RCRA PART B PERMIT APPLICATION

PERMA-FIX OF FLORIDA, INC.
GAINESVILLE, FLORIDA

DECEMBER 8, 2014

REVISED FEBRUARY 10, 2015

REVISED MARCH 18, 2015

SCHREIBER & YONLEY ASSOCIATES
ENVIRONMENTAL ENGINEERS
A Trinity Consultants Company

16252 Westwoods Business Park Drive • Ellisville, MO 63021 • (636) 256-7200

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PART B PERMIT APPLICATION AND RENEWAL APPLICATION

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APPLICATION FOR A HAZARDOUS WASTE PERMIT
PART I – GENERAL
TO BE COMPLETED BY ALL APPLICANTS

Please Type or Print

A. General Information

1. Type of Facility in accordance with Part 270.13(a)

☐ DISPOSAL

☐ Landfill ☐ Land Treatment ☐ Surface Impoundment

☐ Miscellaneous Units Type of Unit ___________

☒ STORAGE

☒ Containers ☒ Tanks ☐ Piles

☐ Surface Impoundment ☐ Containment Building

☐ Miscellaneous Unit Type of Unit ___________

☒ TREATMENT

☒ Tanks* ☐ Piles ☐ Surface Impoundment

☐ Incineration ☐ Containment Building

☐ Boiler / Industrial Furnace Type of Unit ___________

☒ Miscellaneous Unit Type of Unit **

2. Type of application:

☐ Construction Permit

☐ Operation Permit

☒ Construction & Operation Permit

☐ Research, Development & Demonstration (RD&D) Permit

☐ Postclosure Permit

☐ Clean Closure Plan

☐ Subpart H Remedial Action Plan

☐ Equivalency Demonstration

3. Revision Number: 0

4. Date current operation began, or is expected to begin: 10 / ___ / 1983

5. Facility Name Perma-Fix of Florida, Inc.

6. EPA/DEP I.D. No. FLD 980711071

7. Facility location or street address 1940 NW 67th Place, Gainesville, FL 32653

* Non-elementary neutralization, mercury amalgamation, deactivation

**Screen, shredder, crusher, two pug mills, drums, tankers, totes, PF-II reactor vessel, debris treatment, drum rotator.

8. Facility mailing address 1940 NW 67th Place
street or P.O. Box
Gainesville (city) FL (state) 32653 (zip)

9. Contact person Kurt Fogleman Telephone (352) 395-1356

Title Environmental Health & Safety Manager

Mailing address 1940 NW 67th Place
street or P.O. Box
Gainesville (city) FL (state) 32653 (zip)

E-mail address kfogleman@perma-fix.com

10. Operator's name Perma-Fix of Florida, Inc. Telephone (352) 373-6066

Mailing address 1940 NW 67th Place
street or P.O. Box
Gainesville (city) FL (state) 32653 (zip)

E-mail address kfogleman@perma-fix.com

11. Facility owner's name Perma-Fix of Florida, Inc. Telephone (352) 373-6066

Mailing address 1940 NW 67th Place
street or P.O. Box
Gainesville (city) FL (state) 32653 (zip)

E-mail address kfogleman@perma-fix.com

12. Legal structure

- [x] Corporation
- [ ] Non-profit corporation
- [ ] Partnership
- [ ] Individual
- [ ] Local government
- [ ] State government
- [ ] Federal government
- [ ] Other

13. If an individual, partnership, or business is operating under an assumed name, specify the county and state where the name is registered.

County N/A State N/A

14. If the legal structure is a corporation, indicate the state of incorporation.

State of incorporation Florida

15. If the legal structure is an individual or partnership, list the owners.

Name N/A

Address ____________________
Street or P.O. Box city state zip

Name ____________________

Address ____________________
Street or P.O. Box city state zip

16. Site ownership status

■ Owned ☐ To be purchased ☐ To be leased ______ years

☐ Presently leased; the expiration date of the lease is ____/____/________.

If leased, indicate land owner's name ____________________

Address ____________________
Street or P.O. Box city state zip

E-mail address ____________________

17. Name of engineer Robert J. Schreiber, Jr. Registration No. 46126

Address 16252 Westwoods Business Park Dr. Ellisville MO 60321
Street or P.O. Box city state zip

Associated with Schreiber, Yonley & Associates

18. Is the facility located on Tribal land? ☐ Yes ■ No

19. Existing or pending environmental permits (attach a separate sheet if necessary)

NAME OF PERMIT	AGENCY	PERMIT NUMBER	DATE ISSUED	EXPIRATION DATE
RCRA Permit	FDEP	17680-010-HC	9/16/2010	6/8/2015
Radioactive Material License	FDOH	2598-2	3/19/2014	3/31/2019
NPDES (stormwater)	FDEP	FLR058553	2/7/2011	4/5/2016
Air Permit	FDEP	0010113-004-AO	4/5/2011	4/5/2016

See attachment for additional permits

B. Site Information

1. The facility is located in Alachua County.

The nearest community to the facility is Gainesville.

Latitude 82.3499 W Longitude 29.91711 N

Method and datum Center of the facility

2. The area of the facility site is 7.67 acres.

3. Attach a scale drawing and photographs of the facility showing the location of all past, present, and future treatment, storage and disposal areas. Also show the hazardous wastes traffic pattern including estimated volume and control.

4. Attach a topographic map which shows all the features indicated in the instructions for this part.

5. Is the facility located in a 100-year flood plain? ☐ Yes ☒ No

6. The facility complies with the wellhead protection requirements of Chapter 62-521, F.A.C.
☐ Yes ☐ No N/A

C. Land Use Information

1. The present zoning of the site is I-1 (Industrial).

2. If a zoning change is needed, what should the new zoning be? N/A.

D. Operating Information

1. Is waste generated on-site? ☒ Yes ☐ No

2. List the NAICS codes (5 to 6 digits) 562211

3. Use the codes and units provided in the instructions to complete the following table. Specify:

   a. Each process used for treating, storing or disposing of hazardous waste (including design capacities) at the facility, and

   b. The hazardous waste(s) listed or designated in 40 CFR Part 261, including the annual quantities, to be treated, stored, or disposed by each process at the facility.

PROCESS CODE	PROCESS DESIGN CAPACITY AND UNITS OF MEASURE	HAZARDOUS WASTE CODE	ANNUAL QUANITY OF HAZARDOUS WASTE AND UNITS OF MEASURE
S01	161,370 gallons	See Att. I.D.2	2,127,715 gallons
S02	3,000 gallons	D001, F001, F002, F003, F005	110,400 gallons
See attached page for treatment codes			

Process Code	Design Capacity And U/M	Hazardous Waste Code	Annual Quantity of Hazardous Waste And U/M
T18 (Thermal Desorption)	220 gallons/day	See Attachment I.D.2	80,300 Gallons
T21 (Chemical Fixation)	550 gallons/day	See Attachment I.D.2	200,750 Gallons
T22 (Chemical Oxidation)	550 gallons/day	See Attachment I.D.2	200,750 Gallons
T23 (Chemical Precipitation)	550 gallons/day	See Attachment I.D.2	200,750 Gallons
T24 (Chemical Reduction)	550 gallons/day	See Attachment I.D.2	200,750 Gallons
T27 (Cyanide Destruction)	55 gallons/day	See Attachment I.D.2	20,075 Gallons
T31 (Neutralization)	150 gallons/day	See Attachment I.D.2	60,225 Gallons
T38 (Decanting)	220 gallons/day	See Attachment I.D.2	80,300 Gallons
T39 (Encapsulation)	550 gallons/day	See Attachment I.D.2	200,750 Gallons
T40 (Filtration)	220 gallons/day	See Attachment I.D.2	80,300 Gallons
T41 (Flocculation)	55 gallons/day	See Attachment I.D.2	20,750 Gallons
T47 (Sorting and Segregation)	1,100 gallons/day	See Attachment I.D.2	401,500 Gallons
T47 (Size Reduction and Mixing in Feed Preparation Area of New PF-II Process	4,800 gallons/day	See Attachment I.D.2	281,050 Gallons
T50 (Blending)	1,500 gallons/day	See Attachment I.D.2	547,500 Gallons
T54 (Distillation)	110 gallons/day	See Attachment I.D.2	40,150 Gallons
T66 (Solvent Extraction, i.e., Drum Rotater & Debris Treatment)	550 gallons/day	See Attachment I.D.2	200,750 Gallons

DEP Form 62-730.900(2)(a)

ITEM A.19 Existing or Pending environmental Permits(Continued)

Name of Permit	AGENCY	PERMIT NUMBER	DATE ISSUED	EXPIRATION DATE
Biomedical Waste Storage	FDOH	01-64-01666	10/1/2014	9/30/2015
Restricted Rx Drug Reverse Distribution/Destruction	FDOH	5310	7/9/2014	5/31/2016
PCB Storage Approval	EPA	FLD980711071	7/24/2013	7/24/2023
Radioactive Material License	FDOH	2598-1	8/25/2010	8/31/2015

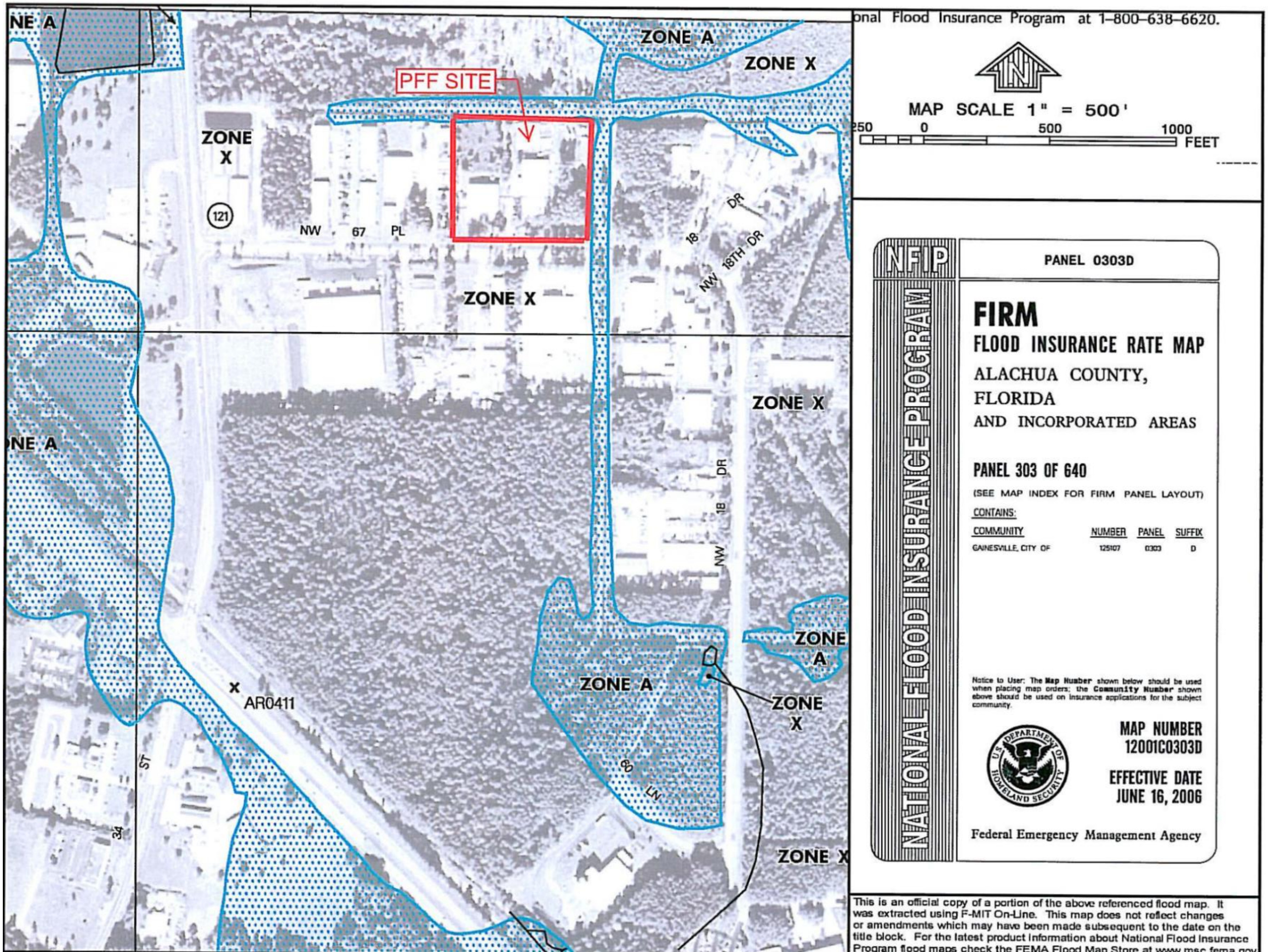
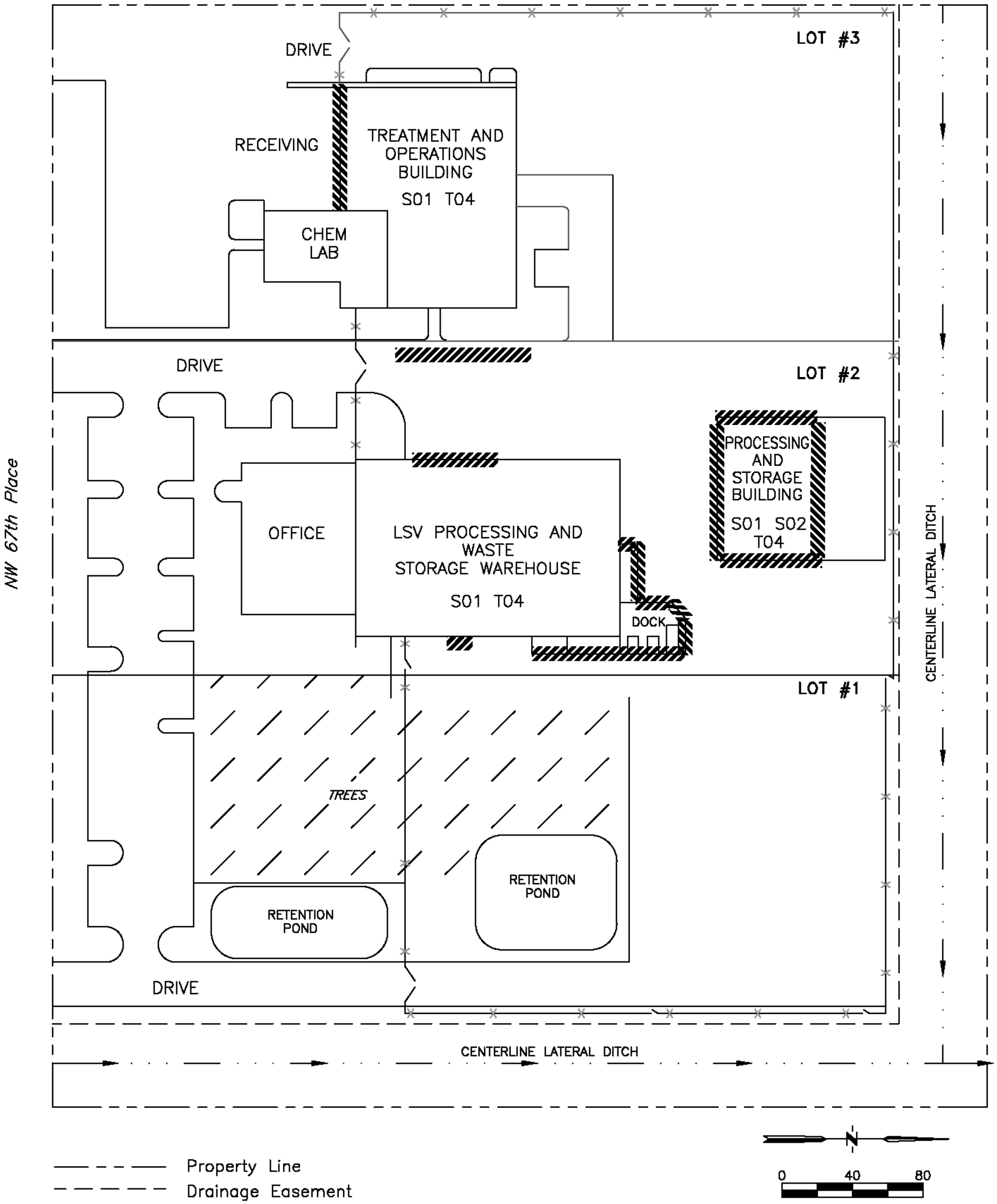


FIGURE I.B.1: 100-Year Flood Plain Map



Property Line
Drainage Easement
Loading Areas

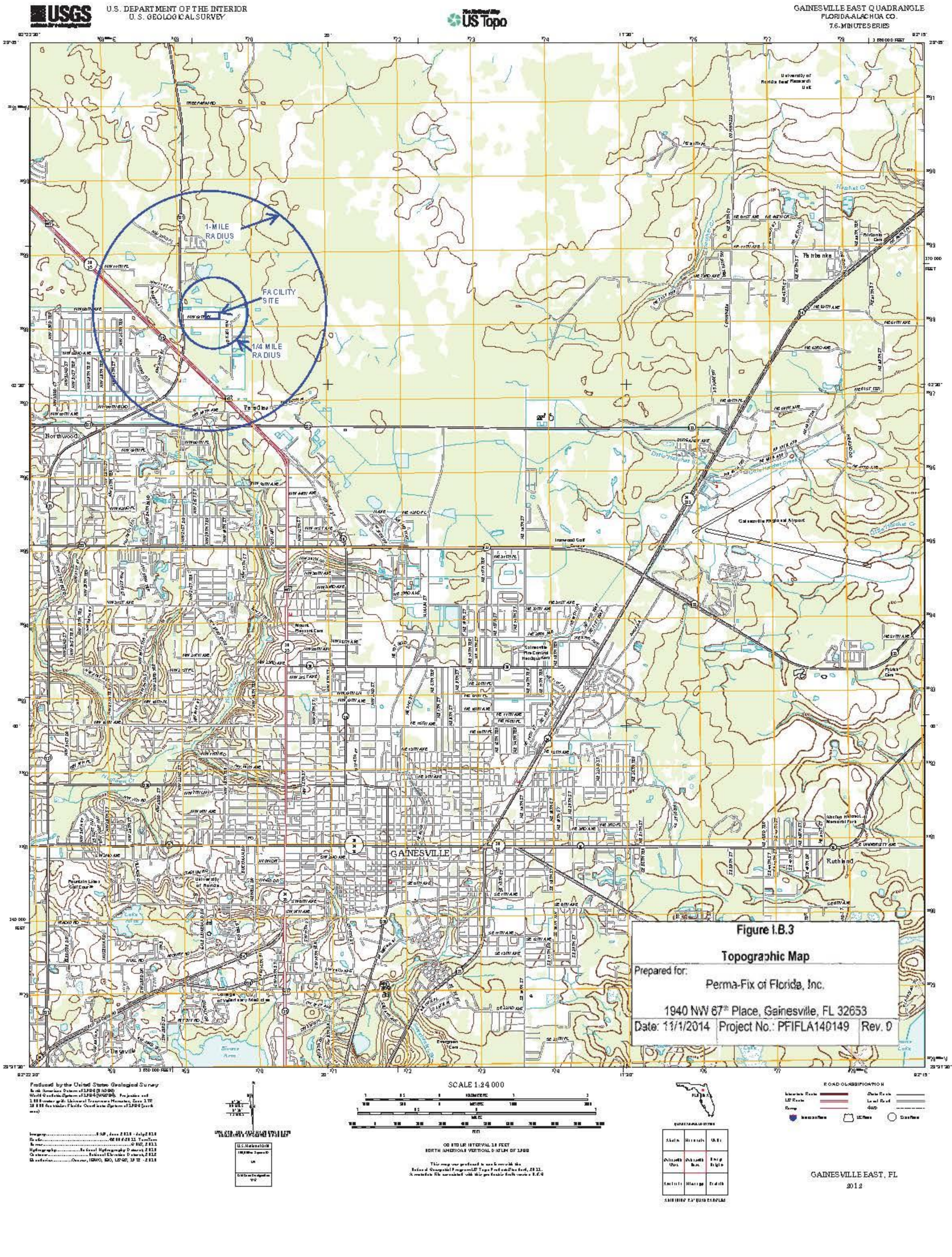
S01 Hazardous Waste Container Storage
S02 Hazardous Waste Tank Storage
T04 Treatment Area

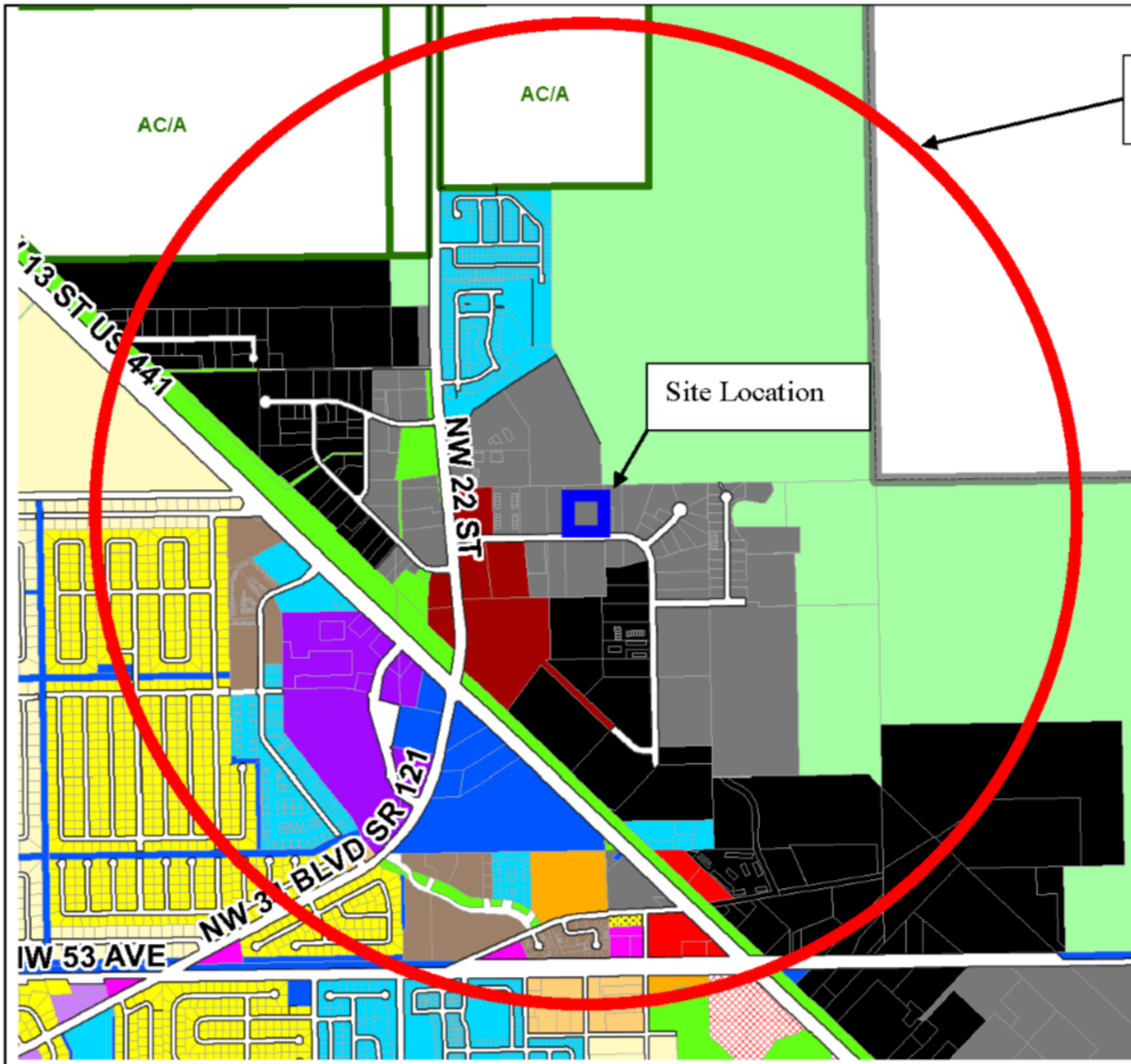
TITLE: FIGURE I. B. 2
Waste Management Areas

PREPARED FOR: PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL. 32653

PERMA-FIX ENVIRONMENTAL SERVICES

SCALE: 1=80	APPROVED BY:	DRAWN: SYA
DATE: 10-3-14		REVISED:
PROJECT NUMBER: PFIFLA 140149		DRAWING NUMBER: PF0343-4


USGS
U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
US Topo
GAINESVILLE EAST QUADRANGLE
FLORIDA-ALACHUA CO.
7.5-MINUTE SERIES
1-MILE RADIUS
FACILITY SITE
1/4 MILE RADIUS
Northwood
Fairbanks
Gainesville Regional Airport
GAINESVILLE
Rutheland
University of Florida
Figure I.B.3
Topographic Map
Prepared for:
Perma-Fix of Florida, Inc.
1940 NW 67th Place, Gainesville, FL 32653
Date: 11/1/2014
Project No.: PFIFLA140149
Rev. 0
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
ROAD CLASSIFICATION
GAINESVILLE EAST, FL
2012



AF: Airport Facility
AGR: Agriculture
BA: Automotive-Oriented Business
BI: Business Industrial
BT: Tourist-Oriented Business
BUS: General Business District
CCD: Central City District
CON: Conservation
CP: Corporate Park
ED: Educational Services
I-1: Limited Industrial
I-2: General Industrial
MD: Medical Services
MH: Mobile Home Residential
MU-1: Mixed Use Low Intensity
MU-2: Mixed Use Medium Intensity
OF: General Office
OR: Office Residential
PD: Planned Development
PS: Public Services and Operations
RC: Residential Conservation
RH-1: Residential High Density
RH-2: Residential High Density
RMF-5: Single-Family/Multiple-Family Residential
RMF-6: Multiple-Family Residential
RMF-7: Multiple-Family Residential
RMF-8: Multiple-Family Residential
RMU: Residential Mixed Use
RSF-1: Single-Family Residential
RSF-2: Single-Family Residential
RSF-3: Single-Family Residential
RSF-4: Single-Family Residential
UMU-1: Urban Mixed-Use
UMU-2: Urban Mixed-Use
W: Warehousing and Wholesaling

Prepared by Planning and Development Services
Date: 8/27/2014

Obtained from City of Gainesville Generalized Zoning Map dated August 27, 2014.
See next page for zoning code descriptions.

FIGURE I.B.4
SURROUNDING LAND USE
PERMA-FIX OF FLORIDA, INC.

Project: PFIFLA 140149 | **Date: 11/1/2014**

SCHREIBER & YONLEY ASSOCIATES
ENVIRONMENTAL ENGINEERS

GAINESVILLE MUNICIPAL CODE

DIVISION 1. – GENERALLY

- **Sec. 30-41. - Establishment of zoning districts and categories.**

(a)In order to classify, regulate and restrict the use of land, water, buildings and structures; regulate the height and bulk of buildings; regulate the intensity of land use; implement the comprehensive plan; and promote orderly urban growth within the corporate area of the city, the following zoning districts/categories are established:

(1) *Residential districts.* (See section 30-41(b)):
RSF-1: 3.5 units/acre single-family residential district.
RSF-2: 4.6 units/acre single-family residential district.
RSF-3: 5.8 units/acre single-family residential district.
RSF-4: 8 units/acre single-family residential district.
RSF-R: 1 unit/acre single-family rural residential district.
RMF-5: 12 units/acre single-family/multiple-family residential district.
RMF-6: 8—15 units/acre multiple-family residential district.
RMF-7: 8—21 units/acre multiple-family residential district.
RMF-8: 8—30 units/acre multiple-family residential district.
RC: 12 units/acre residential conservation district.
MH: 12 units/acre mobile home residential district.
RMU: Up to 75 units/acre residential mixed use district.
RH-1: 8—43 units/acre residential high density district.
RH-2: 8—100 units/acre residential high density district.
(2) *Office districts.* (See section 30-41(b)):
OR: 20 units/acre office residential district.
OF: General office district.
(3) *Business districts.*
BUS: General business district.
BA: Automotive-oriented business district.
BT: Tourist-oriented business district.
(4) *Mixed use districts.*
MU-1: 8—30 units/acre mixed use low intensity.
MU-2: 12—30 units/acre mixed use medium intensity.
CCD: Up to 150 units/acre central city district.
UMU-1: 8—75 units/acre, and up to 25 additional units/acre by special use permit, urban mixed-use district.
UMU-2: 10—100 units/acre, and up to 25 additional units/acre by special use permit, urban mixed-use district.
(5) *Industrial districts.*
BI: Business industrial district.
W: Warehousing and wholesaling district.
I-1: Limited industrial district.
I-2: General industrial district.
(6) *Special use districts.*
AGR: Agriculture district.
CON: Conservation district.
MD: Medical services district.
PS: Public services and operations district.
AF: Airport facility district.
ED: Educational services district.
CP: Corporate park district.

ATTACHMENT I.B.1

FACILITY PHOTOGRAPHS

1. Sign at Main Entrance

2. Main Entrance

3. East Gate

4. East Loading Dock

5. TOB Loading Dock

6. PSB Zone 1 Tanker Loading

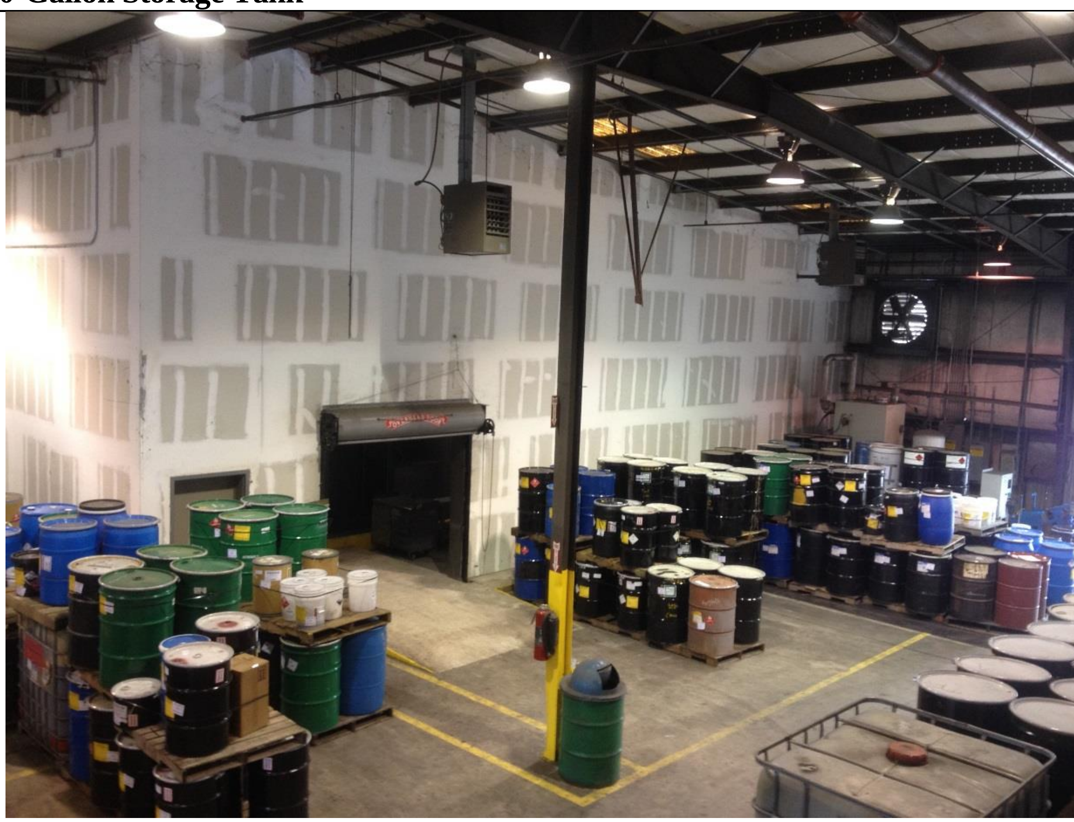
7. PSB Southeast Corner

8. PSB Zone 2 Drum Storage

9. PSB Zone 3 Drum Storage

10. PSB Southwest Corner

11. **PSB 3,000-Gallon Storage Tank**

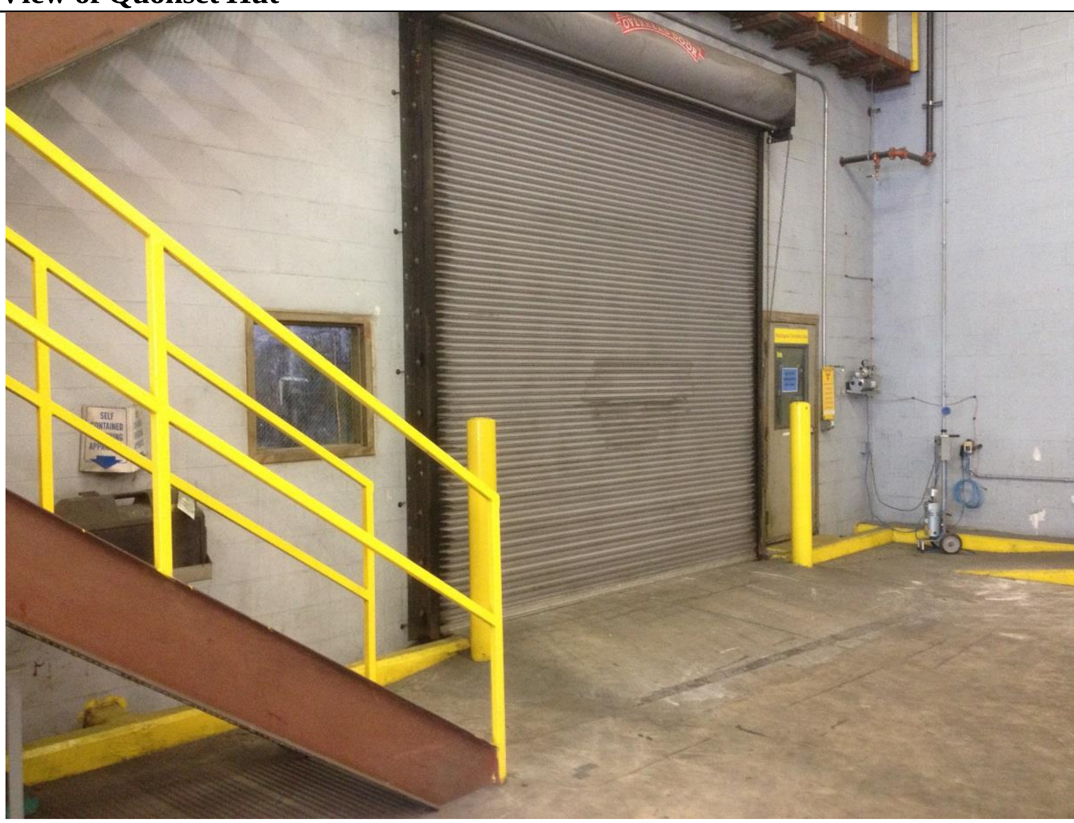


12. **LSV Storage Area**

13. Debris Wash Unit

14. LSV Processing

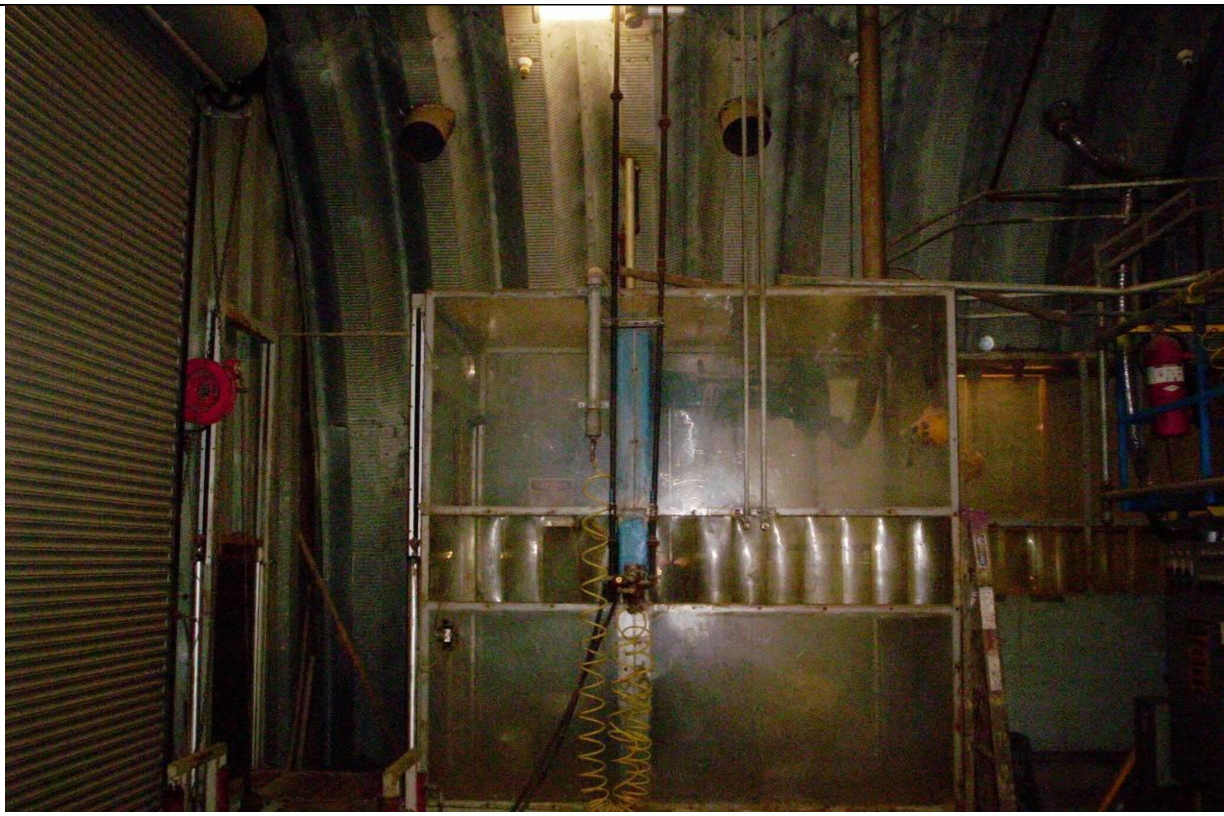
15. Exterior View of Quonset Hut



16. Dry Room

17. Mixed Waste Sampling Room

18. Quonset Hut Jib Crane



19. PF-I Treatment Room

20. PF-II Thermal Desorber

21. Regenerative Thermal Oxidizer (RTO)

22. TOB Drum Storage Area

ATTACHMENT I.D.1

FACILITY DESCRIPTION

ATTACHMENT I.D.1

FACILITY DESCRIPTION

INTRODUCTION

This section of the permit application provides a general description of facility operations. Additional details regarding the various waste management activities at the facility can be found in other parts of this permit application.

Perma-Fix of Florida., Inc. (PFF), a subsidiary of Perma-Fix Environmental Services, Inc. operates a commercial waste bulking, storage, and treatment facility (Facility) in Gainesville, Florida. Waste managed on-site includes a wide variety of hazardous, industrial, universal, biomedical waste, mixed, radioactive-only and non-hazardous wastes. Currently, the Facility blends hazardous, non-hazardous, and mixed wastes into fuels for use in off-site facilities, such as incinerators and industrial furnaces and boilers. The Facility also consolidates, repackages, and sorts waste for shipment off-site for treatment and/or disposal. Current activities at the Facility also include the receipt and non-permanent storage of radioactive (or mixed) wastes pursuant to a license issued by the Florida Department of Health, Bureau of Radiation Control. PFF also manages Polychlorinated Biphenyls (PCBs) in accordance with EPA's Approval to Commercially Store PCBs. Current treatment processes at the Facility include thermal desorption, fuel blending (including phase separation), chemical and physical extraction, chemical oxidation/reduction, stabilization, fixation, microencapsulation, lab pack decommissioning, Perma-Fix processes (i.e., PF-I® and PF-II®), treatment of hazardous debris in accordance with certain alternative treatment standards specified in 40 CFR 268.45, non-elementary neutralization, mercury amalgamation, treatment in drum rotators, and deactivation processes. The Facility also conducts transfer facility operations for used oil regulated under Chapter 62-710, F.A.C. (and 40 CFR 279) and for mercury-containing devices regulated under Chapter 62-737, F.A.C.

Definition of Mixed Wastes

Mixed wastes are wastes that are regulated by two separate federal agencies, the U.S. Environmental Protection Agency (EPA) and U.S. Nuclear Regulatory Commission (NRC). Mixed wastes contain hazardous waste subject to EPA regulation as well as radioactive materials that are regulated by the NRC. The State of Florida Department of Environmental Protection (FDEP) has been delegated authority to administer the Resource Conservation and Recovery Act (RCRA) program in the state. The NRC has an agreement with the State of Florida, Department of Health, Bureau of Radiation Control to carry out the regulatory functions regarding radioactive waste management, environmental concerns, and employee safety at this facility. There are several waste streams described in the hazardous waste permit (i.e., hazardous waste fuels, metals, etc.) that may also contain radioactive materials. PFF understands that these wastes must be handled according to applicable hazardous waste management requirements and Bureau of Radiation Control regulations for mixed wastes. For purposes of this permit application, references to hazardous wastes may also include mixed wastes. There are certain situations where mixed wastes are specifically addressed. These are as follows:

a) The 3,000-gallon tank in which only mixed wastes will be temporarily blended and stored;
b) The closure plan that includes provisions for disposal for mixed wastes; and

c) The authorized storage of mixed (hazardous/radioactive) wastes on-site longer than one year may occur pursuant to the facility's radioactive materials license. This license allows PFF to "decay" short-lived radioactive wastes and to perform research and work on the development of treatment options for mixed waste. These activities may take up to 3 years.

This initial discussion of hazardous and mixed wastes provides an overall definition of the potential wastes on site. For purposes of the review of this permit application, the term "hazardous wastes" or "wastes" includes mixed wastes unless otherwise specified.

PFF is submitting this permit application in order to:

1. Renew its current RCRA permit to conduct the waste management activities included in the previous application; and
2. Obtain continuation of current authorization to store non-hazardous wastes in permitted container storage areas as long as permitted hazardous waste storage capacity is not exceeded after including the non-hazardous waste storage volume and the wastes are compatible.

Wastes Managed and Waste Management Activities

The waste managed at the facility will come from a variety of sources, including medical and research institutions, government agencies, paint and coatings manufacturers and users, solvent users, and other industries that generate hazardous wastes. Waste received will come from Large Quantity, Small Quantity, and Conditionally Exempt Small Quantity Generators, or from other treatment and storage facilities. In addition, waste collected during various county or other household hazardous waste collection campaigns will be managed at the Facility.

The following information generally describes the waste management activities that are being renewed pending permit approval.

- The Treatment and Operations Building (TOB) is used to receive, store, and treat mixed wastes via thermal desorption, chemical oxidation/reduction, solvent extraction, stabilization, blending, bulking, solidification and microencapsulation. Future solvent recycling (RCRA exempt) via a solvent recovery distillation unit is also planned for this area[1]. The current PF-II treatment equipment may be replaced with a continuous PF-II thermal desorption unit, including batch operated feed preparation equipment. A summary of all treatment codes for treatment conducted in this building is provided in Table 2.
- The Processing and Storage Building is used to receive, store, and blend hazardous and mixed waste into fuel for use at off site facilities and to bulk wastes for transfer to off site treatment and/or disposal facilities. A summary of all treatment codes for treatment conducted in this building is provided in Table 2.
- The Liquid Scintillation Vials (LSV) Processing and Waste Storage Warehouse, in addition to the storage of hazardous and non-hazardous waste, is used to receive, empty, and decontaminate LSVs and other small containers, and to treat hazardous waste debris via chemical and physical extraction (e.g., water washing, liquid-phase solvent extraction). A

[1] Vendor specifications for the planned distillation unit are contained in Appendix B.

summary of all treatment codes for treatment conducted in this building is provided in Table 2.

- The Treatment and Operations Building, Processing and Storage Building, and LSV Processing and Waste Storage Warehouse are used to store hazardous and non-hazardous waste.

The conduct of these activities will be driven by the nature of the waste streams received at the Facility. Table 1 at the end of this section summarizes the treatment methods and storage locations for waste streams to be managed at the Facility. Figures I.D.11.1 through I.D.11.4 are decision trees illustrating how incoming waste streams are evaluated and assignment made for their treatment and storage on-site and final disposal off-site.

As shown in Figure I.D.11.1, and addressed in detail in the Facility Waste Analysis Plan, all incoming waste is subjected to inspection and/or sampling to verify conformance with the generator waste profile. The generator profile, the LDR form, and the inspection and/and sampling results performed by the Facility allow for the determination of the waste stream's acceptability and proper management at the Facility.

DESCRIPTION OF OPERATIONS

Treatment and Operations Building

Container Storage

The Facility receives and stores up to 640 drum equivalents (or 35,200 gallons) of hazardous and/or mixed waste in the Treatment and Operations Building. See Figure I.D.1 for the container storage configuration. Additional details regarding container management practices are provided in Section II.B of this permit application. The Facility may store non-hazardous wastes and radioactive-only wastes in this container storage area provided the wastes are compatible and their quantities are counted against the total permitted hazardous waste storage capacity.

Treatment

Mixed wastes may be treated in the Treatment and Operations Building via either one or both of two proprietary processes known as the Perma-Fix I® (PF-I) process (stabilization and fixation) and Perma-Fix II® (PF-II) process (thermal desorption and/or chemical oxidation/reduction). See Figure 1.D.1 for the general layout of the Treatment and Operations Building. The following provides a general description of the treatment processes. Additional details regarding the treatment processes are provided below, in Appendix II.B.1, and Section II.I of this permit application. See Figure I.D.12 for a detailed illustration of the Perma-Fix treatment processes.

The PF-I process is a two-step procedure for permanent stabilization and/or solidification of hazardous and mixed wastes. As indicated in Figure I.D.11.2, the inorganic wastes that do not contain organic hazardous constituents in excess of applicable land disposal restriction levels are target waste streams for the PF-I process. First, the waste is evaluated for specific chemical characteristics in order to identify the appropriate proprietary treatment "recipe" for converting the key waste constituents to a more chemically stable and insoluble form. After receiving chemical stabilization treatment, the waste is in a form that meets the waste acceptance criteria of the authorized disposal facility

Once subjected to the PF-I process, the treated waste is sampled to determine whether it meets the desired treatment standards (e.g., whether the waste no longer exhibits a hazardous waste characteristic and/or meets applicable land disposal restrictions). Typically, the PF-I process is applied to wastes in drums. However, larger or smaller containers may be used, depending upon the nature of the waste to be treated. In any event, the waste is usually stabilized in the same container to be used to ship the waste off site for disposal. In some instances, the addition of treatment additives will increase volume such that the stabilized waste must be transferred to an additional or larger container prior to disposal.

The PF-I process will generate relatively small quantities of secondary waste consisting primarily of personal protective equipment (PPE) and plastic sheeting used to collect any incidental spillage of the treated waste or waste treatment materials. Secondary waste will be appropriately characterized, treated, and/or disposed. Additional details regarding the PF-I process are provided in Appendix II.B.1 in Part II of this permit application.

The PF-II process consists of three primary steps used to treat organic-contaminated soils, sludge, or other process waste (e.g. waste media not classified as debris or <60mm particle size). As indicated in Figure I.D.11.3, target waste streams for the PF-I process are organic-contaminated media (i.e., soils and sludges). Wastes selected for PF-II treatment require compliance with the treatment standards identified in 40 CFR Parts 268.48 or 268.49 prior to land disposal. Dependent upon waste code assignment on the waste "as received" from a generator or upon discovery during process control analyses, PF-II treated waste may require PF-I treatment to ensure total compliance with the identified regulations.

The first step of the PF-II process usually involves pre-conditioning of the waste. Select solvents (as determined through preliminary data review or bench testing) are added to the waste and mixed to remove soluble organics that typically prohibit successful thermal operations. This activity is conducted using the pneumatic drum tumbler or the ploughshare reactor and later decanted.

The pneumatic dual drum tumbler is an end-over-end rotation device that can accommodate 55- or 85-gallon steel containers. (See Figure I.D.3.) Approximately 1/3 of the tumbling vessel is filled with PF-II waste. An equivalent volume quantity of a select solvent is added to the vessel. The tumbling vessel is closed appropriately using the typical bung-top lid. A pressure-relief device accommodates the two-inch bunghole. The waste and solvent are tumbled for a predetermined amount of time (to support sufficient solvent extraction). The vessel's bung-top lid is removed and replaced with a perforated lid. The vessel is drained into a catch pan. A single drum rotator may also be used in lieu of or in addition to the dual drum tumbler.

The process is repeated with a follow-up pre-conditioning step using a solvent with an opposing chemical polarity. Typically, the solvents of choice are hexane followed by water. In certain cases, other more effective solvents are selected through bench testing. Solvent extraction using a drum rotator may also be performed on wastes that may not undergo PF-II treatment.

The second step (sometimes conducted initially without going through the first step described above, depending on the waste matrix) to PF-II processing involves thermal desorption. Thermal desorption is used to separate the remaining volatile, semi-volatile, and other organic constituents from the waste matrix.

To begin the process, contaminated media (waste) and, if necessary, water are introduced into a reactor vessel and thoroughly mixed to form a homogeneous mixture. Heat is applied to the reactor vessel to desorb the organic constituents from the contaminated media. The heat vaporizes the water, volatile, and semi-volatile organic constituents. In a condenser unit, vapors being emitted from the reactor vessel condense and accumulate in the accumulation tank. An absorber tank filled with an organic liquid (e.g., mineral oil, diesel fuel, or kerosene) downstream from the accumulator tank is used to aid in removal of the organic constituents from the vapors exiting the accumulator tank. An inert atmosphere (e.g., nitrogen blanket) is provided for the process. Emissions from the process are vented to the regenerative thermal oxidizer.

The third (optional) step is chemical oxidation/reduction to destroy or reduce any remaining organic compounds. Depending on the initial concentration, volatility, and solubility of the organic constituents, the final (optional) PF-II process treatment step (chemical oxidation/reuction) may not be required. Upon completion of the thermal desorption step, the temperature inside the reactor vessel is allowed to cool to below the boiling point of water, and an appropriate solution is added to chemically react with the residual organic constituents in the waste. Upon completion of the reaction, the reactor vessel is heated once again to the boiling point to destroy any residual treatment chemicals and dry the slurry as appropriate for further treatment and/or disposal. The oxidation/reduction treatment may also be conducted in containers at the facility.

All liquids (decant, condensate, and organic emission scrubbing solution) resulting from the PF-II processes are considered mixed waste. The liquid waste is containerized, blended in fuels bulking operations, and shipped to an authorized final treatment/disposal facility. Figures I.D.2, I.D.3, and I.D. 12 illustrate the PF-II process.

Solvent Recycling

The following information is included for informational purposes only since spent solvent recycling/reclamation is exempt from RCRA permitting requirements or by activities conducted onsite (e.g. recovery of select solvents used in the PF-II process to minimize mixed waste generation). The Facility plans to recycle spent solvents (e.g., Freon) generated by various industrial generators. A low-temperature still or distillation unit will be used to separate the re-useable solvents from contaminants. The reclaimed solvent will be returned to the generator for reuse, to a vendor for resale or kept in-house for further use. The separated contaminants will be containerized or managed in an on-site process. If hazardous, waste not managed on site will be shipped off-site for subsequent treatment and/or disposal by an authorized hazardous waste facility. Ancillary activities will be conducted and equipment operated in accordance with applicable regulations. Applicable emissions control requirements are addressed in Section II.R of this permit application. Vendor specifications for the planned distillation unit are enclosed in Appendix B for information purposes.

Lab Pack Decommissioning

Radioactive and mixed waste lab packs are decommissioned as follows depending upon the waste characteristic.

- Lab packs of compatible flammable, combustible, toxic, and/or non-hazardous liquids are processed (decommissioned) by un-packing the smaller containers, opening them, and pouring them (bulking) into larger containers. These larger containers are bulked into a tanker for shipment to a permitted disposal outlet.
- Lab packs of corrosives are neutralized and shipped to a permitted disposal outlet.
- Lab packs of oxidizers are treated to remove the oxidizing characteristic, and then shipped to a permitted outlet.
- Soluble solid wastes contained in lab packs are processed by first dissolving them in an appropriate solvent, and then bulked for shipment to a permitted disposal outlet.
- Insoluble solid wastes (e.g., soil samples) from lab packs are consolidated and processed through the PF-II treatment and/or PF-I treatment.

Fuel Blending Activity

Fuel blending of mixed waste is conducted as described in the subsection titled "Fuel Blending" for the Processing and Storage Building.

Treatment Using a Drum Rotator: This treatment is described on page 4 of this attachment. The treatment pre-conditions the waste for the PF-II process, or can treat wastes by solvent extraction to meet LDR standards.

Mercury Amalgamation: This treatment will amalgamate liquid elementary mercury contaminated with radioactive materials, which results in a non-liquid amalgam that is non-RCRA regulated material. Amalgamation is specified in 40 CFR 268.40 as the technology-based land disposal treatment standard for certain hazardous wastes. The treatment will consist of mixing a small batch (i.e., up to five gallons) of waste with inorganic reagents such as copper, zinc, nickel, gold, and/or sulfur in a portable unit. A detailed description of this process is contained in Appendix II.B.3 in Section II.B.

Non-elementary Neutralization: Perma-Fix has performed elementary neutralization of mixed wastes for several customers in the past. PFF performs non-elementary neutralization in a portable 300-gallon tank or in containers, if quantities to be treated are small. A detailed description of the process is contained in Appendix II.B.4 of Section II.B.

Deactivation of D003 Wastes: This process will be conducted in a nitrogen atmosphere in a glove box for highly dangerous waste to human health (e.g., highly radioactive waste). See Appendix II.B.2 for process description. This treatment will also be performed in small containers without using a glove box for wastes that do not pose a high health hazard.

In addition, the existing PF-II batch process equipment may be replaced with new continuous PF-II process equipment.

Processing and Storage Building

Fuel Blending

The majority of waste managed at the Facility is expected to be energy-bearing (organic) hazardous waste suitable for blending and use as a fuel in hazardous waste combustors such as boilers and cement kilns. PFF conducts phase separation and decanting activities at the Facility to allow for the blending of energy-bearing hazardous wastes that have significant water content.

Currently, the bulking of ignitable hazardous and mixed waste liquids from drums and other containers to tankers is performed in the Processing and Storage Building. PFF also performs phase separation (decanting) of water in addition to the bulking activities.

Currently, the method for bulking of hazardous and mixed waste fuels is to transfer "pumpable" liquids from containers into larger, DOT-approved containers or directly into a tanker truck using a pump and hose. The suction hose is attached to a metal wand that is immersed in the liquid waste. The discharge hose is fitted with an immersion wand that remains submerged in the larger container during transfer to reduce emissions.

PFF also performs phase separation. In this process, liquid hazardous waste containing excess water is transferred from smaller containers such as 55-gallon drums into larger DOT approved containers and allowed to sit until the excess water separates from the rest of the waste (approximately 3 to 5 hours). Then, the water is drawn from the containers using the previously described suction wand and pump, containerized, and treated or disposed of as a hazardous waste. The remaining hazardous waste is bulked into a tanker using the methods previously described. For containers with solids and/or sludge, the liquids will be decanted and the solids containerized and sent off site for treatment per the LDR standards. Mixed waste solids recovered in the nuclear operations are managed on site using the PF-II process or are sent off-site. In certain cases, the Facility may elect to ship mixed waste fuels, in smaller containers, to the intended final treatment or disposal facility to minimize radiological exposure and maintain contamination control.

See Figure I.D.4 for the layout of the Processing and Storage Building.

Lab Pack Decommissioning

Some lab packs are received, stored, and then sent to a disposal facility without any additional work being performed to them by PFF.

Lab packs of commonly received nonhazardous or hazardous only materials such as acids, bases, or oxidizers are processed by combining compatible materials into a larger lab pack before shipping off-site for disposal. An example of this would be combining six 5-gallon lab packs of small containers of solid oxidizers (e.g. sodium nitrate, potassium permanganate) into a 30-gallon container. This provides a degree of waste minimization as well as disposal cost reduction.

Chemotherapy/Pharmaceutical Waste

Non-infectious medical waste are received and stored in Zone 2 of the Processing and Storage Building (see attachment I.D.4). This waste is not treated at PFF; PFF will bulk the waste into larger DOT-approved containers and then ship the waste to a permitted treatment/disposal facility. This waste stream will consist of unused U- and P-coded pharmaceuticals, non-regulated drugs, and contaminated debris (i.e., IV tubing, IV bags, gloves, wipes, etc.) packaged in pails/buckets having a capacity of up to 30 gallons.

Container Storage

The Facility will continue to receive and store up to 1,311 drum equivalents (or 72,105 gallons) of hazardous and/or mixed waste in the Processing and Storage Building. See Figure I.D.4 for the layout of the Processing and Storage Building and a typical container storage configuration. Additional details regarding container management practices are provided in Section II.B of this permit application.

Tank Storage

A single, 3,000-gallon storage tank may be used to accumulate and store the fluids (waste only) collected from the processing of Liquid Scintillation Vials (LSVs). The waste is stored in the tank until arrangements are made to ship the waste to an authorized waste treatment and/or disposal facility. See Figure I.D.4 for the layout of the Processing and Storage Building and the location of the storage tank. Additional details regarding the tank storage practices are provided in Section II.C of this permit application.

Other Processes

Chemical precipitation, chemical reduction, neutralization, filtration, flocculation, and physical treatment (i.e., sorting and segregation) will also be performed in containers. In addition, the non-elementary neutralization and the chemical extraction using the portable equipment as described in TOB will also be performed in this building.

LSV PROCESSING AND WASTE STORAGE WAREHOUSE

LSV Processing

Medical researchers and scientists conduct research using trace amounts of radioactive materials and a liquid scintillation counting detection system to analyze the results. After the research, the scintillation fluid (either a flammable solvent-based liquid or non-hazardous, biodegradable liquid), contaminated with the trace amount of radioactive material, is placed in a vial (hence, liquid scintillation vial) and accumulated in containers (usually 55-gallon drums) for subsequent treatment, disposal, or reuse as a waste-derived fuel.

Three types of radiological classifications are used at PFF for the scintillation fluid vials. The classifications are initially based on radiological determinations by the generator. PFF uses radiological analyses to verify the first two classifications prior to radiologically releasing these materials. The process residues are then handled as either hazardous or non-hazardous based on regulatory requirements. Items received as, or determined as mixed waste, are managed throughout their life cycle at PFF as radiologically licensed material. These materials are managed according to the regulatory requirements governing them. At the PFF Facility, drums containing LSVs are received at the LSV Processing and Storage Warehouse and processed as follows.

First, a drum of LSV is received in the processing room, the drum lid is removed, and the contents of the drum are visually examined to confirm its contents. Next, the drum is mechanically lifted, and the contents of the drum are dumped into a hopper and then onto a vibratory “Infeed Conveyor”. This vibratory conveyor separates the vials from any absorbent packing material. The packing material is collected into a 55-gallon drum and is either treated on-site or sent off-site for disposal. The LSVs continue along the vibratory conveyor and transfer to the “Hog Infeed Belt.” This belt feeds the “Knife Hog”, which is designed to break up the LSVs and separate solids and liquids. The liquids and crushed vials are discharged from the Knife Hog onto the “Outfeed Conveyor.” This outfeed system consists of a variable speed belt with perforations that allow the liquid scintillation fluid (LSF) to drain and collect in an approximately 110-gallon integral storage tank located beneath the outfeed conveyor unit. Crushed vials move up the outfeed conveyor and can be rinsed with apropriate solvent (e.g., ethanol) through the spray nozzles integral to the equipment. The solvent rinsate will also collect in the 110-gallon integral storage tank. The drained and crushed vials are then transferred from the Outfeed Conveyor into a 55-gallon container. The LSF is pumped out from the Outfeed Conveyor holding tank into a 275-gallon tote, where it is sampled and screened for radioactivity. The LSF is then pumped into containers up to 550-gallon capacity or into the 3,000-gallon storage tank in the Processing and Storage Building. From there, the LSF is shipped off site for use as a fuel or for treatment and/or disposal at an authorized waste facility. Depending upon the level of radioactivity, some LSF (and/or LSVs) may be containerized and stored on site to decay and attain the proper activity level before it may be shipped off site. LSF that is non-regulated radioactive is managed as a Hazardous Waste fuel.

