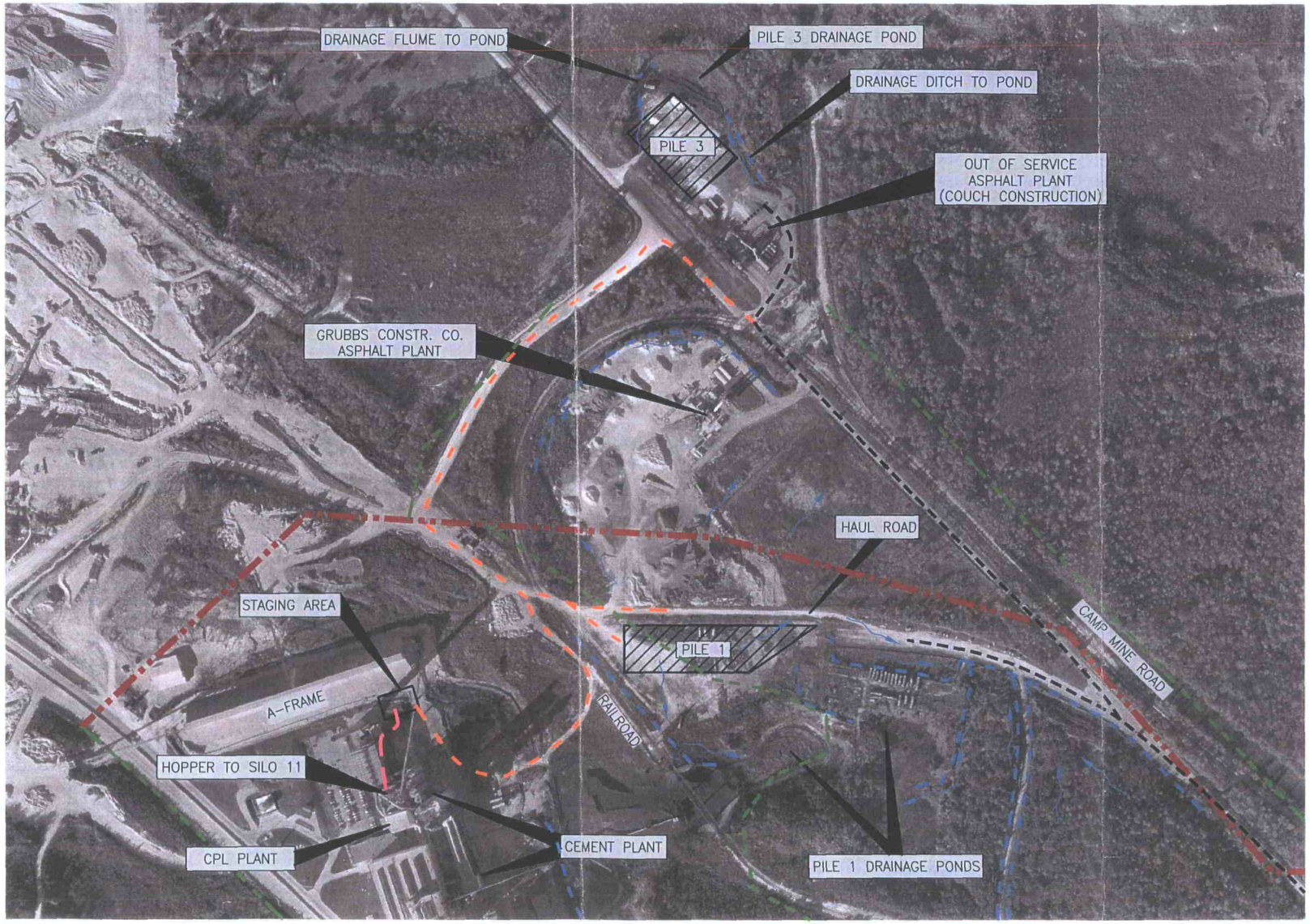
Jan 16, 2003 – 11:08am by jvonborstel

FIGURE 2.
FACILITY OVERVIEW – INCLUDING ENTRANCE
FLORIDA CRUSHED STONE
BROOKSVILLE, FLORIDA

Sources: PBS&J, 2000; ECT, 2003.

ECT
Environmental Consulting & Technology, Inc.



PILE STORAGE

PILE	FOOTPRINT (FT)	QUANTITY STORED
1	156' x (630,412)	99,915 TONS
3	200' x 300'	72,774 TONS

LEGEND

- DRAINAGE SUB–BASIN BOUNDARY
- DRAINAGE SUB–BASIN BOUNDARY
- TRUCK ROUTE TO STORAGE AREA
- HAUL TRUCK ROUTE TO STAGING AREA
- LOADER ROUTE TO HOPPER
- DRAINAGE DITCH
- DRAINAGE FLOW DIRECTION

N

GRAPHIC SCALE

0 100 200 400

SCALE IN FEET

FIGURE 3.
PILE AND DRAINAGE AREAS
FLORIDA CRUSHED STONE
BROOKSVILLE, FLORIDA

Source: ECT, 2003.

ECT

Environmental Consulting & Technology, Inc.