During the rinsing process, the ethanol is continuously re-circulated through the system. Fines or small solid materials removed by the ethanol are accumulated in the Rinse Fines Removal System (RFRS), which consists of a holding tank, grinder screw, and ancillary piping. Solid materials collect at the bottom of the holding tank and are removed by a grinder screw. The solid materials from the RFRS are collected in a 55-gallon drum for off-site treatment by incineration or energy recovery.

At the end of a workday, or when the ethanol becomes spent and unusable, the ethanol is pumped from the RFRS holding tank to the 350-gallon holding/test tank where it is sampled and screened for radioactivity. As with the LSF, the ethanol rinsate is containerized and stored on site to decay or is transferred to the 3,000-gallon storage tank in the Processing and Storage Building for subsequent shipment to an authorized mixed waste facility.

As a result of the above process, the Facility generates clean glass and plastic, packing materials, plastic bags/container liners, miscellaneous trash, liquids, and empty containers. All of these items are tested for radioactivity to assure that radioactivity is at allowable levels or to determine if reprocessing, decay storage, or additional treatment is required. After visually checking for fluids, the glass and plastic vials are bulked in trailers for shipment and subsequent treatment by incineration or energy recovery.

Alternative LSV Final Processing

In certain cases, radiological conditions exist that make final processing of generated LSV solids and liquid more prudent by conducting them manually. Conducting final processing steps manually drastically minimizes secondary waste generation involved with decontamination protocols.

LSV are processed (crushed) as dictated above; however, both the liquids and solids are collected in final containers and segregated per generator. The residual wastes are gravity drained, using a pneumatic drum lift and a perforated lid. Normal rinsate (e.g., ethanol) is added to the container (if hazardous initially), and the waste is again drained. This action is repeated until all visual signs of any original scintillation fluid are removed. Physically this is verified through the draining effort. The containers are maintained in an upright draining position until free liquids are removed to the best extent possible. The residual waste liquid and solid by-products are then managed in accordance with typical regulatory requirements outlined above.

See Figures I.D.5 and I.D.6 for an overview of the LSV processing operation. Figure I.D.7 illustrates the general layout of the LSV processing area. Equipment details for the LSV processing area are provided in Figures I.D.8, I.D.9, and I.D.10.

Technical/regulatory information regarding the sufficiency of the LSV equipment for its intended use, as well as containment calculations, is included as Appendices C and D, respectively.

Repackaging

Repacking, such as lab pack processing and dry activated waste (DAW) consolidation, will also be conducted in the LSV processing area. The Storage Warehouse is currently used for storage of hazardous wastes, non-hazardous wastes, universal wastes received from off-site, and for used oil transfer operations.

Chemical Extraction, Physical Extraction, and Micro-encapsulation (Including Debris Treatment)

Chemical extraction, physical extraction, and micro-encapsulation (including debris treatment) will also be conducted occasionally on hazardous debris in the LSV Processing Area. These activities will consist of the use of high-pressure steam and water sprays or submersion baths, using surfactants, acids, bases, and detergents to remove hazardous contaminants from debris surfaces or to remove contaminated debris surface layers. Decontaminated materials will be shipped off site for reuse, reclamation, or disposal depending upon the nature of the material. The contaminated media or rinsate generated as a result of the decontamination process will be properly characterized, containerized, and, if hazardous, manifested and shipped off site to an authorized treatment, storage, and/or disposal facility. If appropriate, contaminated media and/or treatment residuals may be subjected to microencapsulation or stabilization and fixation prior to shipment to an authorized disposal facility.

As indicated in Figure I.D.11.4, the appropriate debris treatment method depends on the physical characteristics of the debris to be treated. For example, debris with a porous surface would require chemical extraction, and non-porous debris is suitable for physical extraction. The debris treatment methods (alternative treatment standards) are technologically simple, performance-oriented, and specified at 40 CFR 268.45, Table 1. PFF will conduct all debris treatment in accordance with the applicable requirements of 40 CFR 268.45.

Appropriate containment is furnished for the above treatment activities. Additional details regarding debris treatment operations are provided in Appendix A.

Lab Pack Decommissioning

Some lab packs are received, stored, and then sent to an off site TSD facility or stored for on-site treatment.

Lab packs of commonly received non-hazardous or hazardous only materials such as acids, bases, or oxidizers are processed by combining compatible materials into a larger lab pack before shipping off-site for disposal or for on-site treatment. An example of this would be combining six 5-gallon lab packs of small containers of solid oxidizers (e.g. sodium nitrate, potassium permanganate) into a 30-gallon container. This provides a degree of waste minimization as well as disposal cost reduction.

Solid Waste Management

Solid, non-hazardous wastes such as rags, paper, cardboard, plastic oily sludges, oil-contaminated absorbents, crushed glass, and plastic containers are also received at the Warehouse for bulking and shipment to an authorized off-site facility. These wastes are managed by simply bulking them into a roll-off container up to 30 cubic yards in size lined with 6-mil plastic sheeting. The roll-off containers are then covered with a tight tarpaulin and staged adjacent to the Process and Storage Building (PSB).

Miscellaneous Waste Storage and Transfer

Used oil, (including used oil regulated under 40 CFR 279), used oil filters, mercury-containing lamps (PFF is registered with the Florida Department of Environmental Protection to operate as a consolidation point for recyclable mercury-containing lamps and devices.), used antifreeze, and other miscellaneous non-hazardous wastes will be received, bulked, and stored in the Warehouse. Spent mercury-containing lamps will be managed in accordance with Chapter 62-737, F.A.C. The mercury-containing lamp storage (Universal Waste Storage) location is indicated on Figure I.D.7.

Container Storage

PFF receives and stores up to 54,340 gallons (988 drum equivalents) in this area. See Figure I.D.7 for aisle and drum storage layout. Additional details regarding container management practices are provided in Section II.B of this permit application. The Facility may store non-hazardous wastes and radioactive-only wastes in this container storage area.

Fuel Blending Activity

Fuel blending of mixed waste lab packs will be performed as described in the subsection titled "Fuel Blending" for the Process and Storage Building.

Mercury Amalgamation

This treatment will amalgamate liquid elementary mercury, which results in a non-liquid amalgam that is non-RCRA regulated material. Amalgamation is specified in 40 CFR 268.40 as the technology-based land disposal treatment standard for certain hazardous wastes. The treatment will consist of mixing a small batch (i.e., up to five gallons) of waste with inorganic reagents such as copper, zinc, nickel, gold, and/or sulfur in a portable unit (i.e., container). A detailed description of this process is contained in Appendix II.B.3 in Section II.B.

Non-elementary Neutralization

Perma-Fix has performed elementary neutralization of mixed wastes for several customers in the past. PFF also performs non-elementary neutralization in a portable 300-gallon tank or in containers, if quantities to be treated are small. A detailed description of the process is contained in Appendix II.B.4 of Section II.B.

Treatment Using a Drum Rotator

This treatment (i.e., solvent extraction) is described on pages 5 and 6 of this attachment. The treatment pre-conditions the waste for the PF-II process or is used to provide the alternate debris treatment standards under chemical extraction.

Deactivation of D003 Wastes

This process will be conducted in a nitrogen atmosphere in a glove box for highly dangerous waste to human health (e.g., highly radioactive wastes). See Appendix II.B.2 for process description. This treatment will also be performed in small containers without using the glove box or nitrogen blanket for wastes that do not pose a high health hazard.

WASTE GENERATED ON-SITE

During the course of the waste management activities described above, PFF may generate a variety of hazardous wastes including spent solvent/water mixtures used to rinse and decontaminate equipment and debris, soiled personal protective equipment, treatment residuals, and other incidental wastes. PFF will comply with the applicable requirements of 40 CFR 260-268, 270 (hazardous waste) and 279 (used oil), as well as Chapter 62-710, F.A.C (used oil), Chapter 62-730, F.A.C. (hazardous waste), and Chapter 62-740, F.A.C. (petroleum contact water) when managing these on-site generated wastes. The Facility will not engage in any waste generation activity other than that described in this and the preceding paragraphs.

MISCELLANY

The process design capacity of the treatment equipment, layout of the container storage areas, and tank storage capacity dictate the waste management capacity of the site. This information is addressed in the completed Part I application forms. Table I summarizes the treatment methods and storage locations for waste streams to be managed at the Facility. Table 2 provides treatment activity codes per each location within the Facility. It is anticipated that the PFF Facility will remain in operation at least until the year 2050.

CLARIFICATION REGARDING DEFINITION OF RCRA FACILITY

PFF owns the contiguous property consisting of a wooded parcel and the property used for the RCRA facility as shown in Figure I.D.21. Based on the RCRA definition of "Facility" at 40 CFR 260.10, this entire continguous property is considered the "facility" for HSWA purposes. However, only the area consisting of the property actually used for RCRA purposes (i.e., area marked "Perma-Fix RCRA Facility") will be subject to the RCRA permit conditions and/or RCRA regulations (except for HSWA permit conditions/regulations).

TABLE 1
Summary of Treatment Methods and Storage Locations

Waste Description	PF-I®	PF-II®	Physical Extraction	Chemical Extraction	Micro-Encapsulation	Chemical Oxidation/ Reduction	Phase Separation	Deactivation	Mercury Amalgamation	Neutralization	Storage Location[1]
Liquid Scintillation Fluid											T, TOB, LSW
Energy-Bearing Pumpable Liquid							X				PSB, LSW
Energy-Bearing Pumpable Liquid with High Water Content							X				PSB, LSW
Hazardous Wastewater											PSB, TOB, LSW
D002 Wastes	X				X					X	TOB, PSB, LSW
D003 Wastes	X	X						X			TOB, PSB, LSW
D004-D011 Aqueous Waste with No Organics >LDR Levels	X				X						TOB, PSB, LSW
Medical/Pharmaceutical Waste											PSB
D004-D011 Non Aqueous Waste with No Organics >LDR Levels	X				X						PSB, LSW, TOB
D004-D011 Wastes with Organics >LDR Levels (includes D012-D043 and F001-F005)	X	X									TOB, PSB, LSW
Debris (non-porous)			X								TOB, PSB, LSW
Debris (porous)				X							TOB, PSB, LSW
Debris Treatment Residuals	X	X			X						TOB, PSB, LSW
F, P, and U-Listed Flammable Liquids		X									PSB, LSW, TOB
F, P, and U-Listed Toxics	X	X	X	X	X	X	X	X		X	PSB, TOB, LSW
F, P, and U-Listed Corrosives	X									X	TOB, PSB, LSW
Mercury-Containing Wastes									X		TOB, LSW

[1]T - aboveground storage tank; PSB - Processing and Storage Building; TOB - Treatment and Operation Building; LSW - Liquid Scintillation Vials (LSV) Processing and Waste Storage Warehouse. See Figures I.D.1, I.D.4, and I.D.7.

TABLE 2
Treatment Codes and Facility Location for Treatment

Treatment and Operations Building:

Quonset Hut: Or Future Perma-Con Building	T18 (Thermal Desorption) T21 (Chemical Fixation) T22 (Chemical Oxidation) T23 (Chemical Precipitation) T24 (Chemical Reduction) T27 (Cyanide Destruction) T31 (Neutralization) T38 (Decanting) T39 (Encapsulation) T40 (Filtration) T41 (Flocculation) T47 (Physical Treatment - Sort and Segregate; Size Reduction) T54 (Distillation) T66 (Physical Treatment - Solvent Extraction)
Drying Room: Or Future Perma-Con Building	T21 (Chemical Fixation) T22 (Chemical Oxidation) T23 (Chemical Precipitation) T24 (Chemical Reduction) T27 (Cyanide Destruction) T31 (Neutralization) T38 (Decanting) T39 (Encapsulation) T40 (Filtration) T41 (Flocculation) T47 (Physical Treatment - Sort and Segregate) T54 (Distillation) T66 (Physical Treatment - Solvent Extraction)

LSV Processing and Waste Storage Warehouse:

Debris Treatment Area:	T21 (Chemical Fixation) T22 (Chemical Oxidiation) T23 (Chemical Precipitation) T24 (Chemical Reduction) T27 (Cyanide Destruction) T31 (Neutralization) T38 (Decanting) T39 (Encapsulation) T40 (Filtration) T41 (Flocculation) T47 (Physical Treatment - Sort and Segregate; Size Reduction) T54 (Distillation) T66 (Physical Treatment - Solvent Extraction)
LSV Processing Area:	T38 (Decanting) T39 (Encapsulation) T47 (Physical Treatment - Other) T54 (Distillation) T66 (Physical Treatment - Solvent Extraction)

Processing and Storage Building:

Zones l and 2: T23 (Chemical Precipitation)
T24 (Chemical Reduction)
T31 (Neutralization)
T38 (Decanting)
T40 (Filtration)
T41 (Flocculation)
T47 (Physical Treatment - Sort and Segregate)
T50 (Blending)

ATTACHMENT I.D.2

Permitted Waste Codes for Storage and Treatment (except for tank storage)

D001	D039	K062	P030	P074	P122	U020	U060	U099	U140	U179	U221
D002	D040	K086	P031	P075	P123	U021	U061	U101	U141	U180	U222
D003	D041	K156	P033	P077	P127	U022	U062	U102	U142	U181	U223
D004	D042	K157	P034	P078	P128	U023	U063	U103	U143	U182	U225
D005	D043	K158	P036	P081	P185	U024	U064	U105	U144	U183	U226
D006	F001	K159	P037	P082	P188	U025	U066	U106	U145	U184	U227
D007	F002	K161	P038	P084	P189	U026	U067	U107	U146	U185	U228
D008	F003	K169	P039	P085	P190	U027	U068	U108	U147	U186	U234
D009	F004	K170	P040	P087	P191	U028	U069	U109	U148	U187	U235
D010	F005	K171	P041	P088	P192	U029	U070	U110	U149	U188	U236
D011	F006	K172	P042	P089	P194	U030	U071	U111	U150	U189	U237
D012	F007	P001	P043	P092	P196	U031	U072	U112	U151	U190	U238
D013	F008	P002	P044	P093	P197	U032	U073	U113	U152	U191	U239
D014	F009	P003	P045	P094	P198	U033	U074	U114	U153	U192	U240
D015	F010	P004	P046	P095	P199	U034	U075	U115	U154	U193	U243
D016	F011	P005	P047	P096	P201	U035	U076	U116	U155	U194	U244
D017	F012	P006	P048	P097	P202	U036	U077	U117	U156	U196	U246
D018	F019	P007	P049	P098	P203	U037	U078	U118	U157	U197	U247
D019	F020	P008	P050	P099	P204	U038	U079	U119	U158	U200	U248
D020	F021	P009	P051	P101	P205	U039	U080	U120	U159	U201	U249
D021	F022	P010	P054	P102	U001	U041	U081	U121	U160	U202	U271
D022	F023	P011	P056	P103	U002	U042	U082	U122	U161	U203	U278
D023	F026	P012	P057	P104	U003	U043	U083	U123	U162	U204	U279
D024	F027	P013	P058	P105	U004	U044	U084	U124	U163	U205	U280
D025	F028	P014	P059	P106	U005	U045	U085	U125	U164	U206	U328
D026	F032	P015	P060	P108	U006	U046	U086	U126	U165	U207	U353
D027	F034	P016	P062	P109	U007	U047	U087	U127	U166	U208	U359
D028	F035	P017	P063	P110	U008	U048	U088	U128	U167	U209	U364
D029	F037	P018	P064	P111	U009	U049	U089	U129	U168	U210	U367
D030	F038	P020	P065	P112	U010	U050	U090	U130	U169	U211	U372
D031	F039	P021	P066	P113	U011	U051	U091	U131	U170	U213	U373
D032	K001	P022	P067	P114	U012	U052	U092	U132	U171	U214	U387
D033	K048	P023	P068	P115	U014	U053	U093	U133	U172	U215	U389
D034	K049	P024	P069	P116	U015	U055	U094	U134	U173	U216	U394
D035	K050	P026	P070	P118	U016	U056	U095	U135	U174	U217	U395
D036	K051	P027	P071	P119	U017	U057	U096	U136	U176	U218	U404
D037	K052	P028	P072	P120	U018	U058	U097	U137	U177	U219	U409
D038	K061	P029	P073	P121	U019	U059	U098	U138	U178	U220	U410
											U411

Appendix A

Debris Treatment Processes

Debris Treatment

Process Description

PFF treats debris using the "Alternative Treatment Standards for Debris" described in 40 CFR 268.45 Table 1. The alternative treatment technologies conducted at the Facility are either performed in conjunction with or exclusive of the PF-I process and PF-II process.

The debris treatment technologies conducted at the facility include physical extraction (scarification, grinding, and planing; spalling; and, high pressure steam and water sprays) and chemical extraction (water washing and spraying, liquid-phase solvent extraction).

Debris is sorted and segregated from any non-debris prior to size reduction and treatment. Sorting and segregating consist simply of picking out the debris from the original shipping container and placing it into another container. Identification of the most appropriate treatment approach (physical and/or chemical) is determined during the sorting and segregation activities. Size reduction is performed using hand-operated power tools (e.g., circular saw, reciprocating saw), when required, to necessitate compliance with the appropriate size dimensions cited in 40 CFR 268.45.

The alternative debris treatment technologies are primarily performed in the LSV processing area, but in certain cases may be performed in the TOB Area. Selection is based on waste stream quantities. The LSV processing area is equipped with a stainless steel vat measuring approximately 48.5" x 36.5" x 30.5", which is sufficient in size to accommodate all anticipated forms of debris and is used to accommodate large treatment campaigns. Figure I.D.9 illustrates the location of the vat inside the LSV processing area.

The vat is equipped with a gantry crane and pneumatic lift and dump station, including an in-line pneumatic press. One of the two submersion methods are employed to treat hazardous debris: 1) perforated stainless steel baskets (approximately 25-gallon capacity with removable lids) are raised and lowered into and out of the vat using the gantry crane; or 2) debris is directly loaded into the vat and held submerged using a steel grid and later shoveled into the perforated baskets. In either case, and following the required treatment residence time, the perforated baskets are raised and positioned onto a platform (containing rollers with a sloped catch-basin, draining back into the vat) that is equipped with a press. The wetted debris is allowed to drain and is pressed forcing the removal of any additional absorbed liquids. Once pressed, the basket is rolled into the dumping position where a pneumatic lift dumps the treated debris into a pre-positioned receiving container. The vat is equipped with an emissions control hood, which is vented directly to the facility air pollution control system.

Debris treatment activities conducted in the TOB are performed using the pneumatic drum tumbler. Small quantities of debris are treated in the drum tumbler rather than the LSV vat to minimize secondary waste residues. Debris is added to a tumbling vessel (55- or 85-gallon stainless steel drum) along with a select chemical solvent. The tumbling vessel is allowed to agitate on the drum tumbler for the required period of time. The original bung-top lid is replaced with a perforated lid, and the residual liquids are allowed to drain into a pre-positioned stainless steel catch basin.

The debris treatment activities conducted in the TOB are in a closed container provided with a pressure-relief device attached to the bung-top lid to minimize potential emissions. Fugitive emissions from both process areas (i.e., LSV vat and drum tumbler) are directed through the Facility's air control system.

Chemical Selection

PFF is aware that acids, solvents, and chemical reagents may react with some debris and contaminants to form hazardous compounds. Therefore, prior to debris treatment, applicable safety precautions specified in Material Safety Data Sheets and discussed in industrial hygiene publications will be reviewed. Past experience has shown that high-flash mineral spirits or a 1:1 (by volume) mixture of Lift- It® and water are appropriate solvents for most of the debris contaminants. Lift- It® is a mixture of dipropylene glycol methyl ether, dipropylene glycol n-butyl ether, and sodium hydroxide. It is anticipated that Lift-It® or a similar product will be the most commonly used extraction solvent for the liquid-phase solvent extraction procedure. Additional extraction solvents may include ethanol and industrial soaps.

PFF will conduct additional bench testing, as needed on new waste streams, to identify the most appropriate solvent for use. Regulations require that target constituents contaminating debris must be at least 5% soluble in the treatment solvent. Bench testing for solubility will consist of adding 10 parts by weight of solvent to one part by weight of a commercial grade product of the contaminant to be removed from the debris. If no meniscus forms in the mixture, the hazardous constituent is presumed to be at least 5% soluble.

Secondary Wastes

Secondary wastes generated in the vat are removed by pumping or, in the case of solids, by using hand tools (e.g shovels, hoes). Solid treatment residuals generated from the extraction processes are containerized and, prior to being manifested to an off-site hazardous waste disposal facility, may be treated using the PF-I or PF-II process, in accordance with the waste-specific treatment standards of 40 CFR 268 Subpart D. Treatment residual candidates for the PF-I or PF-II processes are solids (e.g., soil) containing organic and inorganic hazardous waste constituents in excess of applicable land disposal restriction standards. The treated debris is managed and disposed of off-site in accordance with the conditioned exclusion provided by 40 CFR 268.45(c). Generated liquids will be blended with other mixed waste fuels and shipped off site or will be directly (i.e., without blending) shipped off site to a permitted facility.

Waste Code Tracking

PFF assigns and tracks waste codes for treatment residuals and treated debris in accordance with 40 CFR 268.45 and 40 CFR 261.3(f)(1). When hazardous debris that exhibits the characteristic of ignitability, corrosivity, or reactivity is deactivated by treatment using one of the technologies identified in Table 1 of 40 CFR 268.45 (and described in the permit application), the treated debris is not a hazardous waste. Residue from the deactivation of ignitable, corrosive, or reactive characteristic hazardous debris (other than cyanide-reactive wastes) that is not contaminated with a listed waste hazardous constituent retains the appropriate characteristic waste code unless it is deactivated. Toxicity characteristic debris treatment residuals remain subject to the waste code(s) and treatment standards for the toxic constituent(s) for which the debris exhibited the toxicity characteristic. Residuals from the treatment of debris contaminated with listed waste remains subject to the treatment standards and waste codes assigned for those constituents or wastes. Hazardous debris that has been treated using one of the physical and/or chemical extraction technologies in conformance with 40 CFR 268.45 and does not exhibit a characteristic of hazardous waste identified under subpart C, Part 261 of 40 CFR after treatment is not a hazardous waste and will not be assigned any waste codes.

If the water washing and spraying technology is ever implemented for waste codes F020, F021, F022, F023, F026, or F027, an application for "Equivalent Technology" approval as specified in 40 CFR 268.42(b) will be filed prior to the commencement of treatment.

Debris Storage

Debris is received and stored prior to and after treatment based on its hazardous characteristics and/or assigned waste code(s). See Table 1, Summary of Treatment Methods and Storage Locations, at the end of Attachment I.D.1.

Environmental Performance Standards

Release Prevention

The debris treatment processes are located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. For purposes of ensuring protection of human health and the environment, PFF has designed and operates the debris treatment equipment in conformance with applicable container standards. Appropriate secondary containment and air emission controls are incorporated into the design and operation of the equipment, and run on and run off of precipitation or liquids from the debris treatment area are controlled. See Part II, Section B of this permit application for details regarding containment; management of ignitable, reactive, and incompatible wastes; condition and management of containers; inspections; and prevention of run on and accumulation of precipitation in the Treatment and Operations Building and LSV area where the debris treatment operations take place.

Prevention of Releases to Groundwater or Subsurface Environment

Releases to groundwater or the subsurface environment from the debris treatment processes are extremely unlikely for the following reasons.

- Relatively small volumes of waste are incorporated into the debris.
- Debris is treated within secondary containment systems designed to collect liquids generated during processing. The containment system is coated with a chemically resistant material that is compatible with the waste streams designated for processing.
- The treatment areas are inspected each treatment day in accordance with the facility inspection plan. Leaks or spills from the system are cleaned up within 24 hours of discovery or as soon as it is practicable and safe to do so.
- The areas are located within buildings physically separated by a concrete base from the subsurface environment and groundwater.

- The Facility maintains a Contingency Plan to provide a framework for facility response to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the system.

Prevention of Releases to Surface Water, Wetlands, or Soil Surface

Releases to surface water, wetlands, or soil surface are extremely unlikely for the following reasons.

- Relatively small volumes of waste are incorporated into the debris.
- Debris is treated within secondary containment systems designed to collect liquids generated during processing. The containment system is coated with a chemically resistant material that is compatible with the waste streams designated for processing.
- The treatment areas are inspected each treatment day in accordance with the facility inspection plan. Leaks or spills from the system are cleaned up within 24 hours of discovery or as soon as it is practicable and safe to do so.
- The areas are located within buildings physically separated by a concrete base from the subsurface environment and groundwater.
- The Facility maintains a Contingency Plan to provide a framework for facility response to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the system.

Prevention of Releases to Air

Releases to air from the debris treatment are extremely unlikely for the following reasons.

- The system is located within building areas equipped with emissions control devices. The emissions control system is designed to handle at least the volume of organic emissions anticipated from the process.
- Limiting the time the debris is exposed to the atmosphere prior to processing minimizes emissions at the loading point.
- Emissions during unloading are minimal because the potential contaminants are significantly removed during processing.

Monitoring and Inspections

PFF personnel monitor the debris treatment process during processing operations. Loading and unloading are conducted manually (or by automated equipment that is manually operated).

The debris treatment areas are visually inspected each operating day for evidence of leaks or spills; the inspection is in accordance with the requirements of the facility inspection plan. The secondary containment systems are also inspected each operating day for evidence of cracks or breaches in containment as specified in the facility inspection plan.

Potential Pathways of Exposure of Humans or Environmental Receptors

PFF workers within the treatment areas are the most likely human receptors for chemicals or chemical constituents released from the debris treatment process. The exposure is anticipated to be minimal because of the emission control devices provided for the areas. The primary pathway for human receptors from debris treatment processes is air, specifically, air emissions (volatiles or particulates) generated during treatment processes. Where appropriate, water may be applied during processing to minimize the generation of particulates.

Operating personnel (or personnel present in the treatment areas for any other reason) are required to wear personal protective equipment (PPE) selected to address the potential hazards identified for the wastes to be managed and the operating parameters of the system. The PPE selected will be in accordance with OSHA standards and may include use of particulate/radioactive/organic respirators (as appropriate).

Environmental receptors such as soil, surface water, groundwater, and air are unlikely to be impacted by the debris treatment processes because of the air controls provided for the treatment areas, containment systems, and location within buildings that are physically separated from soils and protected from precipitation, as well as storm water run on and run off.

Appendix B

Solvent Distillation

Siva
A Division of Pneumatic Products Corporation

M-110 SOLVENT RECOVERY SYSTEM

Standard Terms and Specifications

1.0 SCOPE

1.1 This Proposal covers standard terms and specifications for the sale of one (1) M-110 solvent recovery distillation unit and accessories (**"M-110 System"**) by Siva, a Division of Pneumatic Products Corporation *("SIVA")*, as summarized below and described herein:

- One (1) 30,000 watt, **M-110** distillation unit with wetted parts of 304 stainless steel; explosion-proof light; elevated base stand: and on-board, microprocessor control system with LCD and LED operating displays and trouble-shooting indicators (480V, 3Ph, 60Hz)
- One (1) automatic level-controlled fill system

1.2 Siva's *"Standard Terms and Conditions"* included herein as *"Exhibit C"* shall apply to this Proposal. Siva reserves the right to change the terms and specifications of this Proposal at any time.

3.0 EQUIPMENT SPECIFICATIONS

3.1 Size and Approximate Weights of Vessels and Assemblies:

VESSEL	SIZE (W x D x H)	APPROX. WEIGHT (Empty)
M-110 Unit w/ Stand	56" x 70" x 121"	1700 Lbs.

Siva
A Division of Pneumatic Products Corporation

3.2 M-110 Distillation Unit

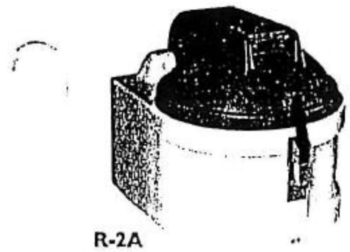
One (1) 30,000 watt, 110-gallon capacity, 304 stainless steel distillation unit to include:

- One (1) stainless steel heating jacket surrounding the distillation unit to the height of the liquid at capacity, with two inches (2") of exterior insulation covered with a painted carbon steel cabinet
- Four (4) 7,500 watt electric immersion heaters (480V, 3Ph)
- One (1) internal demisting assembly
- One (1) 304 stainless steel condenser with removable 316L stainless steel core, mounted on the distillation vessel
- One (1) painted carbon steel supporting frame
- One (1) 18" front-mounted manway for access and inspection of the solvent chamber
- One (1) manually operated 2"Ø still bottoms discharge valve
- One (1) 5" sight window and one (1) 240 volt explosion proof light
- One (1) 5 psig pressure relief valve and one (1) 15 psig pressure rupture disk (ventilation piping for the pressure relief valve and rupture disk not supplied by Siva)

3.3 Internal Oil Heating Package

One (1) 30,000 watt, internal, explosion-proof thermal oil heating unit connected by fiberoptics to the M-110 on-board control system, to include:

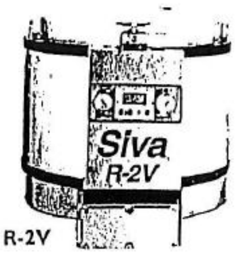
- Four (4) 7,500 watt electric immersion heaters, with heating elements connected to two electric circuits (each @ 15 kW; 480V, 3Ph)
- One (1) carbon steel elevated oil expansion tank, with low-level sensor alarm and shutdown.



R-2A

Siva

...THE **COMPLETE** APPLICATIONS SOLUTION SOURCE

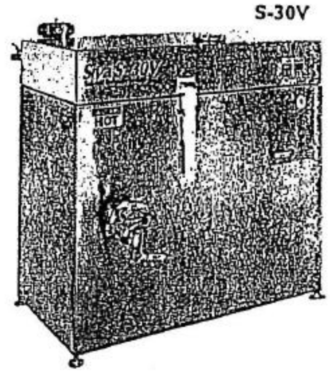


R-2V

R-2A/2AX/2V SERIES

Bench-top still for recycling solvents that boil up to 500°F. R-2A distills 4 gallons in 8 hours.

R-2AX includes closed-loop cooling water system. R-2V distills 5 gallons in 8 hours with vacuum assistance. All units feature fully automatic operation with disposable liners for sludge removal.

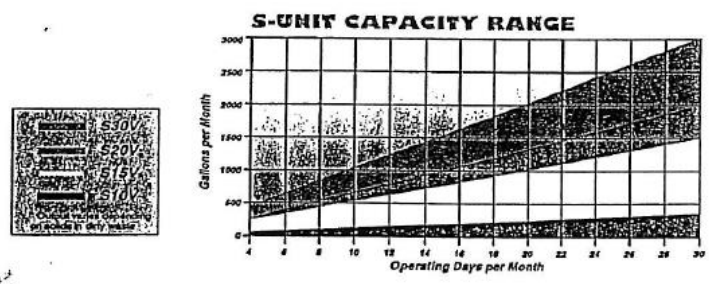


S-30V

S-SERIES

LISTED

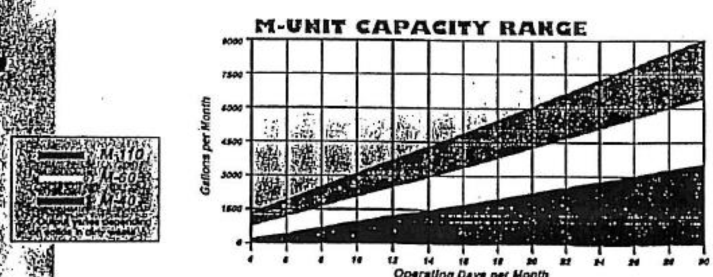
Self-contained vacuum and non-vacuum stills with all stainless steel and Teflon® parts. Single batch and continuous flow capacities from 10 to 100 gallons per day. Microprocessor controls and safety interlocks allow installation anywhere.

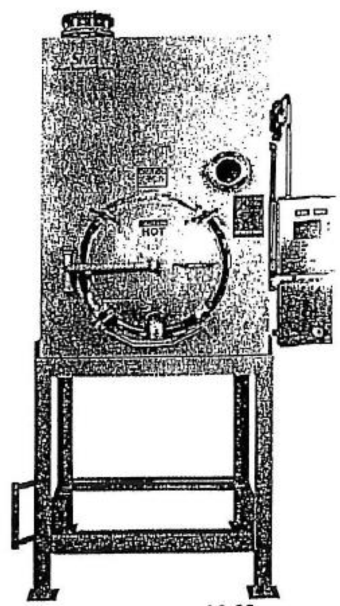


M-SERIES

LISTED

Batch or continuous flow vacuum and non-vacuum stills with throughput capacities from 40 to over 300 gallons per day. Front door drain and elevated base stand provide easy access to still chamber and allow gravity discharge of liquid still bottoms to a 55-gallon drum.





M-60

Siva

M and DAS Series Solvent Recovery Systems

Siva
A Division of Pneumatic Products Corporation

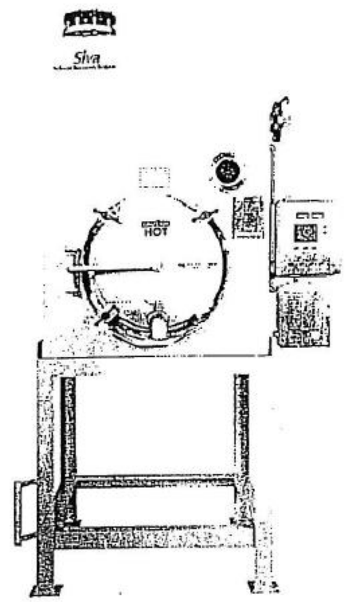
High Capacity Solvent Distillation

Description

Siva M and DAS Series Solvent Recovery Systems are designed for high volume applications with throughput capacities from 40 to over 1000 gallons per day.

Electric heaters immersed in thermal oil surrounding the solvent chamber provide heat for distillation in M- Series systems. An external oil heating package or in-plant steam provides heat for distillation in DAS Series systems. Reclaimed solvent vapors are condensed in water-cooled stainless steel heat exchangers mounted on the rear of the unit. Waste contaminants remain in the solvent chamber as liquid or semi-liquid still bottoms.

All DAS systems feature an automatic internal scraper to clean the sidewalls of the solvent chamber and improve the heating efficiency of the unit. DAS systems are most effective for distillation of viscous solvents or solvents with thermosetting solids.

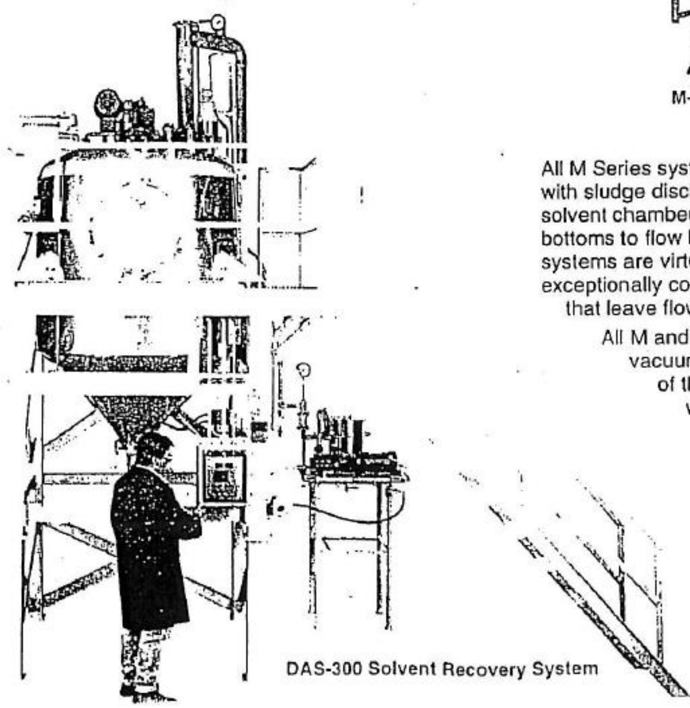


M-60 Solvent Recovery System

All M Series systems feature a large front-mounted door with sludge discharge valve for easy access to the solvent chamber. An elevated base stand allows still bottoms to flow by gravity to a 55-gallon drum. M systems are virtually maintenance free and are exceptionally cost effective when used for applications that leave flowable still bottoms.

All M and DAS Series systems are available with vacuum assistance to reduce the boiling point of the waste solvent. M and DAS systems with vacuum will distill and reclaim most solvents, including the new, high boiling-point, environmentally safe solvents. With vacuum assistance, actual distillation temperatures are typically below 365°F (185°C).

For most M and DAS Series applications, solvent recovery yields exceed 80% and reclaimed solvent purity exceeds 99%.



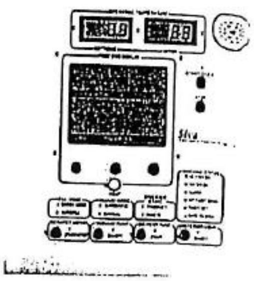
DAS-300 Solvent Recovery System

Control Systems

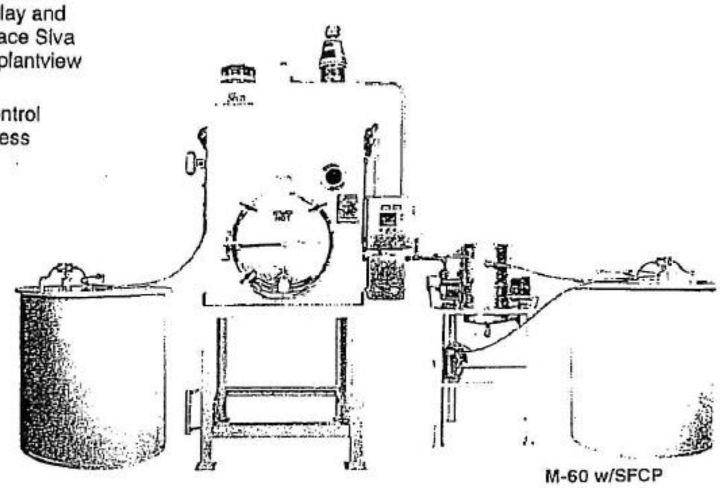
All Siva M and DAS systems feature an explosion-proof, intrinsically safe solid state control system mounted on the unit. The control system has user friendly, programmable temperature and operating set points and features LCD menu-driven displays of operating conditions and trouble-shooting indicators; as well as automatic start and stop functions.

M and DAS Series systems utilize intrinsically safe low voltage electrical circuitry, fiberoptic interfacing of accessories, and explosion-proof electrical components. Remote operating, display and alarm panels and serial ports to interface Siva control systems with customer owned plantview systems are available.

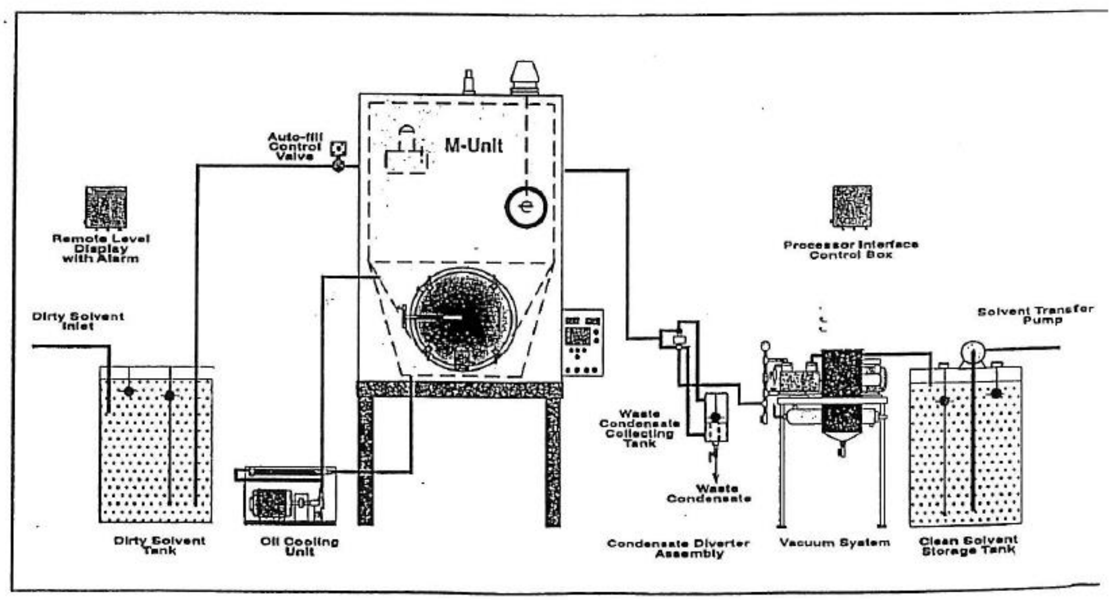
Siva systems with solvent flow and control packages are also available with process interface kits that electronically interface the solvent recovery system with down-stream solvent washers or processors. This allows the user to operate washing equipment with continuous solvent "feed-and-bleed" for true closed-loop operation.



Microprocessor Controller
M & DAS Series



M-60 w/SFCP



M-Unit with Optional Accessories

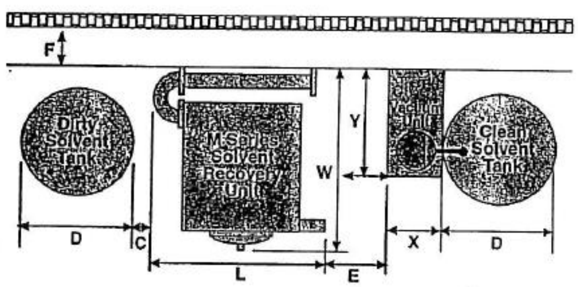
Reference Data*

Unit	Boiler Capacity, Wattage and Typical Through-put		
M-40	40 gallons (Batch or Auto-Fill)	12,000 Watts	40-120 gallons/day
M-60	60 gallons (Batch or Auto-Fill)	18,000 Watts	60-180 gallons/day
M-110	110 gallons (Batch or Auto-Fill)	30,000 Watts	110-330 gallons/day

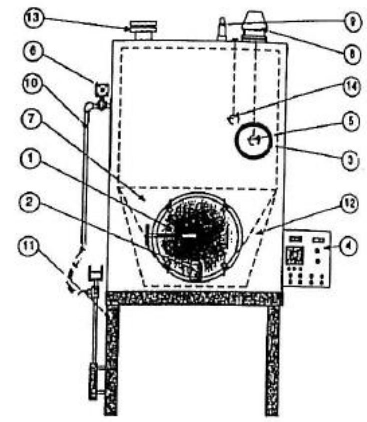
Unit	Electrical			
M-40	480 V	60 Hz	Three 3Ø	16 Amps
M-60	480 V	60 Hz	Three 3Ø	22 Amps
M-110	480 V	60 Hz	Three 3Ø	34 Amps
Vacuum Unit	480 V	60 Hz	Three 3Ø	2 Amps

Unit	Utilities			
	Cooling Water			Process Air
	Flow	*Inlet*	*Pressure*	*Pressure*
M-40	2 gpm	<70°F	35-80 psi	80-100 psi
M-60	4 gpm	<70°F	35-80 psi	80-100 psi
M-110	7 gpm	<70°F	35-80 psi	80-100 psi

Note: Daily throughput will vary depending on the type of solvent and the amount of solids in the waste to be reclaimed. Please consult factory for throughput estimates.

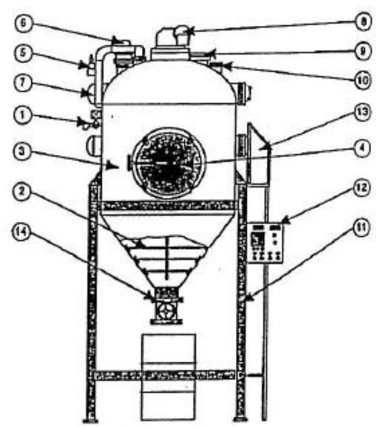


	Width					Depth		Height
	L	X	D	C	W	Y	F	H
M-40 w/Stand	58"			5"	66"		24"	110"
M-60 w/Stand	58"			5"	66"		24"	110"
M-110 w/Stand	58"			5"	72"		24"	121"
Vacuum Assy.		30"				37"		46"
100 Gal.			30"					36"
150 Gal.			36"					34"
250 Gal.			48"					36"



1. CLEAN-OUT DOOR
2. SLUDGE DRAIN VALVE
3. SIGHT GLASS
4. CONTROL PANEL
5. AUTO-FILL FLOAT
6. AUTO-FILL VALVE
7. SOLVENT CHAMBER
8. EXPLOSIONPROOF LIGHT
9. PRESSURE RELIEF VALVE
10. VAC./AUTO-FILL PICKUP
11. ELEVATED BASE STAND
12. THERMAL OIL CHAMBER
13. BURST DISK
14. OVERFILL SAFETY FLOAT

M-110 Front View



1. AUTO-FILL VALVE
2. SCRAPER BLADES
3. DISTILLATION VESSEL
4. MANWAY
5. PRESSURE RELIEF VALVE
6. EXPLOSIONPROOF LIGHT
7. CONDENSERS
8. ROTATING SCRAPER ASSEMBLY
9. INSPECTION GLASS
10. BURST DISK
11. ELEVATED BASE STAND
12. CONTROL PANEL
13. PLATFORM/LADDER
14. SLUDGE DRAIN VALVE

DAS-175 Front View

* Please consult factory for DAS Series Dimensions and Installation Data

Because of our policy of continuous improvement some information, specifications and dimensions contained herein may be revised. For confirmed accuracy, always refer to factory submittals.

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Flair Engineered Products

Appendix C

LSV Process Certification Report

INSPECTION AND CERTIFICATION REPORT:
LIQUID SCINTILLATION VIAL PROCESSING SYSTEM
PERMA-FIX OF FLORIDA, INC.

INTRODUCTION

At the request of Perma-Fix of Florida, Inc., 1940 N.W. 67th Place, Gainesville, Florida, *Lewis Engineering and Consulting, Inc.* (LEC), Gainesville, Florida conducted an inspection of the Liquid Scintillation Vial (LSV) crushing and processing system for purposes of assessing compliance with EPA 40 CFR 264.190, Subpart J: Tank Systems, and 40 CFR 264.600, Subpart X: Miscellaneous Units. An on-site inspection and process documentation review was performed by LEC on November 13, 2009. An initial inspection and certification report for the LSV system was issued November 17, 1998 by R.O. Lewis, P.E. of LEC and A. Bodo, P.E., *Bodo & Associates*, Gainesville, Florida shortly after the system was first constructed and commissioned.

Now in it's 11th year of operation, the LSV system has undergone a major overhaul and revisions. A majority of the material conveyance systems at that time for both wet and dry material processing have been removed and that which has been retained for wet processing only has been modified. The principal component of the LSV processing system remains the Model 13CSE multi-bladed grinder, referred to as a knife hog grinder, manufactured by Reduction Technology, Leeds, Alabama. The grinder was purchased new by Perma-Fix in the first quarter, 1998. The grinder received a new cylinder in 2009 which houses the knife blade assembly. Several other external covers and jackets on the grinder were also replaced during the overhaul. All of the parts used in the overhaul were sourced from the OEM supplier and were of the same material quality and specifications as those originally purchased and assembled in 1998.

The primary LSV system modifications involved removal of a series of in-line outfeed screw conveyors. Those have been replaced by a single fully enclosed fire suppression protected conveyor belt system manufactured by the original equipment manufacturer, Reduction Technology. The conveyor belt is a type 304 stainless steel woven mesh belt that was originally developed for the heat treating industry. The design lends itself well to the LSV process application as the open mesh design of the belt allows liquids to drain through the belt to a sump effectively separating the liquids from the chopped solids that the belt transports to a collector drum. A T304 stainless steel trough beneath the belt collects the liquids which by gravity flow to a 110 gallon T304 SS sump tank located beneath the grinder. Liquids collected in the sump tank can be pumped to a 350 gallon T304 stainless steel tank that remains from the original LSV system certified in 1998, or to portable T340SS tanks for transfer to a bulk transport tanks.

System schematics in **Figures 1, 2 and 3** illustrate the configuration of the system and identify the component parts. The photograph in **Figure 4** shows the LSV system as viewed looking north inside the LSV processing room. During operation, raw feed materials are screened to remove dirt, debris and packing materials. A large permanent magnet positioned above the in-feed conveyor removes ferrous material from the waste stream that could damage the blades of the grinder and potentially generate sparks. Potential fire hazards associated with processing flammable solvents are minimized via a fire suppression system and nitrogen purging.

CONCLUSIONS AND RECOMMENDATIONS

The 11 year old LSV system appears to have been well maintained and those components and parts of the system subject to normal wear, such as the screw-flight outfeed system, have been fully replaced with new components. The knife hog grinder has been refitted with new knives, covers and panels to restore those surfaces subject to abrasion and wear. The successful and safe performance of the grinder during the past 11 years confirms that the original design and materials of construction of the grinder has been well suited for this application.

The use of T304 stainless steel throughout the system for all wetted surfaces and including the recently modified outfeed belt conveyor provides reliable wear and corrosion resistance for all but very corrosive hazardous waste materials. The system would not be suitable for processing very acidic waste streams, less than pH 2, or high solubility chloride content waste streams that would be treated employing high temperature to evaporate solids to dryness. Neither of these two conditions represent foreseeable use of the wet grinding system. Magnetic screening of the waste stream conveyed to the grinder minimizes the potential for generating sparks at the blades, and a fire suppression and nitrogen purge system is installed to further minimize the risk of fire and explosions.

The structural assessment and certification of the concrete floor to support the LSV system equipment remains valid as presented in 1998. No additional equipment weight has been added during system modifications. Instead, there has been an overall equipment weight reduction via the removal of the multiple in-series screw-flight outfeed conveyors and replacement with the smaller and lighter single belt conveyor. No other changes affecting the structural integrity of the floor and containment room for the LSV system have been made since the system was originally certified in 1998.

It is the opinion of the undersigned that the system, as installed, is well suited for its intended purpose and is in very good serviceable condition.

As required by EPA 40 CFR 270.11(d):

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on myinquirey of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurage and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing vilolations.

Respectfully submitted,

Richard O. Lewis

Richard O. Lewis, P.E.
NOVEMBER 16, 2009

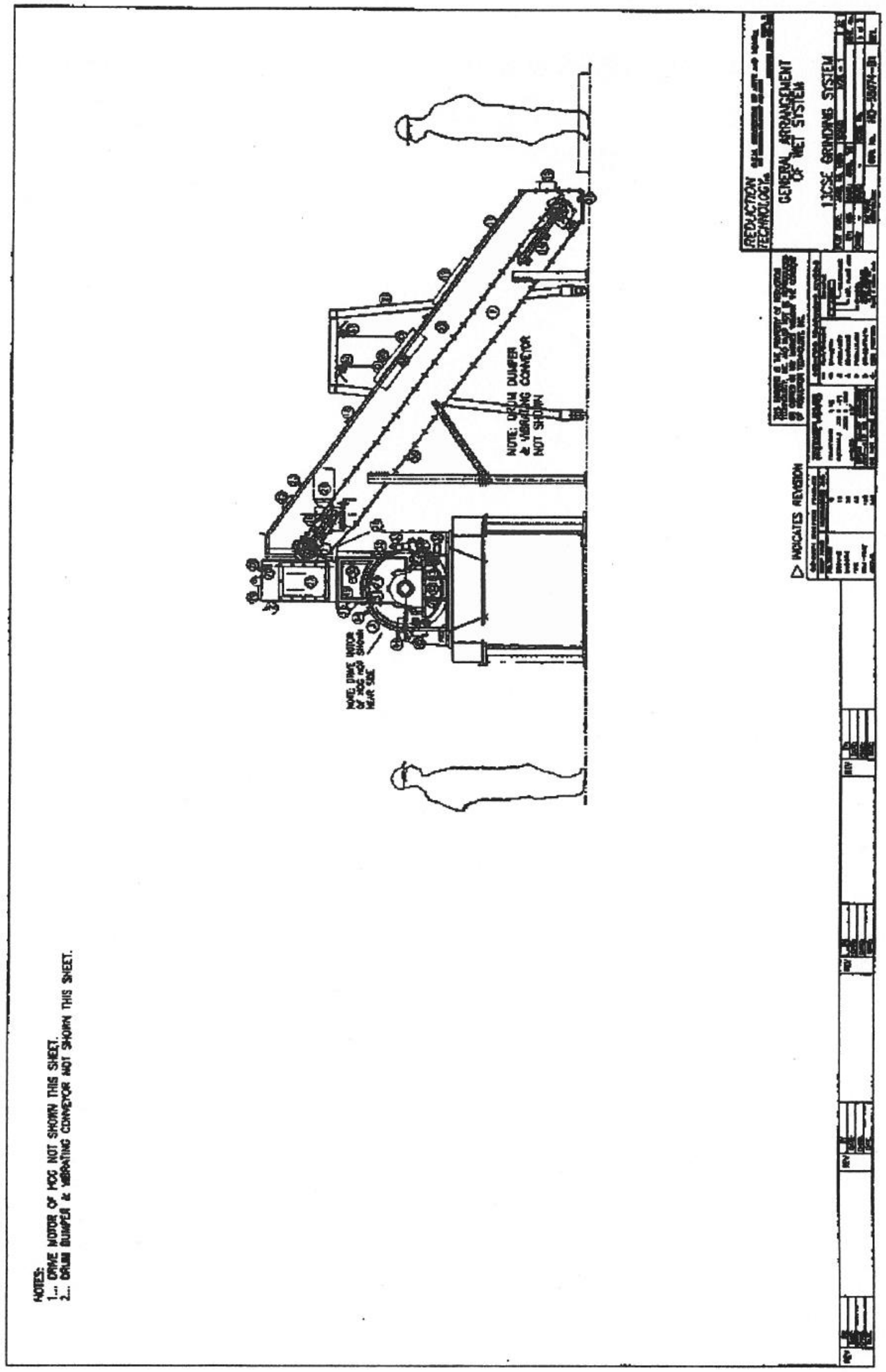


Figure 1. Elevation schematic of Reduction Technology 13 CSE wet grinding system configuration; located at Perma-Fix.

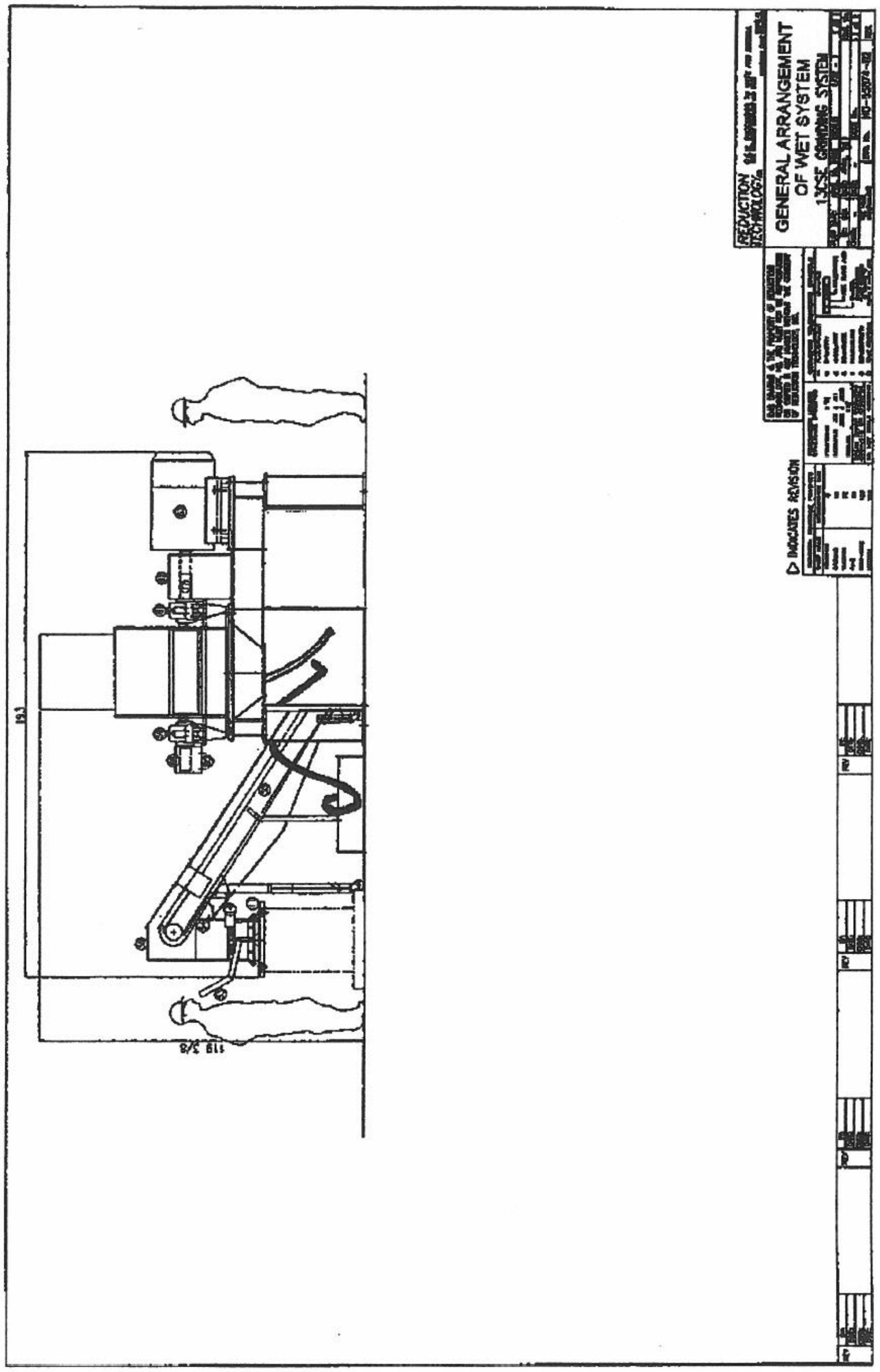


Figure 2. Elevation schematic of Reduction Technology 13 CSI wet grinding system configuration; located at Perma-Fix.

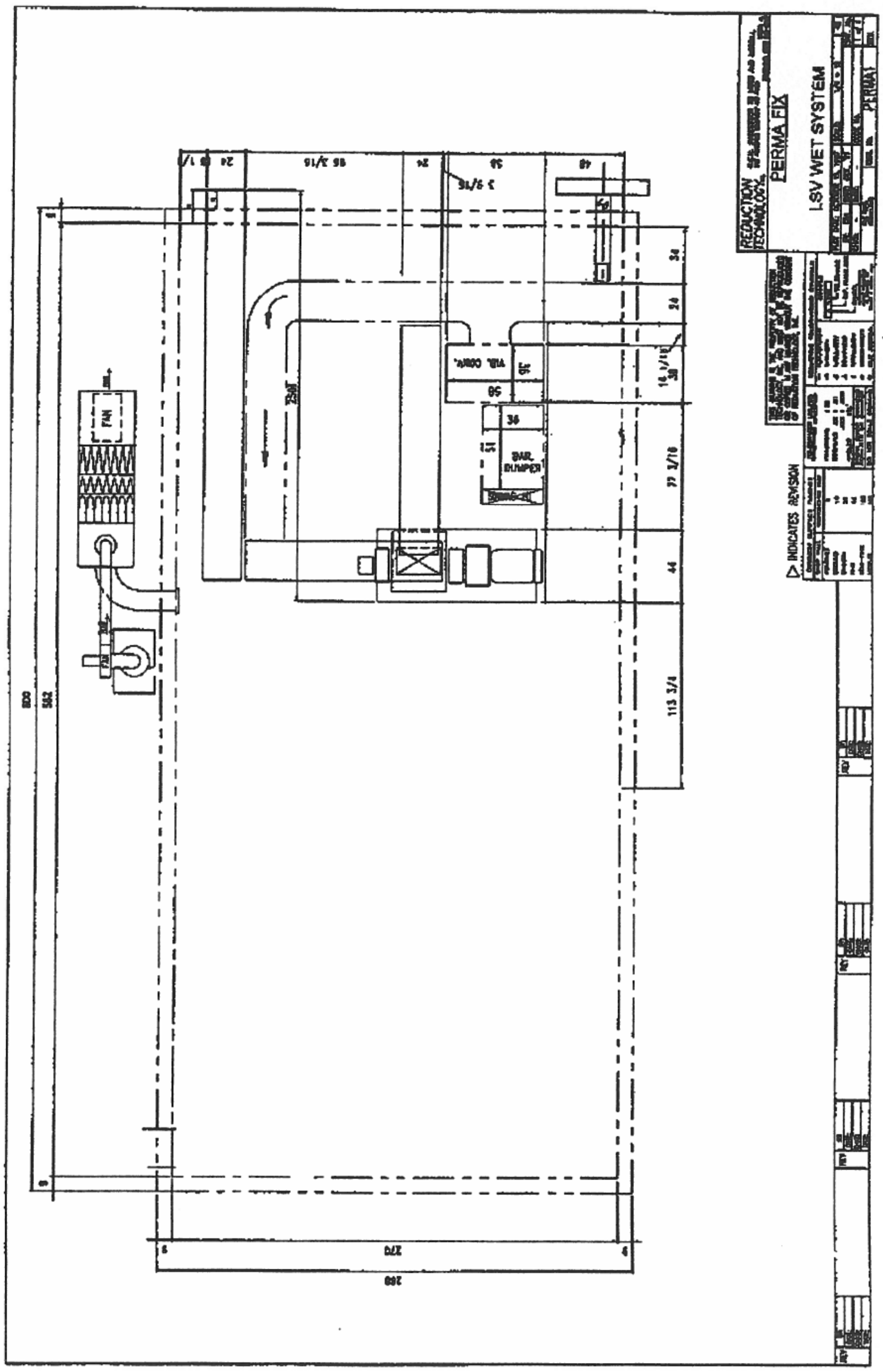


Figure 3. Plan view schematic of Reduction Technology wet grinding system; located at Perma-Fix.

Figure 4. Image of LSV system as viewed looking north inside the LSV room.

Appendix D

LSV Processing Area Containment Calculations

Appendix D

Containment Calculations for LSV Area 1

Crusher Room

GIVEN:

Base Area (a)	= 1,620 ft^2
Curb Height (h)	= 5.5 in = 5.5 in/12 = 0.46
100% Volume of Largest Tank (LT)	= 521 gal debris dip tank
100% Volume of All Tanks (TT)	= 906 gal [521 gal + 275 gal (Test Tank) + 110 gal (Outfeed Conveyor Holding Tank)]
100% Volume of Largest Container (LC)	= 55 gal
100% Volume of All (10) Containers (TC)	= 550 gal
100% Volume All Tanks + All Containers (T)	= 1,456 gal
10% of Total Volume (TV = 10% x T)	= 145.6 gal
25 year/24 hour Stormwater Collected (SC)	= 0 gal (LSV Area is in a building)

CONTAINMENT CAPACITY AVAILABLE (CCA):

CCA = h x a x 7.48 gal/ft^3
= 0.46 ft x 1,620 ft^2 x 7.48 gal/ft^3
= 5,574 gal

VOLUME DISPLACED BY EQUIPMENT (VDP):

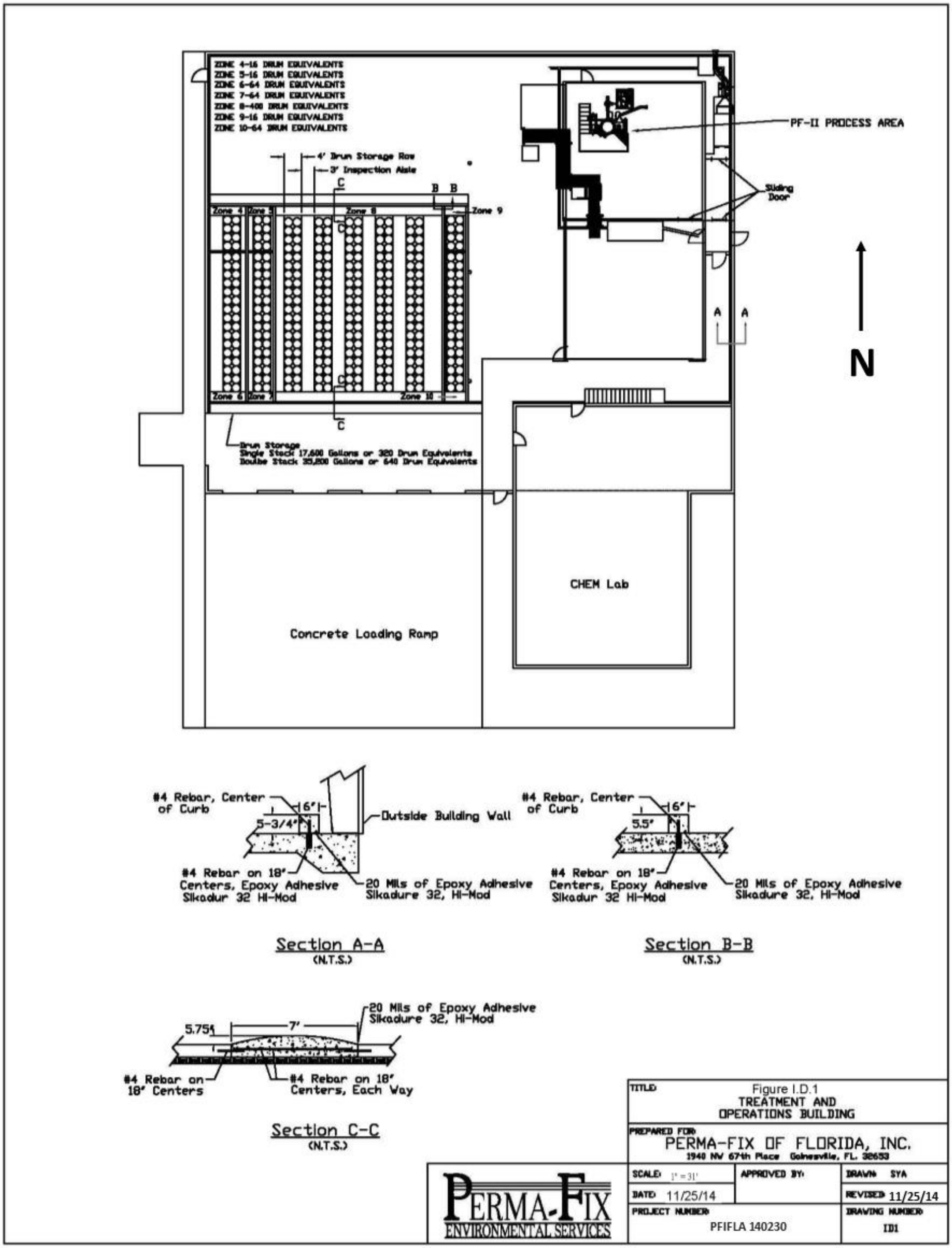
VDP = Equipment in this area is elevated; therefore, displacement is negligible = 0

NET AVAILABLE CONTAINMENT (NAC):

X = TV or LT whichever is greater
NAC = CCA - (X + VDP + SC)
= 5,574 gal - (521 gal + 0 gal + 0 gal)
= 5,053 gal

CONCLUSION:

The net available containment volume exceeds the containment capacity needs; i.e., 5,053 gallons of available containment is well over the volume of tank and container volumes.



ATTACHMENT I.D.1

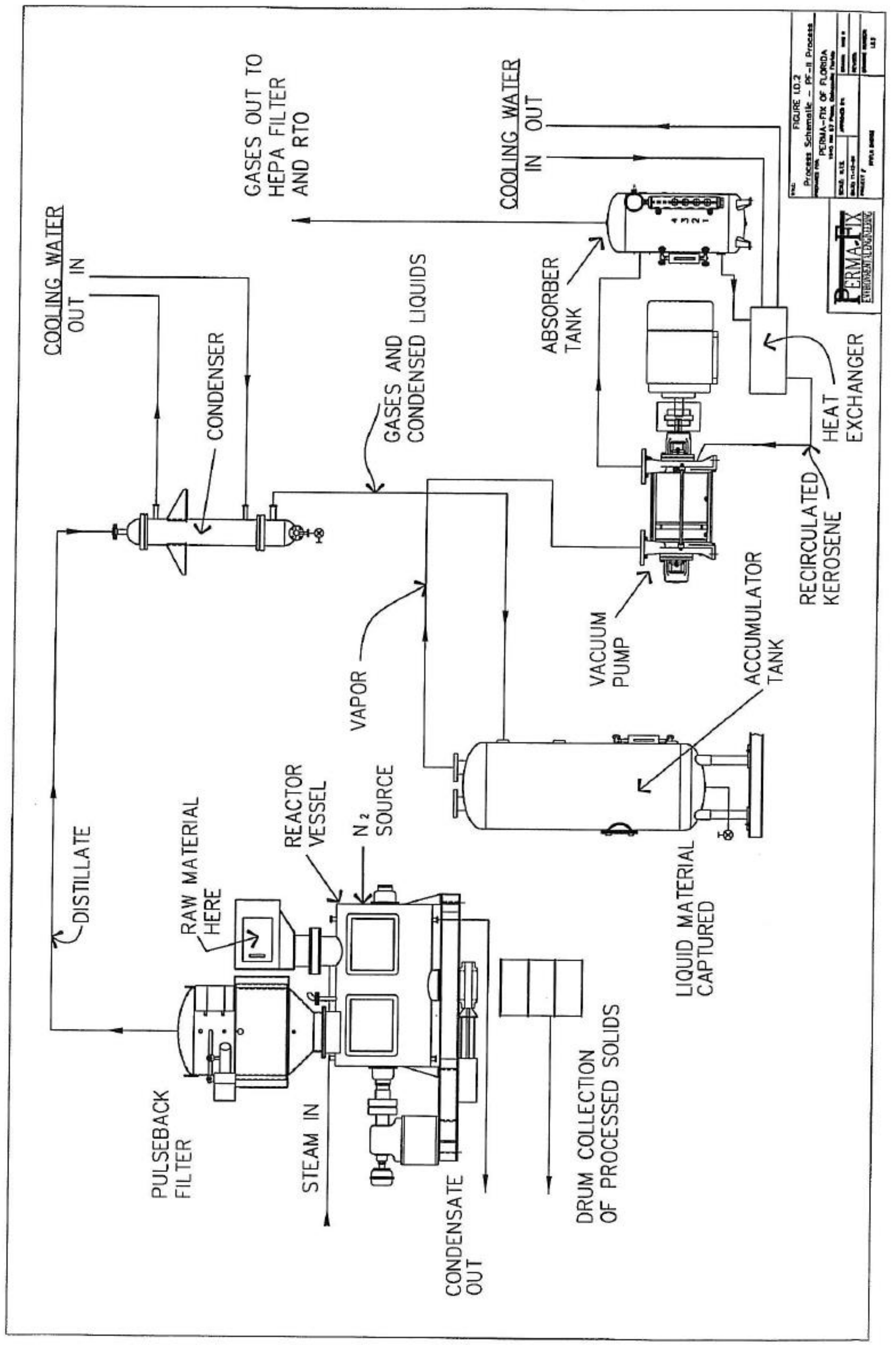
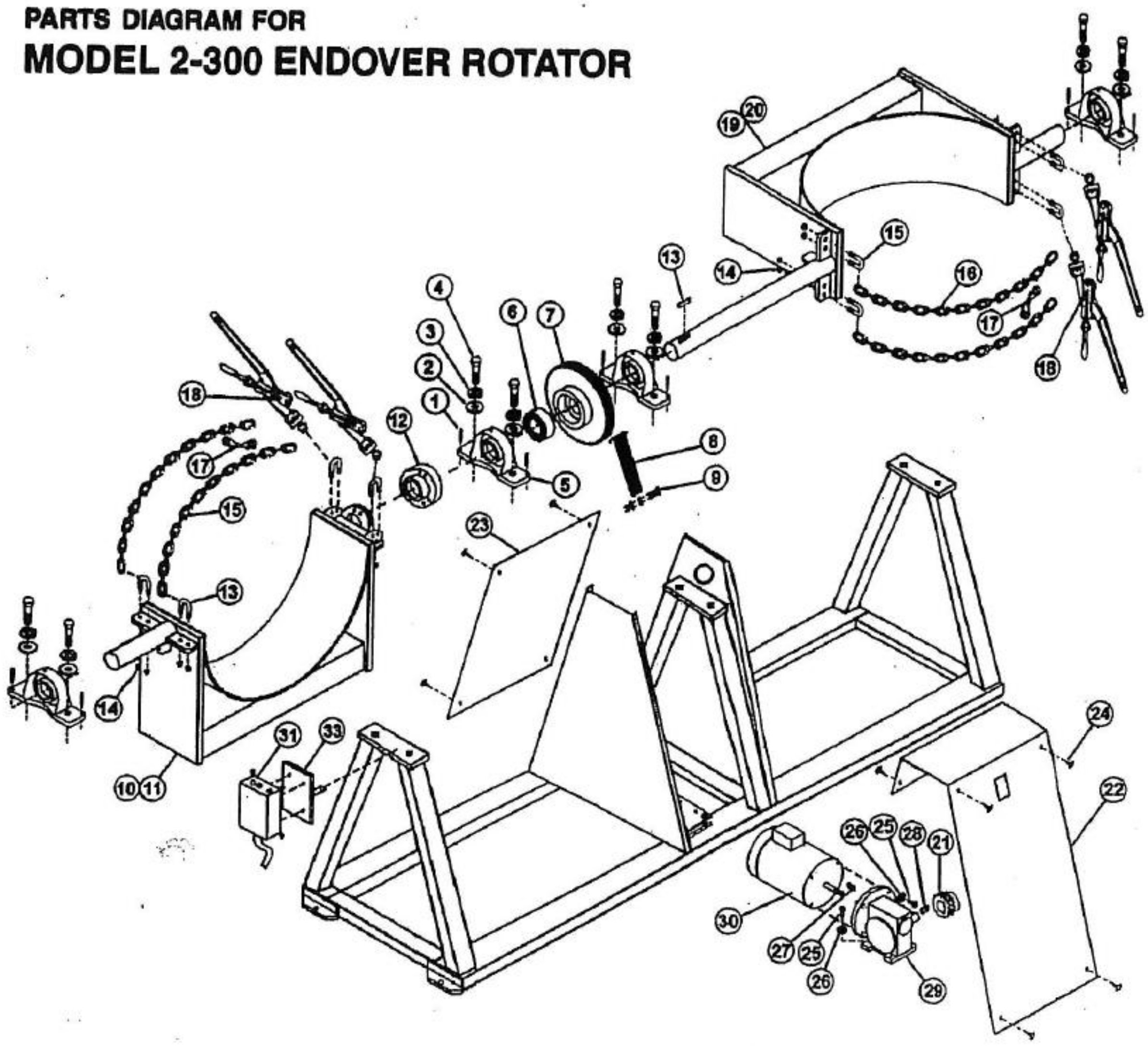


FIGURE I.D.2
Process Schematic – PF-II Process
PERMA-FIX OF FLORIDA
PERMA-FIX
COOLING WATER
OUT IN
CONDENSER
GASES OUT TO HEPA FILTER AND RTO
GASES AND CONDENSED LIQUIDS
COOLING WATER
IN OUT
ABSORBER TANK
HEAT EXCHANGER
RECIRCULATED KEROSENE
VACUUM PUMP
ACCUMULATOR TANK
VAPOR
DISTILLATE
RAW MATERIAL HERE
REACTOR VESSEL
N2 SOURCE
LIQUID MATERIAL CAPTURED
PULSEBACK FILTER
STEAM IN
CONDENSATE OUT
DRUM COLLECTION OF PROCESSED SOLIDS

MORSE THE SPECIALIST IN DRUM HANDLING EQUIPMENT ®

2-300 SERIES ENDOVER ROTATOR

PARTS DIAGRAM FOR
MODEL 2-300 ENDOVER ROTATOR

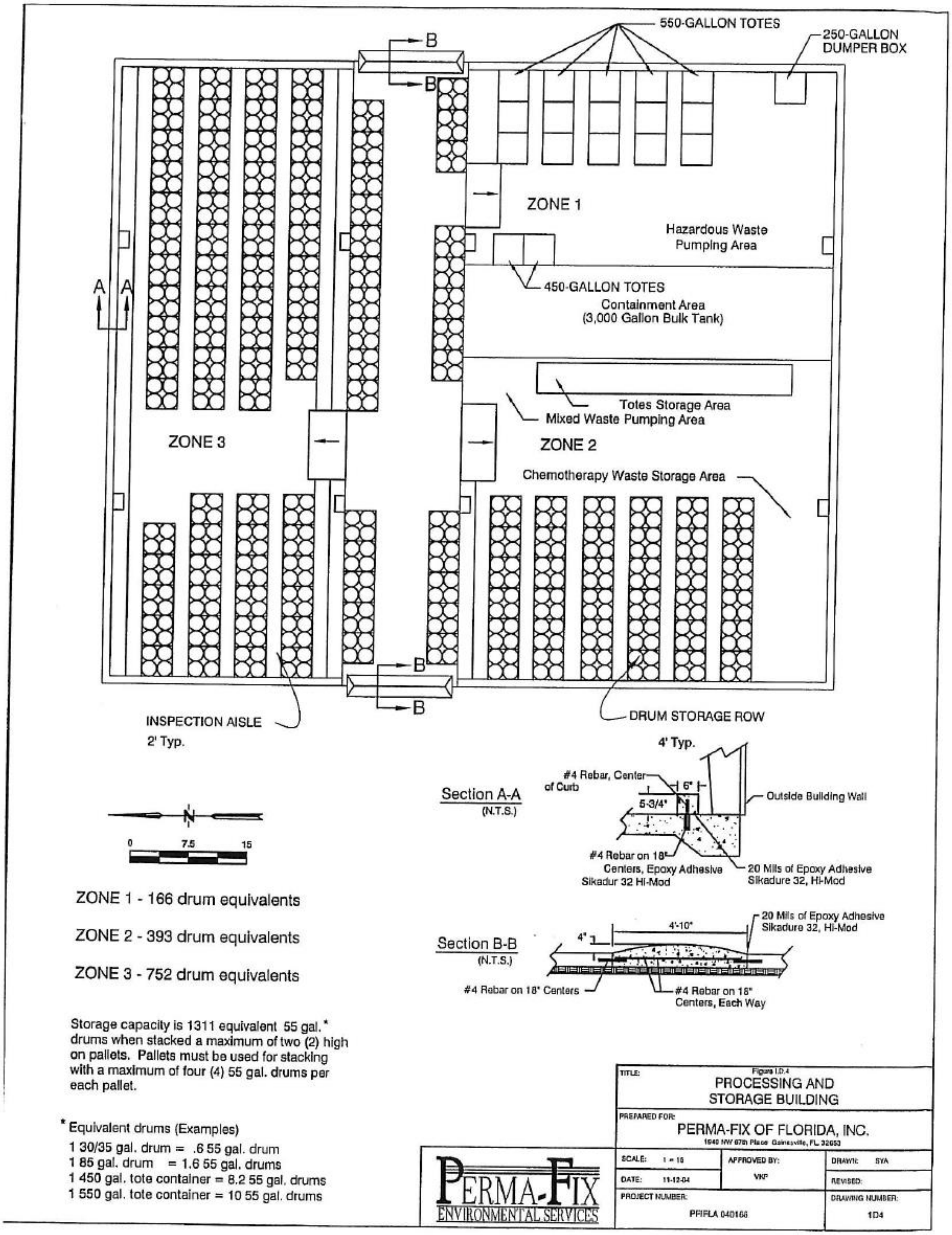


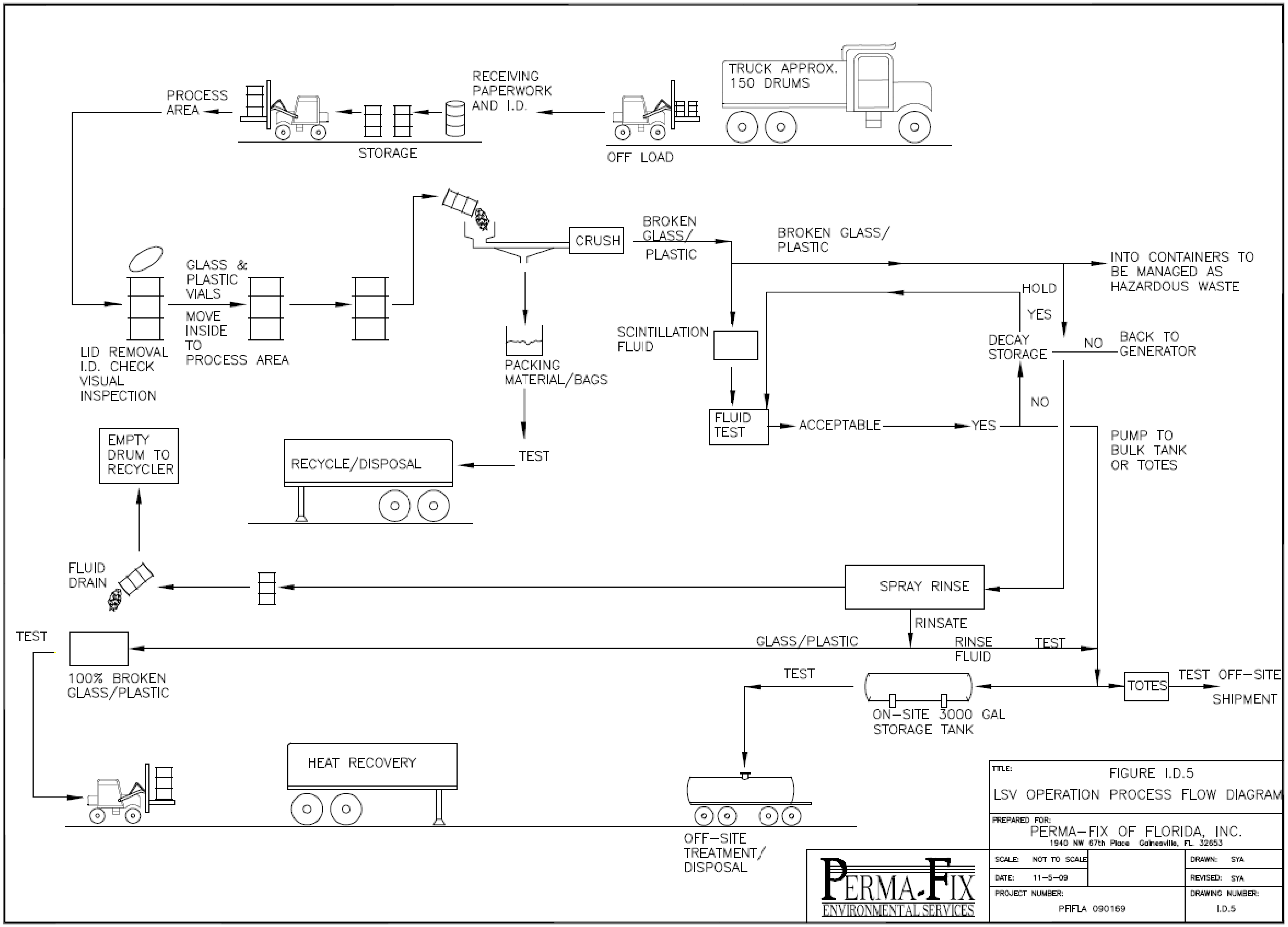
MORSE MFG. CO., INC.
727 West Manlius Street
P.O. Box 518
East Syracuse, NY 13057-0518
Phone: 315-437-8475
Fax: 315-437-1029
E-mail: service@morsemfgco.com
URL: www.morsemfgco.com

When ordering parts, specify part number and description, model number and serial number. Find model number and serial number on metal tag attached to Endover Rotator.

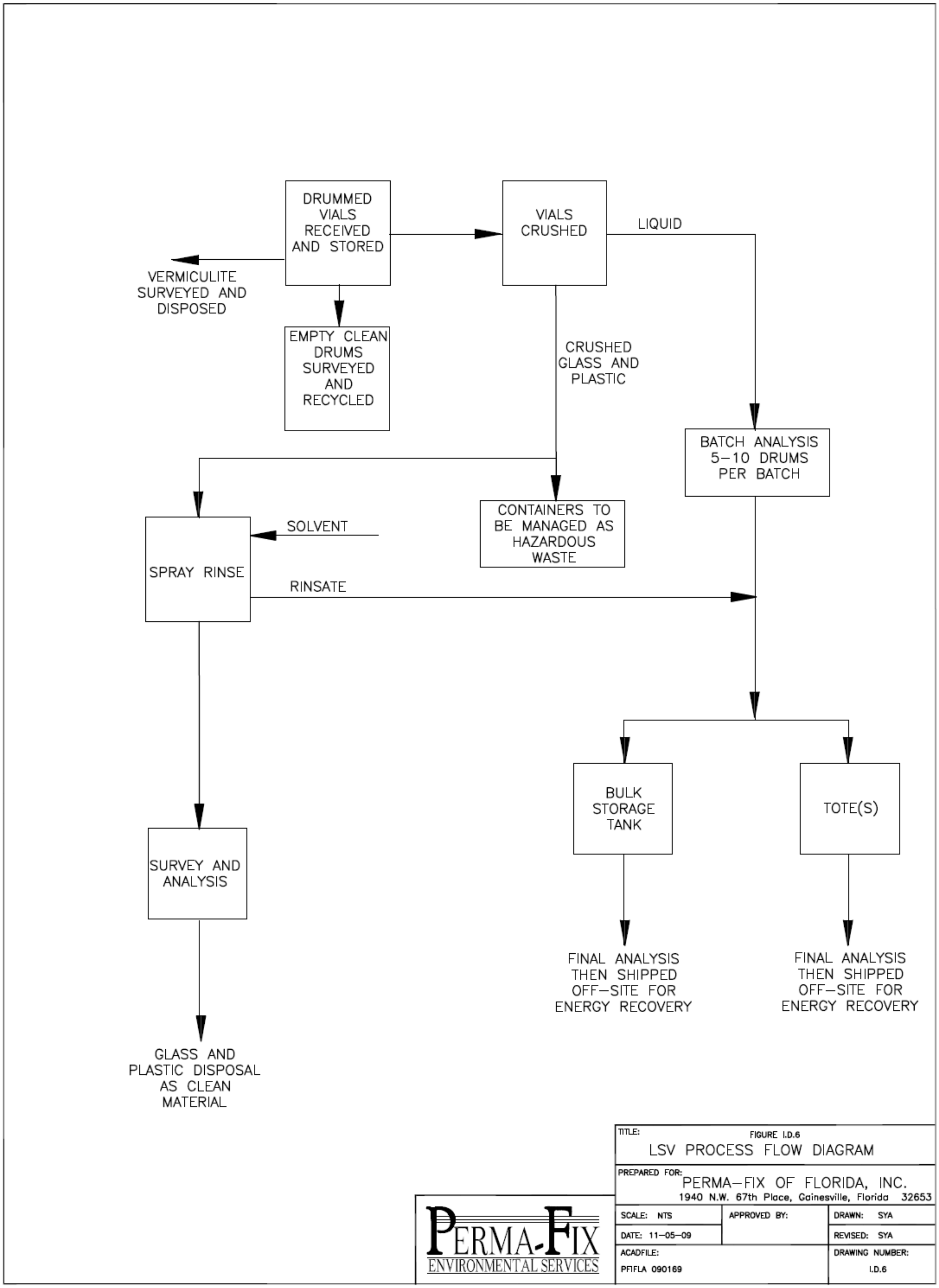
Form PL2-300 (Updated 3/2000)

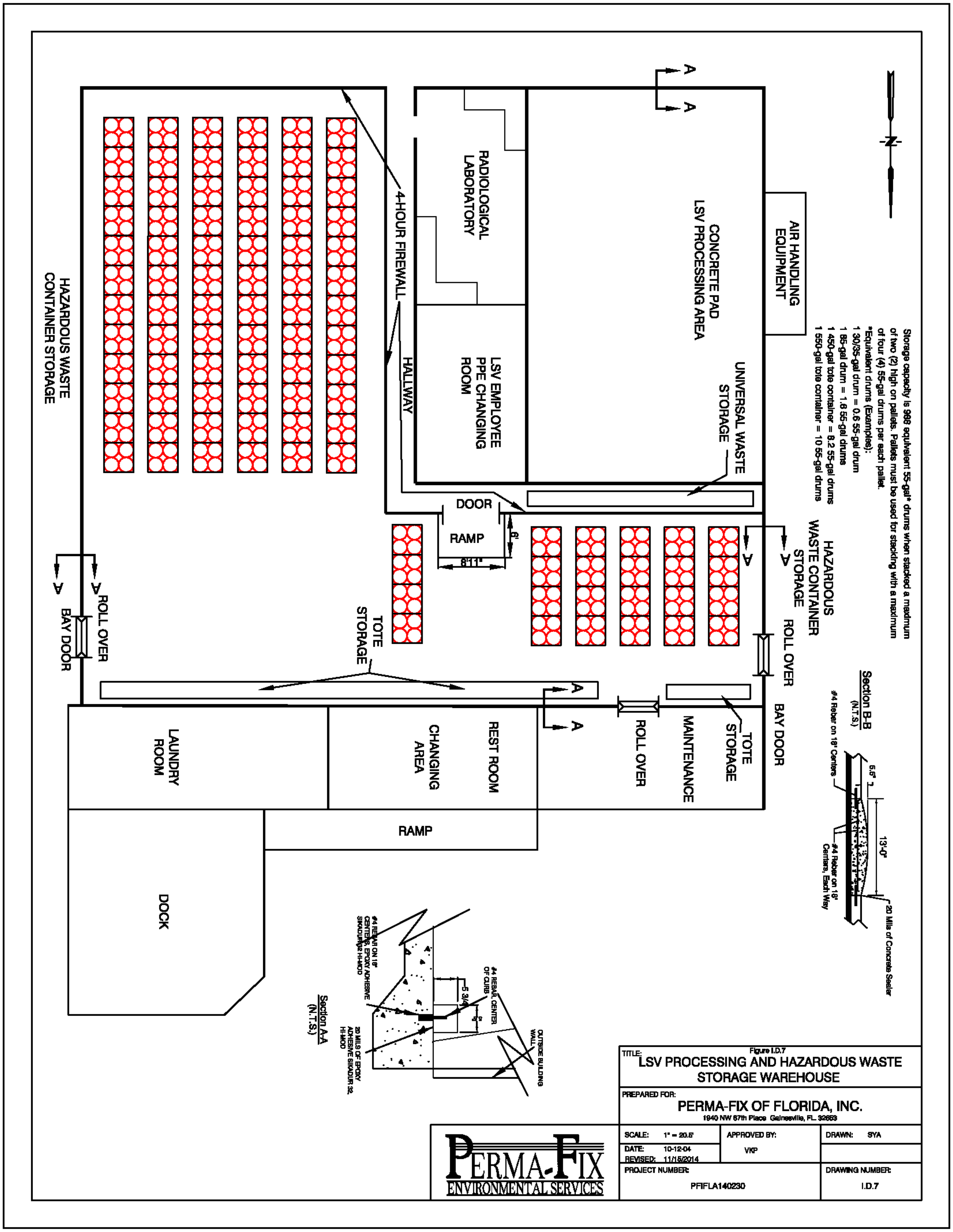
Figure I.D.3
Dual Drum Rotator Details


550-GALLON TOTES
250-GALLON DUMPER BOX
B
B
B
B
A
A
ZONE 1
Hazardous Waste Pumping Area
450-GALLON TOTES
Containment Area (3,000 Gallon Bulk Tank)
Totes Storage Area
Mixed Waste Pumping Area
ZONE 3
ZONE 2
Chemotherapy Waste Storage Area
INSPECTION AISLE
2' Typ.
DRUM STORAGE ROW
4' Typ.
N
0 7.5 15
Section A-A
(N.T.S.)
#4 Rebar, Center of Curb
6"
5-3/4"
Outside Building Wall
#4 Rebar on 18" Centers, Epoxy Adhesive Sikadur 32 Hi-Mod
20 Mils of Epoxy Adhesive Sikadure 32, Hi-Mod
ZONE 1 - 166 drum equivalents
ZONE 2 - 393 drum equivalents
ZONE 3 - 752 drum equivalents
Section B-B
(N.T.S.)
4'-10"
4"
20 Mils of Epoxy Adhesive Sikadure 32, Hi-Mod
#4 Rebar on 18" Centers
#4 Rebar on 18" Centers, Each Way
Storage capacity is 1311 equivalent 55 gal.* drums when stacked a maximum of two (2) high on pallets. Pallets must be used for stacking with a maximum of four (4) 55 gal. drums per each pallet.
* Equivalent drums (Examples)
1 30/35 gal. drum = .6 55 gal. drum
1 85 gal. drum = 1.6 55 gal. drums
1 450 gal. tote container = 8.2 55 gal. drums
1 550 gal. tote container = 10 55 gal. drums
PERMA-FIX
ENVIRONMENTAL SERVICES
TITLE:
Figure I.D.4
PROCESSING AND STORAGE BUILDING
PREPARED FOR:
PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL 32653
SCALE: 1 = 10
APPROVED BY: VKP
DRAWN: SYA
DATE: 11-12-04
REVISED:
PROJECT NUMBER: PFIFLA 040166
DRAWING NUMBER: 1D4

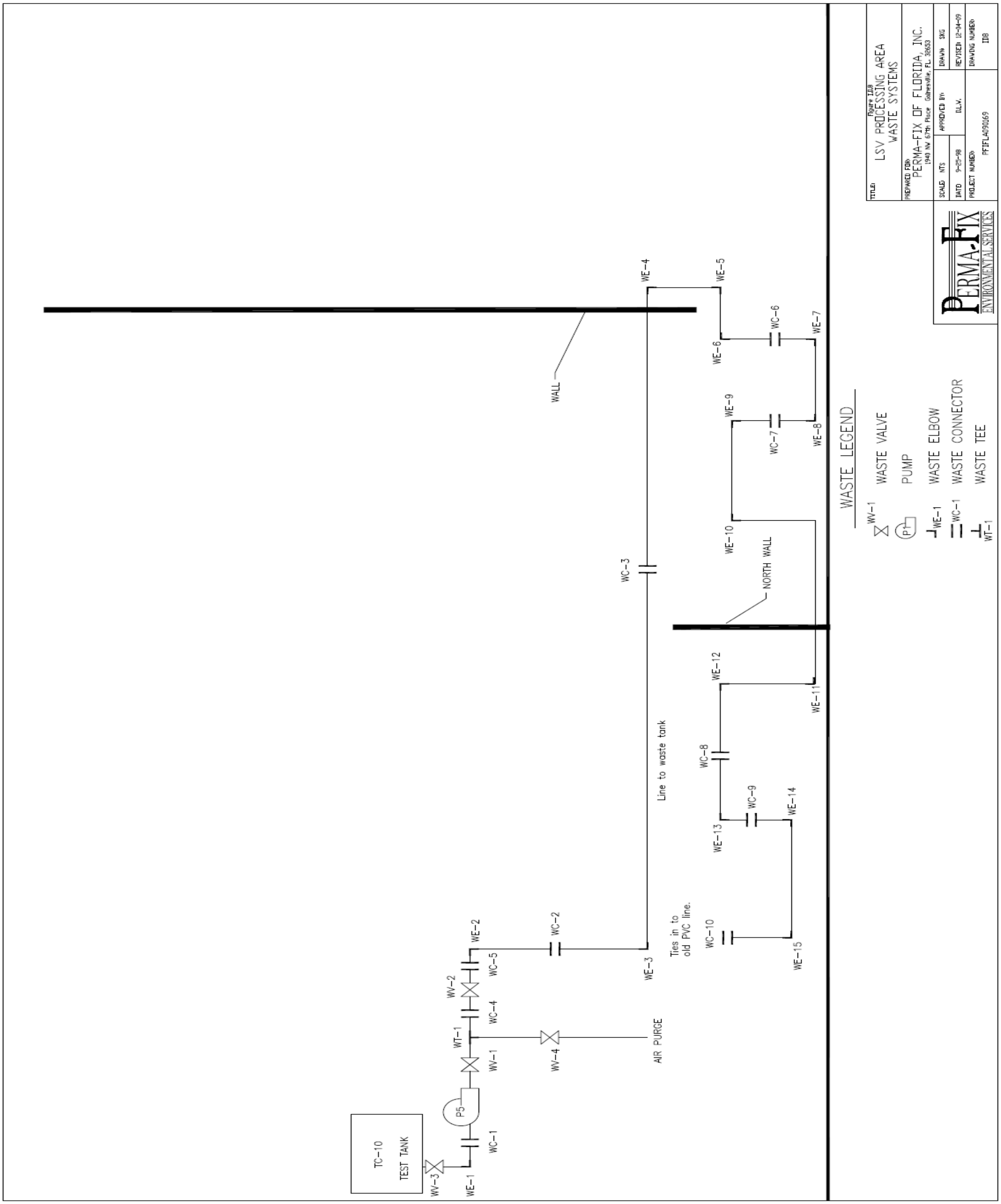


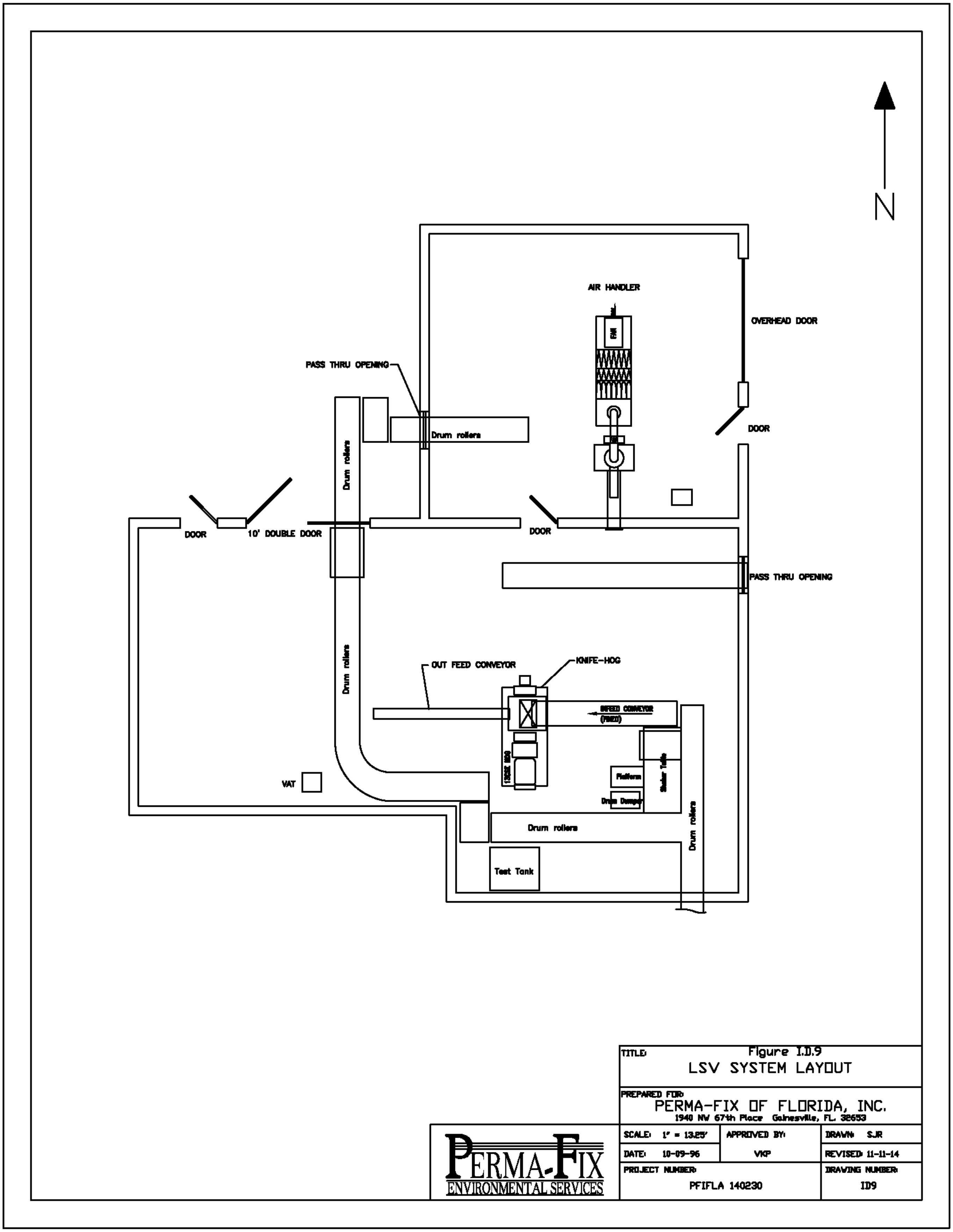
ATTACHMENT I.D.1


DRUMMED VIALS RECEIVED AND STORED
VIALS CRUSHED
LIQUID
VERMICULITE SURVEYED AND DISPOSED
EMPTY CLEAN DRUMS SURVEYED AND RECYCLED
CRUSHED GLASS AND PLASTIC
BATCH ANALYSIS 5–10 DRUMS PER BATCH
CONTAINERS TO BE MANAGED AS HAZARDOUS WASTE
SOLVENT
SPRAY RINSE
RINSATE
BULK STORAGE TANK
TOTE(S)
SURVEY AND ANALYSIS
FINAL ANALYSIS THEN SHIPPED OFF–SITE FOR ENERGY RECOVERY
FINAL ANALYSIS THEN SHIPPED OFF–SITE FOR ENERGY RECOVERY
GLASS AND PLASTIC DISPOSAL AS CLEAN MATERIAL
TITLE: FIGURE I.D.6
LSV PROCESS FLOW DIAGRAM
PREPARED FOR: PERMA–FIX OF FLORIDA, INC.
1940 N.W. 67th Place, Gainesville, Florida 32653
SCALE: NTS
APPROVED BY:
DRAWN: SYA
DATE: 11–05–09
REVISED: SYA
ACADFILE: PFIFLA 090169
DRAWING NUMBER: I.D.6
PERMA-FIX ENVIRONMENTAL SERVICES



Storage capacity is 988 equivalent 55-gal* drums when stacked a maximum of two (2) high on pallets. Pallets must be used for stacking with a maximum of four (4) 55-gal drums per each pallet.
*Equivalent drums (Examples):
1 30/35-gal drum = 0.6 55-gal drum
1 85-gal drum = 1.6 55-gal drums
1 450-gal tote container = 8.2 55-gal drums
1 550-gal tote container = 10 55-gal drums
AIR HANDLING EQUIPMENT
CONCRETE PAD LSV PROCESSING AREA
UNIVERSAL WASTE STORAGE
RADIOLOGICAL LABORATORY
LSV EMPLOYEE PPE CHANGING ROOM
HALLWAY
4-HOUR FIREWALL
HAZARDOUS WASTE CONTAINER STORAGE
DOOR
RAMP
8'11"
HAZARDOUS WASTE CONTAINER STORAGE
TOTE STORAGE
ROLL OVER BAY DOOR
ROLL OVER
MAINTENANCE
REST ROOM
CHANGING AREA
LAUNDRY ROOM
DOCK
Section B-B (N.T.S.)
#4 Rebar on 18" Centers
13'-0"
#4 Rebar on 18" Centers, Each Way
20 Mils of Concrete Sealer
Section A-A (N.T.S.)
#4 REBAR, CENTER OF CURB
OUTSIDE BUILDING WALL
20 MILS OF EPOXY ADHESIVE SIKADUR 32, HI-MOD
TITLE: Figure I.D.7
LSV PROCESSING AND HAZARDOUS WASTE STORAGE WAREHOUSE
PREPARED FOR:
PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL 32653
SCALE: 1" = 20.5'
APPROVED BY: VKP
DRAWN: SYA
DATE: 10-12-04
REVISED: 11/15/2014
PROJECT NUMBER: PFIFLA140230
DRAWING NUMBER: I.D.7
PERMA-FIX ENVIRONMENTAL SERVICES


LSV PROCESSING AREA
WASTE SYSTEMS
PERMA-FIX OF FLORIDA, INC.
WASTE LEGEND
WASTE VALVE
PUMP
WASTE ELBOW
WASTE CONNECTOR
WASTE TEE
TC-10
TEST TANK
AIR PURGE
Line to waste tank
Ties in to old PVC line.
NORTH WALL
WALL


N
AIR HANDLER
OVERHEAD DOOR
PASS THRU OPENING
Drum rollers
DOOR
10' DOUBLE DOOR
DOOR
DOOR
PASS THRU OPENING
Drum rollers
OUT FEED CONVEYOR
KNIFE-HOG
INFEED CONVEYOR (FIXED)
VAT
Platform
Drum Dumper
Drum rollers
Drum rollers
Test Tank
TITLE: Figure I.D.9
LSV SYSTEM LAYOUT
PREPARED FOR: PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL. 32653
SCALE: 1" = 13.25'
APPROVED BY: VKP
DRAWN: SJR
DATE: 10-09-96
REVISED: 11-11-14
PROJECT NUMBER: PFIFLA 140230
DRAWING NUMBER: ID9
PERMA-FIX ENVIRONMENTAL SERVICES

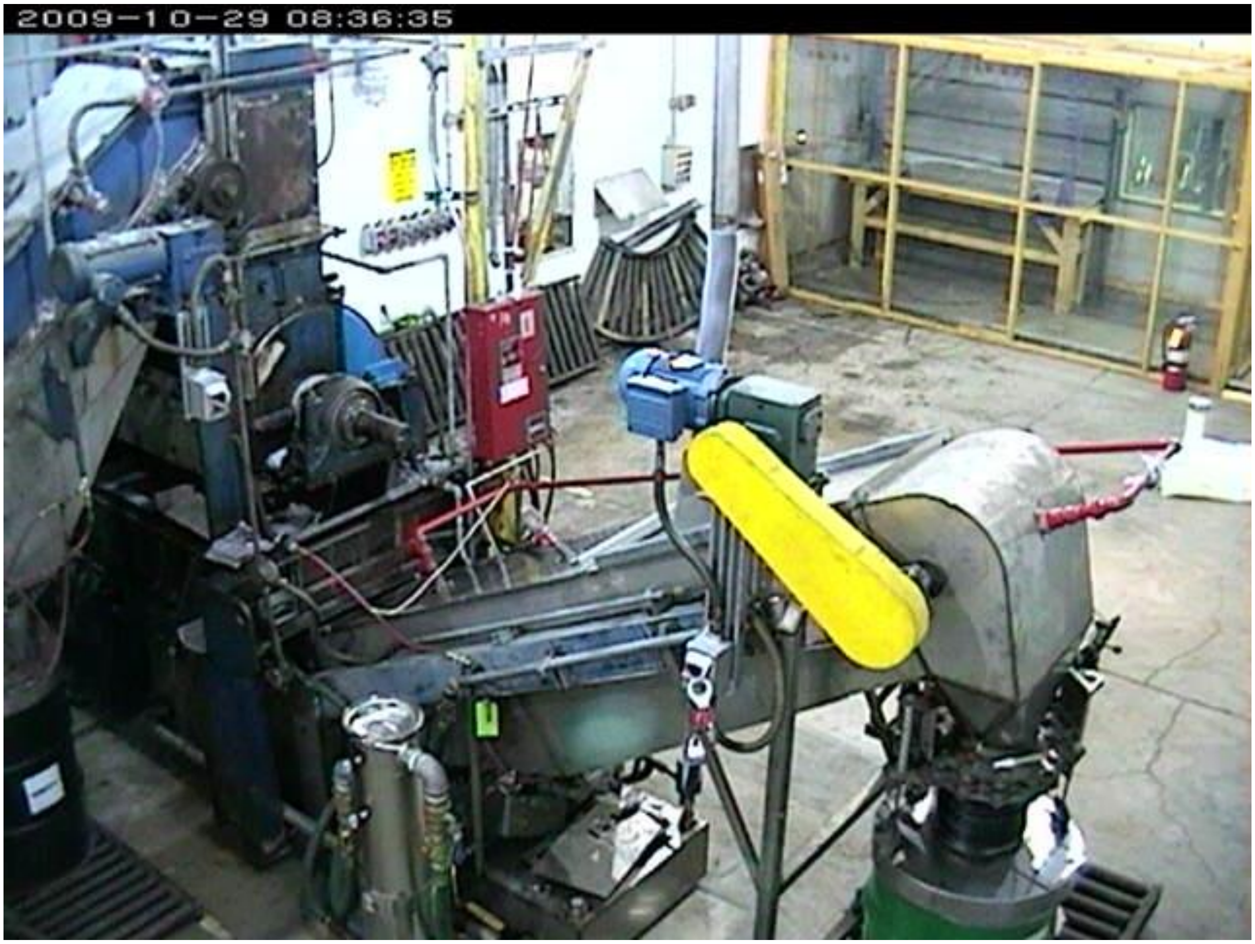


Figure I.D.10
LSV Process Equipment

Figure I.D.11.1
Waste Management Decision Tree

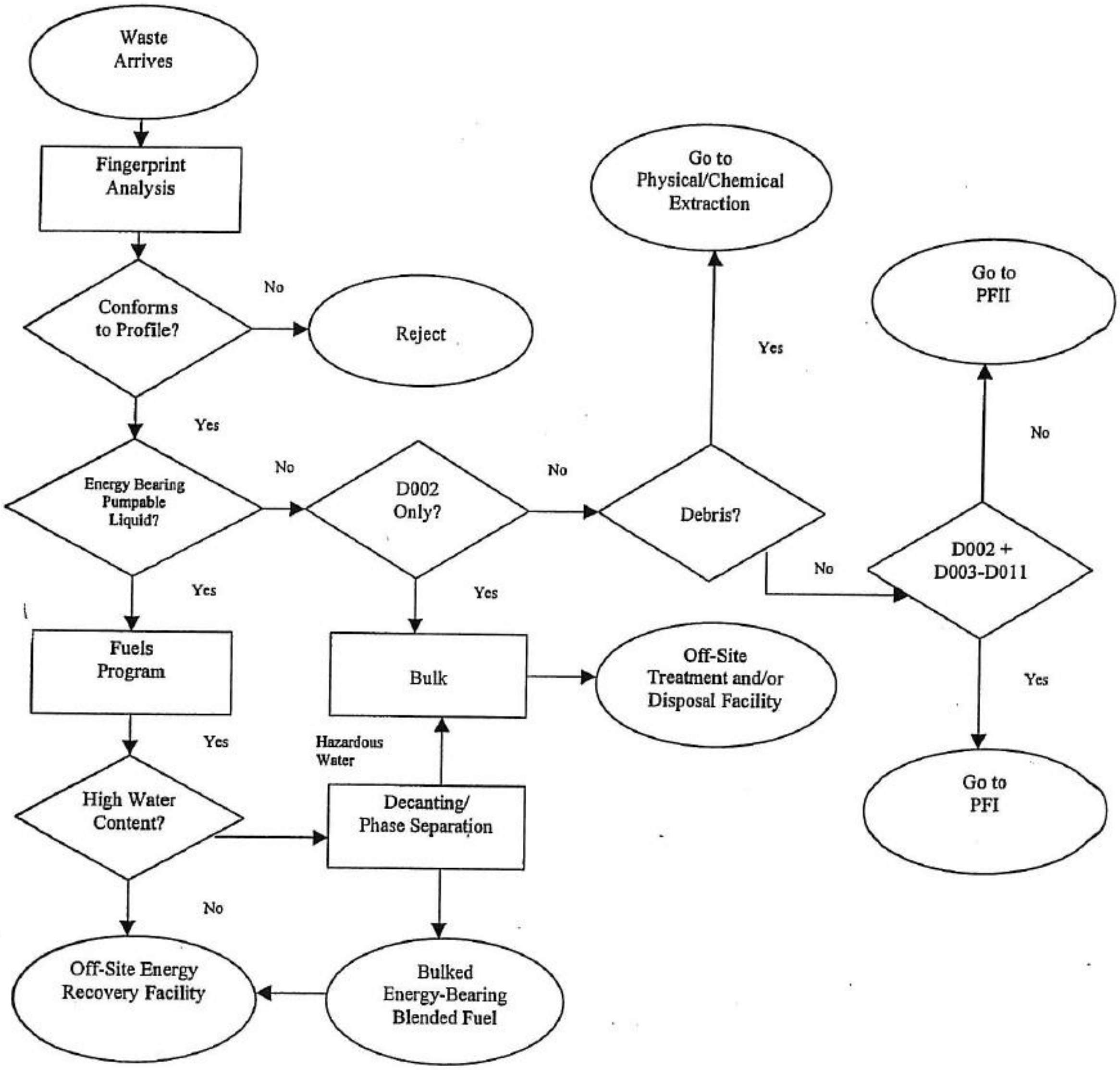
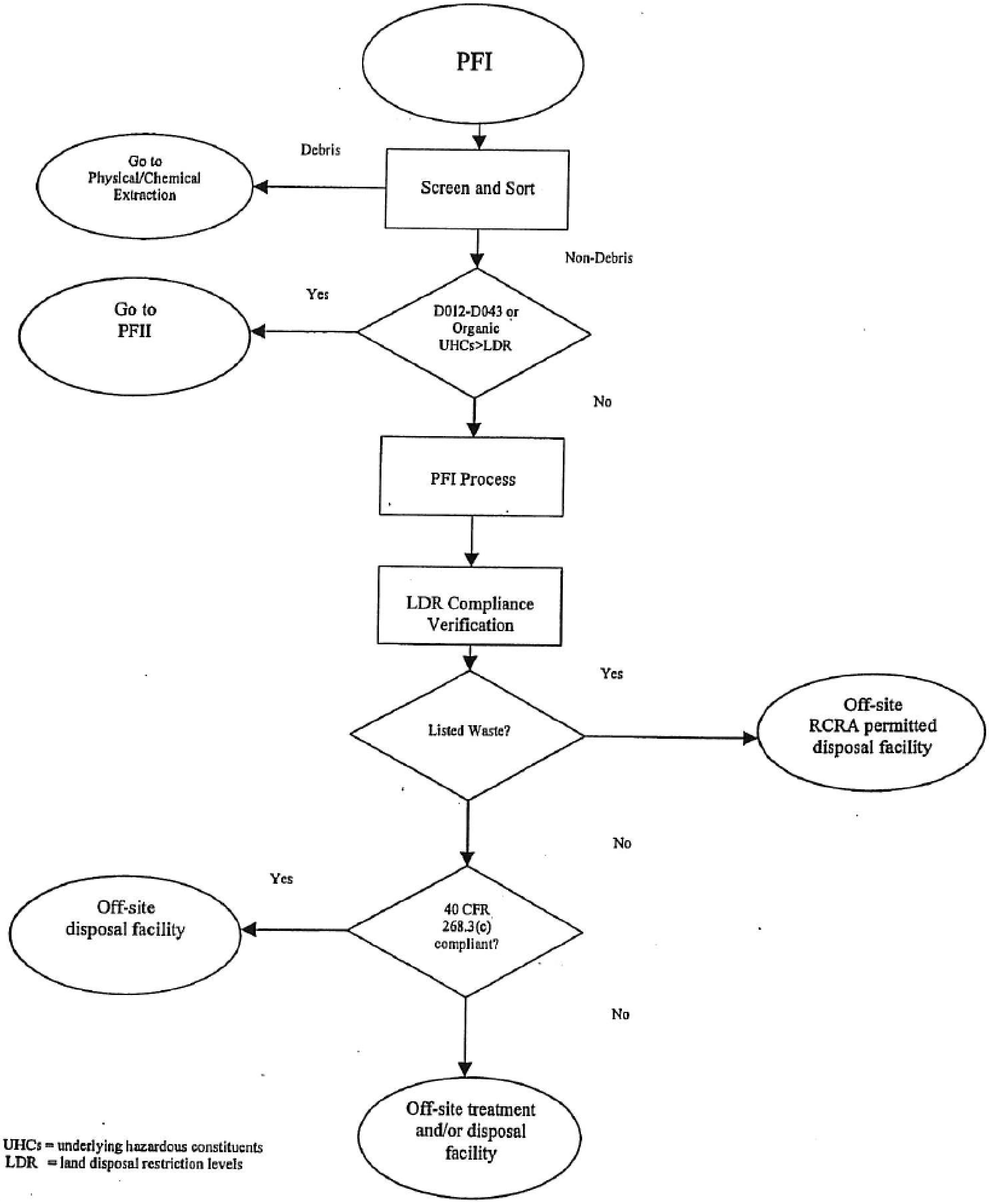


Figure I.D.11.2
Waste Management Decision Tree



[1] UHCs = underlying hazardous constituents
LDR = land disposal restriction levels