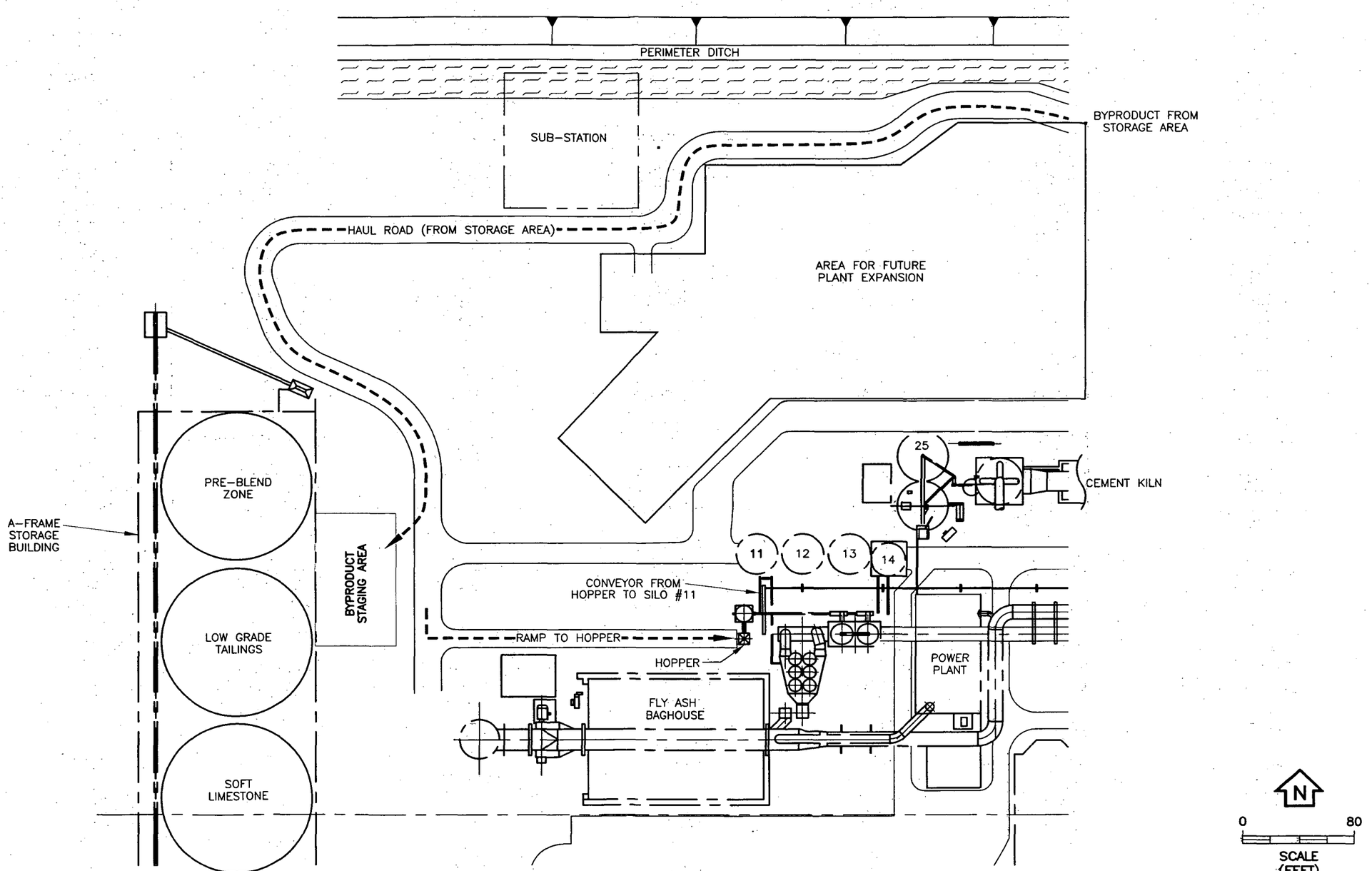


FIGURE 4.
STAGING AREA LAYOUT
FLORIDA CRUSHED STONE
BROOKSVILLE, FLORIDA

Sources: Krupp Polysius Corp., 2000; ECT, 2003.

ECT
Environmental Consulting & Technology, Inc.

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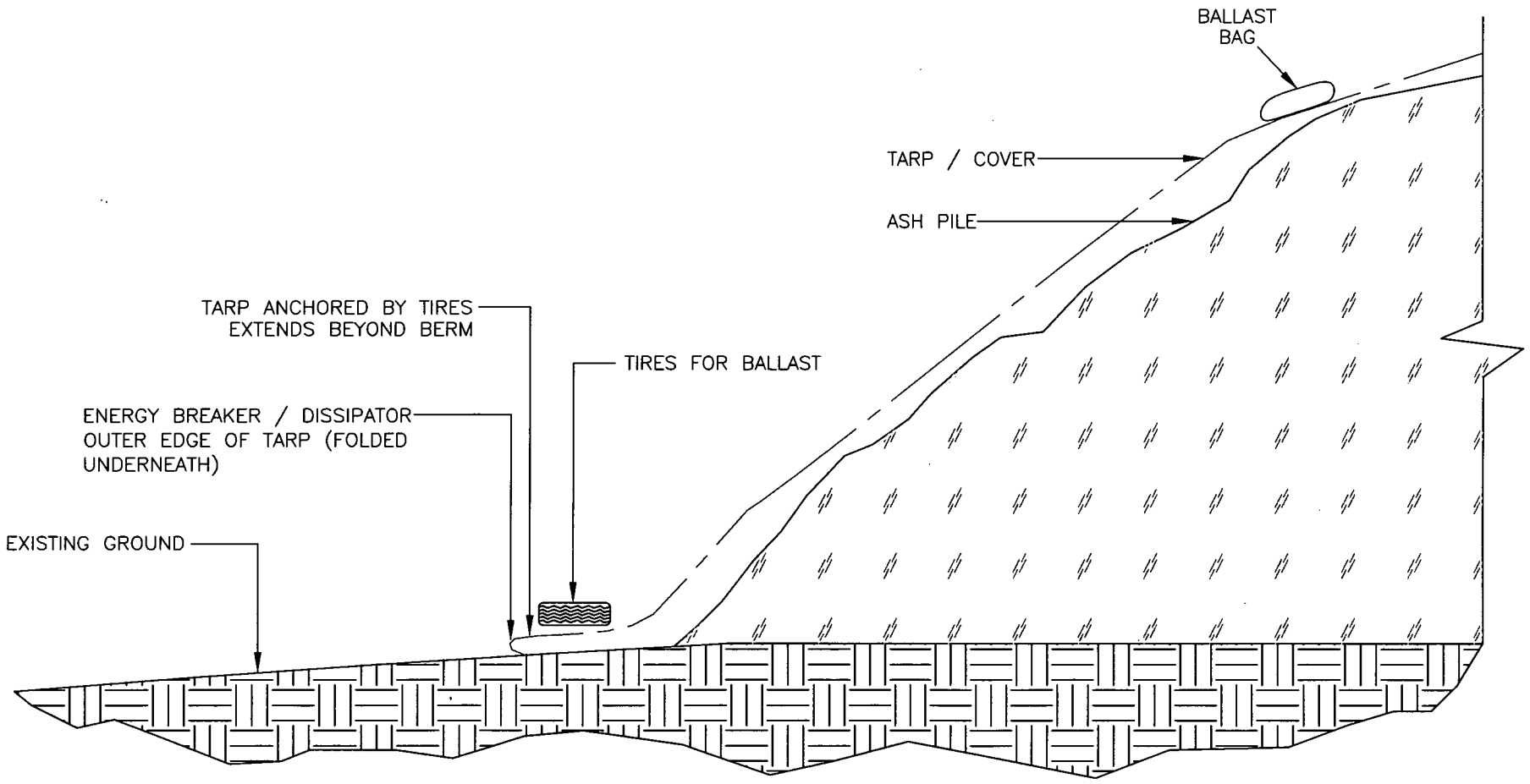

NOT TO SCALE

FIGURE 5.
TARP ANCHORAGE CROSS SECTION
FLORIDA CRUSHED STONE
BROOKSVILLE, FLORIDA

Source: ECT, 2003.

ECT
Environmental Consulting & Technology, Inc.

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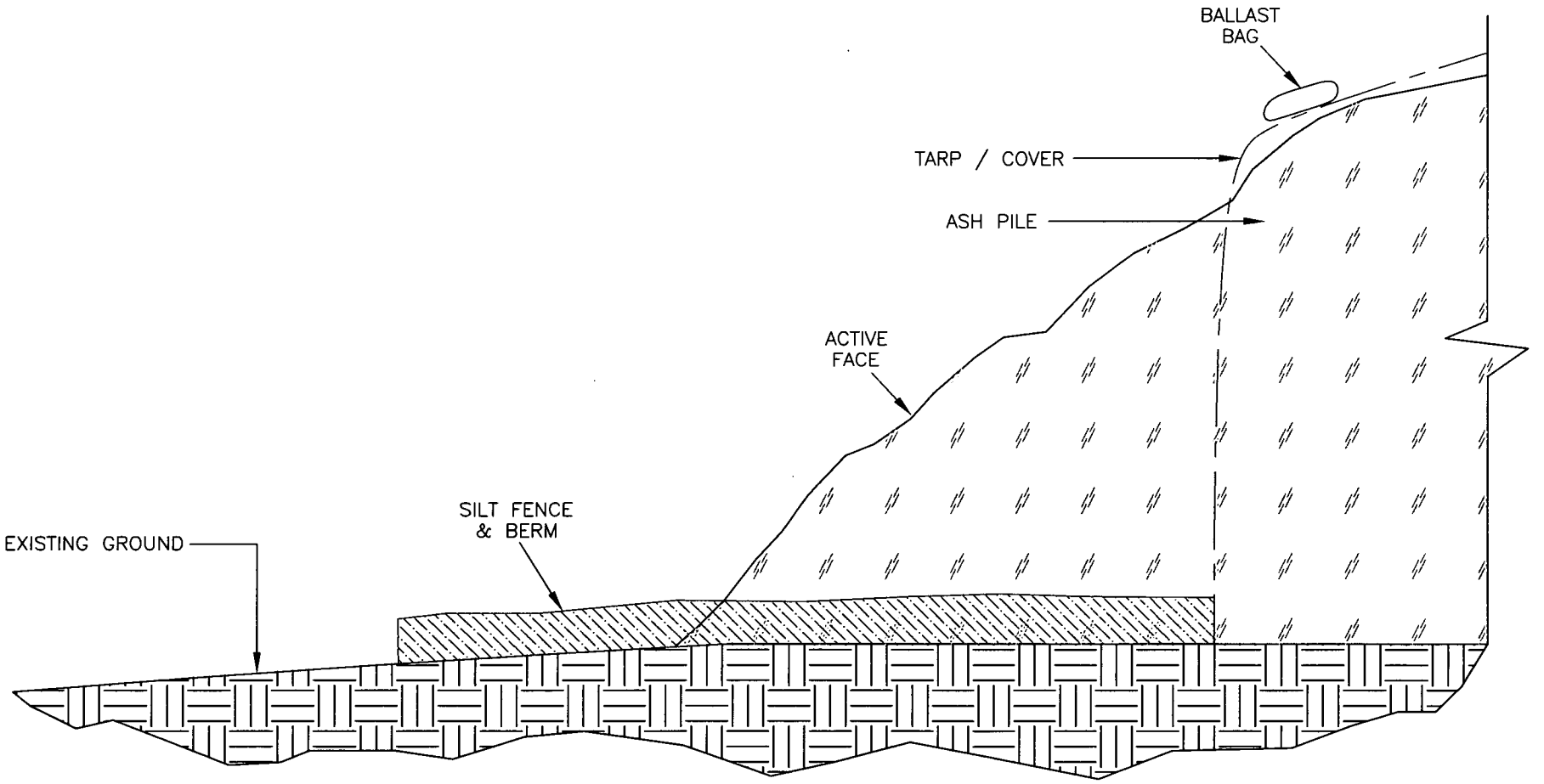

NOT TO SCALE

FIGURE 6.
ACTIVE FACE CROSS SECTION
FLORIDA CRUSHED STONE
BROOKSVILLE, FLORIDA

Source: ECT, 2003.

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Environmental Consulting & Technology, Inc.