Figure I.D.11.3
Waste Management Decision Tree

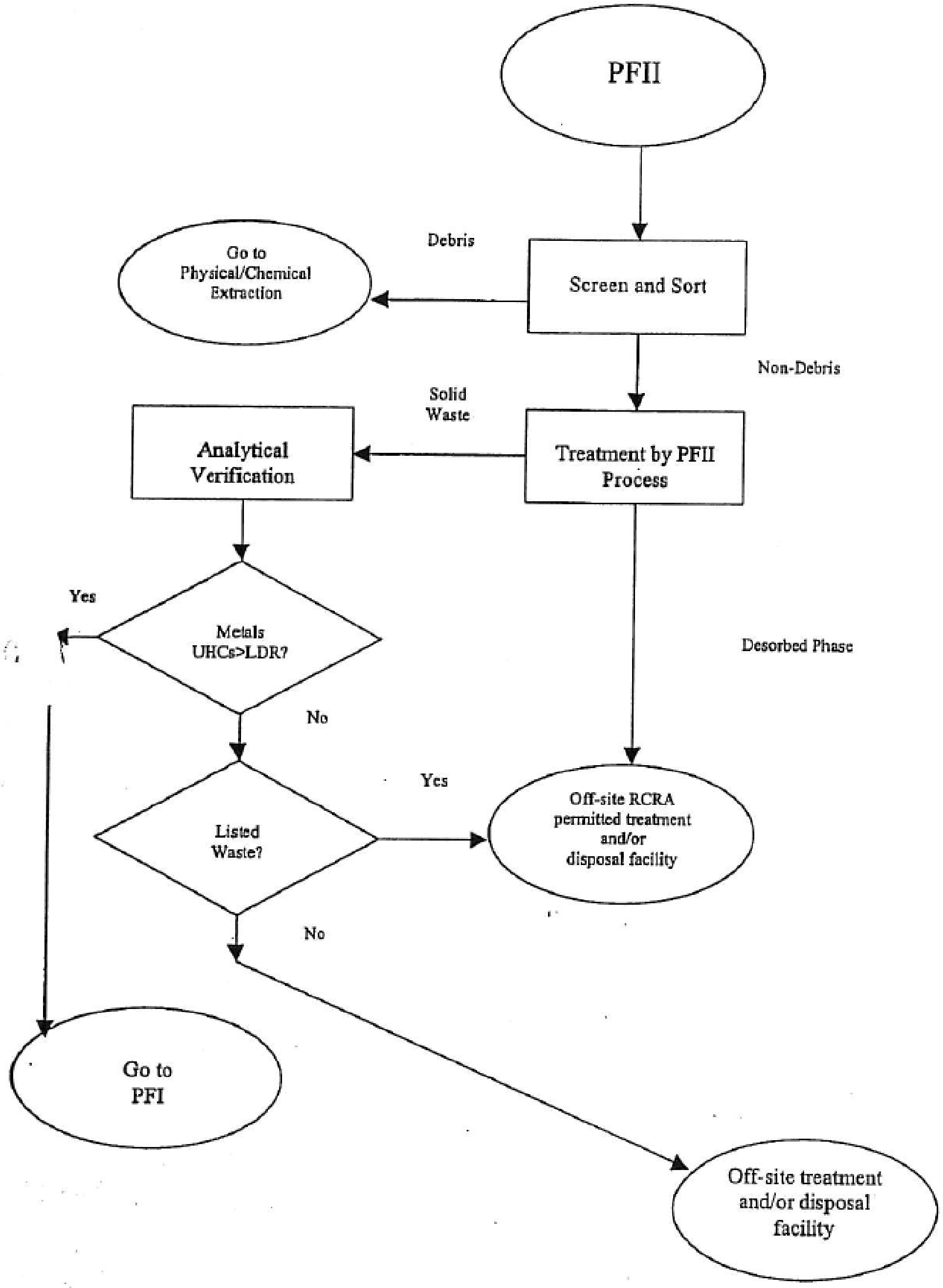
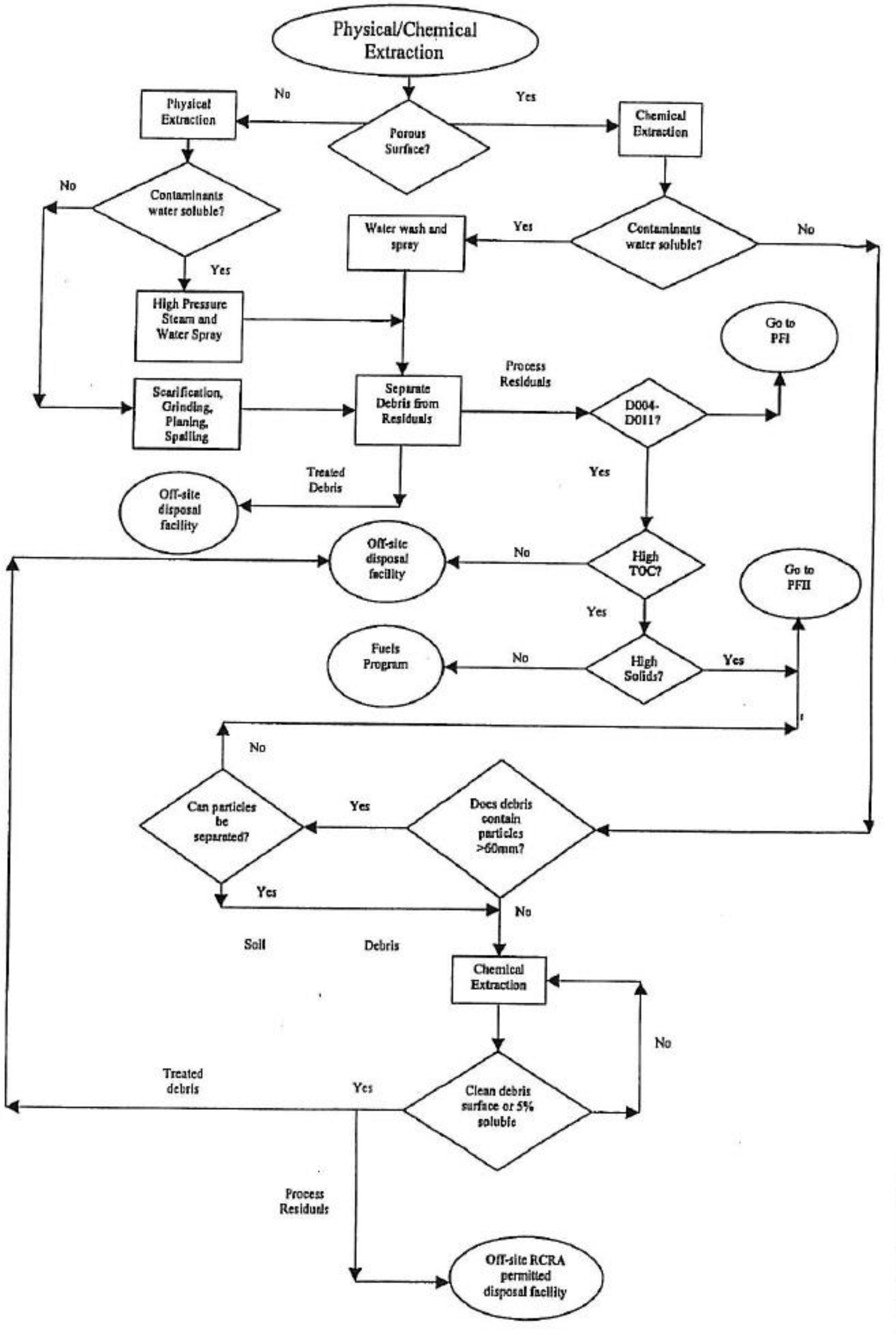
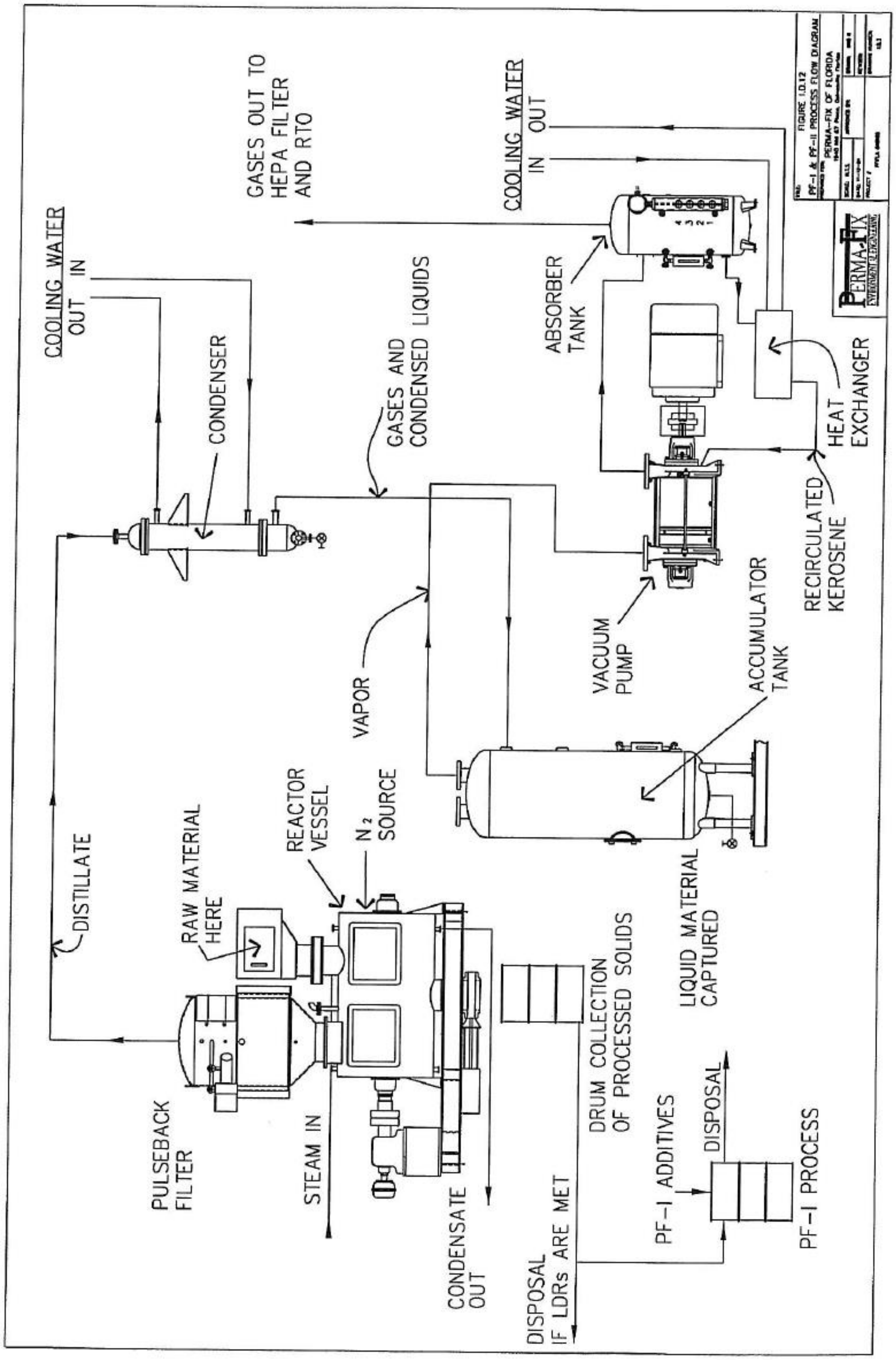
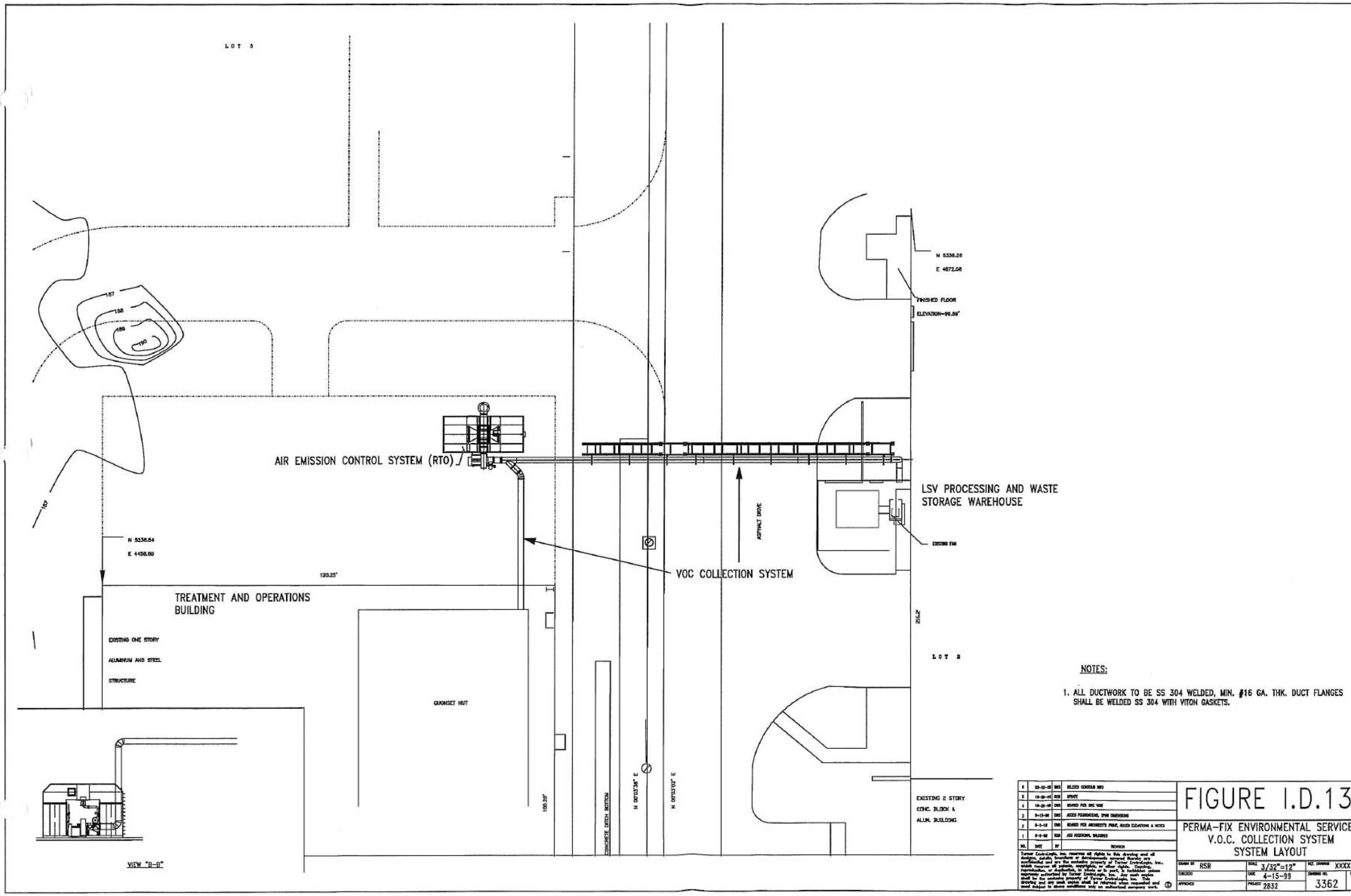
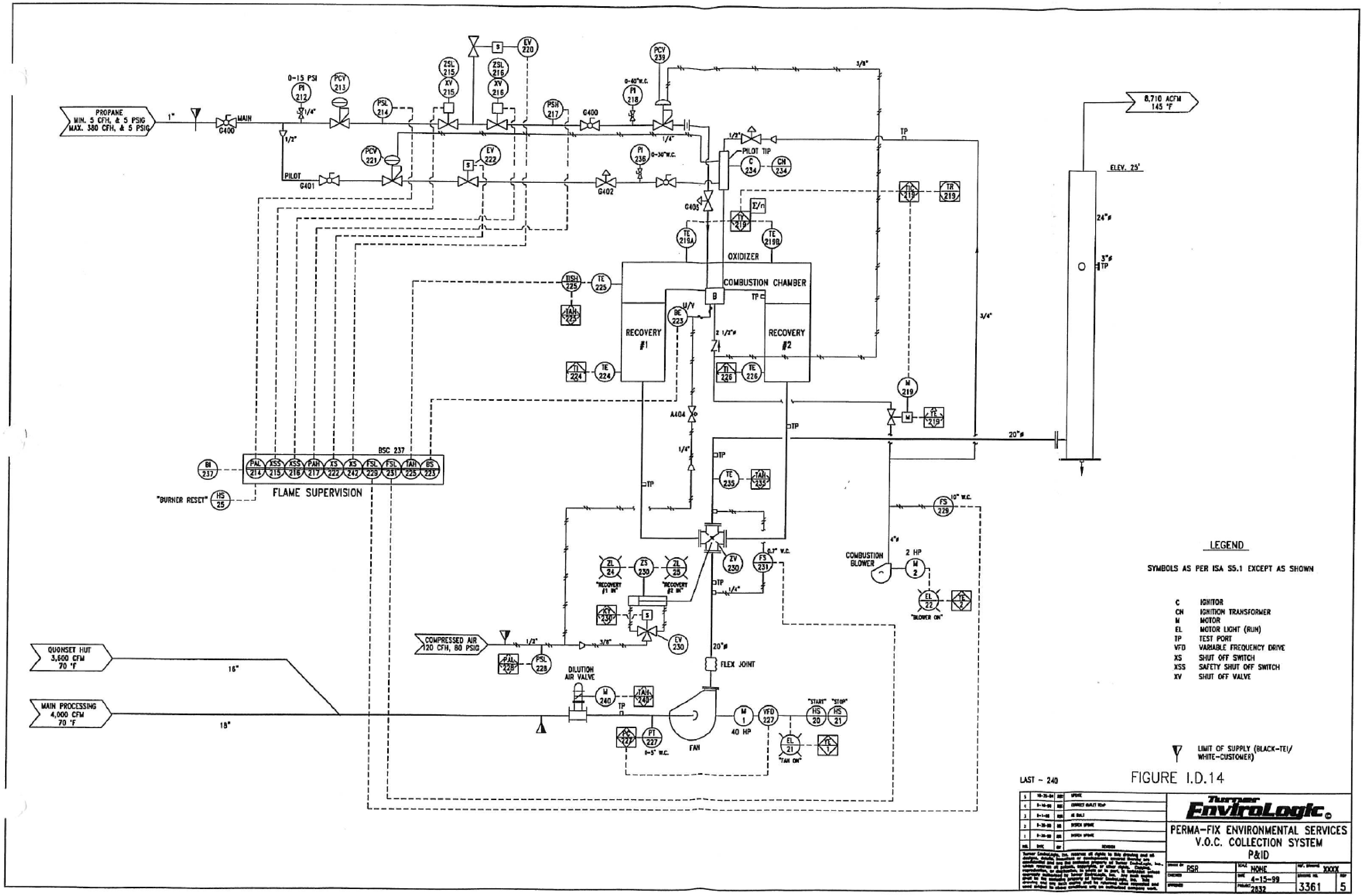


Figure I.D.11.4
Waste Management Decision Tree




COOLING WATER
OUT IN
CONDENSER
GASES OUT TO
HEPA FILTER
AND RTO
COOLING WATER
IN OUT
GASES AND
CONDENSED LIQUIDS
ABSORBER
TANK
HEAT
EXCHANGER
RECIRCULATED
KEROSENE
VACUUM
PUMP
ACCUMULATOR
TANK
VAPOR
DISTILLATE
RAW MATERIAL
HERE
REACTOR
VESSEL
N_2
SOURCE
LIQUID MATERIAL
CAPTURED
DRUM COLLECTION
OF PROCESSED SOLIDS
PULSEBACK
FILTER
STEAM IN
CONDENSATE
OUT
DISPOSAL
IF LDRs ARE MET
PF-I ADDITIVES
DISPOSAL
PF-I PROCESS
FIGURE I.D.12
PF-I & PF-II PROCESS FLOW DIAGRAM
PERMA-FIX OF FLORIDA
PERMA-FIX


LOT 3
AIR EMISSION CONTROL SYSTEM (RTO)
VOC COLLECTION SYSTEM
ASPHALT DRIVE
LSV PROCESSING AND WASTE STORAGE WAREHOUSE
TREATMENT AND OPERATIONS BUILDING
EXISTING ONE STORY ALUMINUM AND STEEL STRUCTURE
QUONSET HUT
CONCRETE DITCH BOTTOM
EXISTING 2 STORY CONC. BLOCK & ALUM. BUILDING
LOT 2
VIEW "D-D"
NOTES:
1. ALL DUCTWORK TO BE SS 304 WELDED, MIN. #16 GA. THK. DUCT FLANGES SHALL BE WELDED SS 304 WITH VITON GASKETS.
FIGURE I.D.13
PERMA-FIX ENVIRONMENTAL SERVICES
V.O.C. COLLECTION SYSTEM
SYSTEM LAYOUT
RSR
3/32"=12"
4-15-99
2832
XXXX
3362
5


PROPANE
MIN. 5 CFH, & 5 PSIG
MAX. 380 CFH, & 5 PSIG
MAIN
PILOT
G400
G401
G402
G405
0-15 PSI
0-40"W.C.
0-30"W.C.
PILOT TIP
OXIDIZER
COMBUSTION CHAMBER
RECOVERY #1
RECOVERY #2
U/V
A404
8,710 ACFM
145 °F
ELEV. 25'
BSC 237
FLAME SUPERVISION
"BURNER RESET"
COMBUSTION BLOWER
2 HP
"BLOWER ON"
"RECOVERY #1 IN"
"RECOVERY #2 IN"
COMPRESSED AIR
120 CFH, 80 PSIG
FLEX JOINT
QUONSET HUT
3,600 CFM
70 °F
MAIN PROCESSING
4,000 CFM
70 °F
DILUTION AIR VALVE
FAN
40 HP
"START" "STOP"
"FAN ON"
0-5" W.C.
LEGEND
SYMBOLS AS PER ISA S5.1 EXCEPT AS SHOWN
C IGNITOR
CN IGNITION TRANSFORMER
M MOTOR
EL MOTOR LIGHT (RUN)
TP TEST PORT
VFD VARIABLE FREQUENCY DRIVE
XS SHUT OFF SWITCH
XSS SAFETY SHUT OFF SWITCH
XV SHUT OFF VALVE
LIMIT OF SUPPLY (BLACK-TEI/ WHITE-CUSTOMER)
LAST - 240
FIGURE I.D.14
Turner EnviroLogic
PERMA-FIX ENVIRONMENTAL SERVICES
V.O.C. COLLECTION SYSTEM
P&ID
RSR
NONE
XXXX
4-15-99
2832
3361
5

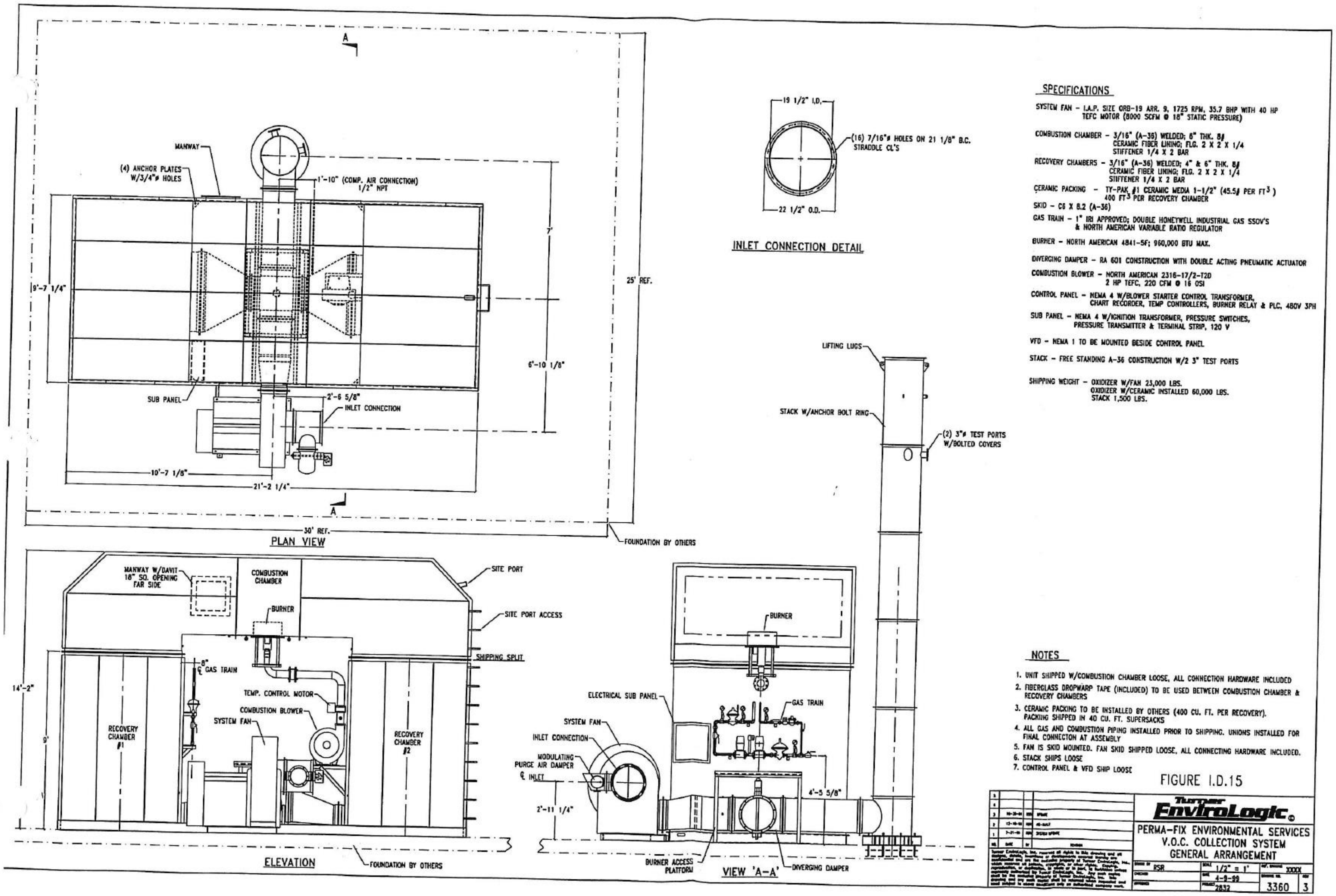
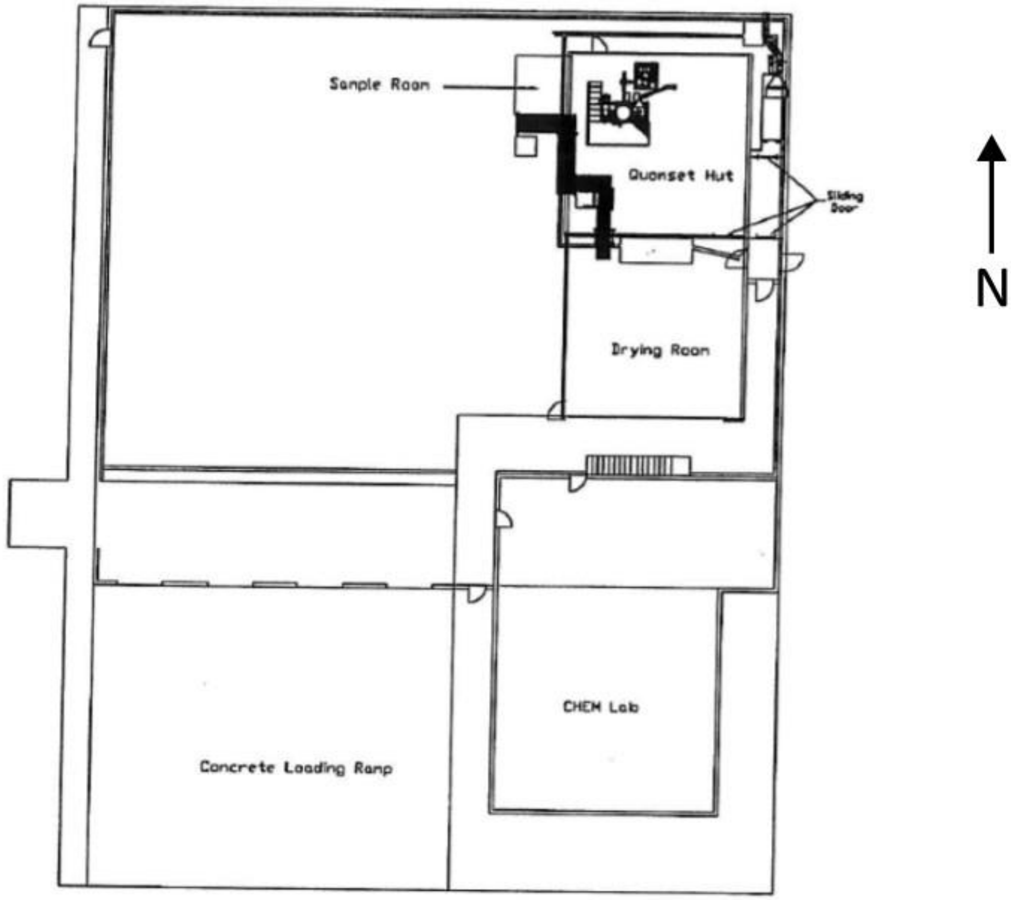

SPECIFICATIONS
SYSTEM FAN – I.A.P. SIZE ORB-19 ARR. 9, 1725 RPM, 35.7 BHP WITH 40 HP TEFC MOTOR (8000 SCFM @ 18" STATIC PRESSURE)
COMBUSTION CHAMBER – 3/16" (A-36) WELDED; 6" THK. 8# CERAMIC FIBER LINING; FLG. 2 X 2 X 1/4 STIFFENER 1/4 X 2 BAR
RECOVERY CHAMBERS – 3/16" (A-36) WELDED; 4" & 6" THK. 8# CERAMIC FIBER LINING; FLG. 2 X 2 X 1/4 STIFFENER 1/4 X 2 BAR
CERAMIC PACKING – TY-PAK #1 CERAMIC MEDIA 1-1/2" (45.5# PER FT^3) 400 FT^3 PER RECOVERY CHAMBER
SKID – C6 X 8.2 (A-36)
GAS TRAIN – 1" IRI APPROVED; DOUBLE HONEYWELL INDUSTRIAL GAS SSOV'S & NORTH AMERICAN VARIABLE RATIO REGULATOR
BURNER – NORTH AMERICAN 4841-5F; 960,000 BTU MAX.
DIVERGING DAMPER – RA 601 CONSTRUCTION WITH DOUBLE ACTING PNEUMATIC ACTUATOR
COMBUSTION BLOWER – NORTH AMERICAN 2316-17/2-T2D 2 HP TEFC, 220 CFM @ 16 OSI
CONTROL PANEL – NEMA 4 W/BLOWER STARTER CONTROL TRANSFORMER, CHART RECORDER, TEMP CONTROLLERS, BURNER RELAY & PLC, 480V 3PH
SUB PANEL – NEMA 4 W/IGNITION TRANSFORMER, PRESSURE SWITCHES, PRESSURE TRANSMITTER & TERMINAL STRIP, 120 V
VFD – NEMA 1 TO BE MOUNTED BESIDE CONTROL PANEL
STACK – FREE STANDING A-36 CONSTRUCTION W/2 3" TEST PORTS
SHIPPING WEIGHT – OXIDIZER W/FAN 23,000 LBS. OXIDIZER W/CERAMIC INSTALLED 60,000 LBS. STACK 1,500 LBS.
INLET CONNECTION DETAIL
19 1/2" I.D.
(16) 7/16"# HOLES ON 21 1/8" B.C. STRADDLE CL'S
22 1/2" O.D.
PLAN VIEW
MANWAY
(4) ANCHOR PLATES W/3/4"# HOLES
1'-10" (COMP. AIR CONNECTION) 1/2" NPT
SUB PANEL
2'-6 5/8"
INLET CONNECTION
10'-7 1/8"
21'-2 1/4"
9'-7 1/4"
7'
6'-10 1/8"
25' REF.
30' REF.
FOUNDATION BY OTHERS
ELEVATION
MANWAY W/DAVIT 18" SQ. OPENING FAR SIDE
COMBUSTION CHAMBER
BURNER
SITE PORT
SITE PORT ACCESS
SHIPPING SPLIT
GAS TRAIN
TEMP. CONTROL MOTOR
COMBUSTION BLOWER
SYSTEM FAN
RECOVERY CHAMBER #1
RECOVERY CHAMBER #2
14'-2"
9'
VIEW 'A-A'
ELECTRICAL SUB PANEL
SYSTEM FAN
INLET CONNECTION
MODULATING PURGE AIR DAMPER
INLET
2'-11 1/4"
4'-5 5/8"
BURNER ACCESS PLATFORM
DIVERGING DAMPER
LIFTING LUGS
STACK W/ANCHOR BOLT RING
(2) 3"# TEST PORTS W/BOLTED COVERS
NOTES
1. UNIT SHIPPED W/COMBUSTION CHAMBER LOOSE, ALL CONNECTION HARDWARE INCLUDED
2. FIBERGLASS DROPWARP TAPE (INCLUDED) TO BE USED BETWEEN COMBUSTION CHAMBER & RECOVERY CHAMBERS
3. CERAMIC PACKING TO BE INSTALLED BY OTHERS (400 CU. FT. PER RECOVERY). PACKING SHIPPED IN 40 CU. FT. SUPERSACKS
4. ALL GAS AND COMBUSTION PIPING INSTALLED PRIOR TO SHIPPING. UNIONS INSTALLED FOR FINAL CONNECTON AT ASSEMBLY
5. FAN IS SKID MOUNTED. FAN SKID SHIPPED LOOSE, ALL CONNECTING HARDWARE INCLUDED.
6. STACK SHIPS LOOSE
7. CONTROL PANEL & VFD SHIP LOOSE
Turner EnviroLogic
PERMA-FIX ENVIRONMENTAL SERVICES
V.O.C. COLLECTION SYSTEM
GENERAL ARRANGEMENT
RSR
1/2" = 1'
XXXX
4-9-99
2832
3360
3

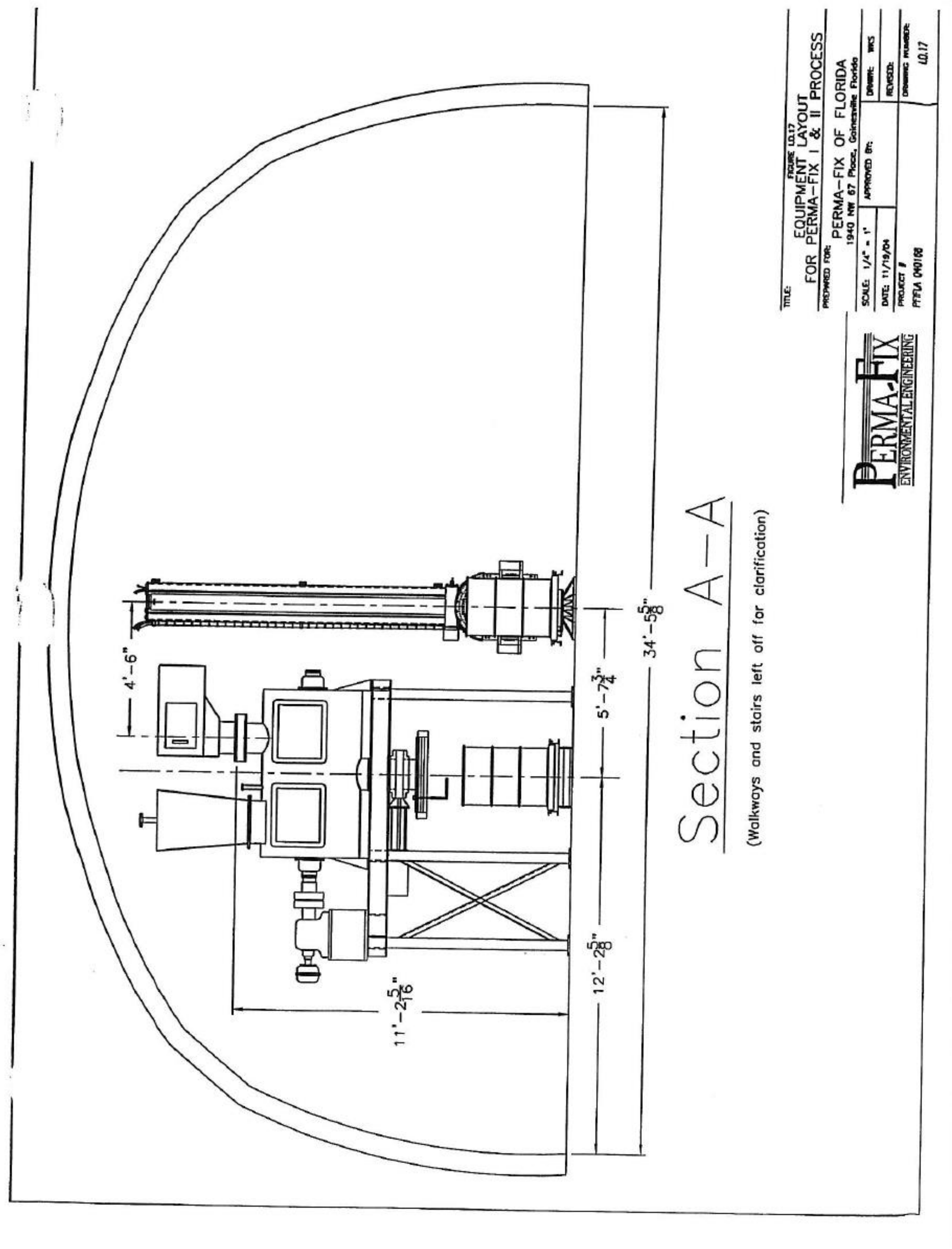
FIGURE I.D.15



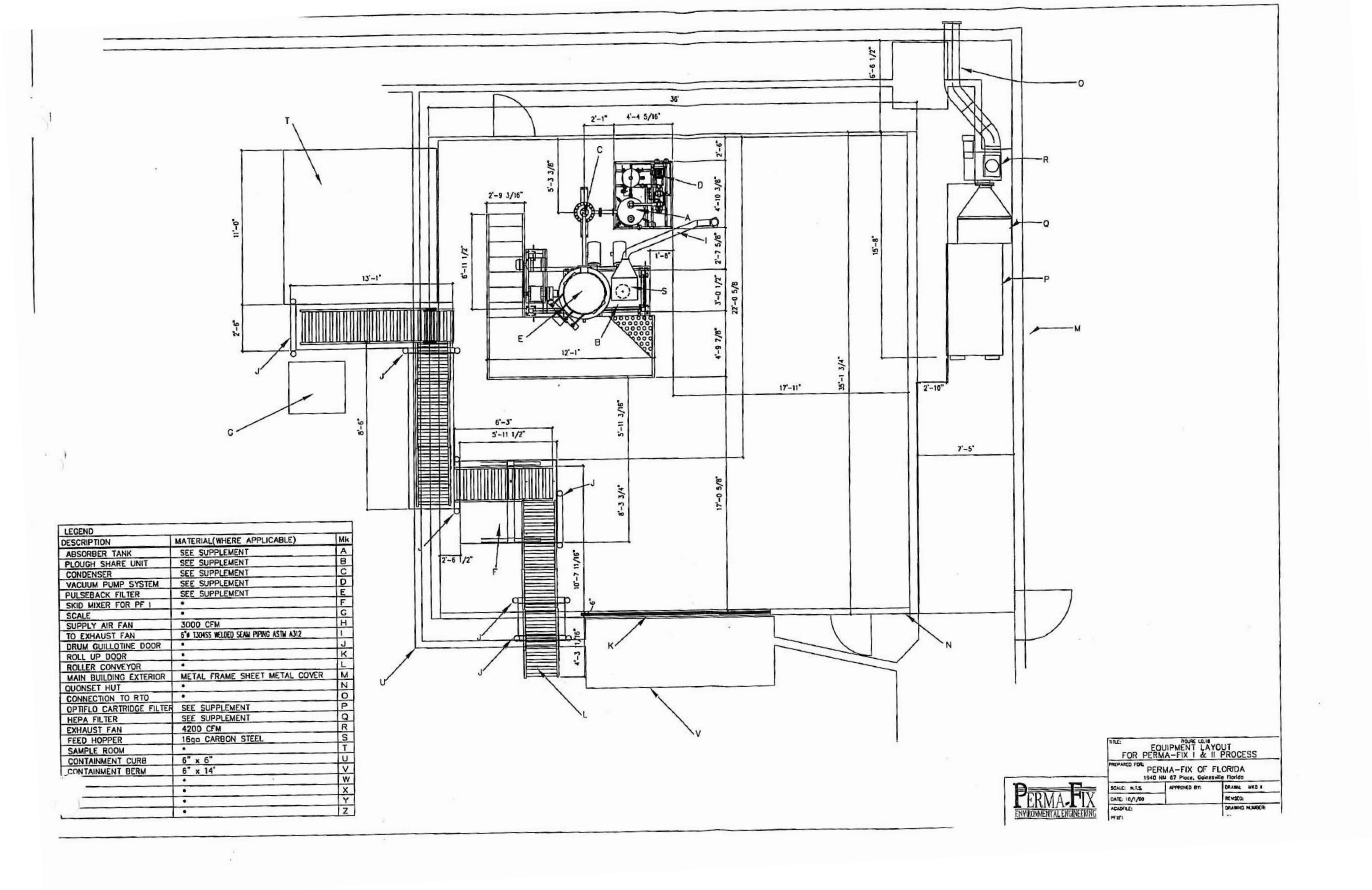
SEE FIGURE I.D.18 FOR DETAILS OF PF-I & PF-II EQUIPMENT

TITLE: Figure I.D.16 EQUIPMENT LAYOUT FOR PERMA-FIX I & II PROCESS		
PREPARED FOR: PERMA-FIX OF FLORIDA, INC. 1940 NW 67th Place Gainesville, FL 32653		
SCALE: 1" = 34.3'	APPROVED BY: VKP	DRAWN: SYA
DATE: 11-30-04		REVISED: 11/15/2014
PROJECT NUMBER: PFIFLA 140230		DRAWING NUMBER: I.D.16

PERMA-FIX ENVIRONMENTAL SERVICES



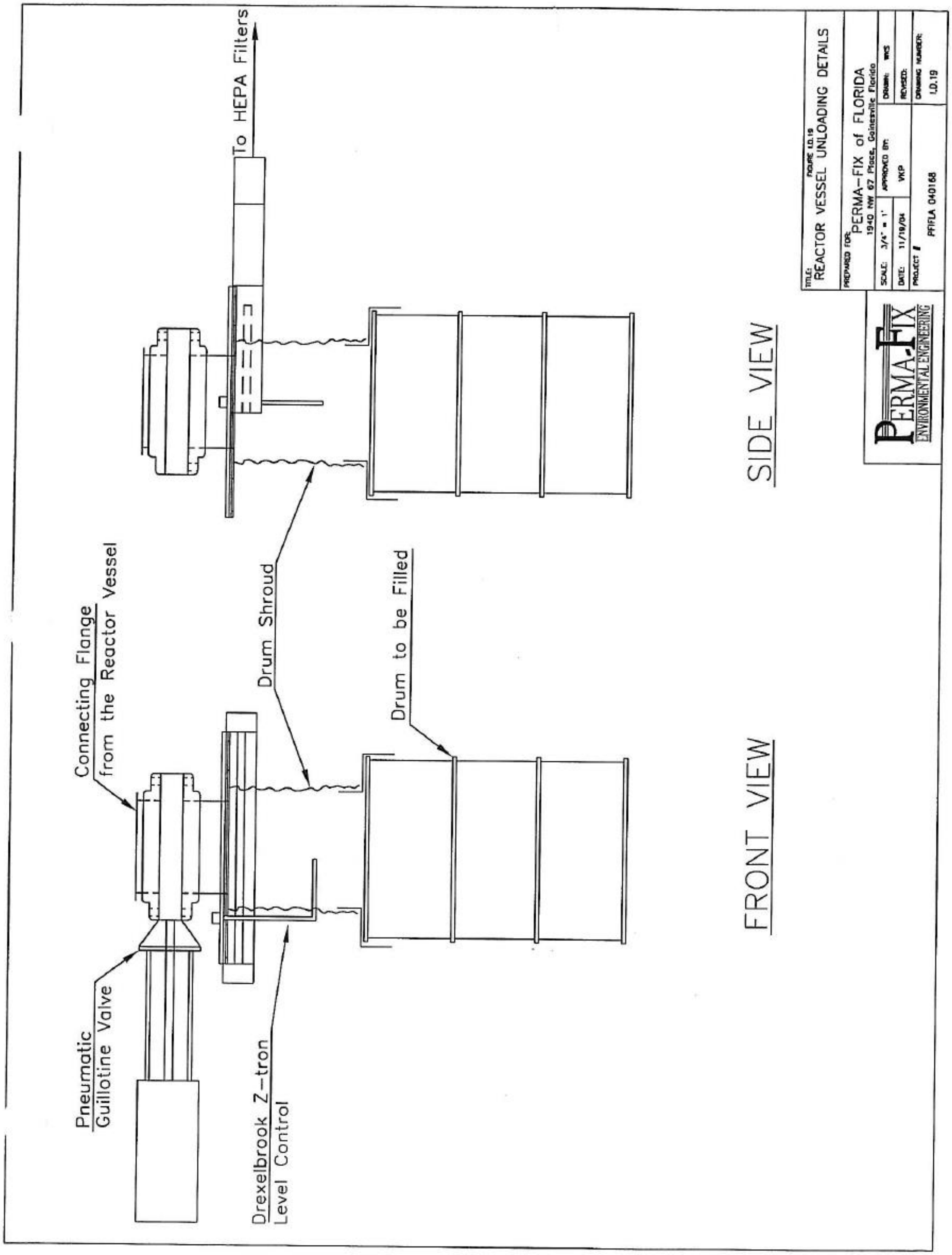
TITLE:
FIGURE I.D.17
EQUIPMENT LAYOUT
FOR PERMA-FIX I & II PROCESS
PREPARED FOR:
PERMA-FIX OF FLORIDA
1940 NW 67 Place, Gainesville Florida
SCALE: 1/4" = 1'
DATE: 11/19/04
PROJECT #
PFFLA 040168
APPROVED BY:
DRAWN:
REVISED:
DRAWING NUMBER:
I.D.17
PERMA-FIX
ENVIRONMENTAL ENGINEERING
Section A-A
(Walkways and stairs left off for clarification)
4'-6"
5'-7 3/4"
34'-5 5/8"
12'-2 5/8"
11'-2 5/16"

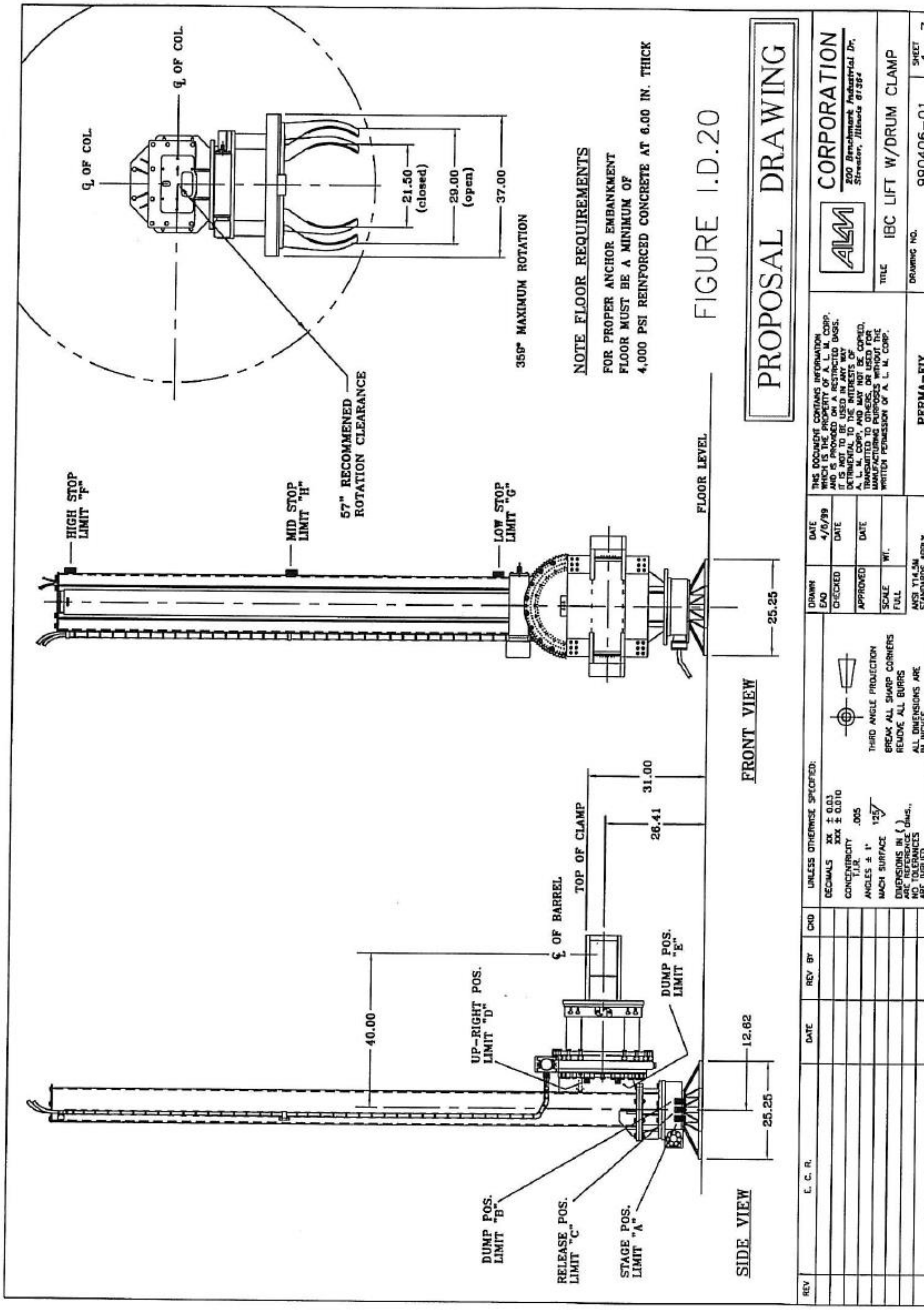


LEGEND

DESCRIPTION	MATERIAL(WHERE APPLICABLE)	Mk
ABSORBER TANK	SEE SUPPLEMENT	A
PLOUGH SHARE UNIT	SEE SUPPLEMENT	B
CONDENSER	SEE SUPPLEMENT	C
VACUUM PUMP SYSTEM	SEE SUPPLEMENT	D
PULSEBACK FILTER	SEE SUPPLEMENT	E
SKID MIXER FOR PF I	•	F
SCALE	•	G
SUPPLY AIR FAN	3000 CFM	H
TO EXHAUST FAN	6"ø T304SS WELDED SEAM PIPING ASTM A312	I
DRUM GUILLOTINE DOOR	•	J
ROLL UP DOOR	•	K
ROLLER CONVEYOR	•	L
MAIN BUILDING EXTERIOR	METAL FRAME SHEET METAL COVER	M
QUONSET HUT	•	N
CONNECTION TO RTO	•	O
OPTIFLO CARTRIDGE FILTER	SEE SUPPLEMENT	P
HEPA FILTER	SEE SUPPLEMENT	Q
EXHAUST FAN	4200 CFM	R
FEED HOPPER	16ga CARBON STEEL	S
SAMPLE ROOM	•	T
CONTAINMENT CURB	6" x 6"	U
CONTAINMENT BERM	6" x 14'	V
	•	W
	•	X
	•	Y
	•	Z

ATTACHMENT I.D.1


To HEPA Filters
Connecting Flange
from the Reactor Vessel
Drum Shroud
Drum to be Filled
Pneumatic
Guillotine Valve
Drexelbrook Z-tron
Level Control
FRONT VIEW
SIDE VIEW
REACTOR VESSEL UNLOADING DETAILS
PERMA-FIX of FLORIDA
PERMA-FIX
ENVIRONMENTAL ENGINEERING
PFFLA 040168



℄ OF COL
℄ OF COL
21.50 (closed)
29.00 (open)
37.00
359° MAXIMUM ROTATION
57" RECOMMENED ROTATION CLEARANCE
NOTE FLOOR REQUIREMENTS
FOR PROPER ANCHOR EMBANKMENT FLOOR MUST BE A MINIMUM OF 4,000 PSI REINFORCED CONCRETE AT 6.00 IN. THICK
FIGURE I.D.20
PROPOSAL DRAWING
HIGH STOP LIMIT "F"
MID STOP LIMIT "H"
LOW STOP LIMIT "G"
FLOOR LEVEL
25.25
FRONT VIEW
31.00
26.41
TOP OF CLAMP
TOP OF BARREL
℄ OF BARREL
40.00
UP-RIGHT POS. LIMIT "D"
DUMP POS. LIMIT "E"
12.62
25.25
DUMP POS. LIMIT "B"
RELEASE POS. LIMIT "C"
STAGE POS. LIMIT "A"
SIDE VIEW
ALM CORPORATION
200 Benchmark Industrial Dr. Streator, Illinois 61364
TITLE IBC LIFT W/DRUM CLAMP
DRAWING NO. 990406-01
SHEET 1 of 3
PERMA-FIX
DRAWN EAD DATE 4/6/99
CHECKED DATE
APPROVED DATE
SCALE FULL WT.
ANSI Y14.5M STANDARDS APPLY
THIRD ANGLE PROJECTION
BREAK ALL SHARP CORNERS REMOVE ALL BURRS
ALL DIMENSIONS ARE IN INCHES.
UNLESS OTHERWISE SPECIFIED:
DECIMALS XX ± 0.03 XXX ± 0.010
CONCENTRICITY T.I.R. .005
ANGLES ± 1°
MACH SURFACE 125
REV
E. C. R.
DATE
REV BY
CKD

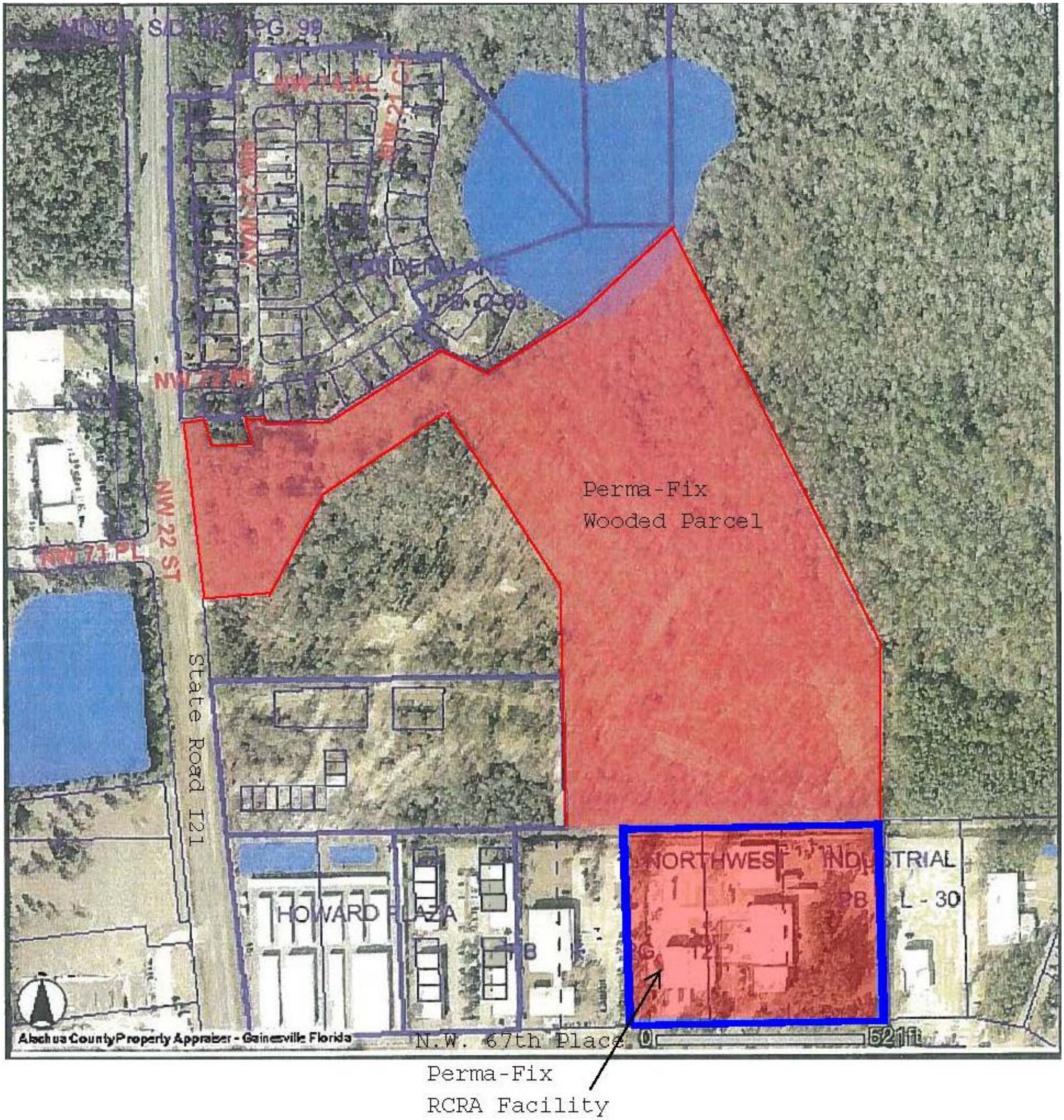


FIGURE I.D.21
PERMA-FIX FACILITY FOR HSWA PURPOSES
PERMA-FIX OF FLORIDA, INC.

SCHREIBER & YONLEY ASSOCIATES
ENVIRONMENTAL ENGINEERS
A Trinity Consultants Company

APPLICATION FOR HAZARDOUS WASTE PERMIT

PART II

A1 GENERAL INFORMATION

A1a Site Information

1. Topographic map: See Figure I.B.3 in Part I of this application.
2. 100 - Year flood zone map: See Figure I.B.1 in Part I of this application.
3. Map orientation: See figure legends.
4. Access control: See Figure II.A.1.
5. There are no injection wells or withdrawal wells used by Perma-Fix of Florida and there are no injection or withdrawal wells within one mile of the Facility.
6. Building and other structures: See Figure II.A.2.
7. Contours: See Figure II.A.3.
8. Loading and unloading areas: See Figure II.A.2.
9. Drainage or flood control: See Figure II.A.4.
10. Hazardous waste units: See Figure II.A.5.
11. Runoff control system: See Figure II.A.4.

A1b Wind Rose

The National Weather Service (NWS) has collected the most recent, representative meteorological data available for the Gainesville, Florida area. The NWS meteorological data consists of surface data collected from 1988 through 1992 at the Gainesville Municipal Airport (Station #12816). The Gainesville Municipal Airport site is approximately 5.5 miles southeast of the Perma-Fix of Florida, Inc. facility (PFF). A five-year wind rose for the 1988 to 1992 meteorological data set is presented in Figure II.A.6. Quarterly wind roses are presented in Figure II.A.7. The wind direction during the 1988 to 1992 time period was variable. The predominant wind direction is from the east with approximately 30.5 percent of the time winds being from the northeast, east-northeast, east, east-southeast, and southeast directions. Approximately 19 percent of the time the winds were from the west, west-northwest, and northwest.

A1c Traffic Patterns

Traffic pattern, traffic control, and access patterns are identified in Figure II.A.8. The average truck traffic of incoming and outgoing waste is anticipated to be no more than 5 trailers or tanker trucks per day. The road system and parking area have adequate load-bearing capacity to withstand the projected loads. The access route to the plant is from US441 to SR121 to NW 67th Place and then to PFF. US441 and SR121 roadways are capable of truck traffic carrying in excess of 80,000 pounds. There are no weight restrictions on these roadways. The internal roadway (NW 67 Place) and PFF parking lot are asphalt paved and can withstand truck traffic without difficulty.

A2 FINANCIAL RESPONSIBILITY INFORMATION

A2a Closure Cost Estimate and Financial Liability Information

The most recent closure cost estimate is included in the attached Closure Plan (see Section K). A copy of the financial mechanism used to establish financial assurance for closure of the facility and a copy of the facility liability coverage are attached (see Attachment II.A.1).

A3 FLOOD MAP

The PFF site is located outside of the 100-year flood plain. See Figure I.B.1 in Part I of this application.

A4 FACILITY SECURITY INFORMATION

A4a Description of Security

PFF is surrounded by a high-quality chain-linked fence topped with three strands of barbed wire with an overall height of at least six feet. The fence is in good condition and is periodically inspected. Entry into the facility is controlled by gate access. The entrance gates are closed and locked at all times, and only authorized personnel are allowed into the facility.

All facility visitors must enter through the main reception area located in the office building. See Figure II.A.1.

Warning Signs: Entrances to PFF loading, unloading, processing, and storage areas are posted with appropriate signs signifying "Danger - Unauthorized Personnel Keep Out" and "No Smoking". These signs are visible and legible from a distance of at least 25 feet.

A4b Contingency Plan

A copy of the PFF Contingency Plan is included as Attachment II.A.2.

A4c Description of Procedures, Structures, or Equipment to Prevent Hazards, etc.

In the event of a power failure, all transfer pumps and treatment operations will stop. Automatic check valves prevent reversal of flow of waste in the LSV transfer lines. Operations in the container and tank storage areas and in the treatment areas are rendered safe during a power failure. Nevertheless, potential hazards will be assessed by the PFF Emergency Coordinator and PFF personnel during power outages and once again upon restoration of power. Emergency exit signs and lighting are provided at critical locations throughout the facility and are powered by battery backup power units. A portable gas-powered electric generator is available for use, if necessary.

Containers of hazardous waste are unloaded from transport trucks into the staging and storage areas located in each of the three buildings where hazardous waste is managed. Special equipment such as non-sparking tools will be used in the flammable hazardous waste management areas. Forklift operators are instructed in proper and safe operation of the forklift and in incident response procedures. See the Contingency Plan and Personnel Training Plan included as Attachment II.A.2 and II.A.3, respectively, for training and incident response details.

All persons entering hazardous waste management areas are required to wear protective clothing, which is appropriate for the activities to be conducted in those areas. Personal protective equipment (PPE) is selected and used according to the standards and guidelines promulgated by the Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists (ACGIH). The Contingency Plan contains a list of PPE available at PFF. Training in the use of PPE is covered by the Personnel Training Plan.

PFF has been designed to prevent runoff from waste management areas onto other areas of the facility or to the environment (e.g., ground water). Waste management areas are enclosed and/or have sufficient containment to prevent runoff of contaminated water. Rainwater is directed to the on-site retention pond or to a drainage ditch north of the facility. The 3,000-gallon mixed waste storage tank is located inside the Processing and Storage Building in a containment area that is capable of containing 150% of the entire contents of the tank. Curbs and/or storm drains prevent surface drainage from passing through the waste management areas. Adequate containment is also provided for all process areas.

Avoiding the discharge of hazardous materials onto unprotected ground will prevent groundwater contamination. No drains are located within the waste management areas, and no unauthorized materials are released to the sanitary sewer or to surface water runoff. PFF accounts for all hazardous wastes delivered to and removed from the facility through a material accounting system. This includes a generator-specific numbering system to identify, at all times, the current status of each container of material received on-site. PFF tracks each container of material from time of receipt through final disposition. Intermediate and on-site generated waste packages are assigned a dedicated number for tracking purposes. Hazardous waste is stored and managed at the facility in areas equipped with secondary containment to prevent releases to the surrounding environment. In the unlikely event of a spill on unprotected ground from a transportation incident, the procedures outlined in the Contingency Plan would provide for immediate control and removal of hazardous waste spills.