APPENDIX A

LABORATORY REPORT

Environmental Conservation Laboratories, Inc.
10207 General Drive
Orlando, Florida 32824-8529
407 / 826-5314
Fax 407 / 850-6945
www.encolabs.com

ENCO Laboratories

DHRS Certification No. E83182

CLIENT : Environmental Consulting & Tech.
ADDRESS: 5405 Cypress Center Drive
Suite 200
Tampa, FL 33609

REPORT # : ORL15321
DATE SUBMITTED: March 27, 2001
DATE REPORTED : April 19, 2001

ATTENTION: Mark Culbreth

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT #: TECO GANNON

03/23/01

#4	- SOIL#4(A3-COMP032301	@ 13:25
#8	- SOIL#8(B8COMP)	@ 14:06
#12	- SOIL#12(C13COMP)	@ 14:45
#16	- SOIL#16(B15COMP)	@ 15:07
#20	- SOIL#20(B19COMP)	@ 15:25
#21	- SOIL#21(DUP2B19COMP)	@ 15:25
#25	- SOIL#25(C21COMP)	@ 15:50
#31	- SOIL#31(C23COMP)	@ 16:15
#32	- EQB#1(EQBLANK1)	@ 12:50

PROJECT MANAGER

for **Marcia C. Terlep**

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#4(A3-COMP032301	SOIL#8(B8COMP)	Units
SPLP Aluminum	1312/6010	0.20 U	0.20 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Antimony	1312/7041	0.0060 U	0.0060 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Arsenic	1312/6010	**0.024**	**0.014**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Barium	1312/6010	**0.39**	**0.37**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Boron	1312/6010	**0.65**	**0.87**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Beryllium	1312/6010	0.0040 U	0.0040 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Cadmium	1312/6010	0.00050 U	0.00050 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Chromium	1312/6010	0.020 U	0.020 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Copper	1312/7210	0.20 U	0.20 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Iron	1312/6010	0.050 U	0.050 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Lead	1312/6010	0.0150 U	0.0150 U	mg/L
Date Analyzed		04/09/01	04/09/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#4(A3-COMP032301	SOIL#8(B8COMP)	Units
SPLP Manganese	1312/6010	0.010 U	0.010 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Mercury	1312/7470	0.00020 U	0.00020 U	mg/L
Date Analyzed		04/13/01	04/13/01	
SPLP Molybdenum	1312/6010	**0.044**	**0.077**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Nickel	1312/6010	0.050 U	0.050 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Selenium	1312/6010	**0.034**	**0.043**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Silver	1312/7760	0.10 U	0.10 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Sodium	1312/7770	**26**	**39**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Strontium	1312/6010	**0.26**	**0.41**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Thallium	1312/7840	0.0020 U	0.0020 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Vanadium	1312/6010	**0.012**	**0.010**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Zinc	1312/6010	**0.12**	**0.11**	mg/L
Date Analyzed		04/09/01	04/09/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

EPA METHOD 300 - Anions by IC	**SOIL#4(A3-COMP032301**	**SOIL#8(B8COMP)**	**Units**
Fluoride	0.50 U	0.50 U	mg/L
Chloride	**4.0**	**42**	mg/L
Sulfate	**85**	**170**	mg/L
Date Analyzed	04/10/01	04/10/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#12(C13COMP)	SOIL#16(B15COMP)	Units
SPLP Aluminum	1312/6010	**4.7**	**0.77**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Antimony	1312/7041	0.0060 U	0.0060 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Arsenic	1312/6010	**0.016**	**0.032**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Barium	1312/6010	**0.30**	**1.1**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Boron	1312/6010	**2.4**	**2.4**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Beryllium	1312/6010	0.0040 U	0.0040 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Cadmium	1312/6010	0.00050 U	0.00050 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Chromium	1312/6010	0.020 U	0.020 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Copper	1312/7210	0.20 U	0.20 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Iron	1312/6010	0.050 U	**0.080**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Lead	1312/6010	0.0150 U	0.0150 U	mg/L
Date Analyzed		04/09/01	04/09/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#12(C13COMP)	SOIL#16(B15COMP)	Units
SPLP Manganese	1312/6010	0.010 U	0.010 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Mercury	1312/7470	0.00020 U	0.00020 U	mg/L
Date Analyzed		04/13/01	04/13/01	
SPLP Molybdenum	1312/6010	**0.26**	**0.064**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Nickel	1312/6010	0.050 U	0.050 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Selenium	1312/6010	**0.018**	**0.017**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Silver	1312/7760	0.10 U	0.10 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Sodium	1312/7770	**46**	**29**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Strontium	1312/6010	**2.2**	**0.62**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Thallium	1312/7840	0.0020 U	0.0020 U	mg/L
Date Analyzed		04/02/01	04/02/01	
SPLP Vanadium	1312/6010	**0.030**	**0.010**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Zinc	1312/6010	**0.11**	**2.7**	mg/L
Date Analyzed		04/09/01	04/09/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

EPA METHOD 300 - Anions by IC	**SOIL#12(C13COMP)**	**SOIL#16(B15COMP)**	**Units**
Fluoride	2.0 U	**0.66**	mg/L
Chloride	**30**	**10**	mg/L
Sulfate	**580**	**190**	mg/L
Date Analyzed	04/10/01	04/10/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#20(B19COMP)	SOIL#21(DUP2B19COMP)	Units
SPLP Aluminum	1312/6010	**0.80**	**0.77**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Antimony	1312/7041	**0.0074**	**0.0061**	mg/L
Date Analyzed		04/05/01	04/05/01	
SPLP Arsenic	1312/6010	**0.033**	**0.038**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Barium	1312/6010	**0.38**	**0.51**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Boron	1312/6010	**1.8**	**2.5**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Beryllium	1312/6010	0.0040 U	0.0040 U	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Cadmium	1312/6010	0.00050 U	0.00050 U	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Chromium	1312/6010	0.020 U	0.020 U	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Copper	1312/7210	0.20 U	0.20 U	mg/L
Date Analyzed		04/07/01	04/07/01	
SPLP Iron	1312/6010	0.050 U	**0.060**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Lead	1312/6010	0.0150 U	0.0150 U	mg/L
Date Analyzed		04/09/01	04/10/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#20(B19COMP)	SOIL#21(DUP2B19COMP)	Units
SPLP Manganese	1312/6010	0.010 U	0.010 U	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Mercury	1312/7470	0.00020 U	0.00020 U	mg/L
Date Analyzed		04/13/01	04/13/01	
SPLP Molybdenum	1312/6010	**0.19**	**0.18**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Nickel	1312/6010	0.050 U	0.050 U	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Selenium	1312/6010	**0.020**	**0.014**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Silver	1312/7760	0.10 U	0.10 U	mg/L
Date Analyzed		04/07/01	04/07/01	
SPLP Sodium	1312/7770	**38**	**37**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Strontium	1312/6010	**1.3**	**1.2**	mg/L
Date Analyzed		04/09/01	04/10/01	
SPLP Thallium	1312/7840	0.0020 U	0.0020 U	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Vanadium	1312/6010	**0.029**	**0.023**	mg/L
Date Analyzed		04/09/01	04/09/01	
SPLP Zinc	1312/6010	0.10 U	**1.9**	mg/L
Date Analyzed		04/09/01	04/10/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

EPA METHOD 300 - Anions by IC	**SOIL#20(B19COMP)**	**SOIL#21(DUP2B19COMP)**	**Units**
Fluoride	**1.3**	**1.0**	mg/L
Chloride	**17**	**22**	mg/L
Sulfate	**350**	**350**	mg/L
Date Analyzed	04/10/01	04/11/01	

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#25(C21COMP)	SOIL#31(C23COMP)	Units
SPLP Aluminum	1312/6010	**0.75**	0.20 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Antimony	1312/7041	0.0060 U	0.0060 U	mg/L
Date Analyzed		04/05/01	04/05/01	
SPLP Arsenic	1312/6010	**0.041**	**0.032**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Barium	1312/6010	**0.75**	0.20 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Boron	1312/6010	**2.2**	**1.0**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Beryllium	1312/6010	0.0040 U	0.0040 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Cadmium	1312/6010	0.00050 U	0.00050 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Chromium	1312/6010	0.020 U	0.20 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Copper	1312/7210	0.20 U	0.20 U	mg/L
Date Analyzed		04/07/01	04/05/01	
SPLP Iron	1312/6010	**0.060**	0.050 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Lead	1312/6010	0.0150 U	0.0150 U	mg/L
Date Analyzed		04/10/01	04/10/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	SOIL#25(C21COMP)	SOIL#31(C23COMP)	Units
SPLP Manganese	1312/6010	**0.013**	0.010 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Mercury	1312/7470	0.00020 U	0.00020 U	mg/L
Date Analyzed		04/13/01	04/13/01	
SPLP Molybdenum	1312/6010	**0.074**	**0.12**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Nickel	1312/6010	0.050 U	0.050 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Selenium	1312/6010	**0.019**	**0.032**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Silver	1312/7760	0.10 U	0.10 U	mg/L
Date Analyzed		04/07/01	04/05/01	
SPLP Sodium	1312/7770	**30**	**31**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Strontium	1312/6010	**0.84**	**0.94**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Thallium	1312/7840	0.0020 U	0.0020 U	mg/L
Date Analyzed		04/09/01	04/05/01	
SPLP Vanadium	1312/6010	0.010 U	**0.019**	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Zinc	1312/6010	**2.2**	0.10 U	mg/L
Date Analyzed		04/10/01	04/10/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

EPA METHOD 300 - Anions by IC	SOIL#25(C21COMP)	SOIL#31(C23COMP)	Units
fluoride	0.52	1.0	mg/L
chloride	10	21	mg/L
Sulfate	210	240	mg/L
Date Analyzed	04/11/01	04/11/01	

RESULTS OF ANALYSIS

SPLP METALS	METHOD	EQB#1(EQBLANK1)	LAB BLANK	Units
SPLP Aluminum	1312/6010	0.20 U	0.20 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Antimony	1312/7041	0.0060 U	0.0060 U	mg/L
Date Analyzed		04/05/01	04/02/01	
SPLP Arsenic	1312/6010	0.010 U	0.010 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Barium	1312/6010	0.20 U	0.20 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Boron	1312/6010	**0.31**	0.10 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Beryllium	1312/6010	0.0040 U	0.0040 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Cadmium	1312/6010	0.00050 U	0.00050 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Chromium	1312/6010	0.020 U	0.020 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Copper	1312/7210	0.10 U	0.10 U	mg/L
Date Analyzed		04/05/01	04/05/01	
SPLP Iron	1312/6010	0.050 U	**0.070**	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Lead	1312/6010	0.0150 U	0.0150 U	mg/L
Date Analyzed		04/10/01	04/09/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	EQB#1(EQBLANK1)	LAB BLANK	Units
SPLP Manganese	1312/6010	0.010 U	0.010 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Mercury	1312/7470	0.00020 U	0.00020 U	mg/L
Date Analyzed		04/13/01	04/10/01	
SPLP Molybdenum	1312/6010	0.010 U	0.010 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Nickel	1312/6010	0.050 U	0.050 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Selenium	1312/6010	0.010 U	0.010 U	mg/L
Date Analyzed		04/10/01	04/09/01	
SPLP Silver	1312/7760	0.10 U	0.10 U	mg/L
Date Analyzed		04/05/01	04/05/01	
SPLP Sodium	1312/7770	**7.6**	0.10 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Strontium	1312/6010	0.10 U	0.10 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Thallium	1312/7840	0.0020 U	0.0020 U	mg/L
Date Analyzed		04/05/01	04/05/01	
SPLP Vanadium	1312/6010	0.00050 U	0.00050 U	mg/L
Date Analyzed		04/10/01	04/10/01	
SPLP Zinc	1312/6010	0.10 U	0.10 U	mg/L
Date Analyzed		04/10/01	04/09/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

EPA METHOD 300 - Anions by IC	**EQB#1(EQBLANK1)**	**LAB BLANK**	**Units**
Fluoride	**0.39**	0.10 U	mg/L
Chloride	0.50 U	0.50 U	mg/L
Sulfate	**13**	2.0 U	mg/L
Date Analyzed	04/11/01	04/10/01	