All hazardous wastes received by PFF are assumed to be ignitable or reactive in some fashion and are managed accordingly until determined otherwise by facility personnel through sample analysis or profile review. Appropriate precautions are taken to eliminate sources of ignition including open flames; smoking, cutting, and welding hot surfaces; frictional heat; and spark from in and around the container storage, tank storage, and processing areas. PFF is fenced for security, and smoking is not allowed within the facility.

The hazardous waste storage and treatment areas are operated in accordance with applicable National Fire Protection Association (NFPA) standards. Other precautions against ignition include the following:

- All electrical systems and motors will be properly grounded and adequately rated for their intended use.

- Storage and treatment areas will be adequately ventilated.
- Special tools with low spark risk will be used for maintenance or repair work.

In the LSV processing and storage areas, additional safety features include:

- Electrical grounding for all key equipment including sampling tanks, bulk storage tank, and ancillary equipment.
- Automatic fire suppression for the LSV process line.
- Overflow interlocks and alarms for the sampling tanks and bulk storage tank.
- Circuit overload and lockout mechanisms.
- Ventilation systems for the process and work areas that maintain negative pressure in these areas and filter the exhaust for particulate matter and organic vapors.
- Automatic LSV process line shutdown button.
- Four-hour fire wall between LSV building and the office area.

In the TOB processing and storage areas, additional safety features include:

- Electrical grounding for all key equipment including the reaction vessel, absorber, condenser, and ancillary equipment.
- Automatic fire suppression for the PF-II process line.
- Mechanical drum dumper for loading the PF-II reactor vessel.
- Overflow interlocks and alarms for the process units.
- Mechanical drum lifter and pneumatic guillotine valve for emptying the reactor vessel into drums.
- Circuit overload and lockout mechanisms.
- Ventilation systems for the process and work areas that maintain negative pressure in these areas and filter the exhaust for particulate matter and organic vapors.
- Equipment pressure relief valves and conservation vents to prevent over pressurization.
- Automatic PF-II process line shutdown button.

Additional details regarding safety equipment and procedures for these operations are provided in Sections II. A-C and II.I.

Undesirable, uncontrolled, and dangerous reactions between incompatible wastes will be prevented by the early identification of potentially incompatible waste streams. Waste characterization and screening procedures are described in detail in the Waste Analysis Plan (WAP) included as Attachment II.A.4. In addition, compatibility testing will be conducted on materials that are part of lab packs or that will be bulked with other waste streams. Compatibility testing procedures are also addressed in the WAP. These procedures include the mixing of samples of potentially incompatible wastes. The mixture(s) will be observed for temperature rise, evolution of gases, and/or polymerization. Leaking or damaged containers of hazardous waste will be isolated from other containers until the contents have been placed in new containers or such drum is overpacked.

A4d Preparedness and Prevention Procedures

Design and Operation of Facility

The PFF treatment, storage, and processing areas, and associated process equipment, are designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste constituents to the air, soil, surface water, or groundwater that could threaten human health or the environment. To facilitate effective responses to potential emergency situations, the following equipment and procedures are used by PFF.

All hazardous waste to be treated with the PF-II process will be assumed to be ignitable until proven otherwise. This waste will be separated and protected from sources of ignition or reaction such as open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electric, or mechanical), spontaneous ignition, and radiant heat. PFF is fenced for security, and smoking is not allowed anywhere inside the facility. Containers holding ignitable and reactive wastes are stored at least 50 feet from the facility property line.

Potentially incompatible wastes or incompatible wastes and materials will not be placed in the same container, tank, or treatment equipment unless the wastes/materials are first tested in order to determine the necessary precautions to prevent reactions that:

1. Generate extreme heat or pressure, fire or explosions, or violent reactions;
2. Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
3. Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion;
4. Damage the structural integrity of the container, tank, or treatment equipment or the facility; or
5. May otherwise threaten human health or the environment.

Incompatible wastes will be stored in separate containers in separate secondary containment areas. Separation will be maintained by the use of berms, dikes, or by placing containers of incompatible waste in separate buildings. Incompatible wastes will not be placed in the same container, tank, or the same bermed storage section.

Required Equipment

A computer system is used for management of important operations data. To minimize the potential for loss of information during power outages or computer system failure, key waste management information is also maintained in hard copy form. The following emergency or incident response equipment is maintained by PFF:

- Internal telephone communication system capable of notifying all employees in the event of an emergency.

- External communications equipment to summon outside assistance, if necessary.

- Emergency equipment:

    - Strategically located fire extinguishers
    - Automatic fire sprinkler system with Aqueous Fire Fighting Foam in the waste processing and storage areas
    - Spill cleanup (e.g., absorbent materials, booms, shovels, etc.)
    - Decontamination supplies

- Water for fire control at an adequate volume and pressure to supply water hose streams, foam-producing equipment, or water spray systems. The water source for supplying water hose streams is the City of Gainesville.

Emergency equipment is listed in Table 1 below.

TABLE 1

EMERGENCY EQUIPMENT LIST

Item	Description/Capability	Location(s)
Telephone	Telephone communications for emergency notification	Waste Areas, Laboratory, and Other General Locations
Fire Extinguishers	Dry chemical, CO_2, extinguish fires	Throughout Facility, Admin & Processing
Fire Hydrant	Fire hydrant – combat fire	Southwest Corner of Process and Storage Building
Absorbent Material	Vermiculite and absorbent material in spill kits – absorbs liquid spills	Waste Treatment Areas, Container Storage and Tank Storage Areas
Respirators	Full-face chemical cartridge, Self-Contained Breathing Apparatus (SCBA)	Waste Treatment Areas, Laboratory, Main Building Storage Areas
Eye Wash	Permanent installation and portable eye wash bottles/stations – flush eyes	Waste Treatment Areas, Laboratory
First Aid Kits	Band-Aids, bandages – provide minor first aid	Laboratories and Container Storage Areas
Fork Lift(s)	Multiple units: 5-, 6-, 15-thousand-pound capacity – assist in moving materials	Designated Equipment Parking Area Adjacent to PSB
Bobcat	Small, bucketed, material-handling machine	Outside Maintenance – West Side
Automatic Fire Suppression	Fire sprinkler system, AFFF system (in LSV PSB, TOB); wet sprinkler system through remainder of building areas	Entire Facility
Protective Apron & Gloves	Cloth, Tyvek, rubber, or nitrile – body protection	Waste Management Areas & Maintenance Area
Safety Glasses and Hard Hats	Personal protective equipment – issued to employees	All Operational Areas
Emergency Exit Lighting & Signs	Emergency egress equipment	Throughout Administrative Offices, Lab, Waste Management Areas
Portable Radios and/or Cellular Phones	Communication devices	Emergency Coordinators, Process Technicians
Spill Kit(s)	Clean up minor spills	Each Waste Management Area
Emergency Generator	Gas-powered generator – to provide electricity during emergency	Maintenance Area

Item	Description/Capability	Location(s)
Shovels, Brooms	To transfer spilled material manually into containers	Kept with Spill Kits, extras kept in Maintenance Area
Empty Containers	To collect spilled material or PPE used during cleanup	On east side of LSV storage Warehouse
Portable Pumps	To transfer spilled liquids into containers or tanker trucks	Maintenance Area
Absorbent Booms	To prevent spills from entering surface waters or to absorb spilled material from the surface water	Mezzanine Above LSV Entry/Exit Area
Field Monitoring Equipment (e.g., dosimeters, PID)	To assess an emergency and screen releases	Dosimeters in Radiation Lab; PID in office of the EHS Manager

Access to Communication System

Access to the communication system is readily available from several locations in and around the facility waste management areas. Additionally, a paging system allows for broadcasting of announcements at the facility. Activities are not conducted in treatment or process areas unless at least two employees are present. Operating personnel will carry two-way portable radios or will have ready access to the plant telephone or both. The plant telephone system is connected to outside telephone systems and can be used to notify local authorities in the event of an emergency. The local fire department is less than one mile from PFF and is adequately equipped to respond in the event of a fire.

Testing and Maintenance of Equipment

An outside contractor inspects and tests PFF's fire suppression equipment and alarm system semi-annually. In addition, all emergency response equipment and supplies are tested and maintained by facility personnel to assure proper operation in time of emergency. Table 1 lists the emergency equipment available at the facility.

Required Aisle Space

Adequate aisle space will be maintained in all areas of the facility to provide unobstructed movement of personnel, material handling machinery, fire suppression equipment, and spill control equipment. Pallets of hazardous waste containers or drums in storage areas that may be stacked up two high will be banded and situated so that at least two sides of each pallet are visible and accessible at all times, except for the chemotherapy and pharmaceutical waste containers. Pallets or drums are added and removed from the ends of rows by lift trucks.

Arrangements with Local Authorities

Arrangements have been made to familiarize local authorities, such as police, fire, and emergency response departments with the:

- Layout of PFF,
- Properties and associated hazards of the wastes managed on site,
- Places where facility personnel would normally be working,
- Entrances to and roads inside the facility, and
- Possible evacuation routes.

This includes the opportunity for facility inspections/visits by the local authorities. Arrangements with state and local emergency response authorities for assisting PFF (in the event that outside emergency response becomes necessary) are listed in Section 12 of the Contingency Plan. See Attachment II.A.2 of the PFF permit application.

Copies of the current Contingency Plan are provided to the local police and fire departments, the nearest major hospital, and the local emergency response team (i.e., the fire department). Copies of each Contingency Plan update will be provided to each of the listed agencies.

A4e Personnel Training

The training programs used to prepare persons to operate or maintain the facility in a safe manner are addressed in the Personnel Training Plan included as Attachment II.A.3 to this permit application.

A5 CHEMICAL AND PHYSICAL ANALYSIS

The hazardous and mixed waste that is stored and treated by PFF is generated by off-site and on-site sources. Off-site sources of hazardous waste may include, but are not limited to, RCRA treatment, storage, or disposal (TSD) facilities; remediation sites; research institutions; government agencies; paint and coatings manufacturers and users; solvent users; and other industries that generate hazardous wastes. The facility also receives wastes from a variety of conditionally exempt and small quantity generators. In addition, waste collected during various county household hazardous waste collection campaigns is managed at the facility. Hazardous waste generated by on-site sources consists primarily of treatment residues, spent PPE, laboratory wastes, including samples of hazardous waste taken for testing and analysis, and, to a lesser extent, occasional small spill clean-up residues and soils.

The diverse nature of waste sources results in hazardous and mixed wastes of variable chemical composition being stored and treated by PFF. A list of wastes and waste constituents that may be accepted by PFF is included as Attachment II.A.5. These materials are listed by the EPA waste numbers found in 40 CFR Part 261, Subparts C and D.

The physical composition of the hazardous waste managed at the facility is either liquid (pumpable) or solid (non-pumpable). The physical composition of hazardous waste generated off-site generally determines its mode of transportation to the facility. Typically, the hazardous waste that is treated and stored at the facility can be characterized as follows:

- Organic liquids, including suspended solids, which are received from off-site in drums and other containers meeting Department of Transportation (DOT) specifications.

- Sludges and solids, possibly containing free liquids, which are received from off-site by truck in drums and other containers meeting the requirements of the DOT.

- A variety of debris contaminated with hazardous constituents received in containers.

- Miscellaneous liquid and solid hazardous waste generated by PFF as a result of waste treatment and miscellaneous management activities, such as clean-up materials, PPE, and decontamination rinsate.

- Lab packs received from off-site.

Liquid wastes generated on-site include cleaning solvents and residues. Solid wastes generated on-site include filter cleaning residues and used PPE.

All hazardous waste shipments determined to be unacceptable will be rejected. Rejected shipments will be returned to the generator or shipped to an alternate authorized TSD facility. Acceptance parameters are addressed in the Waste Analysis Plan.

A6 WASTE ANALYSIS PLAN

The Waste Analysis Plan (WAP) has been developed as a stand-alone document and is included as Attachment II.A.4. The WAP establishes hazardous waste acceptance procedures, sampling methods, frequency of analyses, analytical techniques, and related quality control/quality assurance procedures that will be followed by PFF to ensure that sufficient information is available for proper storage and treatment of hazardous waste. The chemical and physical analytical parameters that define acceptable hazardous waste, along with the rationale for their selection, are presented in the WAP.

Also addressed in the WAP are the precautions used to prevent undesirable chemical reactions resulting from mixing of incompatible hazardous waste or from the inadvertent receipt of hazardous waste exhibiting undesirable chemical reactions.

Undesirable chemical reactions are listed in 40 CFR 264.17(b) as reactions that:

1. Generate extreme heat or pressure, fire or explosions, or violent reactions,
2. Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health and the environment,
3. Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions,
4. Damage the structural integrity of the facility, and
5. May otherwise threaten human health and the environment.

A7 MANIFEST SYSTEM, RECORDKEEPING, AND REPORTING

Required Notice

When entering into any agreement to receive any waste from a generator, PFF will inform the generator in writing of PFF's permit status and the ability to accept the waste the generator will be shipping.

Prior to transferring ownership or operation of PFF, PFF will provide appropriate notification in writing to the proper authorities in accordance with 40 CFR 270.40.

Use of Manifest System

PFF requires generators to provide a completed manifest for each shipment of hazardous waste. PFF will comply with the manifest use requirements of 40 CFR 264.71 and 264.72. In addition to the manifest number, PFF will assign a dedicated internal tracking number to each container and/or shipment received by PFF for ease of identification.

When hazardous waste accompanied by a manifest is received, PFF will:

1. Sign and date each copy of the manifest to certify that the hazardous waste covered by the manifest was received;
2. Note any significant discrepancies in the manifest (as defined in 40 CFR 264.72(a)) on each copy of the manifest;
3. Immediately give the transporter at least one copy of the signed manifest;
4. Within 30 days after the delivery, send a copy of the manifest to the generator; and
5. Retain at the facility a copy of each manifest for at least three years from the date of delivery.

Manifest Discrepancies

Upon discovering a significant discrepancy (as defined in 40 CFR 264.72(a)), PFF will attempt to reconcile the discrepancy with the waste generator or transporter (e.g., through telephone conversations). If the discrepancy is not resolved within 15 days after receiving the waste, PFF will immediately submit to the Florida Department of Environmental Protection a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest at issue.

Unmanifested Waste Report

If PFF accepts for treatment, storage, or disposal any hazardous waste from an off-site source without an accompanying manifest, as described in 40 CFR 263.20(e)(2), and if the waste is not excluded from the manifest requirement by 40 CFR 261.5, then PFF will prepare and submit a single copy of a report to the Florida Department of Environmental Protection (FDEP) within fifteen days after receiving the waste.

Such report will be submitted on EPA form 8700-13B (or by other means as required by FDEP), be designated "Unmanifested Waste Report" and include the following information:

1. The EPA identification number, name, and address of PFF;

2. The date PFF received the waste;
3. The EPA identification number, name, and address of the generator and the transporter, if available;
4. A description and the quantity of each unmanifested hazardous waste PFF received;
5. The method of treatment, storage, or disposal for each hazardous waste;
6. The certification signed by the owner or operator of PFF or his authorized representative; and
7. A brief explanation of why the waste was unmanifested, if known.

Electronic Manifests

PFF may choose to use electronic manifests in lieu of paper manifests by complying with 40 CFR 264.71(f), (g), (h), (i), (j), and (k); and 40 CFR 262.24.

Operating Record/Biennial Report

Copies of the manifests and operating records will be maintained on-site for at least one year. After that, all records may be transferred to an off-site records storage facility where they will remain for at least three years unless otherwise specified below. The Biennial Report of hazardous waste received and processed by PFF will address the quantities of materials shipped to PFF. Copies of the Biennial Report will be submitted to the FDEP by March 1 of each even numbered year.

1. The biennial report will be submitted on EPA form 8700-13B [or by other means as required by FDEP (e.g., electronic format)]. The report will cover facility activities during the previous calendar year and will include all information required by FDEP/USEPA.

The following reports will be maintained by PFF:

- A description and the quantity of each hazardous waste received, and the method(s) and date(s) of its treatment and/or storage at the facility, as required. This record will be maintained until closure of PFF.

- The location of each hazardous waste within the facility and the quantity at each location. This information will include cross-reference to specific manifest document numbers if the waste was accompanied by a manifest. This record will be maintained until closure of PFF.

- Records and results of waste analysis performed.

- Summary reports and details of all incidents that require implementation of the Contingency Plan.

- Records and results of inspections.

- All closure cost estimates in accordance with 40 CFR 264, Subpart G. This record will be maintained until closure of PFF.

PFF will also maintain the following records at the facility or the off-site storage location for a period of at least three years:

- Waste minimization certification;
- Reports of releases, fire, and explosions;
- Closure Plan and Closure Cost Estimate;
- Notices to the off-site generators in accordance with 40 CFR 264.12(b); and
- Land disposal restriction notices received from off-site generators.

All operating records maintained on site pursuant to this permit application will be available to state and federal environmental regulatory personnel for inspection.

A8 FEDERAL ENVIRONMENTAL LEGISLATION

PFF is not subject to the Coastal Zone Management Act, Fish and Wildlife Coordination Act, the National Historic Preservation Act, and Wild and Scenic River Act. PFF is located within an Industrial Park in urban setting and to the best of our knowledge there are no endangered species or archaeological or historical sites within the property. Supporting documentation from the Florida Department of State, Division of Historical Resources, and the Florida Game and Fresh Water Fish Commission is included as Attachment II.A.6.

Attachment II.A.1

Financial Assurance Documentation

STATE OF FLORIDA
HAZARDOUS WASTE FACILITY CERTIFICATE OF LIABILITY INSURANCE
(Primary Policy)

1. Indian Harbor Insurance Company ,(the "Insurer"),
Name of Insurer

Of Seaview House, 70 Seaview Avenue, Stamford, CT 06902-6040
Address of Insurer

hereby certifies that it has issued liability insurance covering bodily injury and property damage to PERMA-FIX ENVIRONMENTAL SERVICES, INC. (the "Insured"), of
Name of Insured

8302 Dunwoody Place, Suite 250, Atlanta, GA 30350
Address of Insured

in connection with the insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147, as adopted by reference in Section 62-730.180, Florida Administrative Code (F.A.C.). The coverage applies at

EPA/DEP I.D. Number	Name	Address
FLD980711071	Perma-Fix of Florida, Inc.	1940 NW 67th Place Gainesville, FL 32653

for:

☒ sudden accidental occurrences,

☐ non-sudden accidental occurrences,

☐ sudden and non-sudden accidental occurrences.

If coverage is for multiple facilities and the coverage is different for different facilities, indicate which facility(ies) are insured for sudden accidental occurrences, which are insured for non-sudden accidental occurrences, and which are insured for both.

The limits of liability are $1,000,000 each occurrence and $2,000,000 annual aggregate, exclusive of legal defense costs. The coverage is provided under policy number PEC0044454, issued on 9/01/14 (Date). The effective date of said policy is 9/01/14 (Date).

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

   (a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy.

   (b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.147(f), as adopted by reference in Section 62-730.180, F.A.C.

   (c) Whenever requested by the Secretary of the Florida Department of Environmental Protection (FDEP), the Insurer agrees to furnish to the Secretary a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the Insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Secretary of the FDEP.

(e) Any other termination of the insurance (e.g., expiration, non-renewal) will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Secretary of the FDEP.

I hereby certify that the wording of this instrument is substantially identical to the wording specified in 40 CFR 264.151(j), as adopted by reference in Section 62-730.180, F.A.C., as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States including Florida.

Signature of Authorized Representative of Insurer

Anthony Gentile
Type Name

Vice President
Title

c/o XL Insurance
505 Eagleview Boulevard
Suite 100
Exton, PA 19341-0636

Authorized Representative of:

Indian Harbor Insurance Company
Name of Insurer

Seaview House, 70 Seaview Avenue, Stamford, CT 06902-6040
Address of Representative

STATE OF FLORIDA
HAZARDOUS WASTE FACILITY INSURANCE CERTIFICATE TO DEMONSTRATE FINANCIAL ASSURANCE
FOR

☒Closure ☐Post-Closure ☐Corrective Action
[Check Appropriate Box(es)]

The term "Required Action" as used in this document means closure, post-closure, or corrective action, or any combination of these, which is checked above.

Name and Address of Insurer (herein called the "Insurer"):

Chartis Specialty Insurance Company
175 Water Street, New York, NY 10038

Name and Address of Insured(herein called the "Insured"):

Perma-Fix Environmental Services, Inc.
8302 Dunwoody Place, Suite 250, Atlanta, Georgia 30350

Facilities Covered: List for each facility: The EPA/DEP Identification Number, name, address, and the amount of insurance for "Required Action". Indicate "Required Action" amounts separately (these amounts for all facilities covered must total the face amount shown below).

EPA/DEP I.D. No.	Name	Address
FLD 980711071	Perma-Fix of Florida, Inc.	1940 NW 67th Place Gainesville, FL 32653

Face Amount: $3,565,649

Policy Number: 1959168

Effective Date: February 28, 2014

The Insurer hereby certifies that it has issued to the Insured the policy of insurance identified above to provide financial assurance for Closure for the facilities identified above. The Insurer further warrants that such policy conforms in all respects with the requirements of 40 CFR 264.143(e), 264.145(e), 265.143(d), and 265.145(d), as adopted by reference in Section 62-730.180, Florida Administrative Code (F.A.C.), as applicable and as such regulations were constituted on the date shown immediately below. It is agreed that any provision of the policy inconsistent with such regulations is hereby amended to eliminate such inconsistency.

Whenever requested by the Secretary of the Florida Department of Environmental Protection (FDEP), the Insurer agrees to furnish to the FDEP Secretary a duplicate original of the policy listed above, including all endorsements thereon.

I hereby certify that the wording of this certificate is substantially identical to the wording specified in 40 CFR 264.151(e), as adopted by reference in Section 62-730.180, F.A.C., as such regulations were constituted on the date shown immediately below.

RDavies
Authorized Signature for Insurer

Richard Davies
Name of Person Signing

VICE PRESIDENT, ENVIRONMENTAL DIVISION AIG
Title of Person Signing

Signature of Witness Or Notary: Christine M. Silva

2/25/14
Date

NOTARIAL SEAL
[illegible] M SILVA
Notary Public
PHILADELPHIA CITY, PHILADELPHIA CNTY
My Commission Expires May 19, 2015

ENDORSEMENT NO. 17

This endorsement, effective 12:01 AM,	1st November 2013
Forms a part of Policy No:	195 9168
Issued to:	Perma-Fix Environmental Services, Inc.
By:	AIG Specialty Insurance Company

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CHANGE OF COMPANY NAME ENDORSEMENT

It is hereby agreed that all references to Chartis Specialty Insurance Company in the Declarations, Policy and all prior Endorsements are deleted in their entirety and replaced with AIG Specialty Insurance Company.

All other terms, conditions and exclusions shall remain the same.

RDavies

AUTHORIZED REPRESENTATIVE
or countersignature (in states where applicable)

ENDORSEMENT NO.18

This endorsement, effective 12:01AM,	February 28, 2014
Forms a part of Policy No:	195 9168
Issued to:	Perma-Fix Environmental Services, Inc.
By:	AIG Specialty Insurance Company

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

POLICY PERIOD AND LIMIT OF LIABILITY ENDORSEMENT

It is hereby agreed that Endorsements Nos. 2, 3, 4, 5, 6, 11, 13, 14, 15 and 16 POLICY PERIOD AND LIMIT OF LIABILITY ENDORSEMENTS are each deleted in their entirety. It is further agreed that **ITEM 2: POLICY PERIOD** and **ITEM 3: LIMIT OF LIABILITY** of the Declarations are amended as follows:

ITEM 2: POLICY PERIOD:

FROM: February 28, 2003 TO: February 28, 2015
12:01 A.M. Standard Time at the address of the Named Insured shown above

ITEM 3: LIMIT OF LIABILITY: $3,565,649

All other terms, conditions, and exclusions shall remain the same.

AUTHORIZED REPRESENTATIVE
or countersignature (in states where applicable)

Attachment II.A.2

Contingency Plan

CONTINGENCY PLAN

PERMA-FIX OF FLORIDA, INC.
1940 NW 67TH PLACE
GAINESVILLE, FLORIDA 32653
(352) 373-6066

DEP/EPA ID#: FLD 980 711 071

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FIGURE

ATTACHMENTS

1.0 SCOPE AND OBJECTIVES

This Contingency Plan (hereafter referred to as "the Plan") describes an organized course of action to be taken by Facility personnel or outside organizations in response to possible hazardous waste emergencies at the Perma-Fix of Florida, Inc. (PFF) facility (Facility). In addition, the Plan lists emergency equipment to be maintained on-site and designates the primary and alternate Emergency Coordinators. This Plan is designed to fulfill the Resource Conservation and Recovery Act (RCRA) Subpart D requirements of 40 CFR Part 264.

The Plan is designed to be a stand-alone document that provides instructions and guidance for responding to Facility emergencies. The Facility was designed and will be operated in a manner to prevent spills, fires, and explosions, in accordance with all permits and licenses. Personnel are trained to immediately implement and execute the Plan whenever there is an imminent or actual fire, explosion, or release of hazardous waste or hazardous waste constituents. Additionally, the Plan will be implemented in the event of natural disasters or bomb threats.

Updated copies of the Plan are posted within the Facility and maintained in the Facility Operating Record. Copies of the Plan and subsequent updates have been supplied to the state and local agencies that may be called upon to assist in the event of an actual emergency at the Facility. A copy of this Plan will be submitted to other agencies after receiving approval by the Florida Department of Environmental Protection (FDEP) of this Plan.

2.0 FACILITY OPERATIONS

PFF currently conducts a commercial waste bulking, storage, and transfer facility operation at its Gainesville, Florida facility. Waste managed on-site includes a wide variety of hazardous, industrial, mixed (i.e., a combination of hazardous and low-level radioactive), and non-hazardous wastes. PFF separately blends hazardous and mixed wastes into fuels for reuse (i.e., energy recovery) in permitted, off-site incinerators, industrial furnaces, boilers, etc. PFF also consolidates, repackages, and sorts waste materials for shipment and off-site treatment and/or disposal. PFF has EPA's Approval to Commercially Store Polychlorinated Biphenyls (PCBs) dated July 24, 2013 in Zone 8 of the TOB.

Permitted activities at the Facility include a variety of chemical and physical waste treatment activities. Specifically, PFF receives, stores, and treats hazardous waste. PFF is currently permitted for the following treatment operations: thermal desorption, chemical and physical extraction (extraction methods include water washing, high pressure steam, blasting, grinding, spalling etc.), chemical oxidation/reduction, size reduction and separation techniques, lab-pack decommissioning, neutralization, mercury amalgamation, deactivation, stabilization, microencapsulation, and macroencapsulation.

Existing treatment operations at the Facility include the Perma-Fix I® (PF-I) (chemical stabilization) and Perma-Fix II® (PF-II) (thermal desorption; chemical oxidation/reduction) processes, as well as treatment of hazardous debris in accordance with the alternative debris treatment standards specified in 40 CFR 268.45 (namely physical abrasion, chemical washing, and encapsulation). In addition, PFF is planning solvent recycling activities (distillation), which are exempt from RCRA permitting requirements. Complete details of these processes may be found in Part II Section I of PFF's RCRA permit application (dated November 2014). Figure CP-1 is a Site Plan showing the locations of hazardous waste management areas at the Facility. Figure CP-2 shows the location of the facility on a street map.

Liquid scintillation fluid (LSF) is an example of one waste stream received at PFF. LSFs are generally received in vials and/or bulk from off-site generators. The vials are crushed, and the scintillation fluid is captured and consolidated into containers ranging from 5-gallon to 550-gallon, or pumped into a 3,000-gallon aboveground storage tank or pumped into DOT-approved containers. The containers are stored in the Processing and Storage Building (see Figure CP- 1). The scintillation fluid is then fuel blended and shipped off site for energy recovery. The broken vials are washed with an ethanol solvent and disposed as a non-hazardous solid waste.

PF-I and PF-II processes are conducted in the Treatment and Operations Building. Debris washing activities are conducted in a segregated area within the LSV processing area. The PF-II process, macroencapsulation, and solvent recycling activities are or will be carried out inside the Treatment and Operations Building. Fuel blending (bulking and de-watering) operations are conducted in the Processing and Storage Building.

Used oil is stored in the LSV Processing and Storage Warehouse (see Figure CP-1) in DOT approved containers. The used oil is generally fuel blended. Spent fluorescent lamps destined for recycling and various non-hazardous wastes are also stored in the LSV Processing and Storage Warehouse.

Additional information regarding facility operations relevant to contingency plan implementation are addressed in the procedures noted below.

3.0 EMERGENCY COORDINATORS

This Plan identifies a primary emergency coordinator and alternate emergency coordinators as indicated in Attachment CP-1. The individuals identified are familiar with all aspects of PFF operations, trained in Contingency Plan implementation, and are capable of making appropriate decisions under emergency circumstances. The primary and alternate emergency coordinators have the authority to commit the resources of PFF required to implement the Plan. The emergency coordinators have the authority to shut down and restart processing areas and evacuate plant personnel. An emergency coordinator will be able to reach the Facility in a short period of time, should it be necessary to respond after regular business hours. If the evacuation of surrounding areas is advisable as determined by the Emergency Coordinator, immediate notification will be made to appropriate local authorities and the Emergency Coordinator (or his/her designee) will be available to assist appropriate officials decide whether surrounding areas should be evacuated.

4.0 IMPLEMENTATION

The Plan will be implemented whenever an incident or emergency at the Facility threatens or has the potential to threaten human health, the environment, and public or private property. The designated emergency coordinator will implement the Plan in the event of an imminent or actual emergency. The emergency coordinator will also provide coordinated assistance to the internal personnel and outside organizations responding to the emergency incident. Criteria for implementation of the Contingency Plan at the Facility include the following scenarios and potential emergencies:

4.1 FIRES AND/OR EXPLOSIONS

- A large fire has been discovered and the fire is not extinguished using portable fire extinguishers;
- Facility personnel have exhausted locally available fire extinguishers on a small fire and the fire continues to burn or spread;
- A fire causes the release of toxic fumes affecting the surrounding area;
- Use of water or chemical fire suppressant could result in contaminated runoff;
- An imminent danger of an explosion exists; and/or,
- An explosion has occurred.

4.2 SPILLS OR RELEASES

- A spill exceeds the size or seriousness that can be controlled and remediated by Facility personnel using portable equipment available in the immediate area of a spill or release; and/or,
- A spill or uncontrolled reaction has caused or could cause the release of hazardous waste or hazardous waste constituents to the air, surface water, or soil.

4.3 NATURAL DISASTERS

A hurricane, tornado, or severe weather event is forecast for the immediate area of the Facility or has occurred at the Facility.

4.4 BOMB THREAT

A bomb threat concerning the Facility is received by Facility personnel or by other persons who make the event known to Facility personnel.

4.5 EMERGENCY RESPONSE PROCEDURES

4.5.1 NOTIFICATION

Facility personnel will immediately notify the emergency coordinator by telephone or intercom when an actual or imminent emergency is identified. If the emergency occurs after regular business hours, the emergency coordinator (or designated alternate) will be immediately notified using the telephone numbers listed in the Emergency Coordinator Contact List (Attachment CP-1).

The Gainesville Police and Fire Department can be summoned by telephone. Telephones that are configured for dialing an outside line can be activated by dialing "9" for external communication. Telephones are located inside each building containing hazardous waste and are also capable of facility-wide notification on a dedicated paging system.

Additionally, all emergency coordinators have the capability to maintain contact by radio to key members of the process technician team. Copies of the Contingency Plan, which contains the Emergency Coordinator Contact List, are posted in several areas of the Facility in hard cover binders in close proximity to processing, storage, and certain administrative areas.

4.5.2 IDENTIFICATION OF HAZARDOUS MATERIALS

As a precaution, all hazardous waste received by PFF is assumed to be ignitable and toxic. All smoke and fumes from fires and explosions will be assumed to be hazardous. The atmosphere around all spills will be assumed to be toxic and potentially reactive until determined to be otherwise. The emergency coordinator(s) or his/her alternate will make an inspection of the material(s) involved in an incident and determine the next course of action.

Whenever there is a release, fire, or explosion, the emergency coordinator(s) will (to the extent possible) immediately identify the character, source, amount, and aerial extent of any released materials. He/she may do this by visual observation (e.g., truck placards, container labels), review of facility records, and (if necessary) by chemical analysis. Facility records available for review include manifests, and waste analysis data on-site kept at the file cabinets in the hallway next to the copy room for at least three years, and then kept off-site with Iron Mountain at 5905 NE Waldo Road, Gainesville, Florida. Iron Mountain provides contracted service to archive the documents. The emergency coordinator may consider incident character (i.e., size of spill or type of incident) as well as weather conditions when coordinating response actions.

4.5.3 HAZARD ASSESSMENT

As part of the Facility training program, Facility personnel are trained to assess the potential emergencies for which they have the capacity to respond. Facility personnel are trained in the use of locally available fire extinguishers and control equipment for minor spills. If more serious events are immediately recognized, or the event exceeds the capabilities of portable extinguishing or spill control equipment, the emergency coordinator will notify local authorities and activate the on-site fire alarm. Upon arrival of the local authorities, the emergency coordinator will provide information regarding the Facility and available materials to prevent the spread of contamination. The local fire or emergency response official, upon arrival at the Facility, shall have primary control and authority during an emergency situation at the Facility.

The need for partial or full evacuations of the Facility and surrounding areas will be assessed by the emergency coordinator and outside emergency agency personnel.

The affected employees’ supervisor will assess medical emergencies. Either the Facility's local medical provider or a local emergency medical facility will treat any employee who is injured to the extent where the injury cannot be remedied by simple first aid.

Bomb threats will be treated as actual emergency events until determined otherwise. The Gainesville Police Department will make further assessments and recommendations to the Facility emergency coordinator.

The emergency coordinator has the authority to notify additional PFF employees as deemed necessary to broaden his/her capability in making assessments by utilizing trained personnel and specialized tools and equipment available to assess the extent and severity of an incident including:

- Photo-ionization detector
- Gas chromatograph
- Mass spectrometer
- Additional miscellaneous lab instruments

The emergency coordinator, or an individual he/she designates, will assess the potential environmental effects of an incident using the following criteria:

- Potential effects of gases, vapors, and smoke.
- Potential effect of water run-off from fire control.
- Potential effect of fire-fighting foams or chemicals.
- Potential effect on local surface water or groundwater.
- Potential effect on human and animal health or life; inside and outside the facility.

4.5.4 CONTROL PROCEDURES

4.5.4.1 Fire and Explosion

Facility employees are trained in fire prevention and response. Employees are trained to respond to small fires with portable fire extinguishers. The Gainesville Fire Department will respond to structural or large fires. In addition, the entire facility is covered by an on-site fire suppression system supported by a diesel fire pump that feeds an array of wet and dry pipe systems and can distribute an AFFF foam/water mixture at the NFPA-required densities in any of the Facility’s waste storage and processing areas. This system is monitored 24 hours a day and also has backup power to maintain all functionality in the event of AC power failure, in accordance with local and NFPA guidelines. Specific instructions for responding to a fire and explosion at PFF are contained in Attachment CP-2A, Emergency Procedures for Fire, and in Attachment CP-2B, Emergency Procedures for Explosion, respectively.

In the event of fire or explosion, the following actions will be immediately taken:

1. All work will cease, and all non-essential personnel will be evacuated to the designated assembly area.

2. All valves and conveyance systems in the LSV processing area that lead to the 3,000-gallon aboveground storage tank and those in the treatment area will be secured. All loading, processing, and unloading operations of the PF-I system, PF-II system, or other site operations in the affected area will be shut down.
3. The emergency coordinator(s) and local authorities will be notified.

4.5.4.2 <u>Minor Spills</u>

Minor spills may occur during waste sampling, equipment maintenance, waste transfer, and treatment operations. Waste is managed throughout the Facility within secondary containment structures. Therefore, minor spills have minimal potential for off-site migration to the local environment. In most cases, these spills occur where adequate ventilation is present to dissipate any harmful vapors. These spills can generally be remediated using absorbent pads or materials.

4.5.4.3 <u>Major Spills</u>

Major spills may result from overturned containers or ruptures in the storage tank, containers, piping, or hoses. Secondary spill containment has been installed around hazardous waste treatment process areas and storage locations within the Facility.

Specific instructions for responding to a spill or unplanned release at the Facility are contained in Attachment CP-3, Emergency Procedures for a Spill/Unplanned Release. Attachment CP-3 includes a step-action table that summarizes those activities that should be taken immediately upon the discovery of a spill or release in any one of the process areas (e.g., LSV processing, PF–I, PF-II, or other treatment areas on site).

4.5.4.4 <u>Natural Disasters</u>

The most probable natural disasters to affect the Facility would be either a tornado or a hurricane. Warnings of approaching tornadoes and tropical storms/hurricanes will be received from the National Weather Service or local media. A NOAA emergency weather radio is kept in the offices and monitored during business hours for this purpose.

With tornadoes, there is usually little time to make preparations. The only emergency action that can be taken during a tornado warning is to have all employees move to the center of the building they are in. All employees working outside (e.g., in the PSB), will be notified and required to move inside to a safer location.

Early warning is possible with tropical storms/hurricanes. If it becomes apparent that a tropical storm or hurricane may impact the Facility, the following tasks will be completed:

- Daily entries to the operating record will be made documenting the path/progress of the storm. This will include storm-tracking maps from weather agencies, written warnings from weather services, etc.
- If the forecast predicts a tropical storm or hurricane force winds (>39 miles per hour) for the Facility, the following steps will be taken:

  - All double-stacked pallets of drums in the PSB will be placed on the floor.
  - Any empty B-25 containers on site will be placed around the outside of the PSB berm to minimize damage caused by flying debris during high winds.
  - All outside roll-off containers will be inspected to verify that covering tarps are secure.
  - Containers subject to wet weather damage will be covered in plastic (e.g., fiber containers) or moved inside the LSV Storage warehouse.
  - Any equipment/supplies and other loose objects outside the main buildings will be brought inside, such as empty drums, over-packs, forklifts, spill kits, etc.
  - Maintenance will verify that the emergency power generator and portable pumps are serviced and ready for use.
  - Emergency response equipment (respirators, protective clothing, gloves, etc.) that might be needed to respond to a spill/fire/release will be placed in a location easily accessible to responders, such as under the front stairwell.

After the event is over and it is safe to go outside, emergency coordinators will tour the facility to evaluate damage, if any, and implement the Contingency Plan as needed.

4.5.4.5 <u>Bomb Threats</u>

All bomb threats will be reported to the emergency coordinator or company officials and subsequently to the Gainesville Police and Fire Departments. The Facility will be evacuated, and local authorities may conduct a bomb search. The Facility will remain unoccupied until the local authorities and emergency coordinators determine the threat no longer exists.

4.5.4.6 <u>Power or Equipment Failure</u>

In the event of a power failure, all transfer pumps and treatment operations will stop. Existing automatic valves inherent in the design of the fluid transfer pumping equipment prevent reversal of flow in the LSV transfer lines. The container storage facilities and conveyors in the LSV area are not rendered unsafe during a power failure. The emergency coordinator(s) and Facility maintenance personnel will survey potential damage resulting from a loss of power. Equipment will be repaired immediately after power is restored or as soon as possible. If equipment is beyond repair, it will be properly disposed or managed as scrap.

No run-away reactions will occur as a result of suspension of the PF-I process. Equipment damage would not be anticipated as a result of a power outage.

In the event of a power failure, all operations in the PF-II process line will be discontinued. The system is manually loaded and unloaded so backflow or unintended unloading of material will not occur. The process line (including the heating system) will automatically shut off and is not configured to automatically restart (i.e., in the event of a power failure, upon system shut-down, manual operator action is required for reactivation of equipment). Power failure will not be a factor for container treatment operations since these operations are manually operated. Therefore, in the event of a power failure, the process will be shut down, and all container(s) will be closed until safe processing can be resumed. No other facility operations are anticipated to potentially result in safety or damage problems if interrupted by a power outage.

Emergency exit signs and lighting are provided at critical locations throughout the facility and are supplied with battery-backup power units providing up to 90 minutes reserve power. The Facility is not equipped with automatic emergency backup generators. However, a portable gas-powered electric generator is located on site.

Equipment failure and malfunction will be recorded in the operating record. Maintenance personnel will check and repair malfunctioning equipment as needed. Equipment and instrument calibration will be performed as needed by qualified individuals to minimize the potential for equipment failure, or use of equipment in an “out of calibration” condition. The facility inspection schedule and inspection log sheets provide a mechanism for inspection of tanks and accessories and minimizes the potential for equipment failure and potential releases to the environment. Most equipment failures would not result in any release of hazardous constituents to the environment. In addition, storage and treatment areas are provided with secondary containment systems designed to prevent migration of released materials to environmental media. In the event that equipment failure results in a release, the incident response procedures outlined in this Contingency Plan are designed to address the most likely possible scenarios.

5.0 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, OR RELEASES

In the event of a fire, explosion, or release, transfer pumps, electric motors, heating units, mixing equipment, and other equipment items will be shut off to eliminate the possibility of recurrence. The emergency coordinator shall institute this as necessary. The storage tank is equipped with a high-level alarm system to prevent overfilling. The proper functioning of this system also will mitigate the possibility of a recurrent emergency situation. The automatic power shut-off system for the PF-II process line will minimize the potential for recurrence of any fire, explosion, or release.

Plant personnel will tour affected areas of the Facility every two hours, inspecting for possible recurrences of fire or material release until the "all clear" determination has been announced.

6.0 STORAGE AND TREATMENT OF RELEASED MATERIAL

If PFF halts operations in response to a fire, explosion, or release, the emergency coordinator must monitor for potential leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever appropriate.

Immediately after an emergency, the emergency coordinator must provide for the treatment, storage, or disposal of recovered waste, contaminated soil, or surface water, or any other material that results from a release, fire, or explosion at the Facility. If the recovered material cannot be processed on-site, it will be characterized and disposed of properly in an approved off-site hazardous or non-hazardous waste management facility, as applicable. Collected waste, contaminated soil/surface water, or other material resulting from release response will be stored in a designated storage area (prior to treatment on-site or shipment off-site) based on the identity of the waste and conditions at the Facility. In most cases, the material will be containerized and stored in container storage areas used for management of the original waste. If incident conditions preclude storage in permitted storage areas, temporary areas will be designated by the Emergency Coordinator in accordance with the requirements of 40 CFR 262.34 (i.e. < 90-day container storage). In some cases, liquid waste may be collected directly onto a tanker and shipped off-site for proper disposal.

The emergency coordinator will supervise Facility personnel in the cleanup and treatment of hazardous wastes after the emergency is mitigated. If an outside emergency response/cleanup contractor is required, the emergency coordinator will interface with the outside contractor to ensure proper response or cleanup in accordance with procedures in the Contingency Plan and with Facility permits and licenses.

Corrosive materials will be neutralized in place, then absorbed and containerized. All others will be absorbed (if liquid) and containerized, followed by waste characterization, and, if necessary, analysis and shipment off-site for disposal. Large volumes of liquids may be pumped into containers or tanker trucks for appropriate management.

7.0 EMERGENCY EQUIPMENT

A list of emergency equipment available on-site is provided in Attachment CP-5, Emergency Equipment List. Locations of the facility's emergency equipment are shown on CP-6, Emergency Equipment Locator Map. Available equipment includes fire extinguishers, portable pumps, forklift, empty containers, shovels, brooms, and absorbent.

8.0 INCOMPATIBLE WASTE

The emergency coordinator will ensure that (in the affected area(s) of the Facility) no waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed. Depending on the situation, this may require isolation of certain classes of material on-site, or loading and shipping certain classes of material off site.

9.0 POST-EMERGENCY EQUIPMENT MAINTENANCE

All emergency equipment listed in Attachment CP-5 and used during an emergency will be replenished or cleaned and inspected for integrity before operations are resumed.

After an incident, non-disposable emergency equipment listed in this Contingency Plan will be cleaned and made fit for its intended use before operations are resumed. Equipment used for emergency response will be decontaminated by steam cleaning, water washing, or other appropriate method. Used fire extinguishers will be re-charged, and depleted supplies will be restocked. Appropriate decontamination methods will be chosen based on the manufacturer's recommendation and/or the type/quantity of contamination present. Disposable equipment will be properly managed, and decontamination residues will be managed in accordance with 40 CFR 262.34.

10.0 CONTAINER SPILL AND LEAKAGE

Leaking containers will be overpacked into non-leaking secondary containers until processed; or the material in the leaking container will be transferred into another appropriate DOT container. No attempt will be made to repair leaking containers. Waste that leaked from a container will be absorbed and managed and disposed of appropriately.

The PF-I and PF-II processes will be conducted in an area equipped with secondary containment. Debris treatment, as well as container treatment activities, is conducted within secondary containment. Spills will be managed in the same manner as tank releases discussed below. Incidental spills will be removed from containment upon detection. Containment areas are subject to routine inspections to facilitate the detection of and timely response to leaking containers or accumulated liquids.

11.0 TANK SPILLS AND LEAKAGE

The bulk storage tank at the Facility is located within secondary containment. Spills will be absorbed and managed as hazardous waste for proper disposal. If the tank itself develops a leak, the remaining waste will be pumped from the tank into containers, or directly into a tanker truck. The tank will then be assessed by a Florida registered professional engineer and either repaired or closed in accordance with the approved closure plan contained in the Facility's Part B permit.

The PF-II system is also equipped with secondary containment. Spills will be managed in the same manner as tank releases discussed above. Incidental spills will be removed in a timely manner. Additionally, these areas are subject to routine inspections to facilitate the detection of and timely response to leaking containers or accumulated liquids.

12.0 COORDINATION AGREEMENTS

Arrangements have been made with the following state and local authorities to provide emergency assistance to the facility:

NAME OF ORGANIZATION	FUNCTION
• City of Gainesville Fire and Rescue Department	• Respond to fires, explosions, spills, or releases
• City of Gainesville Police Department	• Primary responder for plant security & traffic control
• Alachua County Sheriff's Office	• Secondary responder for plant security & traffic control
• North Florida Regional Medical Center	• Emergency medical treatment
• State of Florida DEP Emergency Response Unit	• Assist in emergency response coordination efforts

Coordination agreements are intended to document each emergency response organization's ability and willingness to assist the PFF facility in the event of an emergency incident.

Complete paper copies (or electronic copies, if requested by the organization) of the Plan after approval from FDEP will be sent to the local police and fire departments, nearby hospital, emergency response contractor, and state and local emergency response teams to familiarize them with the Facility and those actions needed in case of an emergency. Documentation indicating that copies of the previous plans have been submitted to these organizations is maintained in the Facility Operating Record. Also, documentation of each organization's acceptance or refusal to enter into a coordination agreement is maintained in the Facility Operating Record. Example copies of these documents are provided as Attachments CP-9 and CP-10, respectively. In addition, the local hospital has been advised about the properties of hazardous waste handled at the facility and the types of injuries/illnesses that could result from fires, explosions, or releases at the facility.

Whenever the Plan is amended, copies of the amendments will be provided to these organizations. The invitation for site inspections will be offered to all organizations listed above whenever there are significant changes to Facility operations, or annually.

13.0 COORDINATION OF EMERGENCY SERVICES

This section of the Contingency Plan identifies outside organizations that are available for emergency response services. Written agreements with these organizations are maintained in the Facility operating record. These service agencies and organizations are to be summoned only by the PFF emergency coordinator or his/her alternate.

The following table summarizes those notifications and actions that should be undertaken in response to emergency situations that could arise at the Facility.

IN CASE OF A	THEN NOTIFY*	SIMULTANEOUS ACTIONS
• Fire or Explosion	Gainesville Fire Rescue Department Call 911, or (352) 334-5078	• Evacuate Facility employees to assembly location • Take attendance for missing persons • Emergency coordinator assists ranking Fire official
• Release of harmful or toxic gases or fumes	Gainesville Fire Rescue Department Call 911, or (352) 334-5078	• Evacuate Facility employees to upwind assembly location • Take attendance for missing persons • Emergency coordinator assists ranking Fire official
• Spill or release of hazardous materials or hazardous wastes	Local Hazardous Materials Response Team (Gainesville Fire Rescue HAZMAT Team) Call 911, or (352) 955-1818 OR North Central Florida Regional Planning Council (352) 955-2200 OR Florida DEP State Warning Point (800) 320-0519 or (850) 413-9911 (24 hours)	• Evacuate Facility employees to Assembly Location (as required) • Take attendance for missing persons (if required) • Emergency coordinator(s) evaluate the situation and potential hazards Either coordinate in-house spill response (minor spills) or contact outside responders (major spills).

IN CASE OF A	**THEN NOTIFY***	**SIMULTANEOUS ACTIONS**
• Bomb threat or unauthorized trespass	Gainesville Police Department Call 911, or (352) 334-2400 OR Alachua County Sheriff's Office Call (352) 955-1818	BOMB THREAT • Evacuate Facility employees to assembly location • Take attendance for missing persons • Emergency coordinator assists ranking police official TRESPASS • Emergency coordinator & operations personnel check for tampering, theft, etc. • Re-secure Facility
* Written reports and additional agency notifications may be required beyond those emergency notifications listed above (e.g., RQ report, or hazardous waste tank release, etc.).		

14.0 EVACUATION PLAN

Potential emergencies requiring evacuation from hazardous waste management areas are primarily fire hazards and the associated potential release of toxic, irritating, or asphyxiating gas/fumes, or bomb threat. In either case, Facility employees will execute the procedures listed below.

All employees are trained in evacuation procedures. Periodic evacuation drills are conducted to familiarize facility personnel of the primary and secondary evacuation routes and assembly locations throughout the Facility. Evacuation routes are shown on Attachment CP-7, Emergency Evacuation Route Map.

Criteria for implementation of the Facility evacuation plan include the following scenarios and potential emergency situations:

14.1 FIRE AND EXPLOSION

All Facility employees are trained in the Facility's evacuation plan procedures in the event of a fire or explosion. Employees are instructed to evacuate the Facility using either primary or alternate emergency evacuation routes, as instructed. Employees shall remain at the assembly location until the ranking fire official and/or emergency coordinator have given clearance, unless conditions warrant an off-site evacuation.

14.2 RELEASE OF TOXIC, IRRITATING, OR ASPHYXIATING GASES OR FUMES

A remote possibility exists for the release of gases or fumes that may cause toxic, irritating, or asphyxiating effects on Facility employees. Employees are instructed to evacuate the Facility and proceed to the designated assembly point for attendance counts. If the primary evacuation routes and assembly point are unusable due to encroaching gases or fumes, employees shall use the secondary evacuation routes and gather at an assembly point advised by the Emergency Coordinator, depending on wind direction or dispersal of fumes or gases. Employees shall remain at the assembly location until clearance has been given by either the emergency coordinator or ranking emergency official, unless conditions warrant an off-site evacuation.

14.3 BOMB THREAT

If a bomb threat is received by the Facility, all employees are instructed to evacuate the Facility via either primary or secondary evacuation routes. All employees will evacuate and proceed to either the primary assembly area or a secondary assembly area designated by the emergency coordinator for an attendance count. Employees shall remain at the assembly location until the ranking police official or the emergency coordinator has given clearance.

14.4 EVACUATION PROCEDURE

Signals: An internal announcement is broadcasted using the telephone public address system. All personnel and employees are instructed to evacuate the Facility through the front door or closest exit.

- The emergency coordinator or designee will make the announcement by dialing 80 (eight zero) on the telephone and saying:

"**ATTENTION!!** THE PERMA-FIX EMERGENCY EVACUATION SYSTEM IS NOW BEING EXECUTED. A SITUATION EXISTS REQUIRING IMMEDIATE EVACUATION OF THE FACILITY. PLEASE CALMLY EXIT THE FACILITY AND ASSEMBLE AT THE DESIGNATED AREA."

- The emergency coordinator(s) shall direct the evacuation. In the event of an issue of accountability, and if conditions allow, the emergency coordinator(s) shall re-enter the Facility to locate personnel. While emergency coordinators are inside the perimeter of the Facility, they shall maintain radio contact with other emergency coordinators and the head counter at all times.
- In a situation that does not warrant re-entry by PFF emergency coordinators, entry of the Facility shall be performed by the local emergency response authorities, with their findings communicated to on-site PFF emergency personnel.
- Primary evacuation routes have been established and are depicted on Attachment CP-7, Emergency Evacuation Route Map. Additionally, secondary evacuation routes have been established in order to provide employees with an alternate route to the assembly location so that an attendance count may be taken. Secondary routes are utilized in the event that primary routes are unusable due to fire, heat, smoke, fumes, or asphyxiating gases. Attachment CP-8 illustrates the areas where potential facility hazard locations could exist.

- Evacuation Route Maps are posted at strategic locations throughout the Facility to guide employees to assembly location by illustrating the established primary and secondary evacuation routes.
- Upon complete evacuation of the Facility, all employees will immediately assemble in the parking lot adjacent to the east side entrance (or alternate assembly location) as directed by the emergency coordinator. In the event that toxic or irritating gases are generated, the emergency coordinator shall direct further evacuation from the area to a safe upwind location. Authorized emergency response personnel remaining in the area will be required to don appropriate personal protective equipment.
- The head counter or designee shall account for all PFF and non-PFF personnel by using a current employee list and sign-in roster, and shall communicate by radio to the emergency coordinator(s) when an issue of accountability exists. The radio is located by the downstairs fax machine in the office area. (VERIFY RADIO IS SET TO CHANNEL 2.) When all personnel have been accounted for, the head counter will then report personnel accountability to the emergency coordinator(s).
- All employees will remain at the assembly point location until instructed otherwise by the emergency coordinator or outside authority.
- The emergency coordinator will advise the appropriate responding agencies if there is a need for the evacuation of the surrounding area.

15.0 REQUIRED REPORTS

The time, date, and details of any incident that requires implementation of the Plan will be documented and kept in the Facility operating log. Within 15 days after an incident, a written report will be submitted to the FDEP. The report will include:

(1) Name, address, and telephone number of the owner or operator;
(2) Name, address, and telephone number of PFF;
(3) Date, time, and nature of incident (e.g., fire, explosion);
(4) Name and quantity of material(s) involved;
(5) The extent of injuries, if any;
(6) An assessment of actual or potential hazards to human health or impacts to the environment, where applicable; and,
(7) Estimated quantity and disposition of recovered material that resulted from the incident.

Notification of any emergency response including interim source removal, which may endanger health or the environment, including the release of any hazardous waste that may endanger public drinking water supplies or the occurrence of a fire or explosion from the facility which could threaten the environment or human health outside the facility, shall be reported verbally to the Department within 24 hours, and a written report shall be provided within five days. The verbal report shall include the name, address, I.D. number, and telephone number of the facility and its owner or operator, the date, time, and type of incident; the name and quantity of materials involved; the extent of any injuries if any; an assessment of actual or potential hazards; and the estimated quantity and disposition of recovered material. The written submission shall contain all the elements of the verbal report and:

1. A description and cause of the release.

2. If not corrected, the expected time of correction, and the steps being taken to reduce, eliminate, and prevent recurrence of the release.

The Plan will be reviewed and immediately amended, if necessary, whenever:

- The Plan fails in an emergency;
- The list of emergency equipment changes;
- Changes occur in the Facility's design, construction, operating, maintenance, or other circumstances that materially increase the potential for fires, explosions, or releases of hazardous waste, or changes, the response necessary in an emergency;
- The list of emergency coordinators changes; or,
- The Facility permit is revised.

FIGURE CP-1

SITE PLAN

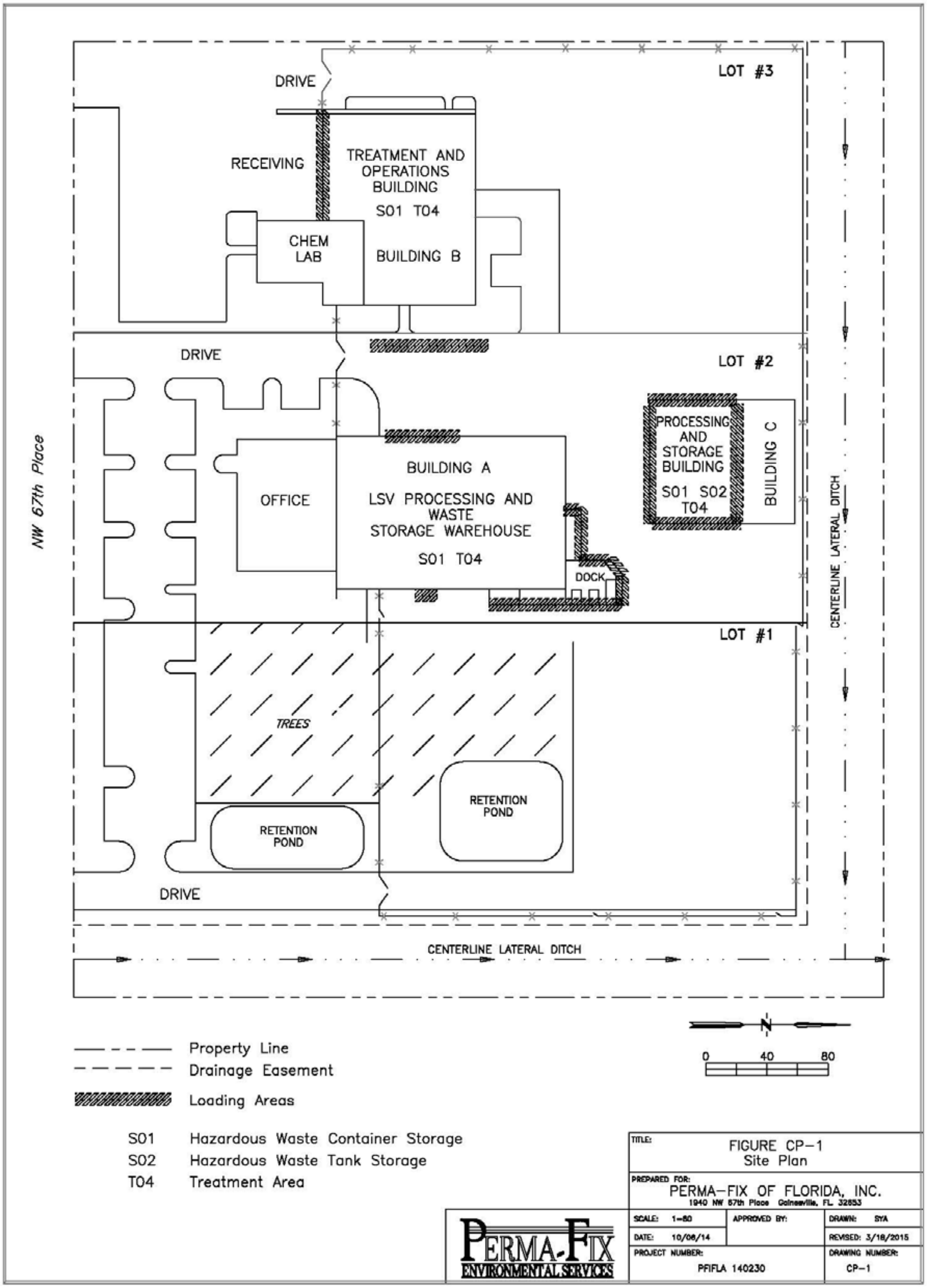
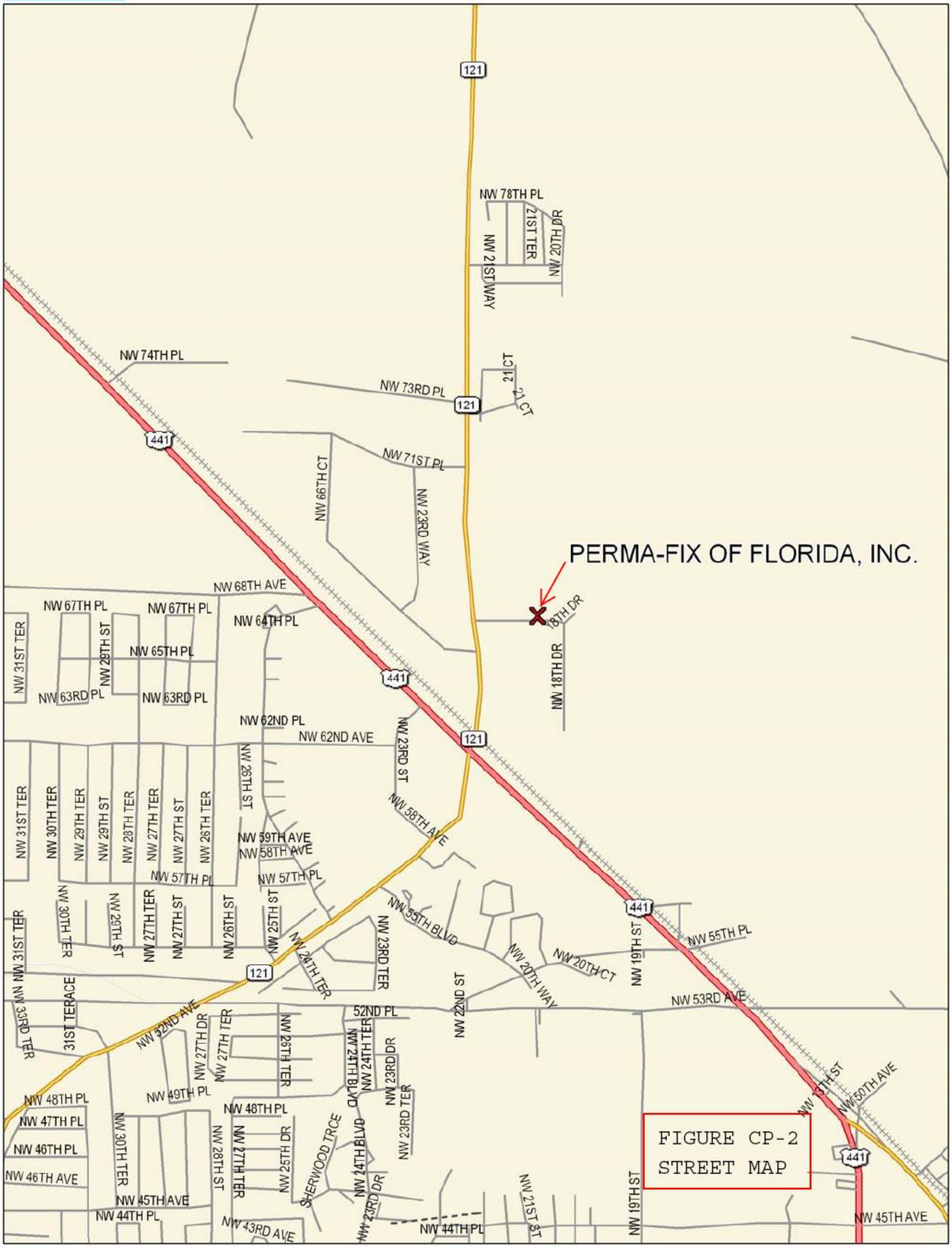

DRIVE
LOT #3
RECEIVING
TREATMENT AND OPERATIONS BUILDING
S01 T04
CHEM LAB
BUILDING B
DRIVE
LOT #2
PROCESSING AND STORAGE BUILDING
S01 S02 T04
BUILDING C
NW 67th Place
OFFICE
BUILDING A
LSV PROCESSING AND WASTE STORAGE WAREHOUSE
S01 T04
DOCK
CENTERLINE LATERAL DITCH
LOT #1
TREES
RETENTION POND
RETENTION POND
DRIVE
CENTERLINE LATERAL DITCH
N
0 40 80
Property Line
Drainage Easement
Loading Areas
S01 Hazardous Waste Container Storage
S02 Hazardous Waste Tank Storage
T04 Treatment Area
TITLE: FIGURE CP-1
Site Plan
PREPARED FOR: PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL 32653
SCALE: 1=80
APPROVED BY:
DRAWN: SYA
DATE: 10/06/14
REVISED: 3/18/2015
PROJECT NUMBER: PFIFLA 140230
DRAWING NUMBER: CP-1
PERMA-FIX ENVIRONMENTAL SERVICES

FIGURE CP-2

STREET MAP

DELORME Topo USA® 5.0



Data use subject to license.