U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	LAB BLANK	LAB BLANK	Units
SPLP Aluminum	1312/6010	0.20 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Antimony	1312/7041	0.0060 U	NR	mg/L
Date Analyzed		04/05/01		
SPLP Arsenic	1312/6010	0.010 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Barium	1312/6010	0.20 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Boron	1312/6010	0.10 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Beryllium	1312/6010	0.0040 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Cadmium	1312/6010	0.00050 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Chromium	1312/6010	0.020 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Copper	1312/7210	0.10 U	NR	mg/L
Date Analyzed		04/07/01		
SPLP Iron	1312/6010	0.050 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Lead	1312/6010	0.0150 U	NR	mg/L
Date Analyzed		04/10/01		

NR = Analysis not requested for this sample.
U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

SPLP METALS	METHOD	LAB BLANK	LAB BLANK	Units
SPLP Manganese	1312/6010	0.010 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Mercury	1312/7470	0.00020 U	0.00020 U	mg/L
Date Analyzed		04/13/01	04/13/01	
SPLP Molybdenum	1312/6010	0.010 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Nickel	1312/6010	0.050 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Selenium	1312/6010	0.010 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Silver	1312/7760	0.10 U	NR	mg/L
Date Analyzed		04/07/01		
SPLP Sodium	1312/7770	0.10 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Strontium	1312/6010	0.10 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Thallium	1312/7840	0.0020 U	NR	mg/L
Date Analyzed		04/09/01		
SPLP Vanadium	1312/6010	0.00050 U	NR	mg/L
Date Analyzed		04/10/01		
SPLP Zinc	1312/6010	0.10 U	NR	mg/L
Date Analyzed		04/10/01		

NR = Analysis not requested for this sample.
U = Compound was analyzed for but not detected to the level shown.

RESULTS OF ANALYSIS

EPA METHOD 300 - Anions by IC	**LAB BLANK**	**Units**
Fluoride	0.10 U	mg/L
Chloride	0.50 U	mg/L
Sulfate	2.0 U	mg/L
Date Analyzed	04/11/01	

U = Compound was analyzed for but not detected to the level shown.

QUALITY CONTROL DATA

Parameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
SPLP METALS				
Aluminum, 1312/6010	94/ 92/ 94	35-172	2	32
Aluminum, 1312/6010	101/ 99/ 97	35-172	2	32
Antimony, 1312/7041	102/113/106	50-150	10	15
Antimony, 1312/7041	102/113/105	50-150	10	15
Antimony, 1312/7041	116/112/102	45-152	4	15
Antimony, 1312/7041	119/121/109	45-152	2	15
Antimony, 1312/7041	116/112/102	45-152	4	15
Arsenic, 1312/6010	92/ 92/ 83	53-153	<1	22
Arsenic, 1312/6010	104/ 98/103	53-153	6	22
Arsenic, 1312/6010	104/103/103	53-153	<1	22
Barium, 1312/6010	96/ 94/ 96	70-120	2	16
Barium, 1312/6010	100/100/102	70-120	<1	16
Boron, 1312/6010	91/ 92/ 89	97-103	1	23
Boron, 1312/6010	100/ 99/ 99	97-103	1	23
Beryllium, 1312/6010	95/ 94/ 93	41-150	1	26
Beryllium, 1312/6010	100/100/101	41-150	<1	26
Cadmium, 1312/6010	94/ 93/ 95	59-130	1	24
Cadmium, 1312/6010	98/ 98/102	59-130	<1	24
Chromium, 1312/6010	97/ 96/ 97	57-135	1	24
Chromium, 1312/6010	100/101/104	57-135	<1	24

Environmental Conservation Laboratories Comprehensive QA Plan #960038

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

QUALITY CONTROL DATA

Parameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
SPLP METALS (Cont.)				
Copper, 1312/7210	102/109/106	75-125	7	10
Copper, 1312/7210	105/105/102	80-115	<1	10
Copper, 1312/7210	102/109/106	75-125	7	10
Copper, 1312/7210	106/103/102	75-125	3	10
Iron, 1312/6010	95/ 94/ 94	48-139	1	38
Iron, 1312/6010	89/ 80/104	48-139	11	38
Lead, 1312/6010	95/ 94/ 94	63-128	1	26
Lead, 1312/6010	99/ 99/102	63-128	<1	26
Manganese, 1312/6010	94/ 92/ 93	84-124	2	21
Manganese, 1312/6010	97/ 97/100	84-124	<1	21
Mercury, 1312/7470	38/ 38/106	75-129	<1	11
Mercury, 1312/7470	101/101/105	70-136	<1	12
Molybdenum, 1312/6010	94/ 93/ 92	97-106	1	21
Molybdenum, 1312/6010	98/ 98/100	97-106	<1	21
Nickel, 1312/6010	94/ 93/ 94	78-111	1	14
Nickel, 1312/6010	98/ 99/101	78-111	1	14
Selenium, 1312/6010	95/ 94/ 94	60-121	1	14
Selenium, 1312/6010	101/100/102	60-121	<1	14
Silver, 1312/7760	100/107/100	80-115	7	10
Silver, 1312/7760	99/ 97/ 97	80-115	2	10
Silver, 1312/7760	100/107/100	80-115	7	10
Silver, 1312/7760	101/113/111	80-115	11	10

Environmental Conservation Laboratories Comprehensive QA Plan #960038

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

QUALITY CONTROL DATA

Parameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
SPLP METALS (Cont.)				
Sodium, 1312/7770	96/ 90/ 91	82-124	6	16
Sodium, 1312/7770	105/104/104	82-124	<1	16
Strontium, 1312/6010	90/ 88/ 88	50-150	2	25
Strontium, 1312/6010	97/100/101	50-150	3	25
Thallium, 1312/7840	100/103/100	70-120	3	15
Thallium, 1312/7840	105/103/101	75-120	2	10
Thallium, 1312/7840	100/103/100	70-120	3	15
Thallium, 1312/7840	100/104/101	75-120	4	10
Zinc, 1312/6010	90/ 90/ 90	76-125	<1	19
Zinc, 1312/6010	96/ 97/101	76-125	1	19
EPA Method 300				
Fluoride	92/ 91/103	43-130	1	25
Chloride	*/ */ 97	51-149	*	26
Sulfate	*/ */101	47-148	*	25
EPA Method 300				
Fluoride	97/ 80/104	43-130	19	25
Chloride	*/ */ 97	51-149	*	26
Sulfate	*/ */100	47-148	*	25

Environmental Conservation Laboratories Comprehensive QA Plan #960038

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

APPENDIX B

MATERIAL SAFETY DATA SHEET
FLY ASH

Material Safety Data Sheet	TECO TAMPA ELECTRIC	Fly Ash Gannon Station

1.0 General Information

Item Name:	Fly Ash
Company's Name:	Tampa Electric Company - Gannon Station
Company's Address:	P.O. Box 111
Company's City:	Tampa
Company's State:	Florida
Company's Zip Code:	33601
Company's Emergency Phone Number:	(813) 622-8281
Company's Information Phone Number:	(813) 228-4111
Date of MSDS Preparation:	November 6, 2000

Signature of Preparer:

2.0 Ingredients/Identity Information

Proprietary: No

Ingredients: Fly ash consists principally of minute glass-like particles composed of oxides of silica, iron, and aluminum with trace amounts of crystalline matter and varying amounts of unbound carbon.

Chemical composition may vary slightly based on coal source and blend being utilized.

Hazardous Component	OSHA PEL	ACGIH TLV	IDLH	CAS Number	%
Silica (SiO_2) Quartz	133 mg/M^3	3 mg/M^3	3,000 mg/M^3	7631-86-9	30-45
Alumina (Al_2O_3)	5 mg/M^3	10 mg/M^3	NE	1344-28-1	15-25
Ferric oxide (Fe_2O_2)	10 mg/M^3	5 mg/M^3	2,500 mg/M^3	1309-37-1	10-25
Calcium oxide (CaO)	5 mg/M^3	2 mg/M^3	25 mg/M^3	1305-78-8	1-20
Potassium oxide (K_2O)	NP	NP	NE	NE	1-5
Aluminum (Al)	5 mg/M^3	10 mg/M^3	NE	7429-90-5	2-4
Antimony (Sb)	0.5 mg/M^3	0.5 mg/M^3	50 mg/M^3	7440-36-0	±0.00072
Arsenic (As)	0.01 mg/M^3	0.01 mg/M^3	NE	7440-38-2	±0.022

Hazardous Component	OSHA PEL	ACGIH TLV	IDLH	CAS Number	%
Barium (Ba)	NP	0.5 mg/M^3	NE	7440-39-3	±0.0305
Beryllium (Be)	0.002 mg/M^3	0.002 mg/M^3	4 mg/M^3	7440-41-7	±0.00065
Boron (B)	15* mg/M^3	10* mg/M^3	2000* mg/M^3	1303-86-2	±0.0615
Cadmium (Cd)	0.005 mg/M^3	0.002 mg/M^3	9 mg/M^3	7440-43-9	±0.000755
Chromium (Cr)	1 mg/M^3	0.5 mg/M^3	250 mg/M^3	7440-47-3	±0.014
Cobalt (Co)	0.1 mg/M^3	0.02 mg/M^3	20 mg/M^3	7440-48-4	±0.0023
Copper (Cu)	1 mg/M^3	1 mg/M^3	100 mg/M^3	7440-50-8	±0.0152
Iron (Fe)	10 mg/M^3	5 mg/M^3	2500 mg/M^3	1309-37-1	±4.5
Lead (Pb)	0.05 mg/M^3	0.05 mg/M^3	100 mg/M^3	7439-92-1	±0.03
Manganese (Mn)	5 mg/M^3	0.2 mg/M^3	500 mg/M^3	7439-96-5	±0.04
Mercury (Hg)	0.1 mg/M^3	0.01 mg/M^3	10 mg/M^3	7439-97-6	±0.0000465
Molybdenum (Mo)	15 mg/M^3	10 mg/M^3	5000 mg/M^3	7439-98-7	±0.003
Nickel (Ni)	1 mg/M^3	1.5 mg/M^3	10 mg/M^3	7440-02-0	±0.01025
Selenium (Se)	0.2 mg/M^3	0.2 mg/M^3	1 mg/M^3	7782-49-2	±0.001185
Silver (Ag)	0.01 mg/M^3	0.1 mg/M^3	10 mg/M^3	7440-22-4	<0.00042
Strontium (Sr)	NP	0.0005** mg/M^3	NE	7789-06-2	±0.0685
Thallium (Ti)	0.1 mg/M^3	0.1 mg/M^3	15 mg/M^3	7440-28-0	±0.000235
Vanadium (V)	0.1† mg/M^3	0.05† mg/M^3	35 † mg/M^3	1314-62-1	±0.015
Zinc (Zn)	5‡ mg/M^3	5‡ mg/M^3	500‡ mg/M^3	1314-13-2	±0.06
Sodium oxide (Na_2O)	NP	NP	NE	NE	1-5
Magnetite (Fe, Mg) $(Fe,Al)_2O_4$	15 mg/M^3	10 mg/M^3	NE	NE	5-25
Hematite (Fe_2O_3)	10 mg/M^3	5 mg/M^3	NE	NE	<5
Periclase (MgO)	15 mg/M^3	10 mg/M^3	NE	NE	<3
Anhydrite ($CaSO_4$)	5 mg/M^3	2 mg/M^3	NE	NE	4-8
Mullite ($Al_6Si_2O_{13}$)	15 mg/M^3	10 mg/M^3	NE	NE	<5

Hazardous Component	OSHA PEL	ACGIH TLV	IDLH	CAS Number	%
Nuisance Dust (Total)	15 mg/M^3	10 mg/M^3	NP-Not Published		40-80
Nuisance Dust-Respirable	5 mg/M^3	5 mg/M^3	NE-Not Established		

* Published as Boron Oxide
** Published as Strontium Chromate
† Published as Vanadium Pentoxide (dust or fume)
‡ Published as Zinc Oxide (dust or fume)

3.0 Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity	2.4-2.5 g/cc
Vapor Pressure (mm Hg)	N/A	Melting Point	>2,300 °F
Vapor Density (Air = 1)	N/A	Evaporation Rate (Butyl acetate = 1)	N/A

N/A Not Applicable
Solubility in Water: Insoluble
Appearance and Odor: Gray-black, fine solid particles, no odor.