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www.delorme.com

MN (0.0° W)

0 600 1200 1800 2400 3000 ft

Data Zoom 13-2

ATTACHMENTS

ATTACHMENT CP-1

EMERGENCY COORDINATORS

ATTACHMENT CP-1
EMERGENCY COORDINATORS

Primary Emergency Coordinator

Name:	**Randy Self**
Position/Title:	Treatment Coordinator
Work Telephone Number:	(352) 395-1368/373-6066
Mobile Telephone Number:	(352) 317-3243
Zip Code for Home Address:	32606

Alternate Emergency Coordinators*

Name:	**Dwayne Singleton**
Position/Title:	Industrial Coordinator
Work Telephone Number:	(352) 395-1362/373-6066
Mobile Telephone Number:	(352) 219-8640
Zip Code for Home Address:	32606

Name:	**Raymond Whittle**
Position/Title:	General Manager
Work Telephone Number:	(352) 395-1353/373-6066
Mobile Telephone Number:	(904) 364-7057
Zip Code for Home Address:	32091

Name:	**Andy Owens**
Position/Title:	Quality Assurance Manager
Work Telephone Number:	(352) 395-1357/373-6066
Mobile Telephone Number:	(352) 284-8064
Zip Code for Home Address:	32641

Name:	**Mike Owens**
Position/Title:	Maintenance Coordinator
Work Telephone Number:	(352) 395-1360/373-6066
Mobile Telephone Number:	(386) 937-6770
Zip Code for Home Address:	32148

Name:	**Kurt Fogleman**
Position/Title:	Environmental Health & Safety Manager
Work Telephone Number:	(352) 395-1356/373-6066
Mobile Telephone Number:	(352) 222-8032
Zip Code for Home Address:	32606

Name:	**Tristan Timm**
Position/Title:	Radiation Safety Officer
Work Telephone Number:	(352) 395-1345/ 373-6066
Mobile Telephone Number:	(352)228-1556
Zip Code for Home Address:	32605

*Alternate Emergency Coordinators are listed in the order in which they will assume responsibility as alternates.
NOTE: The work address for all Emergency Coordinators is 1940 NW 67th Place, Gainesville, Florida 32653.

ATTACHMENT CP-2A

EMERGENCY PROCEDURES FOR FIRE

ATTACHMENT CP-2A
EMERGENCY PROCEDURES FOR FIRE

The following actions should be taken upon discovery of a fire anywhere within the Facility's processing areas.

<table>
<tr><th>STEP</th><th>ACTION</th></tr>
<tr><td>1</td><td>Sound alarm using the intercom and by word of mouth, and quickly evaluate the extent of the emergency. The alarm should alert the emergency coordinator.

If after hours, contact primary or alternate emergency coordinator using phone numbers in Attachment CP-1 posted by phone.</td></tr>
<tr><td>2</td><td>If the situation allows it, actuate the kill switch to disconnect the power to all process equipment. This should stop the flow of potentially ignitable and/or reactive materials. Lights should remain on inside the process area.</td></tr>
<tr><td>3</td><td>Follow the specific instructions of the emergency coordinator who will direct any internal efforts to contain, control or extinguish the fire, if the emergency coordinator is present.</td></tr>
<tr><td>4</td><td>If the primary or alternate emergency coordinator is not present, attempt to contain the fire as follows; otherwise, the primary or alternate emergency coordinator will conduct evaluation:
<table>
<tr><th>If the fire is a…</th><th colspan="2">Then respond by following these steps…</th></tr>
<tr><td rowspan="10">Large fire (i.e., it cannot be extinguished without outside assistance)</td><td>a</td><td>Call the Fire Department – 911</td></tr>
<tr><td>b</td><td>The primary or alternate emergency coordinator should contact the following as necessary:
• Gainesville Police Department 911
• Gainesville Fire Rescue Department (352) 995-1818</td></tr>
<tr><td>c</td><td>Evacuate personnel from the affected area to the designated evacuation assembly area.</td></tr>
<tr><td>d</td><td>Prevent entry into affected area if it would jeopardize the safety of an employee</td></tr>
<tr><td>e</td><td>If the situation allows it, prevent the spread of fire beyond the immediate area using fire extinguishers until outside assistance arrives.</td></tr>
<tr><td>f</td><td>Follow directions given by ranking fire official.</td></tr>
<tr><td>g</td><td>Close appropriate valve on the storm water outfall(s), or use absorbent materials or mechanical means to prevent any contaminated fire-fighting water from exiting the facility, if it is safe to do so.</td></tr>
<tr><td>h</td><td>If hazardous materials are involved in the fire, provide the MSDS or chemical information for the materials to the Fire Department.</td></tr>
<tr><td>i</td><td>After the fire is extinguished, the emergency coordinator should evaluate the situation and determine whether an emergency response contractor is needed for environmental cleanup.</td></tr>
<tr><td>j</td><td>Collect all contaminated absorbents in containers, and close and label the containers. Contained liquids may be pumped into a tank truck or containers.</td></tr>
</table></td></tr>
</table>

ATTACHMENT CP-2A (continued)
EMERGENCY PROCEDURES FOR FIRE

STEP	ACTION		
	If the fire is a…		**Then respond by following these steps…**
		k	Resume operations only after the Fire Department and emergency coordinator have made a full inspection and have determined that the area is fit for restarting operations.
		l	Make proper notifications and prepare a written report regarding the incident.
	Small isolated fire (i.e., one that can be extinguished without outside assistance)	a	Attempt to use fire extinguishers to control the fire.
		b	Use dry chemical, foam, or CO_2 fire extinguishers for fighting fires. Do not use water on electrical fire or liquid fires. • Class C extinguishers: For use on electrical fires • Class B extinguishers: For use on flammable liquid fires.
		c	Direct the stream from the extinguisher at the base of the fire from upwind and the sides. Do not stand downwind of the fire.
		d	If the scope of the incident exceeds the capabilities of the portable fire extinguishers, activate dedicated fire suppression system.
		e	If efforts to extinguish the fire are not immediately effective, the emergency coordinator should contact the following as necessary: • Gainesville Police Department 911 • Gainesville Fire Rescue Department (352) 955-1818
		f	After the fire is extinguished, the emergency coordinator must conduct an inspection before resuming operations.
		g	Prepare a fire report.
5	Refer to Attachment CP-4 for reporting requirements (if applicable).		

ATTACHMENT CP-2B

EMERGENCY PROCEDURES FOR EXPLOSIONS

ATTACHMENT CP-2B
EMERGENCY PROCEDURES FOR EXPLOSIONS

The following actions should be taken if an explosion occurs at the Facility.

STEP	ACTION
1	Notify the Emergency Coordinator immediately if an explosion occurs at the facility. Also, provide any information pertaining to injury to employees, if available.
2	The Emergency Coordinator will notify the appropriate agencies listed in Attachment CP-5.
3	If it is safe to do so, retrieve any injured personnel and arrange for their medical help.
4	If the explosion has resulted in a fire, implement procedures listed in Attachment CP-2A.
5	If the explosion has resulted in a spill, implement procedures listed in Attachment CP-3.
6	Resume operations only after the Emergency Coordinator or his designee has made an inspection of the affected area(s) and has determined that the area(s) is fit for restarting operations.
7	Prepare a report on the explosion event.
8	Submit a written report, if applicable, to appropriate agencies listed in Attachment CP-5.

ATTACHMENT CP-3

EMERGENCY RESPONSE PROCEDURES FOR SPILL/UNPLANNED RELEASE

ATTACHMENT CP-3
EMERGENCY RESPONSE PROCEDURES FOR SPILL/UNPLANNED RELEASE

Minor spills may occur during sampling, equipment maintenance, transfer, and treatment operations. In most cases, these spills will occur where adequate ventilation is present to dissipate any harmful vapors. These spills can generally be remediated using pads and absorbent materials.

Major spills may result from overturned containers or ruptures in storage tanks, containers, piping, and hoses. Secondary spill containment has been installed at hazardous waste process and storage areas. The following actions will be taken in the event of a spill:

<table>
<tr><th>Step</th><th colspan="3">Action</th></tr>
<tr><td>1</td><td colspan="3">Communicate the spill event to others.</td></tr>
<tr><td>2</td><td colspan="3">Assess the extent and magnitude and source of the event.</td></tr>
<tr><td>3</td><td colspan="3">Shut down processing operations, if necessary.</td></tr>
<tr><td>4</td><td colspan="3">Assess immediate health and safety concerns. Evacuate area if necessary.</td></tr>
<tr><td rowspan="11">5</td><td colspan="3">Attempt to remediate the spill/release as follows:</td></tr>
<tr><td>If spill is a...</td><td colspan="2">Then respond by following these steps...</td></tr>
<tr><td rowspan="2">Minor spill (may occur during sampling, equipment maintenance...)</td><td>a</td><td>Remediate using pads and absorbent materials.</td></tr>
<tr><td>b</td><td>Collect all contaminated absorbent and place in closed and labeled container.</td></tr>
<tr><td>If spill is a...</td><td colspan="2">Then respond by following these steps...</td></tr>
<tr><td rowspan="5">Major spill (may result from overturned containers or ruptures in storage tanks, containers, piping, and hoses.)</td><td>a</td><td>Deny entry into any area that would jeopardize the safety of an employee.</td></tr>
<tr><td>b</td><td>Sound alarm. The alarm should alert the emergency coordinator. If after hours, contact the primary or alternate emergency coordinator using phone number in Attachment CP-1.</td></tr>
<tr><td>c</td><td>Follow the specific instructions of the emergency coordinator, including evacuation of the area (if required).</td></tr>
<tr><td>d</td><td>If it is safe to do so, stop the flow of the released material by closing valves, shutting off pumps, or rotating or “overpacking” ruptured containers.</td></tr>
<tr><td>e</td><td>All loading and transfer activities in the area are to be ceased.</td></tr>
</table>

Step	Action			
			f	Contain the spill as much as possible using the following equipment: - **Absorbent booms**: Use these in tandem (one placed a few inches behind the other) to help control the flow of the material. - **Use other absorbent materials**: Use a commercial absorbent to soak up spills. - **Empty 55-gallon drums** can be turned on their sides and rolled to create an "instant" dike. - **Use mechanical means**: Ditch and shovels, if applicable.
			g	Close appropriate valve on the storm water outfall(s), or use absorbent materials or mechanical means to prevent the spilled material from exiting the facility, if it is safe to do so and the potential exists for spills to flow outside the facility.
			h	If there is a need for outside help, the primary or alternate emergency coordinator will contact the appropriate local authority, agency, or remediation contractor.
			i	Pump free liquids into containers or drums or tanker trucks.
			j	Collect all contaminated absorbent and place it in containers. Close and label containers.
			k	If directed by the Facility Radiation Safety Officer, survey all affected areas and materials for radiation.
			l	Begin equipment and area cleanup.
			m	Arrange for proper management of remediation waste.
			n	Complete a written description of the event while details are still fresh.
			o	Refer to Attachment CP-4 to complete reporting requirements, if applicable.
6	Notify local, state, and/or federal agencies listed in Attachment CP-4, as appropriate.			

ATTACHMENT CP-4

EMERGENCY NOTIFICATION AND REPORTING INFORMATION

ATTACHMENT CP-4
EMERGENCY NOTIFICATION AND REPORTING INFORMATION

In the event of an emergency that could threaten human health or the environment outside of PFF, the General Manager or emergency coordinator shall immediately notify:

State of Florida Department of Environmental Protection
State Warning Point
1-800-320-0519 (24 hours)
or 1-850-413-9911 (24 hours)
and
Alachua County Environmental Protection Department
(352) 264-6800 (24 hours)

To report a release to the environment above the reportable quantity of a listed hazardous material, the PFF General Manager or emergency coordinator shall immediately notify:

National Response Center (NRC)
800-424-8802 (24 hours)
or
State Warning Point Number
1-800-320-0519
or 1-850-413-9911

If unsuccessful in reporting to the above numbers, call:

U.S. Environmental Protection Agency, Region 4, Atlanta, GA
Emergency Response Center
(404) 562-8700 (24 hours)

Within 15 days after the incident, send written report to:
State of Florida Department of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256
Attention: Northeast District Manager

The written report must be submitted to FDEP within 5 days in accordance with 62-4.160(17) if the emergency involves a fire or explosion at the facility that could threaten the environment or human health outside the facility.

ADDITIONAL OUTSIDE ORGANIZATIONS:

Police Departments:	Gainesville Police Department	911 (or 352-334-2400)
	Alachua County Sheriff's Office	911 (or 352-955-1818)
Fire & Rescue:	Gainesville Fire Rescue Department	911 (or 352-334-5078)
Hospital:	North Florida Regional Medical Center	352-333-4000
Local Emergency Planning Committee:	North Central Florida Regional Planning Council	352-955-2200
Outside Cleanup Contractor:	AAG Environmental	1-800-472-9251352-472-7295
Florida DOH	Bureau of Radiation Control	407-297-2095

ATTACHMENT CP-5

EMERGENCY EQUIPMENT LIST

ATTACHMENT CP-5
EMERGENCY EQUIPMENT LIST

Item	Description/Capability	Location(s)
Telephone	Telephone communications for emergency notification	Waste Areas, Laboratory, and Other General Locations
Fire Extinguishers	Dry chemical, CO_2 - extinguish fires	Throughout Facility, Admin & Processing
Fire Hydrant	Fire hydrant – combat fire	Southwest Corner of Process and Storage Building
Absorbent Material	Vermiculite and absorbent material in spill kits – absorbs liquid spills	Waste Treatment Areas, Container Storage and Tank Storage Areas
Respirators	Full-face chemical cartridge, Self-Contained Breathing Apparatus (SCBA)	Waste Treatment Areas, Laboratory, Main Building Storage Areas
Eye Wash	Permanent installation and portable eye wash bottles/stations – flush eyes	Waste Treatment Areas, Laboratory
First Aid Kits	Band-Aids, bandages – provide minor first aid	Laboratories and Container Storage Areas
Fork Lift(s)	Multiple units: 5-, 6-, 15-thousand-pound capacity – assist in moving materials	Designated Equipment Parking Area Adjacent to PSB
Bobcat	Small, bucketed, material-handling machine	Outside Maintenance – West Side
Automatic Fire Suppression	Fire sprinkler system, AFFF system (in LSV PSB, TOB); wet sprinkler system through remainder of building areas	Entire Facility
Protective Apron & Gloves	Cloth, Tyvek, rubber, or nitrile – body protection	Waste Management Areas & Maintenance Area
Safety Glasses and HardHats	Personal protective equipment – issued to employees	All Operational Areas
Emergency Exit Lighting & Signs	Emergency egress equipment	Throughout Administrative Offices, Lab, Waste Management Areas

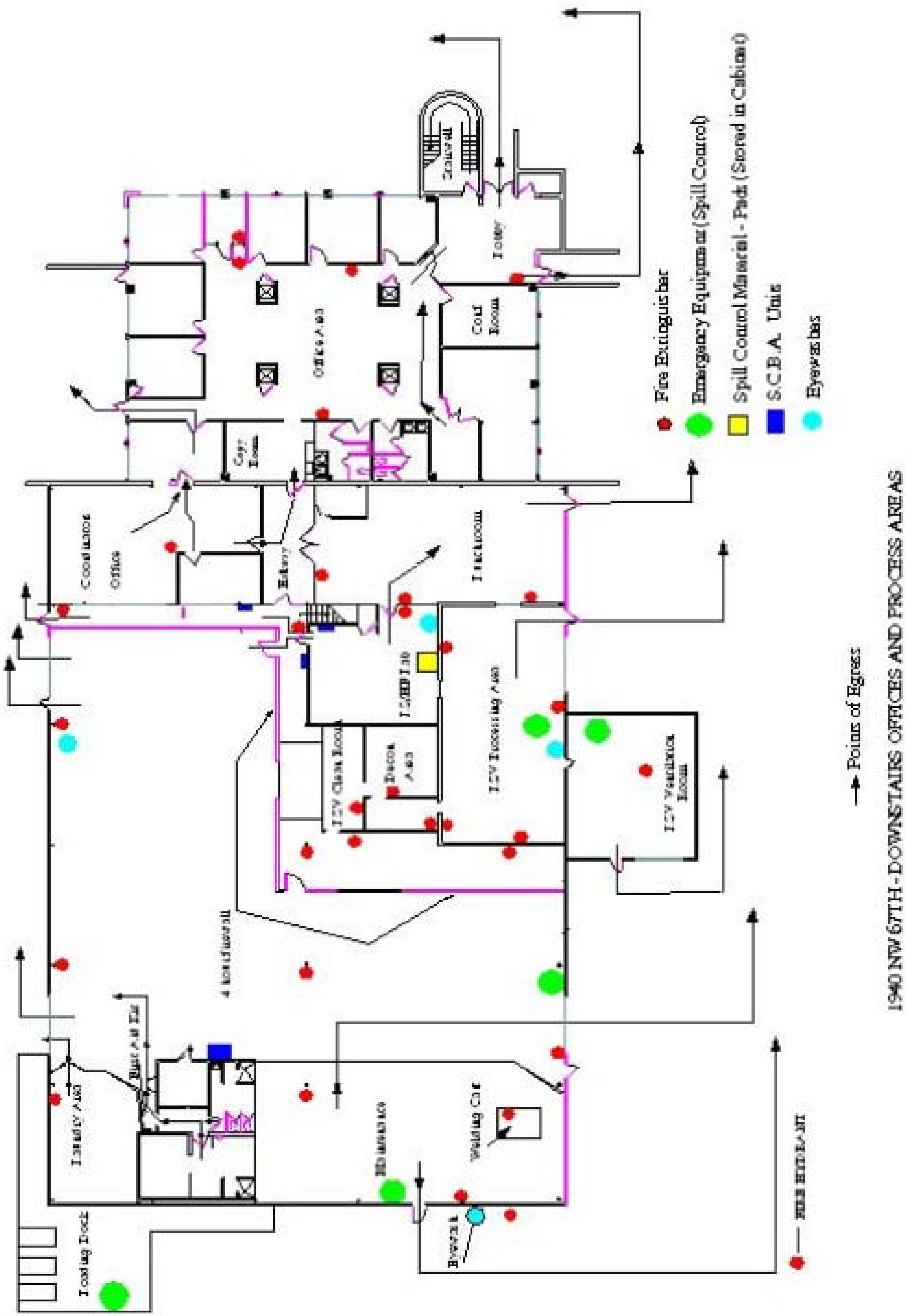
ATTACHMENT CP-5 (continued)
EMERGENCY EQUIPMENT LIST

Item	Description/Capability	Location(s)
Portable Radios and/or Cellular Phones	Communication devices	Emergency Coordinators, Process Technicians
Spill Kit(s)	Clean up minor spills	Each Waste Management Area
Emergency Generator	Gas-powered generator – to provide electricity during emergency	Maintenance Area
Shovels, Brooms	To transfer spilled material manually into containers	Kept with Spill Kits, extras kept in Maintenance Shop
Empty Containers	To collect spilled material or PPE used during cleanup	On east side of LSV storage Warehouse
Portable Pumps	To transfer spilled liquids into containers or tanker trucks	Maintenance Area
Absorbent Booms	To prevent spills from entering surface waters or to absorb spilled material from the surface water	Mezzanine above LSV entry/exit Area
Field Monitoring Equipment (e.g., dosimeters, PID)	To assess an emergency and screen releases	Dosimeters in Radiation Lab; PID in office of the EHS Manager

ATTACHMENT CP-6 - EMERGENCY EQUIPMENT LOCATION MAPS

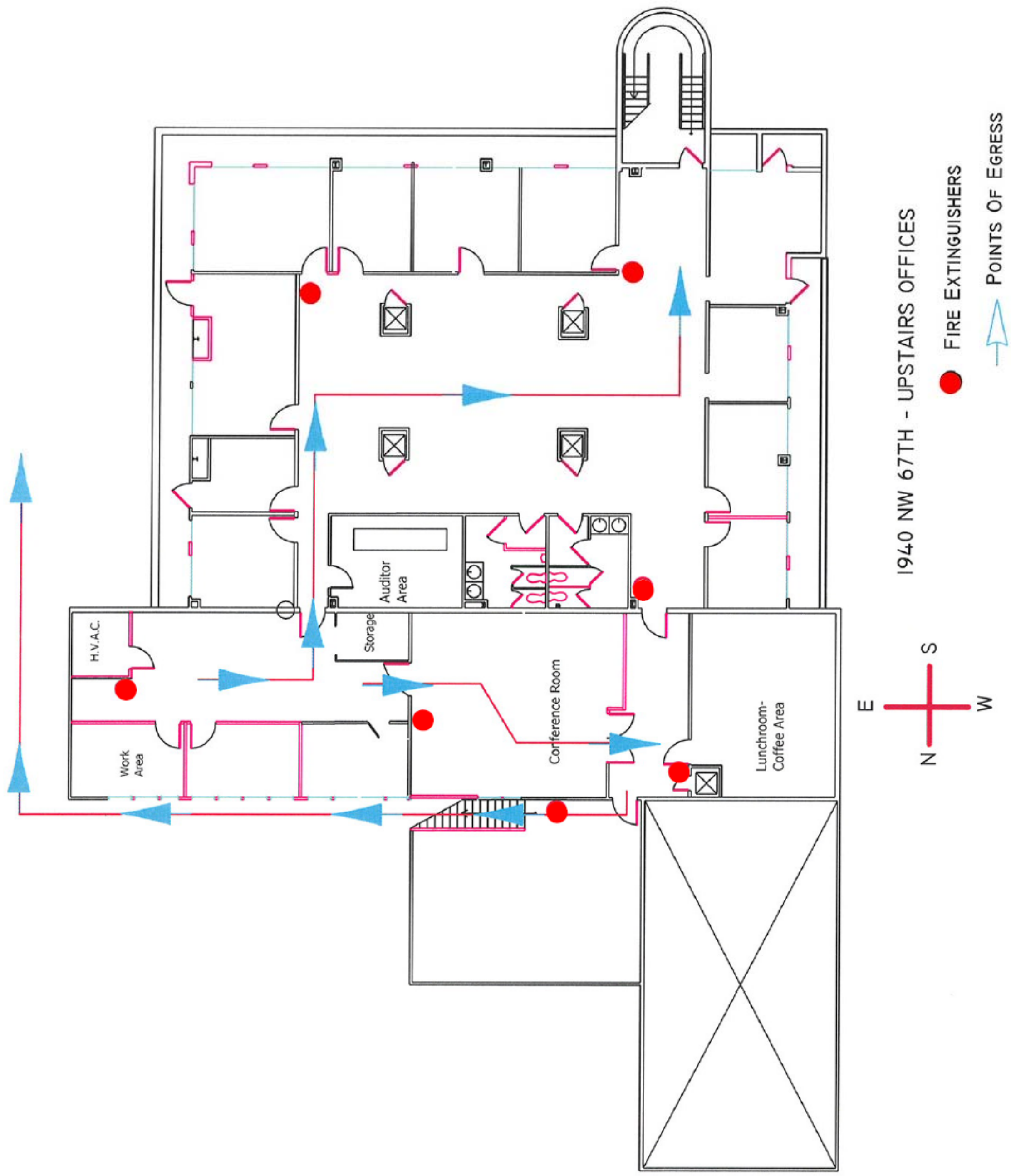
Building A:	**Downstairs Offices and LSV Process Areas**
Building A:	**Upstairs Offices**
Building B:	**TOB (Nelson) Building**
Building C:	**PSB Building**

BUILDING A – DOWNSTAIRS OFFICES & LSV PROCESS AREAS MAPS


Fire Extinguisher
Emergency Equipment (Spill Control)
Spill Control Material - Pads (Stored in Cabinet)
S.C.B.A. Units
Eyewashes
Points of Egress
1940 NW 67TH - DOWNSTAIRS OFFICES AND PROCESS AREAS
Office Area
Conf Room
Lobby
Copy Room
Coordinators Office
Loading Dock
Welding Cart
Eyewash

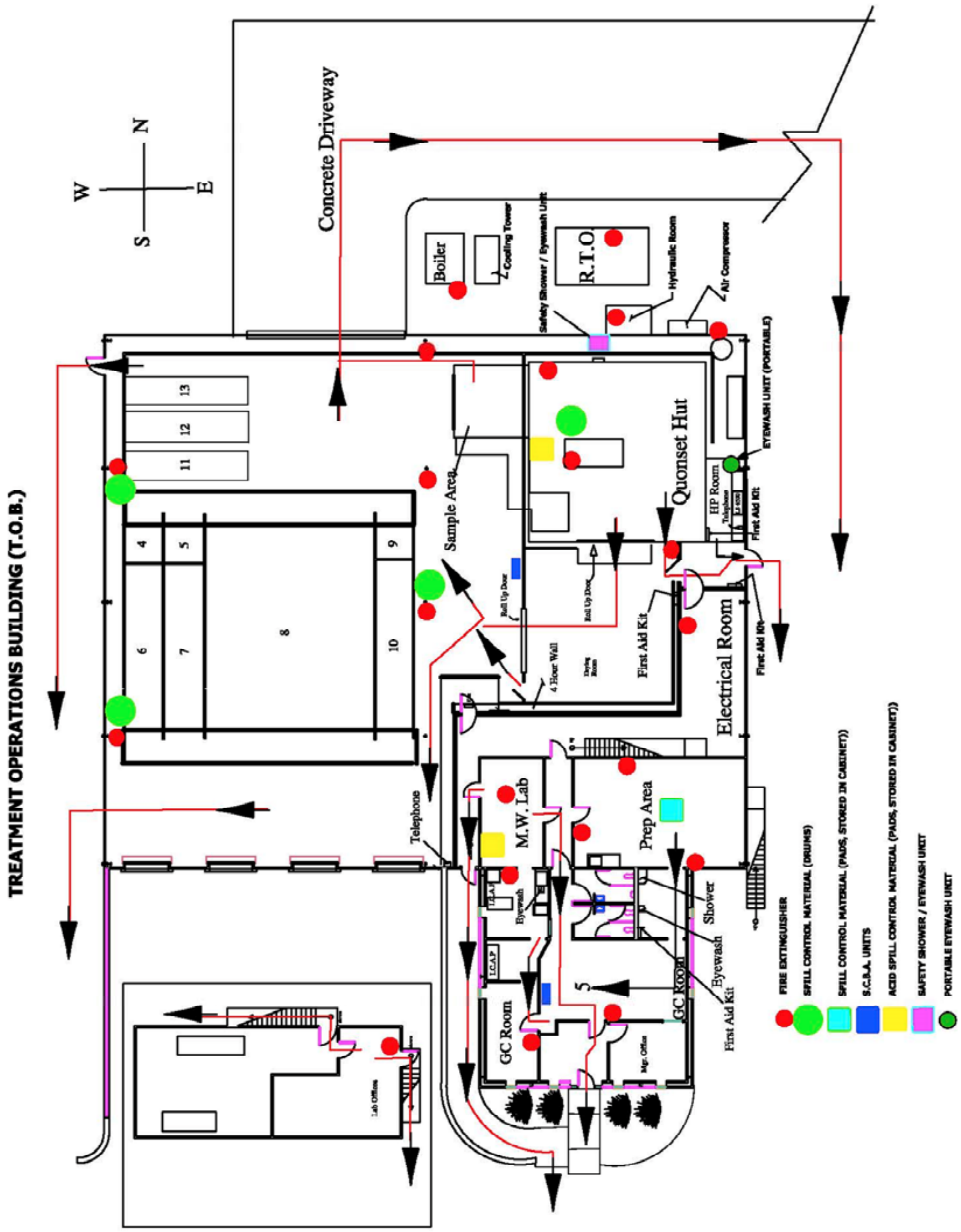
BUILDING A – UPSTAIRS OFFICES

Building A – Upstairs Offices



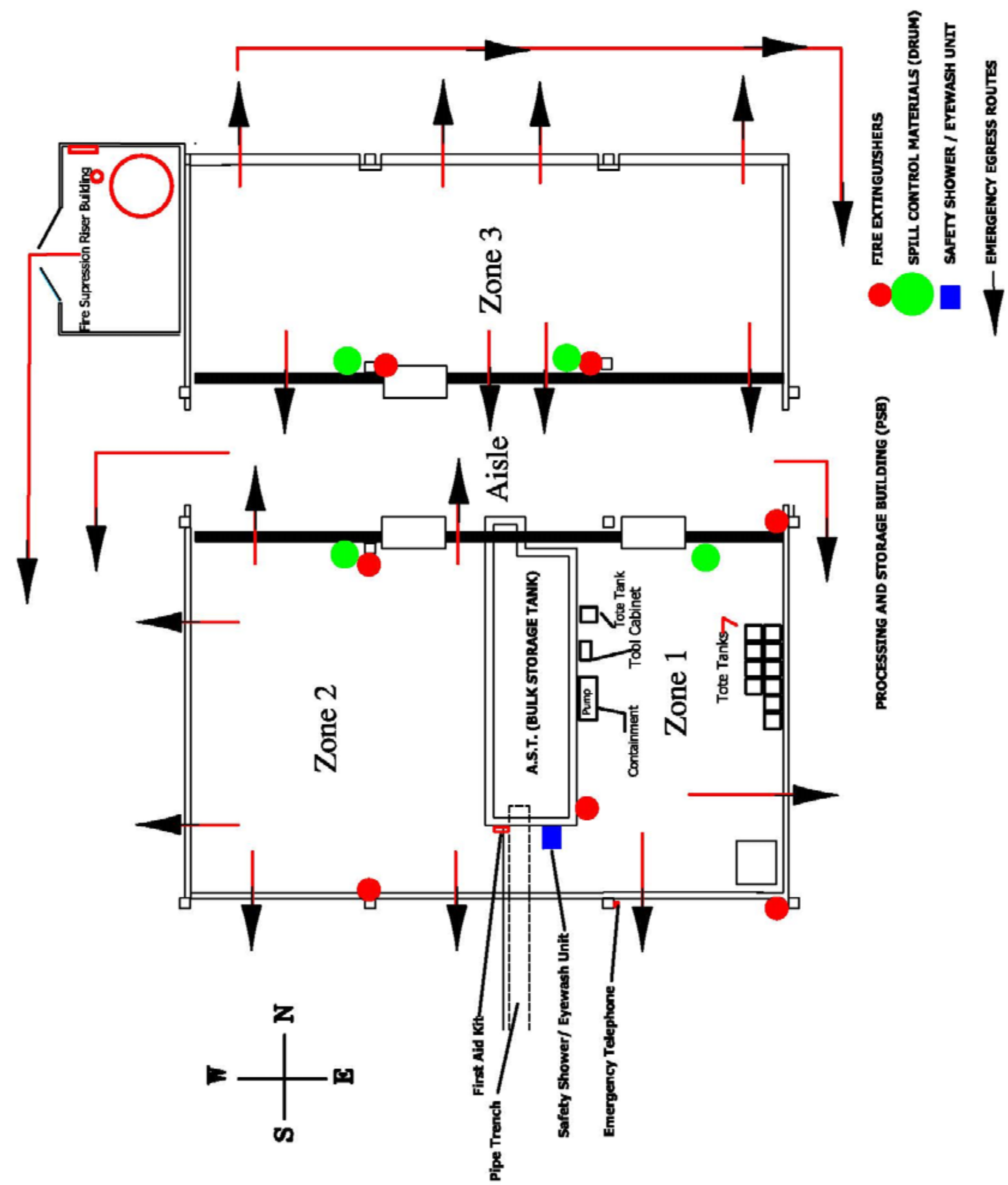
BUILDING B – TOB (NELSON) BUILDING

BUILDING B – TOB (NELSON) BUILDING



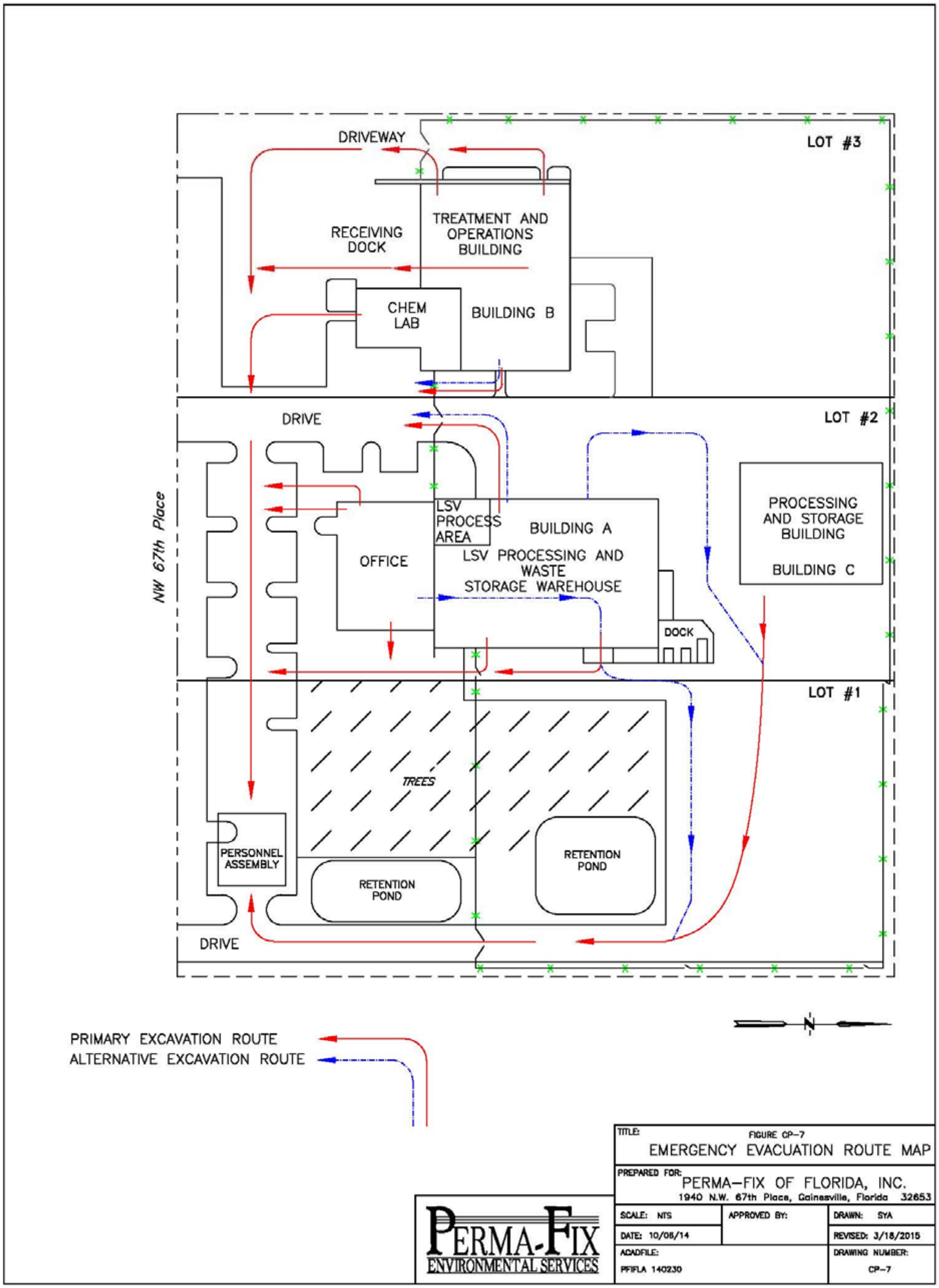
BUILDING C – PSB BUILDING

BUILDING C – PSB BUILDING



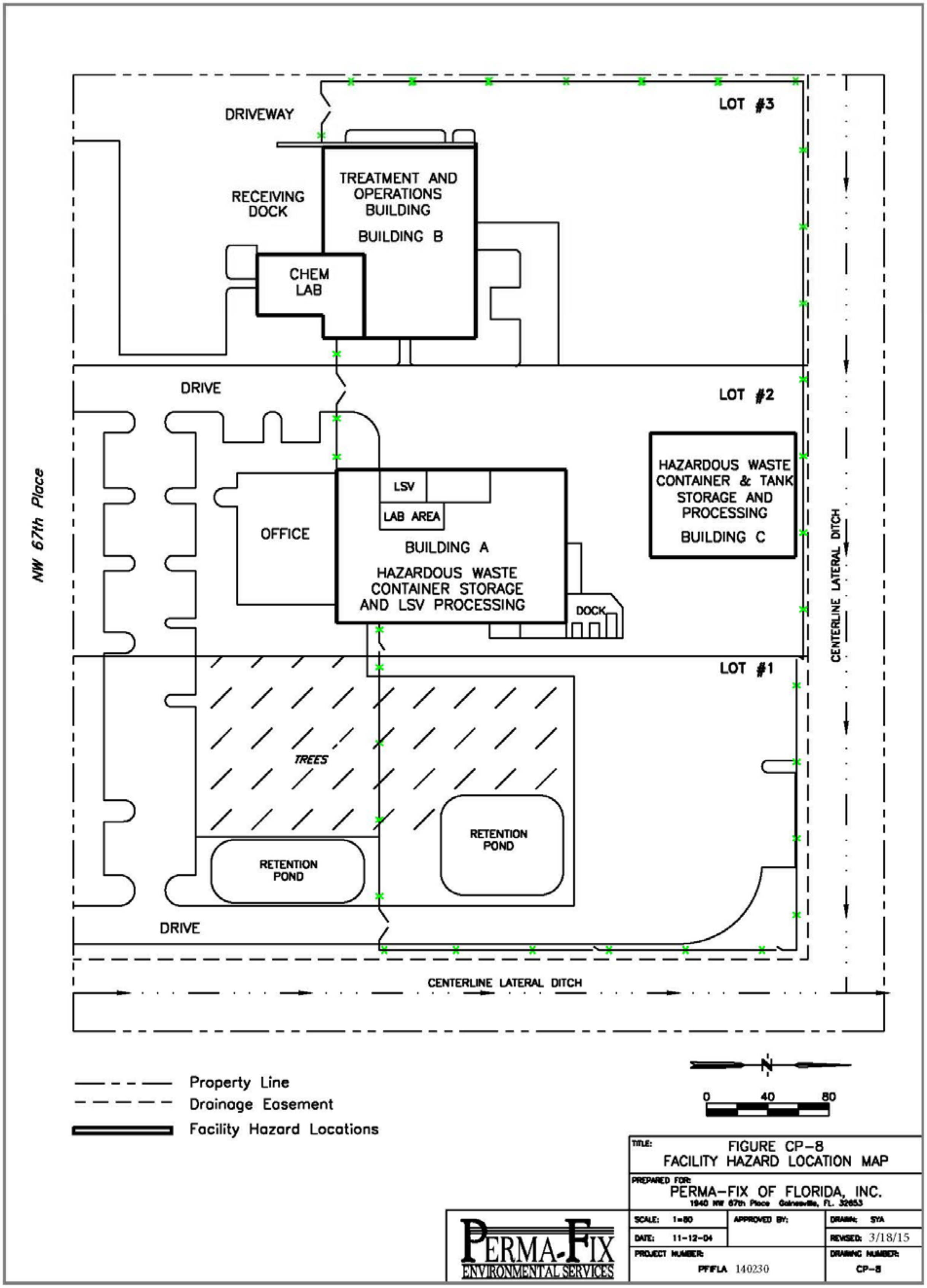
ATTACHMENT CP-7

EMERGENCY EVACUATION ROUTE MAP


DRIVEWAY
LOT #3
TREATMENT AND OPERATIONS BUILDING
RECEIVING DOCK
CHEM LAB
BUILDING B
DRIVE
LOT #2
NW 67th Place
LSV PROCESS AREA
BUILDING A
LSV PROCESSING AND WASTE STORAGE WAREHOUSE
OFFICE
PROCESSING AND STORAGE BUILDING
BUILDING C
DOCK
LOT #1
TREES
RETENTION POND
PERSONNEL ASSEMBLY
RETENTION POND
DRIVE
N
PRIMARY EXCAVATION ROUTE
ALTERNATIVE EXCAVATION ROUTE
PERMA-FIX
ENVIRONMENTAL SERVICES
TITLE: FIGURE CP-7
EMERGENCY EVACUATION ROUTE MAP
PREPARED FOR: PERMA-FIX OF FLORIDA, INC.
1940 N.W. 67th Place, Gainesville, Florida 32653
SCALE: NTS
APPROVED BY:
DRAWN: SYA
DATE: 10/06/14
REVISED: 3/18/2015
ACADFILE: PFFLA 140230
DRAWING NUMBER: CP-7

ATTACHMENT CP-8

FACILITY HAZARD LOCATION MAP



DRIVEWAY
LOT #3
RECEIVING DOCK
TREATMENT AND OPERATIONS BUILDING
BUILDING B
CHEM LAB
DRIVE
LOT #2
HAZARDOUS WASTE CONTAINER & TANK STORAGE AND PROCESSING
BUILDING C
NW 67th Place
LSV
LAB AREA
OFFICE
BUILDING A
HAZARDOUS WASTE CONTAINER STORAGE AND LSV PROCESSING
DOCK
CENTERLINE LATERAL DITCH
LOT #1
TREES
RETENTION POND
RETENTION POND
DRIVE
CENTERLINE LATERAL DITCH
N
0 40 80
Property Line
Drainage Easement
Facility Hazard Locations
TITLE: FIGURE CP-8 FACILITY HAZARD LOCATION MAP
PREPARED FOR: PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL. 32653
SCALE: 1=80
APPROVED BY:
DRAWN: SYA
DATE: 11-12-04
REVISED: 3/18/15
PROJECT NUMBER: PFFLA 140230
DRAWING NUMBER: CP-8
PERMA-FIX ENVIRONMENTAL SERVICES

ATTACHMENT CP-9

COORDINATION AGREEMENTS/RECEIPT DOCUMENTATION

ATTACHMENT CP-9
COORDINATION AGREEMENTS/RECEIPT DOCUMENTATION

EXAMPLE

Certified Mail
____
Return Receipt Request

ACCEPTANCE

I certify that on this ________ day of ___________________, I received a copy of the Contingency Plan for Perma-Fix of Florida located at 1940 NW 67th Place in Gainesville, Florida 32653. Further, this organization agrees to respond to, or assist in, emergency situations which may arise at the subject facility should the need arise.

REFUSAL

☐ By checking this box, the undersigned organization refuses to enter into an agreement to provide emergency response services to the subject facility. However, we do acknowledge receipt of the Contingency Plan being offered by Perma-Fix of Florida, Inc.

Signature:	
Printed Name:	
Title:	
Organization:	

ATTACHMENT CP-10

CONTINGENCY PLAN REVISIONS - TRANSMITTAL LETTER

ATTACHMENT CP-10
CONTINGENCY PLAN REVISIONS - TRANSMITTAL LETTER

EXAMPLE	Certified Mail # ______________ Return Receipt Request

DATE: ____________________________

TO: ____________________________

____

RE: Contingency Plan Revisions - Perma-Fix of Florida, Inc.

Dear ______________:

Perma-Fix of Florida, Inc. has revised the facility's Contingency Plan document. Our facility is required to supply your organization with a complete copy of the Contingency Plan document, and all subsequent revisions in accordance with federal EPA regulations listed at 40 CFR 264.53/264.54.

Copies of the revised pages are enclosed for insertion within your organization's copy of the Perma-Fix Contingency Plan document. Please make the necessary updates to your copy of the plan and discard all outdated pages.

The regulation also requires Perma-Fix to document a coordination agreement with your department to respond to, or assist in, emergency services in the event of an emergency situation which may arise at our facility. A separate form and envelope is enclosed for you to complete and return to the facility in order to assure Perma-Fix is in compliance with these regulations.

If you have any questions regarding the information received or your organization's role in contingency planning for the Perma-Fix of Florida facility, please contact me at (352) 395-1356.

Sincerely,

Perma-Fix of Florida, Inc.

Kurt Fogleman
Environmental Health and Safety Manager

Attachment II.A.3

Personnel Training Program

HAZARDOUS WASTE-RELATED

TRAINING PROGRAM
FOR

PERMA-FIX OF FLORIDA, INC.

GAINESVILLE, FLORIDA

TABLE OF CONTENTS

LIST OF ATTACHMENTS

LIST OF TABLES

LIST OF FIGURES

1.0 PERSONNEL TRAINING PROGRAM

This section outlines, in accordance with 40 CFR 264.16, the initial and continuing training that Perma-Fix of Florida (PFF) employees at the Gainesville waste management facility (Facility) will receive. Training methods include lecture, discussion, hands-on skill training, on-the-job training (OJT), and video or movie viewing followed by discussions. Subject matter for training includes:

- Job content and responsibilities;
- Hazard recognition;
- Hazard communication;
- Health effects and physical hazards of hazardous wastes;
- Communication and alarm systems;
- Process and safety controls and operating procedures;
- Inspection, repair, and replacement of emergency equipment and supplies;
- Use of personal protective equipment (PPE);
- Emergency response procedures and review of the facility's Contingency Plan;
- Record keeping connected with the storage and management of hazardous wastes;
- Standards for owners and operators of transfer, storage, and disposal facilities (TSDFs); and,
- Other applicable RCRA regulations.

PFF's personnel training program is designed to provide all facility employees with a level of training that is directly related and pertinent to their level of responsibility and specific job functions.

1.1 Outline of the Training Program

A description of the content of the classroom training sessions, drills, and OJT is presented in the Personnel Training Plan (Training Plan) which is included as Attachment 1 to this section.

The Training Plan will be modified in response to changes in government regulations, upon direction of the U.S. Environmental Protection Agency (EPA) or the Florida Department of Environmental Protection (FDEP), or when required as a condition of an issued permit.

1.2 Job Title, Job Description, and Duties

The job title, job description, and name of each employee filling a job at the facility related to hazardous waste management will be kept as part of the Facility Operating Record. Job descriptions include minimum educational and other necessary qualifications, as well as the assigned duties and responsibilities for each position.

1.3 Training Content, Frequency, and Techniques

This Section of the Permit Application and Attachment 1, the Personnel Training Plan describes the training that is provided at PFF for employees involved in hazardous waste management.

A. Job Assignment and Training Prerequisites

No employee shall be assigned the duties of transferring, handling, sorting, or mixing hazardous waste unless that employee has demonstrated his/her capabilities to:

1. Read and comprehend label instructions, operational procedures, contingency plans, regulatory directives, and where applicable, inspection procedures;
2. Understand the basic nature of the hazardous materials that he/she is assigned to transfer, handle, sort, or mix relative to the material's reactivity, toxicity, explosiveness, flammability, and corrosivity;
3. Operate all equipment that he/she is assigned to operate, including personal safety and emergency equipment.

No employee of the facility shall be assigned the duties of transferring, handling, sorting, or mixing hazardous waste unless that employee meets the minimum requirements set out in 40 CFR 264.16(a), (b), and (c). The job prerequisites will be verified during pre-employment interviews or through observation and knowledge of present employees, and will be documented in each employee's training file.

B. Initial Training Period

All newly hired, transferred, or cross-trained personnel will receive the instruction and OJT relating to the specific job assignments at the facility within six months of hire and assignment or reassignment to a job position involved in hazardous waste management. Employees will not work in unsupervised positions until they have completed the following minimum training requirements and have demonstrated they can safely perform their duties in compliance with applicable regulations and company operating procedures:

1. Procedures for using, inspecting, repairing, and replacing facility emergency, safety, and monitoring equipment applicable to their job tasks;
2. Key parameters for automatic waste feed cut-off systems;
3. Communications or alarm systems;
4. Response to fires or explosions;
5. Response to spills or releases of hazardous wastes;
6. Shutdown of operations; and,
7. Security provisions.

The initial training will vary in duration for each job title as presented in the training matrices presented as Figure 2 in the Personnel Training Plan, which is found in Attachment 1.

C. On-The-Job Training

The Training Plan lists specific OJT tasks for each job title. The acquisition and mastery of specific skills or operational procedures will be accomplished through supervised OJT activities, which will continue during and after the initial training period. Supervisory personnel will observe and evaluate the performance and competence of trainees during the period of OJT.

D. Annual Review, Update Training, and Retraining

The Training Topic Matrix, Figure 2, of the Training Plan lists facility personnel who will attend eight hours of annual update training and review. The annual review and update program consists of an abbreviated review of the introductory training program, updates, and a detailed review of existing emergency response procedures as contained in the Facility's Contingency Plan. Emphasis is placed on any changes in waste constituents and characteristics, equipment, operating procedures, or regulations that affect the Contingency Plan and emergency response activities. Question and answer periods will allow for focused discussion of any employee concerns, operational difficulties, equipment malfunctions, and incidents or emergencies that may have occurred in the preceding six months.

Employees may be required to participate in retraining activities under the discretion of their supervisor or the Training Director. Examples of this situation include a return to work from an extended leave of absence, new job assignment, unsatisfactory or unsafe job performance, a return to a previous job assignment, or involvement in an accident or incident where review is appropriate to prevent recurrence.

1.4 Training Director

The PFF Environmental Health & Safety Manager will serve as the Facility Training Director. That person shall be qualified by way of training and experience to serve in this function through regular attendance to environmental seminars, workshops, and refresher courses to maintain and ensure competent training skills and knowledge of regulatory changes or updates. Records documenting the training and qualifications of the Training Director will be maintained in the Facility Operating Record. The Facility Training Director may be assisted by qualified outside training consultants or other qualified staff persons in executing the duties of this function.

1.5 Relevance of Training to Job Position

The personnel training program seeks to accomplish two goals:

- Preparation of facility personnel to safely, effectively, and efficiently manage the hazardous materials that are received for storage or processing; and,
- Protection of human health and the environment.

OJT supplements more formal classroom training and provides the practical training and experience in daily waste-handling operations that are related to each employee's particular duties. OJT builds upon PFF's formal classroom training to provide specific job skills an employee will need to function efficiently and safely in his/her position.

1.6 Training for Emergency Response

Facility personnel will receive training in implementing the Contingency Plan during initial training and thereafter during annual refresher training and annual evacuation drills. Facility employees will be trained to be familiar with the Facility's emergency procedures, equipment, and systems so that they can promptly, safely, and effectively respond to emergency situations consistent with the level of emergency response training that each employee has received.

2.0 IMPLEMENTATION OF THE TRAINING PROGRAM

Facility employees will receive, or have received, introductory training in accordance with the Training Plan in Attachment 1 (or an earlier version) and will receive continuing training in accordance with the training frequency described in Section 1.3 above. Refresher training will be conducted annually and documented in the Facility's Operating Record. The following records will be maintained in the Facility's Operating Record to document the training status of each employee:

- The job title for each position at the Facility relating to hazardous waste management and the name of the employee filling each position;
- A written job description for each position, including the requisite skills, education, qualifications, and duties of the employees assigned to each position;
- A written description of the type or amount of both introductory and continuing training that will be given to each employee filling a position; and,
- A written record that confirms that the appropriate training and OJT outlined in the Training Plan has been given to, and completed by, Facility employees.

Training records on current personnel will be kept until closure of the Facility. Training records on former employees will be kept for at least three (3) years from the date the employee last worked at the Facility. Records that will be kept in the Operating Record within each employee's training file to show compliance with the requirements of 40 CFR 264.16(a), (b), and (c) shall include.

- An attendance record for individual training sessions;
- A certificate of training that is used to verify completion of training classes or modules by individual employees and is the basis of entries to the employee training record; and,
- The individual training record for each employee.

Attachment 1

Personnel Training Plan

A. INTRODUCTION

Perma-Fix of Florida, Inc. (PFF) operates a RCRA-regulated treatment and storage facility (Facility) located at 1940 N.W. 67th Place in Gainesville, Florida. The EPA ID# for the facility is FLD 980 711 071.

Currently, hazardous waste management operations conducted on-site include the storage and treatment of a wide variety of industrial wastes. The Facility receives shipments of hazardous wastes from industrial generators and subsequently blends similar waste types into a fuel that will be beneficially reused as a hazardous waste-derived fuel at off-site permitted facilities. The Facility also repackages, sorts, and consolidates other hazardous wastes for shipment and treatment off-site. A variety of chemical and physical treatment activities are also conducted at the Facility.

This document is PFF's Hazardous Waste Related Training Plan, referred to herein as the "Training Plan," for routine and emergency waste-handling operations. The Training Plan enumerates the job titles of and necessary training for those employees who work directly with hazardous wastes and employees who have emergency response duties. Hazard awareness and recognition training is provided to PFF personnel whose job function does not include direct waste handling activities, but are trained as first responders.

This Training Plan describes the integral components of PFF's comprehensive training and resources used to train employees, in addition to methods used to evaluate employee training. Table 4 contains examples of training topic records that will be maintained in the Facility Operating Record.

Training assignments are made through the designation of specific Training Modules to employees filling the job titles listed in this Training Plan. Instructor Manuals, which contain the lesson outlines and course outlines for each training topic, and master sets of participant resource materials are not contained in this Training Plan, but are supplementary materials maintained by the Facility Training Director, or his designee.

B. SCOPE OF TRAINING PLAN

The objective of this Training Plan is to provide a comprehensive program whereby PFF personnel who work directly with hazardous wastes receive training in the following areas, as appropriate:

- Management of hazardous waste materials in a manner that is safe, effective, efficient, and in compliance with applicable laws and regulations.
- Emergency response procedures, equipment, and emergency systems.
- Safety and health-related matters.

All employees who work directly with hazardous waste are trained to perform their job duties in a manner that ensures the operation of the Gainesville hazardous waste management facility in compliance with the requirements of EPA and FDEP regulations. The degree of training that each person receives depends upon his/her job duties, as well as that person's assigned tasks or responsibilities involving hazardous waste in a routine or emergency response capacity.

In addition to providing a training program for employees who work directly with hazardous waste, this Training Plan provides for the training of PFF employees who have emergency response duties. These employees are responsible for implementing the Facility's Contingency Plan. The degree of training of these employees is consistent with their role in emergency response, as specified in the Facility's Contingency Plan.

PFF recognizes that there are potential safety and health hazards associated with the improper handling and storage of hazardous waste. This Training Plan is prepared with a goal that Facility personnel, the community, the environment, and PFF property be adequately protected. The Training Plan is meant to be flexible and will be reviewed at least annually by the PFF Environmental Health & Safety Manager. The Training Plan will be modified based on Facility or process changes, the Facility's needs, changing government regulations, or when modification is required as a condition of a permit.

C. LOCATION OF TRAINING

The majority of personnel training will be conducted on-site at the Facility. Adequate classroom facilities and training aids are available. Documented OJT will be conducted on the premises in the related work areas.

Some training courses may be offered away from the Facility due to small numbers of personnel needing training in specialty subjects or when special facilities are necessary.

D. PERSONNEL TO BE TRAINED

An organizational chart for the PFF Gainesville Facility as it relates to hazardous waste management activities is shown in Figure 1. The jobs that are directly involved with hazardous waste operations are listed in Table 1. The job titles of personnel who have emergency response duties are listed in Table 2. Other jobs at the Facility that have no direct relationship to hazardous waste management and no emergency response duties under the Facility's Contingency Plan are listed in Table 3.

Job descriptions and qualifications for the various jobs that are directly involved with waste management operations have been developed and included in the Facility Operating Record, which is maintained on-site. Each job qualification requires the completion of specific training topics, as described in this Training Plan, including on-the-job training and annual refresher training. Section H of this Training Plan provides details about the training topics and the specific training assignments required for personnel in each job classification.

Not all personnel are required to be trained in all of the training topics. The training that an employee receives depends upon his or her assigned job duties, as contained in his/her job description.

No employee shall be assigned to work in an unsupervised position in the waste management Facility until he/she has demonstrated his/her capabilities and has successfully completed the training topics assigned to his/her job description, in compliance with 40 CFR 264.16(a) and (b) or any condition of the Facility's Part B permit.

E. INSTRUCTORS AND TRAINING METHODS

With the exception of OJT, training conducted at the Facility will be under the direction of the Facility Training Director. The Training Director is experienced in hazardous waste management procedures and other appropriate areas of instruction. On-the-job training is under the direction of the employee's supervisor. Supervisors have received classroom training and OJT appropriate to their positions and job functions and are qualified and authorized to provide OJT under this Training Plan.