4.0 Fire and Explosion Data

Flash Point	N/A	Flammable Limits	N/A
Lower Explosive Limit (LEL)	N/A	Upper Explosive Limit (UEL)	N/A

Extinguishing Media: Use media suitable for surrounding fire.

Special Fire-fighting Procedures: Wear NIOSH/MSHA approved SCBA and full protective equipment.

Unusual Fire & Explosion Hazards: Material is non-flammable, non-explosive, and does not support combustion.

5.0 Reactivity Data

Stability:	Stable	Stable under anticipated storage conditions. Avoid contact with acid.	
Hazardous Polymerization	Will not occur	Conditions to avoid:	N/A

Incompatibility: Strong acids, particularly hydrofluoric acid.

This Material Hazardous Decomposition or Byproducts with silicon tetrafluoride gas.

6.0 Health Hazard Data

Route(s) of Entry:	Inhalation - Yes	Skin - No	Ingestion - Yes
Carcinogenicity:	Silica, Hematite - Yes	IARC Monographs - 2A	OSHA Regulated - No

Parameter	Material Composition (mg/kg)	Direct Contact Industrial Exposure Limits* (mg/kg) (40 hrs/week; 50 week/yr; 25 yr)
Aluminum	20,000 - 40,000	--
Antimony	5.3 - 9.1	240
Arsenic	180 - 260	3.7
Barium	140 - 470	87,000
Beryllium	5.3 - 7.7	800
Boron	470 - 760	160,000
Cadmium	5.6 - 9.5	1,300
Chromium	130 - 150	420
Cobalt	19 - 27	110,000

Parameter	Material Composition (mg/kg)	Direct Contact Industrial Exposure Limits* (mg/kg) (40 hrs/week; 50 week/yr; 25 yr)
Copper	54 - 250	76,000
Iron	38,000 - 52,000	480,000
Lead	220 - 380	920
Manganese	170 - 230	22,000
Mercury	0.35 - 0.58	26
Molybdenum	16 - 44	9,700
Nickel	65 - 140	28,000
Selenium	8.7 - 15	10,000
Silver	<2.0 - 4.2	9,100
Strontium	270 - 1,100	--
Thallium	1.9 - 2.8	--
Vanadium	120 - 180	7,400
Zinc	200 - 1,000	560,000

*Chapter 62-777, Florida Administrative Code.

Health Hazards (Acute and Chronic):
A moderate risk, from inhalation of particulates. Pneumonoconiosis is a possible health hazard from excessive inhalation. The International Agency for Research on Cancer (IARC) classes this substance in Group 2A, which IARC defines as "probably carcinogenic to humans". According to IARC, there is sufficient evidence for the carcinogenicity of crystalline silica to experimental animals and limited evidence for the carcinogenicity of crystalline silica to humans. On the basis of sufficient evidence of carcinogenicity in experimental animals, NTP (National Toxicology Program) places this substance in the group "which may reasonably be anticipated to be carcinogens".

Signs and Symptoms of Exposure:
The material can be drying and irritating to mucous membranes.

Medical Conditions Generally Aggravated by Exposure:
Pre-existing health conditions, particularly respiratory, may be aggravated by prolonged exposure.

Emergency and First Aid Procedures:
Eyes: Flush with water for at least 15 minutes.
Skin: Flush with water for at least 15 minutes and wash with soap.
Inhalation: Remove person to fresh air.
Ingestion: Rinse mouth with water.

7.0 Precautions for Safe Handling and Use

Do not induce vomiting. Get medical attention.

Steps to Be Taken in Case Material is Released or Spilled:
Use eye/respiratory protection. No special procedures required for cleanup. Wet sweep into an appropriate container will help reduce airborne dust.

Waste Disposal Method:
Disposal should follow all environmental regulations. Uncontaminated product does not exceed Toxicity Characteristic Leaching Procedure (TCLP) limits and may be disposed of as an inert material in an appropriate solid waste landfill according to applicable federal, state, and local regulations. Exempt from regulations under RCRA subtitle C.

Precautions to Be Taken in Handling and Storing:
Avoid creating unnecessary airborne dust when handling. Wetting with water will reduce airborne dust. Wash areas of dermal contact with soap and water.

8.0 Control Measures

Other Precautions:
Store away from strong acids in a dry, well ventilated area. Releases of ammonia vapor may occur when ash is wet.

Respiratory Protection:

Respiratory protection is not required below the PEL. A dust mask or half-mask air-purifying respirator with HEPA cartridge is recommended for exposures between 5 and 50 mg/M^3. Between 50 and 500 mg/M^3, a full-face air-purifying respirator with HEPA cartridge is recommended. Exposures above 500 mg/M^3 require use of supplied air.

Ventilation:
Use local exhaust where feasible. Use mechanical ventilation as required to maintain employee exposure below the PEL/TLV.

Personal Protective Equipment:
Use cotton work gloves with dry material. Use acid-resistant if material is wet. Protective goggles or side-shield safety glasses. Wearing of contact lenses is not recommended. Coveralls or other protective clothing may be necessary in high concentrations of dust. Wash areas of dermal contact with soap and water.

Work/Hygiene Practices:
Wash hands/face prior to eating, drinking, using tobacco products, or applying cosmetics.

9.0 U.S. DOT Classification

Material is not regulated by U.S. DOT as a hazardous material.

Use good housekeeping practices to prevent accumulation of dust and follow cleaning techniques that will keep airborne particulates to a minimum. Avoid inhalation of dust.

This MSDS was prepared using the analytical data collected in 1996 and compositing the three different results that included:

- 100% coal blend with no flue gas conditioning
- 80% coal and 20% scrape tire blend with no flue gas conditioning
- 100% coal blend with sulfur trioxide injection

Total metal analysis are pending.