Methods of training may include lecture, discussion, hands-on skill training, on-the-job training, and video or movie viewing followed by discussions. This Training Plan incorporates simulation or case study/scenario training where pertinent. Some training materials may be recorded and subsequent trainees will view the recording. The Training Director or an authorized designee may facilitate training by video or movie viewing by introducing the material and leading discussion after the recording has been reviewed. Training videos may also be made available to the trainees for viewing on electronic devices or through a web browser.

Individual instructors may be PFF employees or outside consultants depending upon the course, the topic, and the schedule. All instructors will be knowledgeable in the subjects that they teach. The instructors will be familiar with PFF Gainesville and hazardous waste operations. Instructors will be qualified through education, credentials, or experience. The Training Director's qualifications will be maintained on-site in the Facility Operating Record.

F. EVALUATION

The evaluation technique will vary by course, purpose, and format. Techniques may include written exam, skills observation, skills performance checklists, or questionnaires. Occasionally, other representatives of PFF may participate in evaluating course instruction. OJT will be evaluated by the employee's supervisor or the Training Director.

G. RECORD KEEPING AND CERTIFICATION

As required by EPA and FDEP, documentation of attendance, method of instruction, instructor's qualifications, and successful completion of each training topic will be maintained in the Facility Operating Record. Table 4 contains an example of employee training topic records that will be maintained in the Facility Operating Record.

A record of successful completion of OJT Task Training will be completed by the employee's supervisor and maintained in the training file of each employee.

Records documenting completion of the various training topics by current personnel will be kept until closure of the Facility. Records documenting former employees' completion of the various training topics will be kept for at least three (3) years from the date the employee last worked at the Facility. Training records will be maintained in the Facility Operating Record.

Additional records required by 40 CFR 264.16(d), including job titles, names of incumbents in those jobs, and job descriptions, will be maintained in the Facility Operating Record.

H. TRAINING TOPICS AND SCHEDULING

This Training Plan provides numerous training topics. Each job classification is assigned specific training topics related to the successful performance of that job in a manner that is safe and healthful to self, co-worker, environment, and property. These training assignments are listed on Figure 2 in this Training Plan. Table 4 lists an example record of description of each training topic assigned to employees.

The Facility normally operates one shift per day, five (5) days per week. It is the responsibility of the Facility Training Director or his/her authorized designee to schedule the necessary training for each person and to document attendance and successful course completion. The General Manager will advise the Facility Training Director of new hires and personnel classification changes that result in the need for training. The Facility Training Director will be responsible for scheduling timely refresher training for current employees when annual refresher training comes due.

Supervisors are responsible for providing OJT and for assuring that employees will not work in unsupervised positions until they have completed the training requirements of their job classification. Supervisors evaluate OJT and document the completion of each assigned OJT task. The OJT training documentation is provided to the Facility Training Director for appropriate record keeping. Table 5 contains a list of OJT tasks. Supervisors also provide refresher OJT to appropriate personnel, and document the completion of assigned OJT tasks for record keeping at the Facility.

TABLE 1

JOB TITLES RELATED TO HAZARDOUS WASTE MANAGEMENT

Assistant Analytical Chemistry Lab Manager (AACLM)
Assistant Manager Technical Services (AMTS)
Analytical Chemistry Lab Manager (ACLM)
Environmental Chemistry Lab Technician (ECLT)
Environmental Chemistry Lab Technician - Metals (ECLT(M))
Environmental Health & Safety Manager (EHSM)
Industrial Coordinator (IC)
Industrial Area Supervisor (IAS)
Maintenance Coordinator (MC)
Maintenance Technician 1 (MT1)
Maintenance Technician 2 (MT2)
Nuclear Operations Supervisor (NOS)
Process Technician III (PT III)
Quality Assurance Inspector (QAI)
Quality Assurance Manager (QAM)
Radiation Safety Officer (RSO)
Route Truck Driver (RTD)
Senior Lab Technician, Radiological (SLTR)
Support Technician Supervisor (STS)
Support Technician Radiological (STR)
Transportation Supervisor (TS)
Transportation Specialist 1 (TS1)
Treatment Coordinator (TC)
Treatment Technician (TT)

Note: Job description for the above positions is maintained at the PFF Gainesville facility. Each job description contains those duties typically performed by an individual filling each position.

TABLE 2

JOB TITLES OF EMERGENCY COORDINATORS

General Manager
EH&S Manager
Quality Assurance Manager
Treatment Coordinator
Industrial Coordinator
Maintenance Coordinator

TABLE 3

JOB TITLES NOT INVOLVED WITH HAZARDOUS WASTE OPERATIONS OR EMERGENCY RESPONSE

Controller (CO)
Document Specialist (DS)
Administration/Marketing Support Specialist(AMSS)
Accounting Specialist (AS)
Receptionist (RE)
Manager, Customer Service (MCS)
Customer Service Support Specialist (CSSS)
Manager, Technical Services (MTS)

Staff Accountant (SA)

All Sales Positions

TABLE 4

PERMA-FIX OF FLORIDA, INC.
EMPLOYEE INITIAL/ANNUAL TRAINING TOPICS EXAMPLE RECORD

NAME: ______________________________ START DATE: ______________

TITLE: ______________________________

HAZARDOUS WASTE MANAGEMENT TRAINING

COURSE TOPIC	DATE	INSTRUCTOR	LENGTH
HAZWOPER 24-Hour (New Hire)			
HAZWOPER 8-Hour Annual Refresher			
Respiratory Protection			
Hazard Communication			
Personal Protective Equipment			
Contingency Plan			
Facility Inspection Plan			
Waste Operations Procedures			
Equipment Procedures			
Lab (Non-Rad) Procedures			
D.O.T. Training			

TABLE 5

ON-THE-JOB TRAINING TOPICS

TASK

1. Sampling
2. Off Loading
3. Maintenance
4. Tank Management Practices
5. Container Management Practices
6. Repackaging Operations
7. Laboratory
8. Inspection and Remedial Action
9. Record Keeping
10. Administration
11. Personal Protective Equipment
12. Emergency Procedures and Controls
13. Supervisory Duties

FIGURE 1

ORGANIZATION CHART
For
PERMA-FIX OF FLORIDA, INC.

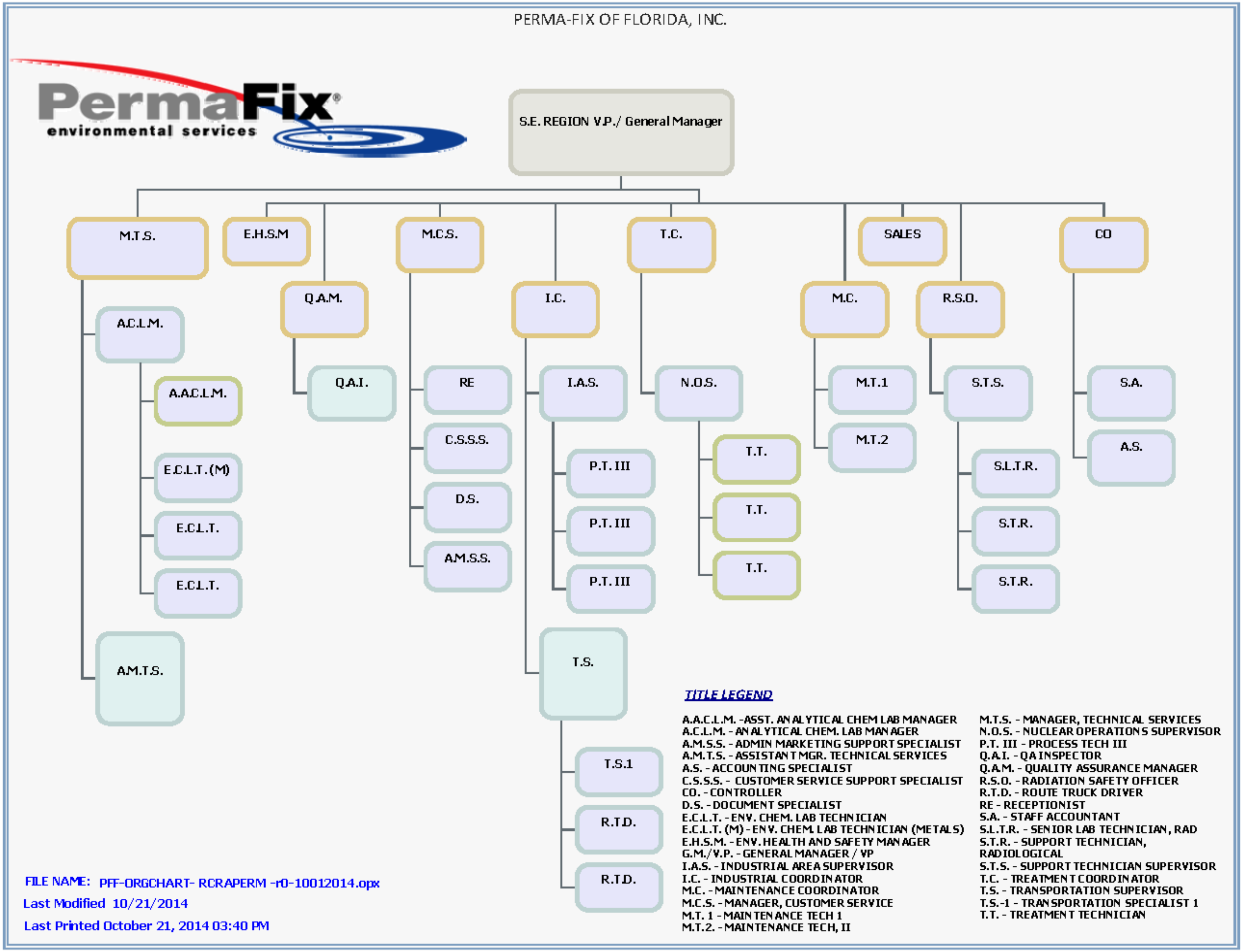

PERMA-FIX OF FLORIDA, INC.
PermaFix environmental services
S.E. REGION V.P./ General Manager
M.T.S.
A.C.L.M.
A.A.C.L.M.
E.C.L.T.(M)
E.C.L.T.
E.C.L.T.
A.M.T.S.
E.H.S.M
Q.A.M.
Q.A.I.
M.C.S.
RE
C.S.S.S.
D.S.
A.M.S.S.
I.C.
I.A.S.
P.T. III
P.T. III
P.T. III
T.S.
T.S.1
R.T.D.
R.T.D.
T.C.
N.O.S.
T.T.
T.T.
T.T.
M.C.
M.T.1
M.T.2
SALES
R.S.O.
S.T.S.
S.L.T.R.
S.T.R.
S.T.R.
CO
S.A.
A.S.
TITLE LEGEND
A.A.C.L.M. -ASST. ANALYTICAL CHEM LAB MANAGER
A.C.L.M. - ANALYTICAL CHEM. LAB MANAGER
A.M.S.S. - ADMIN MARKETING SUPPORT SPECIALIST
A.M.T.S. - ASSISTANT MGR. TECHNICAL SERVICES
A.S. - ACCOUNTING SPECIALIST
C.S.S.S. - CUSTOMER SERVICE SUPPORT SPECIALIST
CO. - CONTROLLER
D.S. - DOCUMENT SPECIALIST
E.C.L.T. - ENV. CHEM. LAB TECHNICIAN
E.C.L.T. (M) - ENV. CHEM. LAB TECHNICIAN (METALS)
E.H.S.M. - ENV. HEALTH AND SAFETY MANAGER
G.M./V.P. - GENERAL MANAGER / VP
I.A.S. - INDUSTRIAL AREA SUPERVISOR
I.C. - INDUSTRIAL COORDINATOR
M.C. - MAINTENANCE COORDINATOR
M.C.S. - MANAGER, CUSTOMER SERVICE
M.T. 1 - MAINTENANCE TECH 1
M.T.2. - MAINTENANCE TECH, II
M.T.S. - MANAGER, TECHNICAL SERVICES
N.O.S. - NUCLEAR OPERATIONS SUPERVISOR
P.T. III - PROCESS TECH III
Q.A.I. - QA INSPECTOR
Q.A.M. - QUALITY ASSURANCE MANAGER
R.S.O. - RADIATION SAFETY OFFICER
R.T.D. - ROUTE TRUCK DRIVER
RE - RECEPTIONIST
S.A. - STAFF ACCOUNTANT
S.L.T.R. - SENIOR LAB TECHNICIAN, RAD
S.T.R. - SUPPORT TECHNICIAN, RADIOLOGICAL
S.T.S. - SUPPORT TECHNICIAN SUPERVISOR
T.C. - TREATMENT COORDINATOR
T.S. - TRANSPORTATION SUPERVISOR
T.S.-1 - TRANSPORTATION SPECIALIST 1
T.T. - TREATMENT TECHNICIAN
FILE NAME: PFF-ORGCHART- RCRAPERM -r0-10012014.opx
Last Modified 10/21/2014
Last Printed October 21, 2014 03:40 PM

FIGURE 2

JOB ASSIGNMENTS
TRAINING TOPIC MATRIX

FIGURE 2
JOB ASSIGNMENTS - TRAINING TOPIC MATRIX

DESCRIPTION	GENERAL PERSONNEL	WASTE OPERATIONS	LAB PERSONNEL	MAINTENANCE	TRANSPORTATION
Annual Facility Fire Drill	X	X	X	X	X
HAZWOPER 8 hour Refresher (Annual)	X	X	X	X	X
HAZWOPER 24 Hour (NEW HIRE)	X	X	X	X	X
Respiratory Protection - 29 CFR 1910.134	X	X	X	X	X
Hazard Communication - 29 CFR 1910.1200	X	X	X	X	X
Personal Protective Equipment. - 29 CFR 1910 Subpart 1	X	X	X	X	X
Contingency Plan - 29 CFR 1910.120 / 40 CFR 264.16(3)	X	X	X	X	X
Facility Inspection Plan	X	X	X	X	X
Annual RCRA Training	X	X	X	X	
Periodic Professional Development Training			X		
WASTE OPERATIONS PROCEDURES		X			
EQUIPMENT PROCEDURES				X	
LAB (NON RAD) PROCEDURES			X		
D.O.T. (49 CFR TRAINING)					X

Positions included under each category that involves hazardous waste management:

General Personnel: General Manager, EHSM, QAI, QAM, RSO, MTS, AMTS

Waste Operations: IC, IAS, NOS, PTIII, TC, TT Lab Personnel: AACLM, ACLM, ECLT, ECLT(M), SLTR, STS, STR

Maintenance: MC, MT1, MT2

Transportation: RTD, TS, TS1

Attachment II.A.4

Waste Analysis Plan

ATTACHMENT II.A.4

WASTE ANALYSIS PLAN

1.0 INTRODUCTION

The Perma-Fix of Florida (PFF) Facility (Facility) receives wastes from off-site generators for storage and treatment. Wastes received on-site are managed using the following methods: Perma-Fix I® Process (PF-I) solidification/stabilization, Perma-Fix II® Process (PF-II) (thermal desorption and/or chemical oxidation/reduction), waste bulking activities, storage, and miscellaneous treatment processes (e.g., chemical and physical extraction, deactivation, and fuel blending). The facility accepts hazardous waste, non-hazardous waste, and mixed waste for these processes. This section provides details on the types of hazardous wastes received, the analyses performed, and acceptance limits. This section also provides information regarding post-treatment analysis, where applicable.

1.1 General Description of the Wastes

PFF receives wastes in both pumpable and non-pumpable forms from various generators. In general, the pumpable wastes received at the PFF Facility are received from industrial, manufacturing, and service industries. PFF typically receives solids from service industries and environmental remediation sites.

The wastes accepted at the facility can be divided into the following five major categories:

- Non-hazardous, non-radioactive wastes such as:
  - Diesel-contaminated soils;
  - Oil-contaminated pads, booms, and absorbent;
  - Off-spec greases and lubricants;
  - Petroleum contact waters; and,
  - Used oil and oily waters
- Non-hazardous, radioactive wastes such as:
  - Dry active waste (DAW) containing personal protective equipment (PPE), rags, wipes, glassware, pipettes, etc.; and,
  - Debris
- Hazardous, radioactive wastes (mixed wastes) such as:
  - Lab packs;
  - Bulk liquids (flammables, acids, bases, oxidizers);
  - Solids (soils, sludges); and,
  - Debris
- Hazardous, non-radioactive wastes such as:
  - Flammable liquids;
  - Hazardous waters;
  - Solids (paint solids/sludges, debris); and,

  - Lab packs
- PCB Wastes

This Waste Analysis Plan is specifically designed for the hazardous wastes received from off-site and for the hazardous waste generated on-site (e.g., treatment residuals). PBC wastes are managed in accordance with EPA's Approval to Commercially Store PBCs dated July 24, 2013.

A list of acceptable hazardous waste codes is included in Attachment II.A.4.1.

2.0 WASTE ANALYSIS PLAN

The Waste Analysis Plan for the PFF facility incorporates procedures to meet three main objectives:

1. Pre-Acceptance Analyses performed by or at the request of PFF to determine whether a hazardous waste will be accepted from off-site generators;
2. Waste Receipt Analyses used to confirm that wastes, when received, are consistent with the profile; and,
3. Post-Treatment Analyses to confirm that the PF-I and/or PF-II treatment processes, as well as the other treatment processes (i.e., non-elementary neutralization, mercury amalgamation, and deactivation) have successfully treated the waste, as required.

The following provides details regarding the Pre-Acceptance Analysis, the Waste Receipt Analysis, and the Post-Treatment Analysis for the wastes received at the facility. PFF may collect and analyze process control samples at its discretion for evaluating factors such as process efficiency and recipe for treatment. Such process control sampling and analysis is not performed for regulatory compliance under RCRA; hence it is outside the scope of this Waste Analysis Plan.

2.1 Pre-Acceptance Analysis

2.1.1 Waste Profile Sheet

Before approving hazardous wastes for management at the Facility, PFF conducts a preliminary evaluation to determine if the material is suitable for management at the Facility. A Waste Profile summarizing waste characteristics is required to be completed by the generator for each hazardous waste stream. An example of such Waste Profile is included in Attachment II.A.4.2. The Waste Profile will include the following information, at a minimum:

- Hazardous waste generator's name;
- Description of process generating the hazardous waste;
- Physical and chemical characteristics of the hazardous waste; and,
- Regulatory information (e.g., land disposal restriction).

2.1.2 Waste Stream Pre-Approval Analysis

The Waste Profile is reviewed by appropriate PFF personnel prior to its approval/disapproval.

For a waste profile of a waste stream containing the following waste codes , PFF will follow the procedure in the Attachment II.A.4.5 to ensure that chemical constituents of the waste codes contained in a single container do not exceed the amount predicted by the Off-site Consequence Analysis: submitted with December 4, 2009 (revised March 10, 2010) permit renewal: F010, F011, F012, F019, F020, F021, F022, F023, F026, F027, F028, F032, F034, F035, F037, F038, K001, K048, K049, K050, K051, K052, K061, K062, K086, K156, K157, K158, K159, K161, K169, K170, K171, K172, AND U395.

For hazardous wastes, generator knowledge, Material Safety Data Sheets (MSDSs), technical bulletins, etc., often provide all the information needed to make a pre-approval determination. However, for those wastes for which limited or questionable information is available, a pre-approval laboratory analysis may be required. This analysis may be performed by the generator, PFF, or an independent laboratory. Any PFF management personnel reviewing the profile may request additional information or analyses prior to waste stream approval. A typical example of chemical and physical analyses is included in Attachment II.A.4.6. Records of the chemical and physical data are maintained at the Facility in file cabinets in the hallway next to the copy room for at least 3 years.

The analysis required for a pre-approval sample will vary from sample to sample. For example, a hazardous solids sample submitted for pre-approval may only need a BTU determination to distinguish it as a fuel candidate or a material that will be bulked for disposal at a Class C landfill.

A listing of the analytical methods that may be used by the on-site laboratory for pre-approval analysis is included in Attachment II.A.4.3. In any event, characterization of the waste remains the responsibility of the generator.

2.1.3 Waste Stream Recertification

Approved Hazardous Waste Profiles are valid for one year and must be recertified annually by the generator. If a generator can certify that the chemical and physical characteristics and the process generating the waste have not changed over the past year, the initial waste analysis requirements (if applicable) will not be repeated. A periodically shipped waste will be recertified with the first shipment after the annual recertification date.

Recertification of a waste stream will be required for generators who have not manifested the profiled waste stream to the Facility during the preceding 12-month period. Additionally, when a generator notifies PFF that the process or operation generating a profiled waste stream has changed, the waste must be re-characterized. In the event PFF has reason to believe that the process or operation generating the waste has changed without notice from the generator, a re-characterization will also be required. In order to re-characterize its waste stream, the generator may be required to complete a new Waste Profile and undergo the waste stream pre-approval process as outlined in Subsection 2.1.2 above.

For certain emergency response situations and generator spills, some of the initial waste analysis parameters for on-site management may be waived until after the waste is received at PFF. This will only occur if the generator can adequately make the hazardous waste determination of 40 CFR 262.11. The available analytical data and supporting MSDSs will be evaluated prior to receipt of the waste at the facility.

2.2 Waste Receipt Analysis

Every waste stream received at the Facility is inspected and/or analyzed when it arrives. The following sections describe the different categories of wastes received at the Facility, the verification analysis performed, and rationale used in determining what analysis to perform.

2.2.1 Waste Not Subject to Sampling

The following types of waste streams will be routinely subject to visual inspection only, unless it is determined by PFF that additional sample analysis is needed:

- Lab Packs; and
- Hazardous Only Solids, such as
    - Paint solids;
    - Soils; and
    - Debris

2.2.2 Hazardous Fuels (HF), Fuel Blend (B), Fuels with High Halogens (BH), Fuel Blend with Sludge (BS), High Solid Fuel Blend (BSO), and Fuel with High Water (BW)

If a waste stream includes more than one drum, a composite sample made up of individual samples from at least 10% of the drums in that waste stream is collected for analysis.

These waste stream composites will be tested for specific gravity and % water. If the % water is >20%, the pH will be determined. If the waste reacts (i.e., fumes, smokes, effervesces, or raises the temperature significantly) with the Karl Fischer reagent during the water determination, a compatibility test will be performed.

These waste streams are primarily paint-related materials or solvents from hospitals, labs, manufacturing operations, etc. Historically, these tests have been sufficient for screening. A sample from the tanker these materials are bulked into is analyzed for each off-site shipment. Such samples have shown that the combined wastes are consistent with the profiled materials. The bulked liquids from this category are sent to a RCRA-permitted facility.

2.2.3 Hazardous Waters (HW)

If the waste stream includes more than one drum, a composite sample made up of individual samples from at least 10% of the drums in that waste stream is collected for analysis.

This waste stream composite will be tested for density, % water, and pH. If the waste reacts (i.e., fumes, smokes, effervesces, or raises the temperature significantly) with the Karl Fischer reagent during the water determination, a compatibility test will be performed.

This waste stream consists of water that has been contaminated with hazardous constituents such as solvents or metals. Examples include oily water from sumps and gasoline-contaminated water from monitoring wells. Historically, these tests have been sufficient for screening. A sample from the tanker these materials are bulked into is analyzed for each off-site shipment. Such samples have shown that the combined wastes are consistent with the profiled materials. The liquids from this waste stream are sent to a permitted hazardous waste facility.

2.2.4 Mixed Wastes

All mixed wastes (with the exception of lab packs and debris) received at PFF are subjected to one or more fingerprint analyses consisting of 1) specific gravity, 2) % water, 3) pH, and 4) flashpoint. Applicability of each fingerprint analysis is indicated in Attachment II.A.4.3. Fingerprint analysis results are provided for comparison to corresponding parameter values specified in the generator's waste profile. This allows verification that the identity of the waste received in a particular shipment is the same as the waste profiled and approved for that generator. Additional process control samples may also be analyzed at the discretion of PFF.

2.2.5 Non-Conforming Waste

Wastes are considered to be non-conforming under the following conditions:

1. Analytical results are significantly different from data provided on the profile:
    - The pH is more than ±2 units from the pH range shown on the profile;
    - The difference in water content is greater than ±30% by weight of the profiled range;
    - The flashpoint is more than ±30% different from the profiled range in degrees C; or
    - The specific gravity is more than ±30% different from the profiled range.

2. Analytical results indicate that the waste exhibits a RCRA characteristic not shown on the profile.

Non-conforming waste will be handled in the following manner.

- A non-conformance report will be generated detailing why the waste is non-conforming. If the waste is still one that PFF can process, in accordance with the applicable provisions of the RCRA permit, the generator or broker will be contacted to get their permission to:
    - Make changes to the profile so that it matches the analytical results;
    - Generate a Hazardous Waste Manifest if the material has been determined to be hazardous and was shipped as non-hazardous. Also, an Unmanifested Waste Report will be submitted to FDEP within 15 days of receipt.
    - Make any necessary changes to the Hazardous Waste Manifest (add codes, change shipping description, etc.) if the waste was shipped as hazardous.

- If the generator disputes the analytical results generated from the incoming waste analysis, PFF may agree to send a sample of the waste to an independent outside lab. Another option will be to return the waste to the generator.
- If the waste is not acceptable for processing under the PFF RCRA permit, it will be returned to the generator or shipped to a properly permitted treatment, storage, or disposal facility. Unacceptable wastes will not be stored at PFF.

2.3 Post-Treatment Analysis

Residues remaining after on-site treatment of wastes will either be sent off-site for further treatment (e.g., combustion) or sent off-site for disposal, depending on whether the residues meet Land Disposal Restrictions (LDR) treatment standards as specified in 40 CFR 268.40. Hazardous waste/residues sent off-site will be sent to facilities with interim status or final hazardous waste permits. PFF will follow procedures outlined in this subsection to determine whether the treatment residues meet LDR treatment standards.

Treatment residues that exceed applicable LDR treatment standards will be sent off-site for further treatment (e.g., combustion). LDR notifications will be supplied and will contain the information required under 40 CFR 268.7.

Several types of waste may be generated by the various steps in the PF-II process. Waste characterization will be conducted on these wastes in accordance with the requirements of 40 CFR 262 and may include application of process knowledge and/or analytical testing. Residuals from the PF-II process will be assumed to retain detectable radioactivity levels. The anticipated disposition of these wastes is discussed below. Alternative treatment/disposal options may be used if additional facilities become available.

Treatment residues that are shipped off-site for land disposal will be analyzed to verify that the wastes meet LDR treatment standards as specified in 40 CFR 268.40. If the residue to be disposed exhibits a hazardous characteristic and/or possesses a listed waste code, the residue will be disposed at a Subtitle C facility. Otherwise, the residue may be shipped to a Subtitle D facility.

For treatment residue that is sent to a Subtitle C facility:

- Analytical results will be used to ensure that accurate LDR notifications and certifications are prepared;
- LDR notifications and certifications will be supplied and will contain the information required under 40 CFR 268.7; and,
- Analytical results completed in support of LDR requirements will be retained within the Facility Operating Record.

For treatment residue that is sent to a Subtitle D facility:

- Analytical results will be used to ensure that accurate LDR notifications and certifications are prepared;
- Any LDR notifications and certifications required per 40 CFR 268.7 will be submitted to FDEP; and,

- LDR notifications and certifications will be placed in the Facility Operating Record.

Identification of the parameters to be tested are determined based on pretreatment waste stream knowledge, RCRA waste identification information (i.e., 40 CFR Part 261, Appendix VII – the basis for listing hazardous waste, and Appendix VIII – Hazardous Constituents) and the generator's land disposal restriction notification information. For LDR treatment standards expressed as concentrations in the residue extract, the TCLP (EPA SW-846 Method 1311) will be employed to obtain an extract of the waste. Then, the extract and/or residue sample will be analyzed for TCLP and/or total waste concentrations, respectively.

After the non-elementary neutralization, the treated material will be sampled and analyzed for pH to ensure that it is no longer a D002 hazardous waste. The treated material after the deactivation process is no longer a RCRA-regulated hazardous waste since it has undergone a specific treatment method (i.e., deactivation) prescribed by 40 CFR 268.40. The amalgam formed after the mercury amalgamation is no longer a RCRA-regulated hazardous waste if it passes the TCLP test. The amalgamated waste does not require sampling or analyses if it is disposed of in a Subtitle C landfill, unless required by the receiving facility. If amalgamated waste is to be disposed of in a Subtitle D landfill, a TCLP analysis for mercury or generator knowledge will be used to ensure that it is not a D009 hazardous waste.

2.4 Waste Analysis Parameters and Rationale

Summaries of the waste analysis parameters selected and the rationales for selection are shown in Attachment II.A.4.3.

2.5 Analytical Test Methods

Analytical test methods used by PFF to test for waste parameters are standard laboratory methods or methods developed specifically for waste managed on-site. Attachment II.A.4.3 provides analytical test methods that may be used to evaluate physical/chemical waste analysis parameters for pre-accepted and received waste.

The analytical test methods performed for the post-treatment organic and inorganic constituents follow SW-846 Test Methods or American Society for Testing and Materials (ASTM) methodologies, or equivalent. Such analyses may be performed at an off-site laboratory.

2.6 Sampling Methods

Sampling methods used at the Facility will be those listed in Florida DEP SOP-001/01, FS 5000 Waste Sampling, or equivalent. PFF recognizes the importance of collecting a representative sample (as defined in 40 CFR 260) of each waste stream. If standard facility sampling techniques do not provide a representative sample for analysis, an appropriate alternate method will be used.

2.6.1 As-Received Wastes

Wastes are primarily received at the Facility in containers (e.g., drums). However, wastes may also be received at the Facility in vials, lab packs, tanker trucks, and roll-off boxes. For waste streams that consist of multiple containers, a grab sample will be drawn from at least ten percent (10%) of the total number of containers for each waste stream. Drum thieves are generally used for sampling containerized liquids. Sampling devices for other than containerized liquids may be weighted bottles, dippers, coliwasas, triers, or other equivalent devices depending upon the characteristics of waste to be sampled. Sludges and/or solids are sampled using a scoop or similar device in order to obtain a representative sample.

2.6.2 Post-Treatment Wastes

For batch treatment operations, PFF will either:

1) collect and analyze one grab sample from the residue generated from each batch; or,
2) if residues are generated from multiple treatment batches from the same waste stream, collect one random grab sample from no less than 10% of the total number of containers of residues generated, composite the grab samples, and analyze the composite sample. In some cases, PFF may analyze each grab sample.

The treatment residues will be sampled using one of the following:

* coliwasa, dipper (liquids); or,
* trier, auger, scoop, tube sampler, dipper (solids, sludges).

Once a sample is drawn, the sample is placed in a sample container. The samples are stored in glass or polyethylene bottles, depending on whether organic analyses are to be conducted. In addition, the samples will be cooled if necessary to preserve volatile constituents.

2.7 Procedures for Ignitable, Reactive, or Incompatible Wastes

PFF may handle ignitable, reactive, or incompatible wastes. Prior to co-mingling wastes, PFF operations personnel will use existing waste analysis information provided by the generator and/or published literature to determine if there is a potential danger in mixing wastes. Potentially incompatible wastes will also be bench-tested in the on-site laboratory, in accordance with the method listed in Attachment II.A.4.4 or by operations personnel in the waste treatment area.

Materials will be considered incompatible and will not be mixed together in containers, tanks, or treatment processes if they:

* Generate extreme heat or pressure, fire or explosions, or violent reactions;
* Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
* Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
* Damage the structural integrity of the container, tank, or treatment process or facility; or,
* May otherwise threaten human health or the environment.

PFF will manage ignitable and reactive waste in accordance with the following procedures. Ignitable or reactive wastes are either stored in containers or tanks and are protected from sources of ignition or reaction. Activities that would produce open flames, hot surfaces, frictional heat, sparks, spontaneous ignition, or radiant heat will not occur in the vicinity of ignitable wastes. As a safeguard for handling ignitable and reactive wastes, smoking is not allowed within the Facility (except in designated areas).

Incompatible wastes are placed in separate secondary containment areas. Incompatible wastes are physically separated by the use of a berm or dike, or by placing them in separate buildings. Incompatible wastes will not be placed in the same container or tank.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

3.1 Sampling Quality Assurance/Quality Control

The quality assurance (QA) of sampling is controlled through the proper training of all personnel who are involved in sampling. In addition, sample identity information is documented on each sample taken, usually in the form of a label attached to the sample container, or written directly on the container.

Quality control (QC) on samples is measured by comparing the analytical results of the sample against its Pre-Acceptance Analysis, if any. If a discrepancy is noted, a second sample may be obtained and analyzed to verify the results of the first analysis, or the instruments that yielded the discrepant result may be checked for proper calibration, programmed dilution factors, etc. Where applicable, and depending on the specific QA/QC requirements of a test procedure, a duplicate sample analysis will be performed to verify sampling quality control.

3.2 Laboratory Quality Control

The PFF on-site laboratory uses standard QC procedures as part of the overall QA program. These QC procedures specify that QC checks must be conducted to verify that all analyses are accurate and precise. Each analytical procedure uses the following QC checks, where applicable:

Calibration and Reagent Standardization:
Each time an instrument is calibrated or a reagent is standardized, a record is kept of the results. The analytical methods specify the procedure and frequency required to maintain accuracy.

Known Standards:
Calibration or analysis of a known standard will be performed when the instrument is being used for laboratory analyses and per the specific requirements of the analytical method.

Blanks:
Where applicable, blanks are run for each analytical method on a daily basis, and the results are recorded in the laboratory operating record.

Duplicates:
A duplicate or matrix spike duplicate sample is run in accordance with the frequency specified in the analytical method and when the instrument is being used for laboratory analyses. The results are recorded in the laboratory operating record.

Spiked Samples:

Where applicable, samples are spiked with the analyte and analyzed. Spikes are conducted at the frequency specified in the analytical method.

Attachment II.A.4.1

List of Waste Codes Accepted at the Facility

ATTACHMENT II.A.4.1

List of Waste Codes Accepted at the Facility

D001	D037	K050	P021	P063	P106	U002	U038	U076	U113	U149	U185	U225
D002	D038	K051	P022	P064	P108	U003	U039	U077	U114	U150	U186	U226
D003	D039	K052	P023	P065	P109	U004	U041	U078	U115	U151	U187	U227
D004	D040	K061	P024	P066	P110	U005	U042	U079	U116	U152	U188	U228
D005	D041	K062	P026	P067	P111	U006	U043	U080	U117	U153	U189	U234
D006	D042	K086	P027	P068	P112	U007	U044	U081	U118	U154	U190	U235
D007	D043	K156	P028	P069	P113	U008	U045	U082	U119	U155	U191	U236
D008	F001	K157	P029	P070	P114	U009	U046	U083	U120	U156	U192	U237
D009	F002	K158	P030	P071	P115	U010	U047	U084	U121	U157	U193	U238
D010	F003	K159	P031	P072	P116	U011	U048	U085	U122	U158	U194	U239
D011	F004	K161	P033	P073	P118	U012	U049	U086	U123	U159	U196	U240
D012	F005	K169	P034	P074	P119	U014	U050	U087	U124	U160	U197	U243
D013	F006	K170	P036	P075	P120	U015	U051	U088	U125	U161	U200	U244
D014	F007	K171	P037	P077	P121	U016	U052	U089	U126	U162	U201	U246
D015	F008	K172	P038	P078	P122	U017	U053	U090	U127	U163	U202	U247
D016	F009		P039	P081	P123	U018	U055	U091	U128	U164	U203	U248
D017	F010		P040	P082	P127	U019	U056	U092	U129	U165	U204	U249
D018	F011	P001	P041	P084	P128	U020	U057	U093	U130	U166	U205	U271
D019	F012	P002	P042	P085	P185	U021	U058	U094	U131	U167	U206	U278
D020	F019	P003	P043	P087	P188	U022	U059	U095	U132	U168	U207	U279
D021	F020	P004	P044	P088	P189	U023	U060	U096	U133	U169	U208	U280
D022	F021	P005	P045	P089	P190	U024	U061	U097	U134	U170	U209	U328
D023	F022	P006	P046	P092	P191	U025	U062	U098	U135	U171	U210	U353
D024	F023	P007	P047	P093	P192	U026	U063	U099	U136	U172	U211	U359
D025	F026	P008	P048	P094	P194	U027	U064	U101	U137	U173	U213	U364
D026	F027	P009	P049	P095	P196	U028	U066	U102	U138	U174	U214	U367
D027	F028	P010	P050	P096	P197	U029	U067	U103	U140	U176	U215	U372
D028	F032	P011	P051	P097	P198	U030	U068	U105	U141	U177	U216	U373
D029	F034	P012	P054	P098	P199	U031	U069	U106	U142	U178	U217	U387
D030	F035	P013	P056	P099	P201	U032	U070	U107	U143	U179	U218	U389
D031	F037	P014	P057	P101	P202	U033	U071	U108	U144	U180	U219	U394
D032	F038	P015	P058	P102	P203	U034	U072	U109	U145	U181	U220	U395
D033	F039	P016	P059	P103	P204	U035	U073	U110	U146	U182	U221	U404
D034	K001	P017	P060	P104	P205	U036	U074	U111	U147	U183	U222	U409
D035	K048	P018	P062	P105	U001	U037	U075	U112	U148	U184	U223	U410
D036	K049	P020										U411

Attachment II.A.4.2

Example of Waste Profile Form

WASTE PROFILE

*Perma-Fix Nuclear Services: DSSI * M&EC * Perma-Fix of Florida * Perma-Fix Northwest*

Profile Number

Generator Information:

EPA ID#

Generator Name

Generator Address

City/State/Zip

Telephone

Fax

Billing Information:

☐ Electronic users: check here to copy Generator info, if same.

Broker/Site

Address

City/St/Zip

Telephone

Fax

Check all that apply

☐ Hazardous Waste - *Include LDR-UHC Constituent Form*
- ☐ *Mercury >260 PPM* ☐ *Oxidizers*
- ☐ *Elemental Mercury*
- ☐ *Reactives - specify:*

☐ TSCA Regulated PCB
- ☐ *PCB Bulk Products*
- ☐ *PCB Remediation Waste*
- ☐ *PCB Articles*

☐ Radioactive Waste

☐ Non-Hazardous Waste
☐ Universal Waste
☐ Used Oil Filter
☐ Used Oil

Please provide a detailed description of the process that generated this waste. Attach additional sheets if needed. Note: for a line break, press alt-return.

Characterization Method: *(check ONE only)* ☐ Laboratory Analysis ☐ MSDS ☐ Generator Knowledge

Physical Description: *(check all that apply)* ☐ Solid ☐ Liquid ☐ Sludge ☐ Debris ☐ Labpack *(add inventory form)*
☐ Other:

Volume: *(include units: 30 liters, 5 gal., etc)* Gross Weight: *(include units: 75 lbs, 10 kg, etc.)* Container Type: Total Number of Containers:

Overpacked: ☐ Yes ☐ No **US DOT Hazardous Material:** ☐ Yes ☐ No **Proper Shipping Name:**

DOT Hazard Class: *primary* *subsidiary*

☐ This waste stream is subject to the Land Disposal Restriction of 40 CFR 268. *(If checked, complete a Land Disposal Restriction Notification form)*
☐ This waste stream contains Benzene. *(If checked, complete the Benzene NESHAP Worksheet)*
☐ This waste stream consists of off-spec used oil.
☐ This is a CERCLA waste.

For Broker Use Only

I certify the following:
The packages used to ship this material meet the requirements of 40 CFR 173 Subpart B (HazMat). This material will be inspected for consistency with the preapproved profile at the time of transportation.

Name Date

CHEMICAL PROPERTIES AND COMPOSITION:

Percent Free Liquid: % (None=0%, all=100%) Percent Settled Solids: % (None=0%, all=100%) Viscosity: Centistokes

pH Actual: OR Range: to **Specific Gravity** Actual: OR Range: to

CERTIFICATION

I certify that all hazards, known or suspected, have been disclosed on this profile. Further I understand that a surcharge may be imposed for any material which is rejected or requires additional handling due to the material being inconsistent with the profile, improper or damaged containers, or improper shipping documents.
1. Any sample submitted is representative as defined in 40 CFR 261-Appendix I or is obtained using an equivalent method.
2. I authorize Perma-Fix to obtain a sample from any waste shimpment for purposes of verification.

Name Title Date

Perma-Fix Use Only

☐ Accepted ☐ Accepted with the following conditions:

☐ Rejected for the following reasons:

Designated Facility:
☐ DSSI
☐ M&EC
☐ PF Florida
☐ PFNW

Perma-Fix has all of the necessary permits and licenses for the waste that has been characterized and identified by this approved profile and accepted by Perma-Fi

Name Title Date

NucSvcsProfilesv4.xls
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Attachment II.A.4.3

Waste Analysis Parameters, Rationale, and Applicability

Attachment II.A.4.3
Waste Analysis Parameters, Rationale, and Applicability

Parameter	Rationale	PFF Method No.*	Reference Analytical Methods**	Applicability***
Non-Purge Volatiles (GC/FID)	Pre-approval sample analysis	4000-001	SW-846 8000B, SW-846 8015C	Liquid fuels
Flashpoint (Miniflash)	Pre-approval and received waste fingerprint property, determine ignitability	4000-002	SW-846 1020B	Liquid waste streams not characterized as ignitable. Not applicable to corrosives.
Percent Water (KF)	Pre-approval and received waste fingerprint property	4000-003	SW-846-9000	Waste liquid fuel streams
pH Electrode	Pre-approval and received waste fingerprint property	4000-004	SW-846 9040C, SW-846 9045D	Liquid waste streams >20% H_2O
Flashpoint (Pensky-Martin)	Pre-approval and received waste fingerprint property, determine ignitability	4000-005	SW-846-1010A	Liquid waste streams not characterized as ignitable. Not applicable to corrosives.
Semi-Volatiles (GC/MS)	Optional process control sample analysis	4000-006	SW-846 8270D	Non-debris solid mixed wastes accepted for treatment at PFF rather than bulking
Inorganic Chlorides	May be required by the RCRA permit	4000-007	SW-846 9212	PF-II solid stream input
Btu Content	Pre-approval sample analysis	4000-008	Parr Operations Manual	Non-radioactive fuels
Density/Specific Gravity	Pre-approval and received waste fingerprint property	4000-009	PFF Protocol	All liquid waste streams
PCB (GC/ECD)	Screen for TSCA wastes, receipt analysis	4000-010	SW-846 8000B, SW-846 8082A	Non-debris mixed waste
Metals Prep. & Digestion	Process control sample analysis	4000-011	SW-846 3005A, SW-846 3010A, SW-846 3050B	Wastes accepted for metals stabilization treatment by PFF
pH (Indicator Paper)	Pre-approval and received waste fingerprint property	4000-012	SW-846 9041A	Liquid waste streams >20% H_2O
Fuel Compatibility	Pre-approval sample analysis	4000-013	PFF Protocol	Waste fuels
Metals (ICP)	Process control sample analysis	4000-015	SW-846 6010C, SW-846 6020A	Wastes accepted for metals stabilization treatment by PFF
Volatiles (GC/MS)	Optional process control sample analysis	4000-016	SW-846 8260B	Non-debris solid mixed wastes accepted for treatment at PFF rather than bulking
Mercury (CVAA)	Process control sample analysis	4000-017	SW-846 7470A	Wastes accepted for metals stabilization treatment at PFF
TCLP Extraction for Metals	Pre-approval and process control sample analysis	4000-018	SW-846 1311	Wastes accepted for metals stabilization treatment at PFF

Attachment II.A.4.3
Waste Analysis Parameters, Rationale, and Applicability

Parameter	Rationale	PFF Method No.*	Reference Analytical Methods**	Applicability***
Free Liquids (Paint Filter Test)	Identification of free liquids	4000-019	SW-846 9095B	Optional analysis
Cyanide Screen	Optional process control sample analysis	4000-020	Drager Tube Handbook	Wastes requiring acidification for metals stabilization treatment at PFF
Sulfide Screen	Optional process control sample analysis	4000-021	Drager Tube Handbook	Wastes requiring acidification for metals stabilization treatment at PFF
Flash Point (Setaflash)	Pre-approval and received waste fingerprint property, determine ignitability	4000-022	SW-846 1020B	Liquid waste streams not characterized as ignitable. Not applicable to corrosives.
Total Halides	Optional process control sample analysis and for meeting used oil requirements	4000-014	SW-846 9023 SW-846 9056A SW-846 9076	Liquid, solid or sludge waste streams

*Refers to PFF method revision currently in effect.

**PFF methods were developed specifically for waste managed on site using the listed standard methods as guidelines.

***Refers to RCRA-regulated waste only.

Attachment II.A.4.4

Potential Incompatibility Testing Procedure

ATTACHMENT II.A.4.4

POTENTIAL INCOMPATIBILITY TESTING PROCEDURE

PFF currently mixes different waste streams during bulking operations for its waste-derived fuels blending operations. Although it is not anticipated that different waste streams will be routinely mixed and treated in the same batch during Perma-Fix® treatment operations, the need exists to confirm the compatibility of individual waste streams that may come into contact with other waste streams and with treatment additives used in the Perma-Fix treatment processes. In addition to avoiding undesirable chemical reactions such as those listed in 40 CFR 264.17(b), potential reactions that may be incompatible with the treatment processes or equipment (e.g., polymerization of liquid wastes into a solid inside process equipment, excessive foaming, synergistic interference with the effectiveness of a treatment process, etc.) need to be identified.

In situations where there is a need to mix different waste streams together or to mix treatment additives with waste streams, samples of the wastes (and additives as appropriate) will first be segregated into compatibility groups based on the available waste generator material profile and analytical data. Next, samples from within each of these groups will be blended together and observed for changes in temperature, pH, and other signs of chemical reactions such as fumes, smoke, bubbles, color changes, and changes in viscosity. See 40 CFR 264.17(b). Next, the sample will be observed for the first five minutes after blending. The samples will then be periodically (every 5-10 minutes) inspected during a 30-minute period following blending. Any counter-indications to mixing or treatment will be evaluated further. For example, tests may be conducted to determine whether blending with different wastes or in smaller or more dilute quantities would allow the mixing or treatment to proceed in a safe manner. Mixing of wastes will be prohibited or managed in accordance with the observations and determinations made as described above.

Samples of wastes and treatment additives intended for treatment using the Perma-Fix treatment processes will be mixed in a manner simulating the entire treatment processes (PF-I and/or PF-II) on a bench scale prior to full scale processing. In addition, samples of waste streams intended for fuel blending will be tested for compatibility prior to blending.

Attachment II.A.4.5

PFF Procedure for Certain Waste Codes

ATTACHMENT II.A.4.5

PFF PROCEDURE FOR CERTAIN WASTE CODES

PFF will implement the following procedure to ensure that the quantity of a chemical stored at the facility in a single container is not more than the amount predicted in the Off-site Consequence Analysis (OCA) report submitted with the previous renewal application in 2010. This procedure applies to the following waste codes:

> F010, F011, F012, F019, F020, F021, F022, F023, F026, F027, F028, F032, F034, F035, F037, F038, K001, K048, K049, K050, K051, K052, K061, K062, K086, K156, K157, K158, K159, K161, K169, K170, K171, K172 and U395.

1. Prior to receiving any waste streams, a profile review and approval process is conducted by PFF personnel. Any waste stream containing the above-listed waste codes will undergo additional scrutiny to identify container size and, if necessary, concentration of chemical constituent(s) for which the waste is listed.

2. If the waste profile does not provide the concentrations of constituents, PFF will assume that the entire content of the shipment container has 100% of the constituent of concern for the waste code. Based on this assumption, the quantity of the relevant constituent will be calculated. If this quantity does not exceed the amount predicted by the OCA, no additional information is necessary. Calculations will be kept in facility records.

3. If the quantity calculated in item 2 is above the quantity predicted by the OCA, then PFF must obtain the concentration of the relevant constituent(s) through analysis and/or generator knowledge.

4. The waste stream will not be approved during the waste profile review if the quantity calculated exceeds the amount predicted in the OCA. At this point, the generator may choose to ship the new waste code in smaller containers. However, PFF will repeat this evaluation in such a case.

5. PFF will keep records of calculations showing that the container shipped from the generator does not have constituent amounts in the container above the amount predicted by the OCA for these waste codes.

Attachment II.A.4.6

Example of Typical Chemical and Physical Analysis

PermaFix environmental services
A Nuclear Services and Waste Management Company

PERMA-FIX ANALYTICAL SERVICES
1940 N.W. 67th Place
Gainesville Fl. 32653
(352) 373-6066 Fax: (352) 338-7922

CERTIFICATE OF ANALYSIS

PAS Number : 94628
Sample I.D. : NUC-113-63
Chain of Custody # : MW-3658

Date Sampled : 08/13/14
Date Received : 08/13/14
Project # : Profile Verification

GENERAL SAMPLE INFORMATION (Visual Inspection)

Analysis Performed on : Shaken
Solid/Sludge Level : <1% by volume
No. of Liquid Layers : Single
Solid Form : Debris
Comments :

Parameter	Result (1,2)	W.A.C. Limits	Method Detection Limits (3)	Practical Quantitation Limits (4)	Units	Dilution Factor	Analyst Initials	Date Analyzed	PAS SOP 4000-
Density	0.8450	N/A	0.05	0.25-20.0	g/mL	1	VTT	08/15/14	009
Percent Water	<MDL	+/- 30%	0.73	2.92	% by wt.	2	TWY	08/15/14	003
Flashpoint	>70	+/- 30%	0-200	23-70	Deg. C	1	MGT	09/04/14	002/022
Total Halogens (TX)	311	+/- 10%	51	400	ppm	10	MCN	08/20/14	014
Extractable Halogens(EOX)	N/A	+/- 10%	0	0					014
pH	7.34	+/- 2	0-14.0	1.68-12.45	Std. units	1	VTT	08/20/14	004/012
PCB 1242	<MDL	N/A	1.51	10.50	ppm	105	RMB	08/21/14	010
PCB 1254	<MDL	N/A	0.315	10.50	ppm	105	RMB	08/21/14	010
PCB 1260	<MDL	N/A	2	10.50	ppm	105	RMB	08/21/14	010

NOTES:
1. Unless otherwise indicated, concentrations are reported on an as-received rather than dry weight basis.
2. Results Reported as N/A were not analyzed for.
3. Results reported as <M.D.L. were analyzed for, but not detected, above detection limit.
4. Results with reported values outside the range of quantitation limits must be regarded as estimated values. If no upper quantitation limit is listed, it is assumed to be 100%.
5. Perma-Fix Analytical Services is not a state certified lab, therefore these results cannot be used to make regulatory determinations. Perma-Fix Analytical Services analytical method S.O.P.s are based on modified SW-846 methods where applicable.

This report has been prepared and reviewed in accordance with Perma-Fix of Florida, Inc. standard operating procedures. Please direct any questions to Ken Justice, Laboratory Manager.

Data reviewed by ______ Waste approved for acceptance ______ Date __/__/__

PermaFix®
environmental services
A Nuclear Services and Waste Management Company

PERMA-FIX ANALYTICAL SERVICES

2010 N.W. 67th Place
Gainesville, Fl. 32653
(352) 373-6066 Fax: (352) 338-7922

REPORT OF TOTAL METALS ANALYSIS
ICP-MS; AGILENT MODEL 7700X

PAS Number	: PAS-94628	Chain of Custody	: MW-3658
Project	: Profile Verification	Date Analyzed	: 08/20/14
Sample ID	: NUC-113-63	Analyst	: MGT
Sample Matrix	: Liquid	Digestion Method	: PFF-4000-011

ANALYTE	RESULT	UNITS	MDL LIMIT	PQL LIMIT	PAS SOP
ANTIMONY, (Sb)	<PQL	ppm	0.0456	1.00	4000-015
ARSENIC, (As)	<PQL	ppm	0.0509	1.00	4000-015
BARIUM, (Ba)	<PQL	ppm	0.0554	1.00	4000-015
BERYLLIUM, (Be)	<PQL	ppm	0.0934	1.00	4000-015
CADMIUM, (Cd)	<PQL	ppm	0.0488	1.00	4000-015
CHROMIUM, (Cr)	<PQL	ppm	0.110	1.00	4000-015
LEAD, (Pb)	1.47	ppm	0.0875	1.00	4000-015
MERCURY, (Hg)	<PQL	ppm	0.00278	0.10	4000-015
NICKEL, (Ni)	<PQL	ppm	0.0423	1.00	4000-015
SELENIUM, (Se)	<PQL	ppm	0.222	1.00	4000-015
SILVER, (Ag)	<PQL	ppm	0.0102	0.10	4000-015
THALLIUM, (Tl)	<PQL	ppm	0.0276	1.00	4000-015
VANADIUM, (V)	<PQL	ppm	0.0387	1.00	4000-015
ZINC, (Zn)	285	ppm	1.17	5.00	4000-015
ALUMINUM, (Al)	<PQL	ppm	1.03	10.0	4000-015
COPPER, (Cu)	2.19	ppm	0.0453	1.00	4000-015
IRON, (Fe)	<PQL	ppm	0.467	10.0	4000-015
MAGNESIUM, (Mg)	1.72	ppm	0.227	1.00	4000-015
PHOSPHORUS, (P)	40.7	ppm	2.25	10.0	4000-015
POTASSIUM, (K)	<PQL	ppm	2.33	10.0	4000-015
SODIUM, (Na)	<PQL	ppm	2.14	10.0	4000-015
SULFUR, (S)	929	ppm	136	544	4000-015
URANIUM 238, (U)	<PQL	ppm	0.0231	1.00	4000-015

NOTES :

NR: Not Requested

1. Unless otherwise indicated, concentrations are reported on an as-received rather than dry weight basis.
2. The PQL (Practical Quantitation Level) is based on 4X the MDL or the lowest calibration standard.
3. Perma-Fix Analytical Services is not a state certified lab, therefore these results cannot be used to make regulatory determinations.
4. Perma-Fix Analytical Services analytical method S.O.P. s are based on modified SW-846 methods where applicable.

All QC Passes

This report has been prepared and reviewed in accordance with Perma-Fix of Florida, Inc. standard operating procedures.
Please direct any questions to Ken Justice, Laboratory Manager.

/ /

Data reviewed by Date

94620 Totals

Attachment II.A.5

Acceptable Hazardous Waste and Waste Constituents

Waste Code	Description
D001	Ignitable Waste
D002	Corrosive Waste
D003	Reactive Waste (not DOT Class I (explosive) hazardous materials)
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
D012	Endrin
D013	Lindane
D014	Methoxychlor
D015	Toxaphene
D016	2,4-D
D017	2,4,5-TP (Silvex)
D018	Benzene
D019	Carbon Tetrachloride
D020	Chlordane
D021	Chlorobenzene
D022	Chloroform
D023	o-Cresol
D024	m-Cresol
D025	p-Cresol
D026	Cresol
D027	1,4-Dichlorobenzene
D028	1,2-Dichloroethane
D029	1,1-Dichloroethylene
D030	2,4-Dinitrotoluene
D031	Heptachlor (and its epoxide)
D032	Hexachlorobenzene
D033	Hexachlorobutadiene
D034	Hexachloroethane
D035	Methyl ethyl ketone
D036	Nitrobenzene
D037	Pentrachlorophenol
D038	Pyridine
D039	Tetrachloroethylene
D040	Trichloroethylene
D041	2,4,5-Trichlorophenol
D042	2,4,6-Trichlorophenol
D043	Vinyl chloride
F-Codes	
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

Waste Code	Description
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluorethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F004	The following spent non-halogenated solvents: cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F005	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating of carbon steel; (5) cleaning/stripping associated with tin, zinc, and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum
F007	Spent cyanide plating bath solutions from electroplating operations
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations
F012	Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process. Wastewater treatment sludges from the manufacturing of motor vehicles using a zinc phosphating process will not be subject to this listing at the point of generation if the wastes are not placed outside on the land prior to shipment to a landfill for disposal and are either: disposed in a Subtitle D municipal or industrial landfill unit that is equipped with a single clay liner and is permitted, licensed or otherwise authorized by the state; or disposed in a landfill unit subject to, or otherwise meeting, the landfill requirements in §258.40, §264.301 or §265.301. For the purposes of this listing, motor vehicle manufacturing is defined in paragraph (b)(4)(i) of this section and (b)(4)(ii) of this section describes the recordkeeping requirements for motor vehicle manufacturing facilities.
F020	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.)

Waste Code	Description
F021	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives
F022	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions
F023	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.)
F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene sythesized from prepurified 2,4,5-trichlorophenol as the sole component.)
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027
F032	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with §261.35 of this chapter or potentially cross-contaminated wastes that are otherwise currently regulated as hazardous wastes (i.e., F034 or F035), and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol
F034	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.
F035	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.
F037	Petroleum refinery primary oil/water/solids separation sludge-Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oil cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in oil/water/solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as defined in §261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are not included in this listing. This listing does include residuals generated from processing or recycling oil-bearing hazardous secondary materials excluded under §261.4(a)(12)(i), if those residuals are to be disposed of.

Waste Code	Description
F038	Petroleum refinery secondary (emulsified) oil/water/solids separation sludge-Any sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters and oily cooling wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges and floats generated in aggressive biological treatment units as defined in §261.31(b)(2) (including sludges and floats generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and F037, K048, and K051 wastes are not included in this listing.
F039	Leachate (liquids that have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under Subpart D of this part. (Leachate resulting from the disposal of one or more of the following EPA Hazardous Wastes and no other Hazardous Wastes retains its EPA Hazardous Waste Number(s): F020, F021, F022, F026, F027, and/or F028.)
K-Codes	
K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol
K048	Dissolved air flotation (DAF) float from the petroleum refining industry
K049	Slop oil emulsion solids from the petroleum refining industry
K050	Heat exchanger bundle cleaning sludge from the petroleum refining industry
K051	API separator sludge from the petroleum refining industry
K052	Tank bottoms (leaded) from the petroleum refining industry
K061	Emission control dust/sludge from the primary production of steel in electric furnaces
K062	Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332)
K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead
K156	Organic waste (including heavy ends, still bottoms, light ends, spent solvents, filtrates, and decantates) from the production of carbamates and carbamoyl oximes. (This listing does not apply to wastes generated from the manufacture of 3-iodo-2-propynyl n-butylcarbamate.)
K157	Wastewaters (including scrubber waters, condenser waters, washwaters, and separation waters) from the production of carbamates and carbamoyl oximes. (This listing does not apply to wastes generated from the manufacture of 3-iodo-2-propynyl n-butylcarbamate.)
K158	Bag house dusts and filter/separation solids from the production of carbamates and carbamoyl oximes. (This listing does not apply to wastes generated from the manufacture of 3-iodo-2-propynyl n-butylcarbamate.)
K159	Organics from the treatment of thiocarbamate wastes
K161	Purification solids (including filtration, evaporation, and centrifugation solids), bag house dust and floor sweepings from the production of dithiocarbamate acids and their salts. (This listing does not include K125 or K126.)
K169	Crude oil storage tank sediment from petroleum refining operations
K170	Clarified slurry oil tank sediment and/or in-line filter/separation solids from petroleum refining operations
K171	Spent Hydrotreating catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (this listing does not include inert support media)
K172	Spent Hydrorefining catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (this listing does not include inert support media)
P-Codes	
P001	Warfarin & salts; 2H-1-Benzopyran-2-on, 4-hydroxy-3-(3-oxo-1-phenylbutyl), when present at concentrations >0.3%
P002	Acetamide, N-(aminothioxomethyl)-; 1-Acetyl-2-thiourea

Waste Code	Description
P003	Acrolein; 2-Propenal
P004	Aldrin; 1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a-hexahydro-
P005	Allyl alcohol; 2-Propen-1-ol
P006	Aluminum phosphide (R, T)
P007	5-(Aminomethyl)-3-isoxazolol; 3(2H)-Isoazolone, 5-(aminomethyl)-
P008	4-Aminopyridine; 4-Pyridinamine
P009	Ammonium picrate; Phenol, 2,4,6-trinitro-, ammonium salt
P010	Arsenic acid H_3AsO_4
P011	Arsenic oxide As_2O_5; Arsenic pentoxide
P012	Arsenic trioxide
P013	Barium cyanide
P014	Benzenethiol; Thiophenol
P015	Beryllium powder
P016	Dichloromethyl ether; Methane, oxybis[chloro-
P017	Bromoacetone; 2-Propanone, 1-bromo-
P018	Brucine; Strychnidine-10-one, 2,3-dimethoxy-; Strychnine & salts
P020	Dinoseb; Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P021	Calcium cyanide $Ca(CN)_2$
P022	Carbon disulfide
P023	Acetaldehyde, chloro-; Chloroacetaldehyde
P024	Benzenamine, 4-chloro-; p-Chloroaniline
P026	1-(O-chlorophenyl)thiourea; Thiourea, (2-chlorophenyl)-
P027	3-Chloropropionitrile; Propanenitrile, 3-chloro-
P028	Benzene, (chloromethyl)-; Benzyl chloride
P029	Copper cyanide
P030	Cyanides (soluble cyanide salts), not otherwise specified
P031	Cyanogen; Ethanedinitrile
P033	Cyanogen chloide (CN)Cl
P034	2-Cyclohexyl-4,6-dinitrophenol; Phenol, 2-cyclohexyl-4,6-dinitro-
P036	Arsonous dichloride, phenyl-; Dichlorophenylarsine
P037	Dieldrin; 2,7:3,6-Dimethanonaphth[2,3-b]oxirine
P038	Arsine, diethyl-; Diethylarsine
P039	Disulfoton; Phosphorodithioic acid, o,o-diethyl s-[2-(ethylthio)ethyl] ester
P040	O,O-Diethyl O-pyrazinyl phosphorothioate; Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P041	Diethyl-p-nitrophenyl phosphate; Phosphoric acid, diethyl 4-nitrophenyl ester
P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, epinephrine
P043	Diisopropylfluorophosphate; Phosphorofluoridic acid, bis(1-methylethyl) ester
P044	Dimethoate; Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P045	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[methylamino)carbonyl] oxime; Thiofanox
P046	Benzeneethanamine, a,a-dimethyl-; a,a-Dimethylphenethylamine
P047	4,6-Dinitro-o-cresol & salts; Phenol, 2-methyl-4,6-dinitro- & salts
P048	2,4-Dinitrophenol; Phenol, 2,4-dinitro-
P049	Dithiobiuret; Thionidodicarbonic diamide $[(CH_2N)C(S)]_2NH$
P050	Endosulfan; 6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide; Endosulfan sulfate
P051	2,7:3,6-Dimethanonaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-; Endrin & metabolites; Endrin aldehyde
P054	Aziridine; Ethyleneimine
P056	Fluoride, Fluorine
P057	Acetamide, 2-fluoro-; Fluoroacetamide
P058	Acetic acid, fluoro-, sodium salt; Fluoroacetic acid, sodium salt

Waste Code	Description
P059	Heptachlor; 4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-, 3a,4,7,7a-tetrahydro-; Heptachlor epoxide
P060	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a-hexahydro-; Isodrin
P062	Hexaethyl tetraphosphate; Tetraphosphoric acid, hexaethyl ester
P063	Hydrocyanic acid; Hydrogen cyanide
P064	Methane, isocyanato-; Methyl isocyanate
P065	Fulminic acid, mercury (2+) salt; Mercury fulminate
P066	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester; Methomyl
P067	Aziridine, 2-methyl-; 1,2-Propylenimine
P068	Hydrazine, methyl-; Methyl hydrazine
P069	2-Methyllactonitrile; Propanenitrile, 2-hydroxy-2-methyl-
P070	Aldicarb; Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P071	Methyl parathion; Phosphorothioic acid, O,O,-dimethyl O-(4-nitropheynl) ester
P072	a-Naphthylthiourea; Thiourea, 1-naphthalenyl-
P073	Nickel carbonyl $Ni(CO)_4$
P074	Nickel cyanide $Ni(CN)_2$
P075	Nicotine & salts; Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts
P077	Benzenamine, 4-nitro-; P-Nitroaniline
P078	Nitrogen dioxide
P081	Nitroglycerine; 1,2,3-Propanetriol, trinitrate
P082	Methanamine, n-methyl-n-nitroso-; n-Nitrosodimethylamine
P084	n-Nitrosomethylvinylamine; Vinylamine, n-methyl-n-nitroso-
P085	Diphosphoramide, octamethyl-; Octamethylpyrophosphoramide
P087	Osmium tetroxide; Osmium oxide OsO_4, (T-4)-
P088	Endothall; 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P089	Parathion; Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P092	Mercury, (acetato-O)phenyl-; Phenylmercury acetate
P093	Phenylthiourea; Thiourea, phenyl-
P094	Phorate; Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P095	Carbonic dichloride; Phosgene
P096	Hydrogen phosphide; Phosphine
P097	Famphur; Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester
P098	Potassium cyanide K(CN)
P099	Argentate(1-), bis(cyano-C)-, potassium; Potassium silver cyanide
P101	Ethyl cyanide; Propanenitrile
P102	Propargyl alcohol; 2-Propyn-1-ol
P103	Selenourea
P104	Silver cyanide
P105	Sodium azide
P106	Sodium cyanide
P108	Strychnidin-10-one, & salts; Strychnine, & salts
P109	Tetraethyldithiopyrophosphate; Thiodiphosphoric acid, tetraethyl ester
P110	Lead; Plumbane, tetraethyl-; Tetraethyl lead
P111	Diphosphoric acid, tetraethyl ester; Tetraethyl pyrophosphate
P112	Methane, tetranitro-; Tetranitromethane
P113	Thallic oxide; Thallium oxide Tl_2O_3
P114	Selenious acid, dithallium (1+) salt; Thallium selenite
P115	Sulfuric acid, dithallium (1+) salt; Thallium sulfate
P116	Hydrazinecarbothioamide; Thiosemicarbazide
P118	Methanethiol, trichloro-; Trichloromethanethiol
P119	Ammonium vanadate; Vanadic acid, ammonium salt
P120	Vanadium pentoxide
P121	Zinc cyanide

Waste Code	Description
P122	Zinc phosphide Zn_3P_2, when present at conc. >10%
P123	Toxaphene
P127	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate
P128	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)
P185	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O-[(methylamino) carbonyl] oxime
P188	Physostigminesalicylate
P189	Carbamic acid, [(dibutylamino) thio] methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester
P190	Carbamic acid, methyl-, 3-methylphenyl ester
P191	Carbamic acid, dimethyl-, 1- [(dimethylamino) carbonyl]-5-methyl-1H-pyrazol-3-yl ester
P192	Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester
P194	Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino)carbonyl]oxy]-2-oxo-, methyl ester
P196	Manganese, bis(dimethylcarbamodithioato-S,S')-
P197	Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[[(methylamino) carbonyl]oxy]phenyl]-
P198	Methanimidamide, N,N-dimethyl-N'-[3-[[(methylamino) carbonyl]oxy]phenyl]-, monohydrochloride
P199	Phenol, (3,5-dimethyl-4-(methylthio)-, methyl carbamate
P201	Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate
P202	Phenol, 3-(methylethyl)-, methyl carbamate
P203	Propanal, 2-methyl-2-(methylsulfonyl)-, O-[(methylamino) carbonyl] oxime
P204	Pyrrolo[2,3-b]indol-5-01, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbmate (ester), (3aS-cis)-
P205	Zinc, bis(dimethylcarbamodithioato-S,S')-, (T-4)-
	U-Codes
U001	Acetaldehyde; Ethanal
U002	Acetone; 2-Propanone
U003	Acetonitrile
U004	Acetophenone; Ethanone, 1-phenyl-
U005	Acetamide, n-9h-fluoren-2-yl-; 2-Acetylaminofluorene
U006	Acetyl chloride
U007	Acrylamide; 2-Propenamide
U008	Acrylic acid; 2-Propenoic acid
U009	Acrylonitrile; 2-propenenitrile
U010	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarboynl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-; Mitomycin C
U011	Amitrole; 1H-1,2,4-Triazol-3-amine
U012	Aniline; Benzenamine
U014	Auramine; Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
U015	Azaserine; L-Serine, diazoacetate (ester)
U016	Benz(c)acridine
U017	Benzal chloride; Benzene, (dichloromethyl)-
U018	Benz(a)anthracene
U019	Benzene
U020	Benzenesulfonic acid chloride; Benzenesulfonyl chloride
U021	Benzidine; [1,1'-Biphenyl]-4,4'-diamine
U022	Benzo(a)pyrene
U023	Benzene, (trichloromethyl)-; Benzotrichloride
U024	Dichloromethoxy ethane; Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U025	Dichloroethyl ether; Ethane, 1,1'-oxybis[2-chloro-
U026	Chlornaphazin; Naphthalenamine, N,N'-bis(2-chloroethyl)-
U027	bis(2-Chloroisopropyl) ether; Dichloroisopropyl ether; Propane, 2,2'-oxybis[2-chloro-
U028	1,2-Benzenedicarboxylic acid, bis(2-Ethylhexyl) ester; Diethylhexyl phthalate
U029	Methane, bromo-; Methyl bromide

Waste Code	Description
U030	Benzene, 1-bromo-4-phenoxy-; 4-Bromophenyl phenyl ether
U031	1-Butanol; n-Butyl alcohol
U032	Calcium chromate; Chromic acid H_2CrO_4, calcium salt
U033	Carbon oxyfluoride; Carbonic difluoride
U034	Acetaldehyde, trichloro-; Chloral
U035	Benzenebutanoic acid, 4-[bis(2-chloroethyl_amino]-; Chlorambucil
U036	Chlordane, alpha & gamma isomers; 4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U037	Benzene, chloro-; Chlorobenzene
U038	Benzeneacetic acid, 4-chloro-a-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester; Chlorobenzilate
U039	p-Chloro-m-cresol; Phenol, 4-chloro-3-methyl-
U041	Epichlorohydrin; Oxirane, (chloromethyl)-
U042	2-Chloroethyl vinyl ether; Ethene, (2-chloroethoxy)-
U043	Ethene, chloro-; Vinyl chloride
U044	Chloroform; Methane, trichloro-
U045	Methane, chloro-; Methyl chloride
U046	Chloromethyl methyl ether; Methane, chloromethoxy-
U047	b-Chloronaphthalene; Naphthalene, 2-chloro-
U048	o-Chlorophenol; Phenol, 2-chloro-
U049	Benzenamine, 4-chloro-2-methyl-, hydrochloride; 4-Chloro-o-toluidine, hydrochloride
U050	Chrysene
U051	Creosote; Lead; Naphthalene; Pentachlorophenol; Phenanthrene; Pyrene; Toluene; m-Xylene; p-Xylene; p-Xylene
U052	Cresol (Cresylic acid); Phenol, methyl-
U053	2-Butenal; Crotonaldehyde
U055	Cumene; Benzene, (1-methylethyl)-
U056	Benzene, hexahydro-; Cyclohexane
U057	Cyclohexanone
U058	Cyclophosphamide; 2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U059	Daunomycin; 5,12-Naphthacenedione, 8-acetyl-10-[)3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
U060	O,P'-DDD; Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-
U061	O,P'-DDD; P,P'-DDD; O,P'-DDE; P,P'-DDD; O,P'-DDT; Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-; P,P'-DDT; DDT
U062	Carbamothioic acid, bis (1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester; Diallate
U063	Dibenz(a,h)anthracene
U064	Benzo(rst)pentaphene; Dibenzo(a,i)pyrene
U066	1,2- Dibromo-3-chloropropane; Propane, 1,2-dibromo-3-chloro-
U067	Ethane, 1,2-dibromo; Ethylene dibromide
U068	Methane, dibromo-; Methylene bromide
U069	1,2- Benzenedicarboxylic acid, dibutyl ester; Dibutyl phthalate
U070	o-Dichlorobenzene; Benzene, 1,2-dichloro-
U071	m-Dichlorobenzene; Benzene, 1,3-dichloro-
U072	Benzene, 1,4-dichloro-; p-Dichlorobenzene
U073	[1,1'- Biphenyl]-4,4'-diamine, 3,3'-dichloro-; 3,3'-Dichlorobenzidine
U074	2-Butene, 1,4-dichloro-; 1,4- Dichloro-2-butene
U075	Dichlorodifluoromethane; Methane, dichlorodifluoro-
U076	Ethane, 1,1-dichloro-; Ethylidene dichloride
U077	Ethane, 1,2-dichloro-; Ethylene dichloride
U078	1,1- Dichloroethylene; Ethene, 1,1-dichloro
U079	1,2- Dichloroethylene; Ethene, 1,2-dichloro
U080	Methylene chloride; Methane, dichloro-

Waste Code	Description
U081	2,4- Dichlorophenol; Phenol, 2,4-dichloro-
U082	2,6- Dichlorophenol; Phenol, 2,6-dichloro-
U083	Propane, 1,2-dichloro-; Propylene dichloride
U084	1,3-Dichloropropene; 1-Propene, 1,3-dichloro-; 1,3-Dichloropropene (cis); 1,3-Dichloropropene (trans)
U085	2,2'-Bioxirane; 1,2:3,4-Diepoxybutane
U086	N,N'-Diethylhydrazine; Hydrazine, 1,2-diethyl-
U087	O,O-Diethyl s-methyl dithiophosphate; Phosphorodithioic acid, O,O-diethyl s-methyl ester
U088	1,2-Benzenedicarboxylic acid, diethyl ester; Diethyl phthalate
U089	Diethylstilbesterol; Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-
U090	Benzodioxole, 5-propyl-1,3-; Dihydrosafrole
U091	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-; 3,3'-Dimethoxybenzidine
U092	Dimethylamine; Methanamine, n-methyl-
U093	Benzenamine, N,N-dimetyl-4-(phenylazo)-; p-Dimethylaminoazobenzene
U094	Benz(a)anthracene, 7,12-dimethyl-; 7,12-Dimethylbenz[a]anthracene
U095	[1,1'- Biphenyl]-4,4'-diamine, 3,3'-dimethyl-; 3,3'-Dimethylbenzidine
U096	a,a-Dimethylbenzylhydroperoxide; Hydroperoxide, 1-methyl-1-phenylethyl-
U097	Carbamic chloride, dimethyl-; Dimethylcarbamoyl chloride
U098	1,1-Dimethylhydrazine; Hydrazine, 1,1-dimethyl-
U099	1,2-Dimethylhydrazine; Hydrazine, 1,2-dimethyl-
U101	2,4-Dimethylphenol; Phenol, 2,4-dimethyl-
U102	1,2-Benzenedicarboxylic acid, dimethyl ester; Dimethyl phthalate
U103	Dimethyl sulfate; Sulfuric acid, dimethyl ester
U105	Benzene, 1-methyl-2,4-dinitro-; 2,4-Dinitrotoluene
U106	Benzene, 2-methyl-1,3-dinitro-; 2,6-Dinitrotoluene
U107	Di-n-octyl phthalate;
U108	1,4-Dioxane; 1,4-Diethyleneoxide
U109	1,2-Diphenyl hydrazine; Hydrazine, 1,2-diphenyl-
U110	Dipropylamine; 1-Propanamine, N-propyl-
U111	1-Propanamine, n-nitroso-n-propyl-; Di-n-propylnitrosamine
U112	Ethyl acetate; Acetic acid, ethyl ester
U113	Ethyl acrylate; 2-Propenoic acid, ethyl ester
U114	Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters; Ethylenebisdithiocarbamic acid; Ethylenebisdithiocarbamic acid, salts & esters
U115	Ethylene oxide; Oxirane
U116	Ethylenethiourea; 2-Imidazolidinethione
U117	Ethyl ether; Ethane, 1,1'-oxybis
U118	Ethyl methacrylate; 2-Propenoic acid, 2-methyl-, ethyl ester
U119	Ethyl methanesulfonate; Methanesulfonic acid, ethyl ester
U120	Fluoranthene
U121	Methane, trichlorofluoro-; Trichloromonofluoromethane
U122	Formaldehyde
U123	Formic acid
U124	Furan; Furfuran
U125	2-Furancarboxaldehyde; Furfural
U126	Glycidylaldehyde; Oxiranecarboxyaldehyde
U127	Benzene, hexachloro-; Hexachlorobenzene
U128	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-; Hexachlorobutadiene
U129	a-BHC; b-BHC; d-BHC; g-BHC; Cyclohexane, 1,2,3,4,5,6-hexachloro-; Lindane
U130	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro; Hexachlorocyclopentadiene
U131	Ethane, hexachloro-; Hexachloroethane
U132	Hexachlorophene; Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U133	Hydrazine

Waste Code	Description
U134	Fluoride (as hydrogen fluoride); Hydrofluoric acid; Hydrogen fluoride
U135	Hydrogen sulfide
U136	Arsenic acid, dimethyl-; Cacodylic acid
U137	Indeno(1,2,3-cd)pyrene
U138	Methane, iodo-; Methyl iodide
U140	Isobutyl alcohol; 1-Propanol, 2-methyl-
U141	Benzodioxole, 5-(1-propenyl)-1,3-; Isosafrole
U142	Kepone; 1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5a,5b,6-decachlorooctahydro-
U143	2-Butenoic acid, 2-methyl, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]-; Lasiocarpine
U144	Acetic acid, lead(2+) salt; Lead acetate
U145	Lead phosphate; Phosphoric acid, lead (2+) salt (2:3)
U146	Lead subacetate; Lead, bis(acetato-o)tetrahydroxytri-
U147	2,5-Furandione; Maleic anhydride
U148	Maleic hydrazide; 3,6-Pyridazinedione, 1,2-dihydro-
U149	Malononitrile; Propanedinitrile
U150	Melphalan; L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U151	Mercury
U152	Methacrylonitrile; 2-Propenenitrile, 2-methyl-
U153	Methanethiol; Thiomethanol
U154	Methanol; Methyl alcohol
U155	1,2-Ethanediamine, N,N-dimethyl-n'-2-pyridinyl-n'-(2-thienylmethyl)-; Methapyrilene
U156	Carbonochloridic acid, methyl ester; Methyl chlorocarbonate
U157	Benz(j)aceanthrylene, 1,2-dihydro-3-methyl-; 3-Methylcholanthrene
U158	Benzenamine, 4,4'-methylenebis[2-chloro-; 4,4'-Methylenebis(2-chloroaniline)
U159	Methyl ethyl ketone (MEK); 2-Butanone
U160	2-Butanone, peroxide; Methyl ethyl ketone peroxide
U161	Methyl isobutyl ketone; 4-Methyl-2-pentanone; Pentanol, 4-methyl-
U162	Methyl methacrylate; 2-Propenoic acid, 2-methyl-, methyl ester
U163	Guanidine, n-methyl-n'-nitro-n-nitroso-; MNNG
U164	Methylthiouracil; 4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U165	Naphthalene
U166	1,4-Naphthalenedione; 1,4-Naphthoquinone
U167	1-Naphthalenamine; a-Naphthylamine
U168	2-Naphthalenamine; b-Naphthylamine
U169	Nitrobenzene; Benzene, nitro-
U170	p-Nitrophenol; Phenol, 4-nitro-
U171	2-Nitropropane; Propane, 2-nitro-
U172	1-Butanamine, n-butyl-n-nitroso-; N-Nitrosodi-n-butylamine
U173	Ethanol, 2,2'-(nitrosoimino)bis-; N-Nitrosodiethanolamine
U174	Ethanamine, n-ethyl-n-nitroso-; N-Nitrosodiethylamine
U176	N-Nitroso-n-ethylurea; Urea, n-ethyl-n-nitroso-
U177	N-Nitroso-n-methylurea; Urea, n-methyl-n-nitroso-
U178	Carbamic acid, methylnitroso-, ethyl ester; N-Nitroso-n-methylurethane
U179	N-Nitrosopiperidine; Piperidine, 1-nitroso-
U180	N-Nitrosopyrrolidine; Pyrrolidine, 1-nitroso-
U181	Benzenamine, 2-methyl-5-nitro-; 5-Nitro-o-toluidine
U182	Paraldehyde; 1,3,5-Trioxane, 2,4,6-trimethyl-
U183	Benzene, pentachloro-; Pentachlorobenzene
U184	Ethane, pentachloro-; Pentachloroethane
U185	Benzene, pentachloronitro-; Pentachloronitrobenzene (PCNB)

Waste Code	Description
U186	1-Methylbutadiene; 1,3-Pentadiene
U187	Acetamide, n-(4-ethoxypheyl)-; Phenacetin
U188	Phenol
U189	Phosphorus sulfide; Sulfur phosphide
U190	1,3-Isobenzofurandione; Phthalic anhydride
U191	2-Picoline; Pyridine, 2-methyl-
U192	Benzamide, 3,5-dichloro-n-(1,1-dimethyl-2-propynyl)-; Pronamide
U193	1,2-Oxathiolane, 2,2-dioxide; 1,3-Propane sultone
U194	1-Propanamine; N-Propylamine
U196	Pyridine
U197	P-Benzoquinone; 2,5-Cyclohexadiene-1,4-dione
U200	Reserpine; Yohimban-16-carbozylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta, 16beta, 17alpha, 18beta,20alpha)-
U201	1,3-Benzenediol; Resorcinol
U202	1,2-Benzisothiazol-3(2h)-one, 1,1 dioxide, & salts; Saccharin, & salts
U203	Benzodioxole, 5-(2-propenyl)-1,3-; Safrole
U204	Selenious acid; Selenium dioxide
U205	Selenium sulfide SeS_2
U206	Glucopyranose, 2-deoxy-2(3-methyl-3-nitrosoureido)-, D-; D-Glucose, 2-deoxy-2-2-[[(methylnitrosoamino)-carbonyl]amino]-; Streptozotocin
U207	Benzene, 1,2,4,5-tetrachloro-; 1,2,4,5-Tetrachlorobenzene
U208	1,1,12-Tetrachloroethane; Ethane, 1,1,1,2-tetrachloro-
U209	1,1,2,2-Tetrachloroethane; Ethane, 1,1,2,2-tetrachloro-
U210	Tetrachloroethylene; Ethene, tetrachloro-
U211	Carbon tetrachloride; Methane, tetrachloro-
U213	Tetrahydrofuran; Furan, tetrahydro-
U214	Acetic acid, thallium(1+) salt; Thallium acetate
U215	Carbonic acid, dithallium (1+) salt; Thallium carbonate
U216	Thallium chloride
U217	Nitric acid, thallium (1+) salt; Thallium nitrate
U218	Ethanethioamide; Thioacetamide
U219	Thiourea
U220	Benzene, methyl-
U221	Benzenediamine, ar-methyl-; Toluenediamine
U222	Benzenamine, 2-methyl-, hydrochloride; O-Toluidine hydrochloride
U223	Benzene, 1,3-diisocyanatomethyl-; Toluene diisocyanate
U225	Bromoform; Methane, tribromo-
U226	Ethane, 1,1,1-trichloro-; Methyl chloroform
U227	Ethane, 1,1,2-trichloro-; 1,1,2-Trichloroethane
U228	Trichloroethylene; Ethene, trichloro-
U234	Benzene, 1,3,5-trinitro-; 1,3,5-Trinitrobenzene
U235	1-Propanol, 2,3-dibromo-, phosphate (3:1); Tris(2,3-dibromopropyl) phosphate
U236	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-dlyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt; Trypan blue
U237	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-; Uracil mustard
U238	Carbamic acid, ethyl ester; Ethyl carbamate (urethane)
U239	Xylene; Benzene, dimethyl-
U240	Acetic acid, (2,4-dichlorophenoxy)-, salts & esters; 2,4-D, salts, esters
U243	Hexachloropropene; 1-Propene, 1,1,2,3,3,3-hexachloro-
U244	Thioperoxydicarbonic diamide, tetramethyl-; Thiram
U246	Cyanogen bromide (CN)Br
U247	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-; Methoxychlor

Waste Code	Description
U248	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-butyl)-; Warfarin, & salts when present at conc. of <= 0.3%
U249	Zinc phosphide Zn_3P_2, when present at conc. <= 10%
U271	Carbamic acid, [1- [(butylamino) carbonyl]- 1H-benzimidazol-2-yl] -, methyl ester
U278	1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate
U279	1-Naphthalenol, methylcarbamate
U280	Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester
U328	Benzenamine, 2-methyl-; o-Toluidine
U353	Benzenamine, 4-methyl-; p-Toluidine
U359	Ethylene glycol monoethyl ether; Ethanol, 2-ethoxy-
U364	1,3-Benzodioxol-4-ol, 2,2-dimethyl-
U367	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-
U372	Carbamic acid, 1H-benzimidazol-2-yl, methyl ester
U373	Carbamic acid, phenyl-, 1-methylethyl ester
U387	Carbamothioic acid, dipropyl-, s-(phenylmethyl) ester
U389	Carbamothioic acid, bis(1-methylethyl)-, s-(2,3,3-trichloro-2-propenyl) ester
U394	Ethanimidothioic acid, 2-(dimethylamino) -n-hydroxy-2-oxo-, methyl ester
U395	Diethylene glycol, dicarbamate; Ethanol, 2,2'-oxybis-, dicarbamate
U404	Ethanamine, N,N-diethyl-
U409	Carbamic acid, [1,2-phyenylenebis (iminocarbonothioyl)] bis-, dimethyl ester
U410	Ethanimidothioic acid, N,N'-[thiobis [(methylimino) carbonyloxy]] bis-, di-methyl ester
U411	Phenol, 2-(1-methylethoxy)-, methylcarbamate

Attachment II.A.6

Federal Environmental Legislation

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Gainesville, Florida 32653

In Reply Refer To:
Robin D. Jackson
Historic Sites Specialist
(904) 487-2333
Project File No. 961234

RE: Cultural Resource Assessment Request
Permit Renewal - Existing Treatment, Storage and Disposal Facility
Gainesville, Alachua County, Florida

Dear Ms. Hazard:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places. The authority for this procedure is the National Historic Preservation Act of 1966 (Public Law 89-665), as amended.

It is the opinion of this agency that because of the project nature it is considered unlikely that archaeological or historical sites will be affected. Therefore, it is the opinion of this office that the proposed project will have no effect on any sites listed, or eligible for listing in the National Register.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer
for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Jrj

PERMA-FIX
ENVIRONMENTAL SERVICES

April 2, 1996

Mr. George W. Percy, Compliance Review Department
Division of Historical Resources
R A Gray Building, 500 South Bronough
Tallahassee, Florida 32399

CERTIFIED MAIL

Dear Mr. Percy:

Perma-Fix of Florida, Inc. (PFF) is an existing Treatment, Storage and Disposal (TSD) facility located in Gainesville, Florida. PFF received its Final Part B Permit in September of 1989 and we are presently in the renewal phase of our permit with the Florida Department of Environmental Protection (FDEP).

On April 2, 1996, I spoke with Gary Goodwin, Historical Preservation Planner, to determine if any historically significant sites exist in the vicinity of the PFF facility. After reviewing an extensive list of sites and concluding no sites existed in the PFF vicinity, Mr. Goodwin transferred me to Ms. Robin Jackson, of your office. Ms. Jackson suggested that I submit a facility description and a USGS map for an archaeological review.

In accordance with 40 CFR 270.3(b), PFF requests an evaluation of the presence of any historically significant sites in the area of our facility.

Should you have any questions or concerns, please contact me at (352) 395-1356.

Sincerely,

Jennifer B Hazard

Jennifer B. Hazard
Southeast Regional Compliance Coordinator

Enclosures: Facility Description and USGS Map

JBH\96.049

1940 N.W. 67TH PLACE · GAINESVILLE, FLORIDA 32653 · TEL (352) 373-6066 · FAX (352) 372-8963

EPA-PERMITTED TSD FACILITY · HAZARDOUS WASTE · NON-HAZARDOUS WASTE · MIXED WASTE

FLORIDA GAME AND FRESH WATER FISH COMMISSION

NORTHEAST REGION
Lt. COL. LARRY L. MARTIN, Director
Route 7, Box 440
Lake City, FL 32055
(904) 758-0525

April 5, 1996

Ms. Jennifer B. Hazard
Southeast Regional Compliance Coordinator
Perma-Fix Environmental Services
1940 N.W. 67th Place
Gainesville, FL 32653

Dear Ms. Hazard:

This responds to your inquiry dated April 3, 1996 regarding the potential occurrence of listed species in the vicinity of your facility in Alachua County, Florida. You defined the location as Latitude 29°43'00" and Longitude 82°20'58". We have conducted a search on our computer database and other pertinent records of wildlife observations. To facilitate this, we searched an area whose boundaries are two miles north, east, south, and west of your facility:

Latitude: >29°41'00"N and <29°45'00"N
Longitude: >82°18'58"W and <82°22'58"W

As for wildlife species over which this agency has jurisdiction, at least one wading bird rookery is known to occur in close proximity of the searched area. It is located at 29°45'30"N, 82°23'42"W, T8S, R19E, Sec. 12SW. Cattle egret (*Bubulcus ibis*), little blue heron (*Egretta caerulea*), a Species of Special Concern, and other unidentified small white wading birds have been known to occur there.

Please note, however, that our database is not necessarily inclusive of all listed species which may occur in a given area. For various reasons, occurrence records for some species are not necessarily input into our database on a site-specific basis. The indigo snake, gopher tortoise and most listed mammal species are notable examples of that. Moreover, some species which are accounted for in the database may occur in areas we are unaware of. Only through systematic field surveys could such data be factored in with respect to your request.

1943 - 1993
50 YEARS AS STEWARD OF FLORIDA'S FISH AND WILDLIFE

Ms. Jennifer B. Hazard
April 5, 1996
Page 2

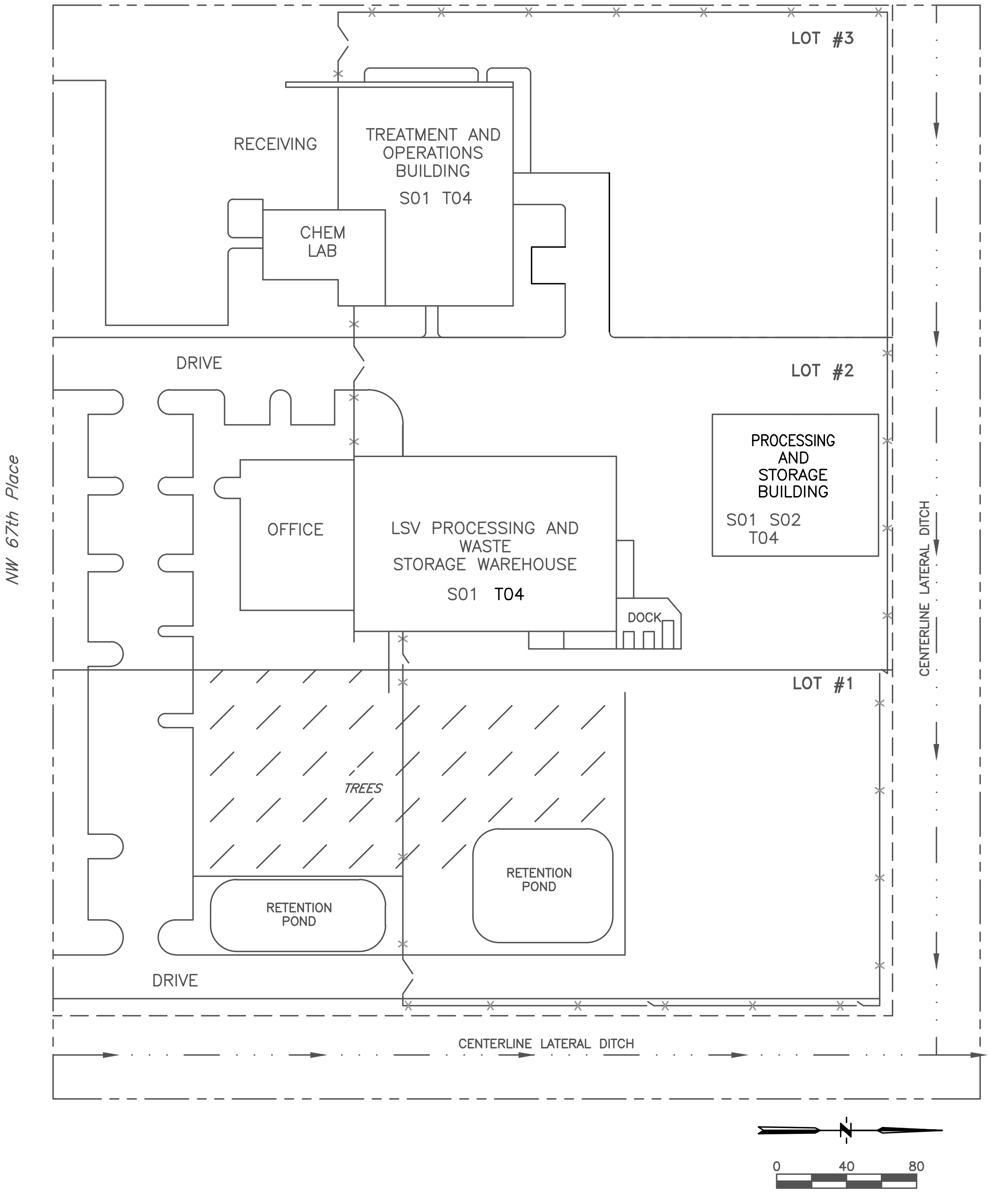
Thank you for consulting us in this matter. As for occurrence records for listed plants and plant communities of concern, the appropriate contact would be the Florida Natural Areas Inventory, 1018 Thomasville Road, Suite 200C, Tallahassee, FL 32303, 904/224-8207.

Sincerely,

Keith Singleton

Keith G. Singleton
Nongame Wildlife Biologist

KGS/
WLD 4-3-5
Enclosure
listed13.ltr

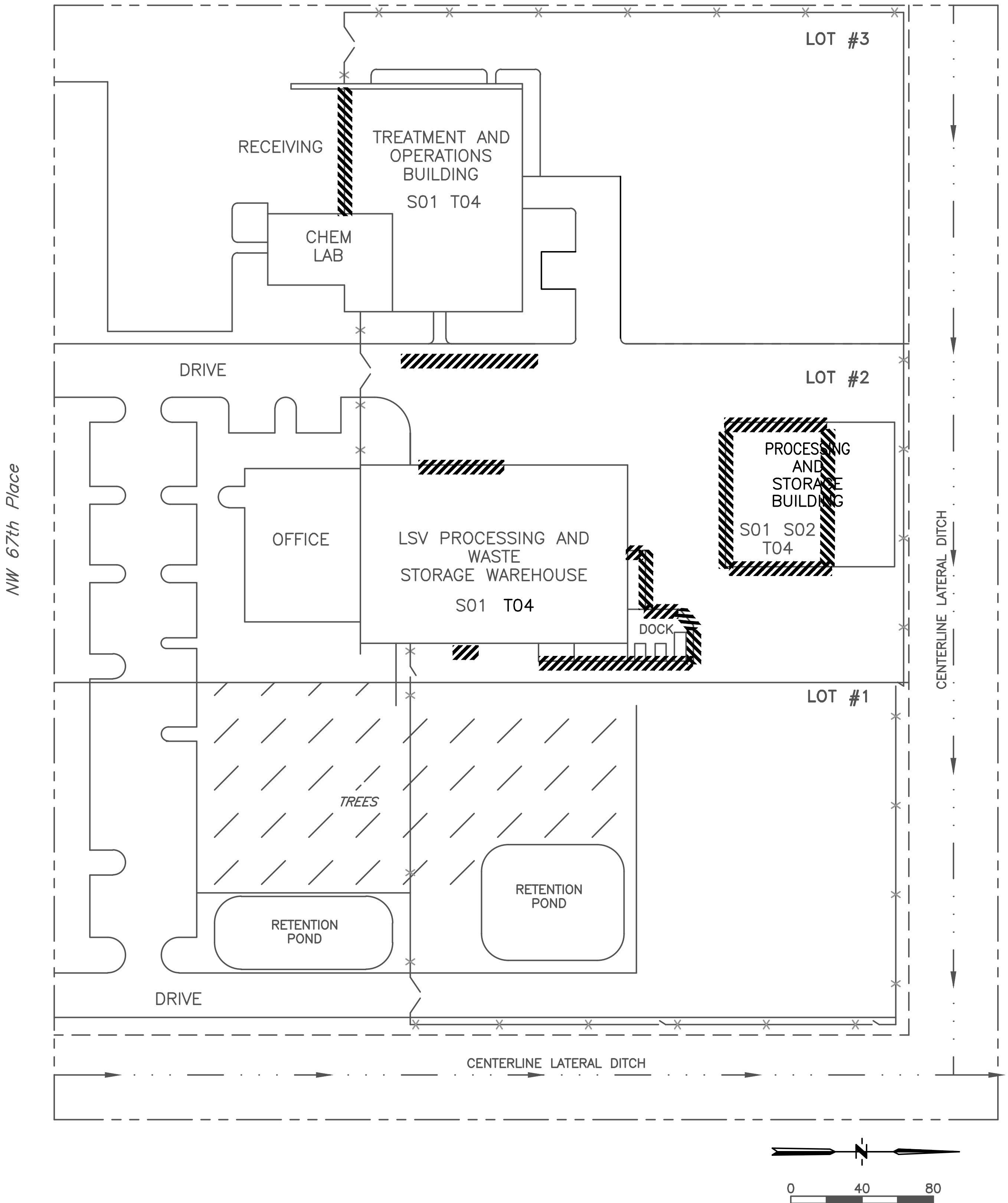


Drainage Easement

S01 Hazardous Waste Container Storage
S02 Hazardous Waste Tank Storage
T04 Treatment Area

TITLE: FIGURE II.A.1 ACCESS CONTROL		
PREPARED FOR: PERMA–FIX OF FLORIDA, INC. 1940 NW 67th Place Gainesville, FL 32653		
SCALE: 1=80	APPROVED BY:	DRAWN: SYA
DATE: 10/07/14		REVISED:
PROJECT NUMBER: PFIFLA 140149		DRAWING NUMBER: CPFIG1

PERMA-FIX ENVIRONMENTAL SERVICES



Loading Areas

Drainage Easement

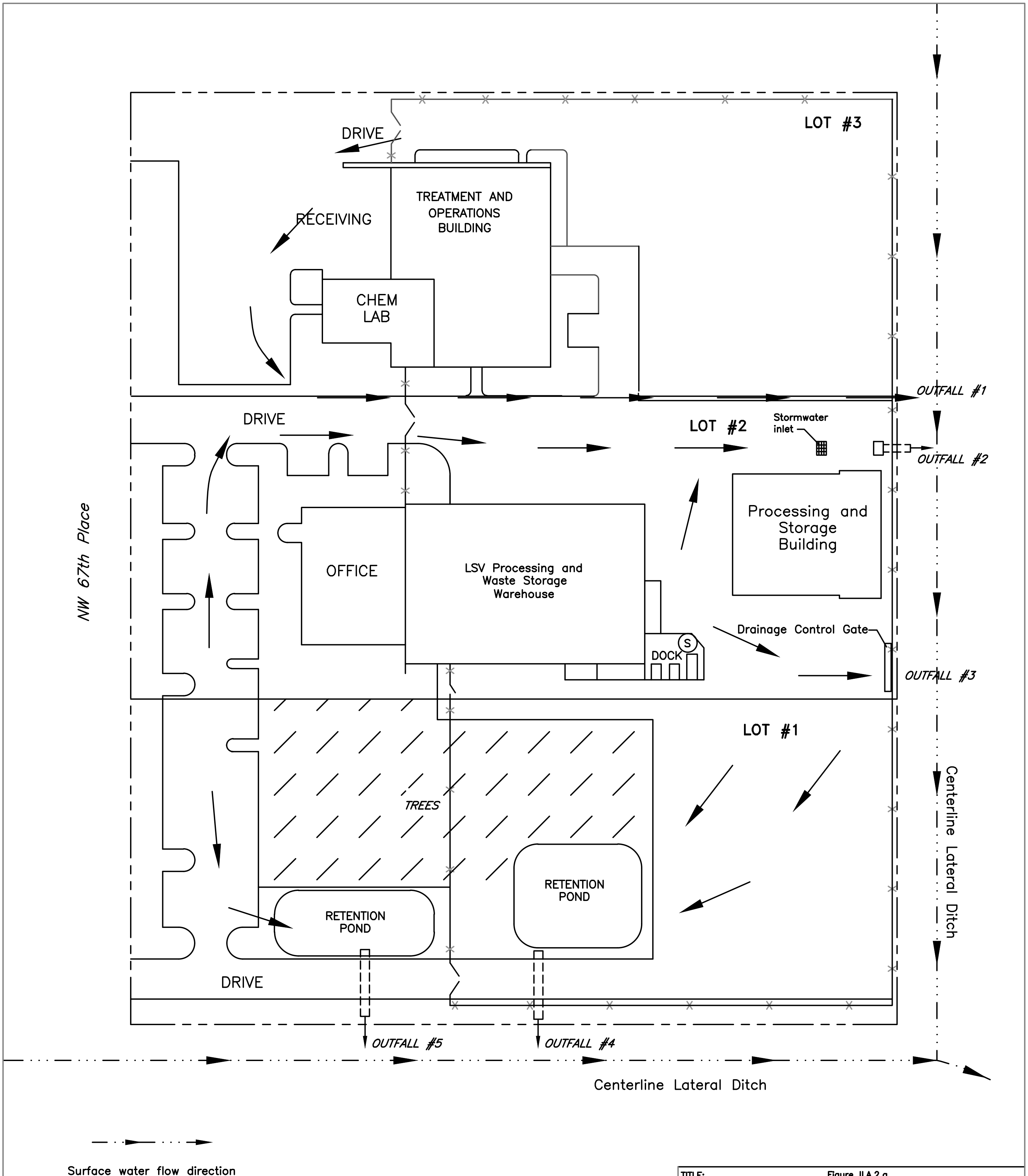
S01	Hazardous Waste Container Storage
S02	Hazardous Waste Tank Storage
T04	Treatment Area

PERMA-FIX ENVIRONMENTAL SERVICES

TITLE: FIGURE II.A.2 BUILDING AND OTHER STRUCTURES

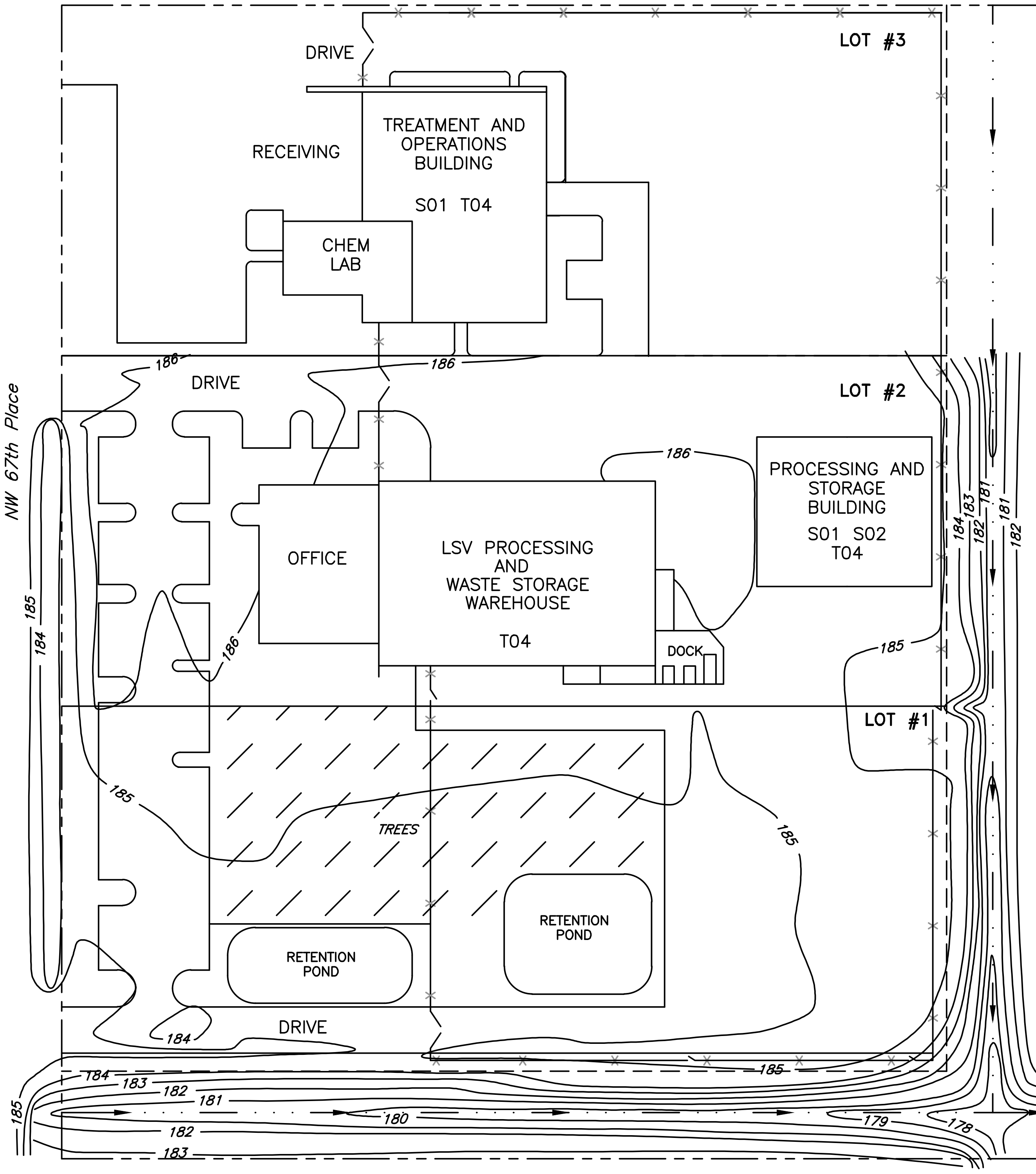
PREPARED FOR: PERMA–FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL. 32653

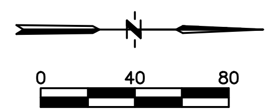
SCALE: 1=80	APPROVED BY:	DRAWN: SYA
DATE: 10/07/14		REVISED:
PROJECT NUMBER: PFIFLA 140149		DRAWING NUMBER: CPFIG1



TITLE: Figure IIA.2.a SURFACE WATER FLOW DIRECTION		
PREPARED FOR: PERMA–FIX OF FLORIDA, INC. 1940 NW 67th Place Gainesville, FL. 32653		
SCALE: NTS	APPROVED BY:	DRAWN: SYA
DATE: 10/07/14	W. A. DECKER	REVISED:
PROJECT NUMBER: PFIFLA 140149		DRAWING NUMBER: IIA2a

PERMA-FIX ENVIRONMENTAL SERVICES



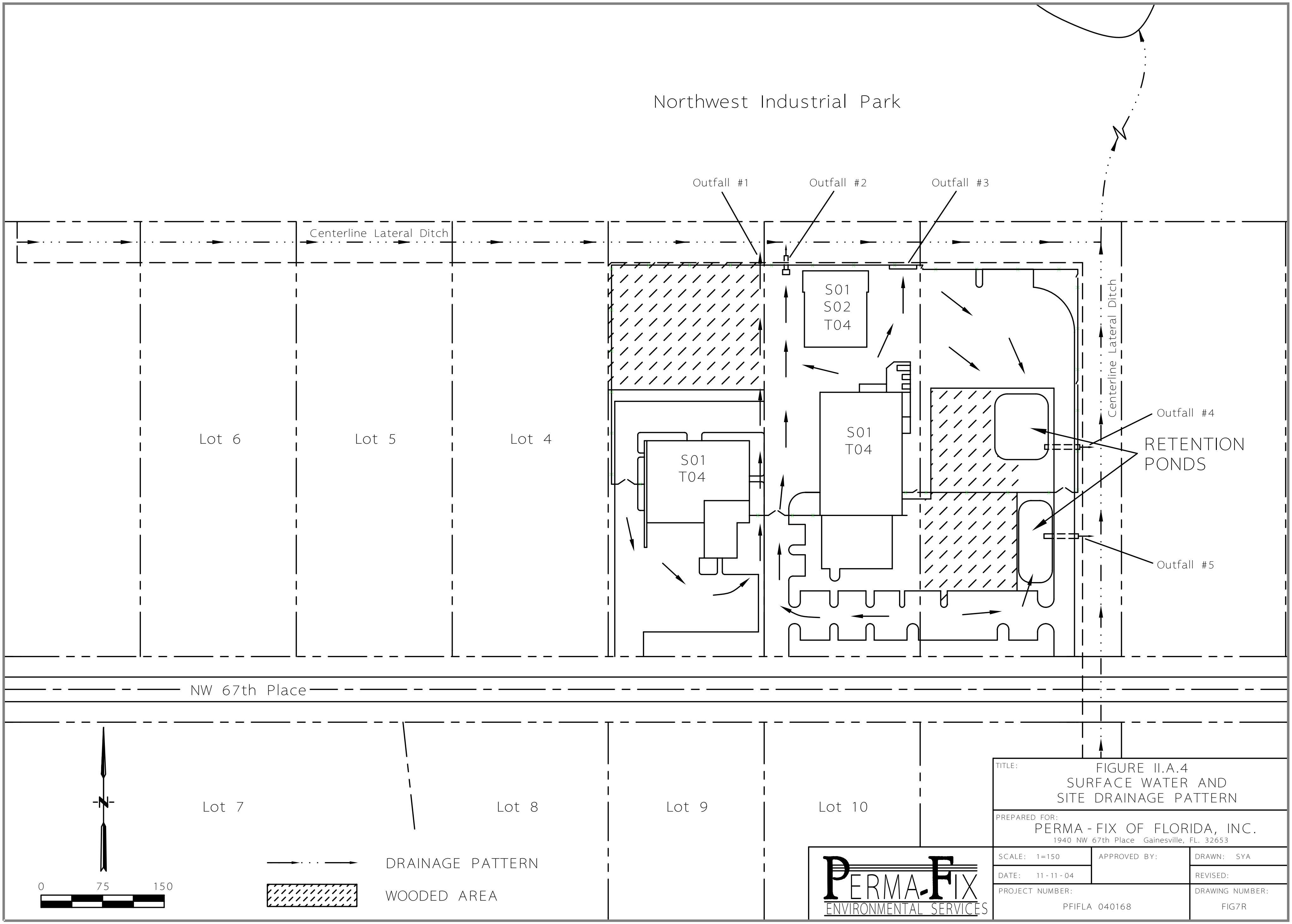


Property Line
Drainage Easement

S01 Hazardous Waste Container Storage
S02 Hazardous Waste Tank Storage
T04 Treatment Area

TITLE: FIGURE II.A.3 TOPOGRAPHIC CONTOURS		
PREPARED FOR: PERMA–FIX OF FLORIDA, INC. 1940 NW 67th Place Gainesville, FL. 32653		
SCALE: 1=80	APPROVED BY:	DRAWN: SYA
DATE: 10/07/14		REVISED:
PROJECT NUMBER: PFIFLA 140149		DRAWING NUMBER: FIG5R

PERMA-FIX
ENVIRONMENTAL SERVICES

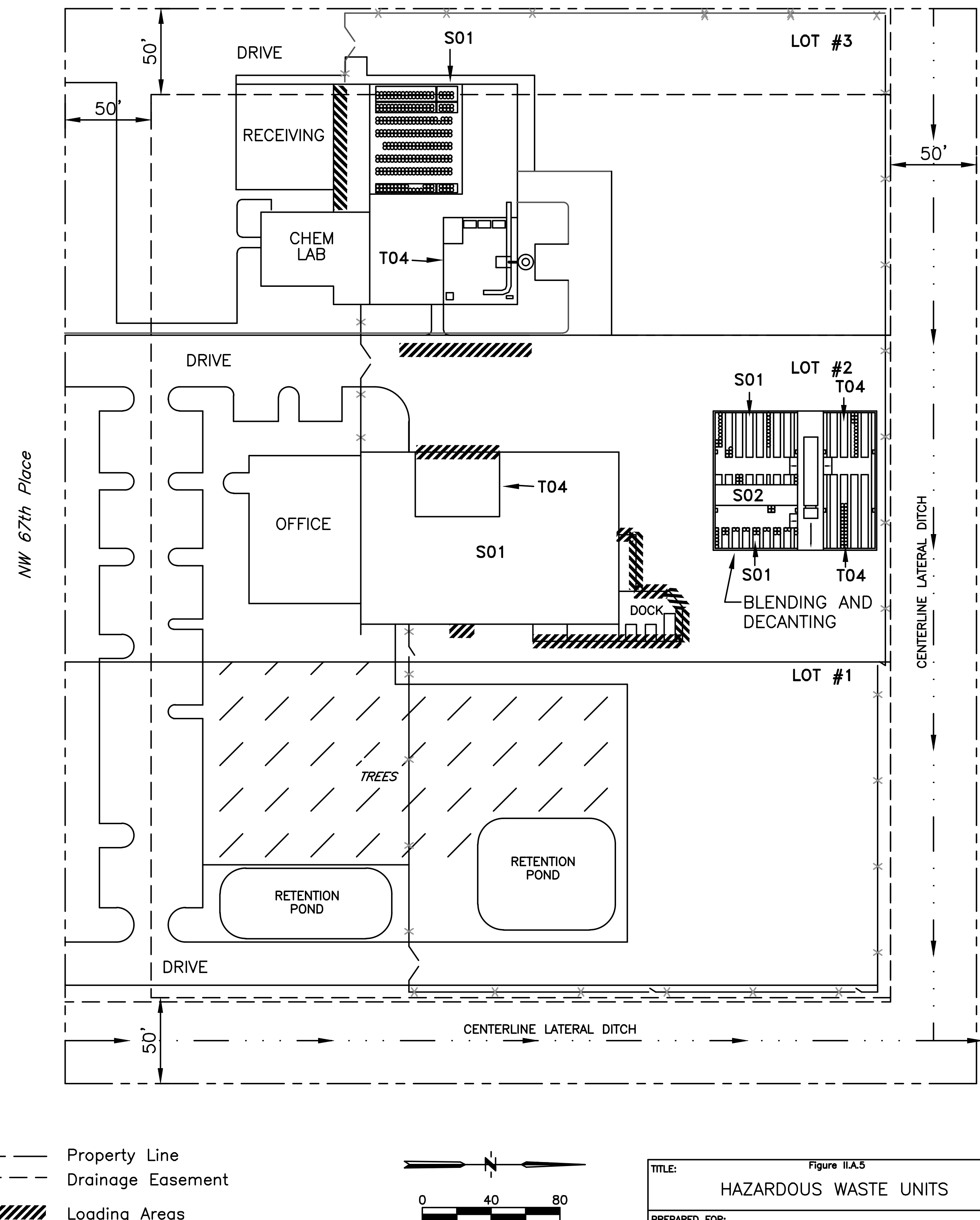


TITLE: FIGURE II.A.4 SURFACE WATER AND SITE DRAINAGE PATTERN

PREPARED FOR: PERMA - FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL. 32653

PERMA-FIX ENVIRONMENTAL SERVICES

SCALE: 1=150	APPROVED BY:	DRAWN: SYA
DATE: 11-11-04		REVISED:
PROJECT NUMBER: PFIFLA 040168		DRAWING NUMBER: FIG7R



— - - —	Property Line
— — — —	Drainage Easement
//////////	Loading Areas
S01	Hazardous Waste Container Storage
S02	Hazardous Waste Tank Storage
T04	Treatment Area

TITLE: Figure II.A.5

HAZARDOUS WASTE UNITS

PREPARED FOR:
PERMA–FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL. 32653

PERMA-FIX ENVIRONMENTAL SERVICES

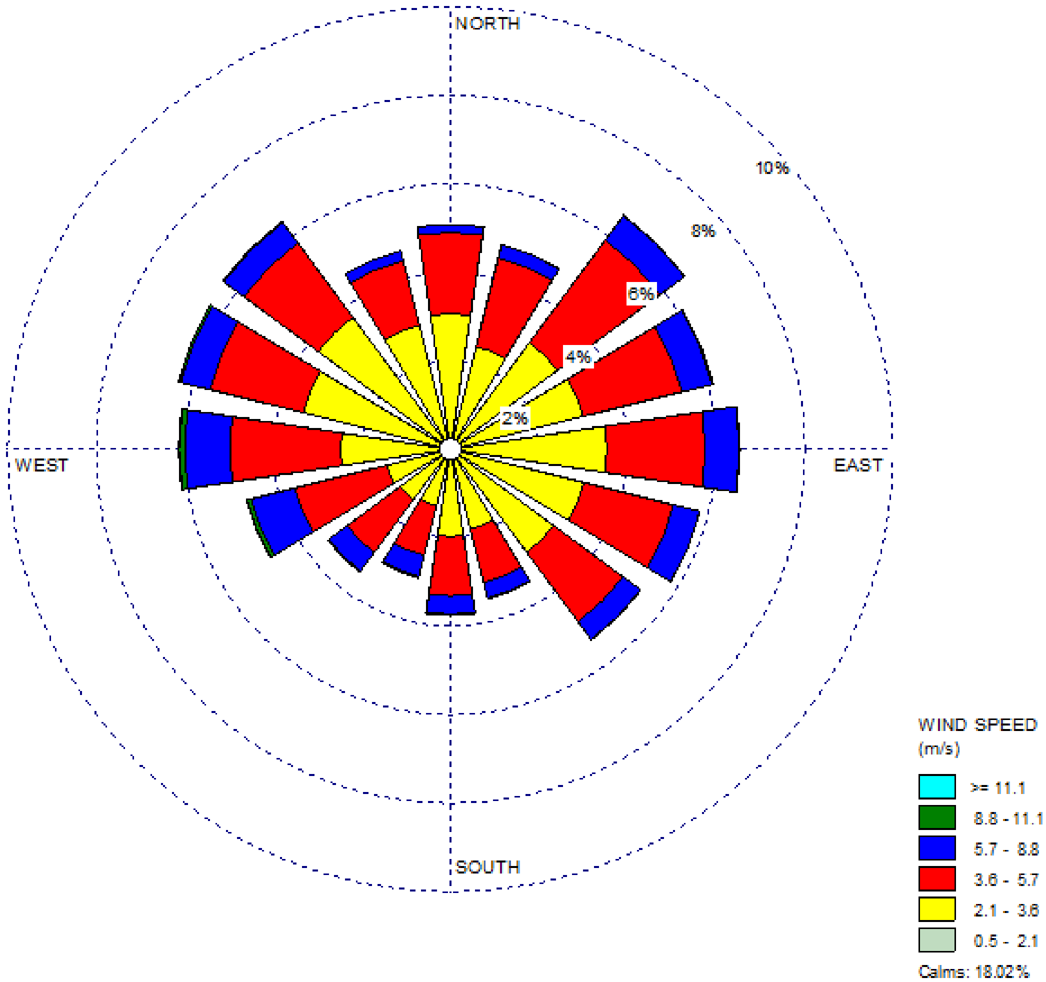
SCALE: 1=80	APPROVED BY: SEE	DRAWN: SYA
DATE: 10/07/14		REVISED:
PROJECT NUMBER: PFIFLA 140149		DRAWING NUMBER: IIA5

WIND ROSE PLOT:

Station #12816 - GAINESVILLE/MUNICIPAL AIRPORT, FL

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Five-year Wind Rose

COMPANY NAME:

MODELER:

CALM WINDS:

18.02%

TOTAL COUNT:

43848 hrs.

AVG. WIND SPEED:

3.00 m/s

DATE:

9/19/2014

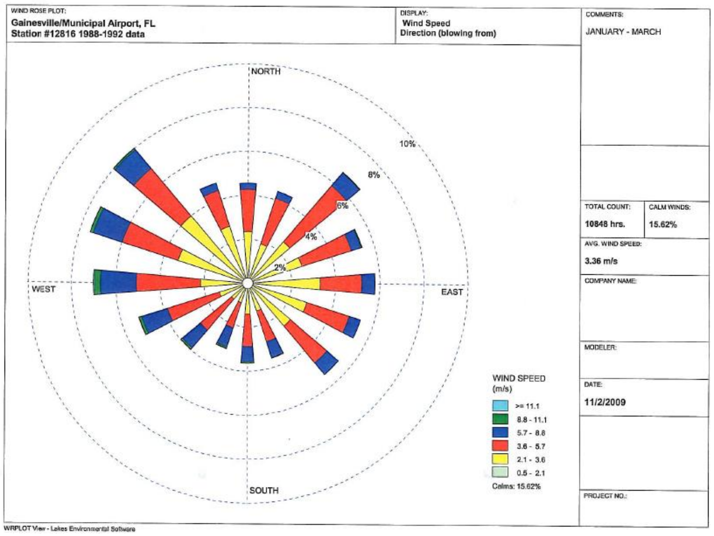
PROJECT NO.:

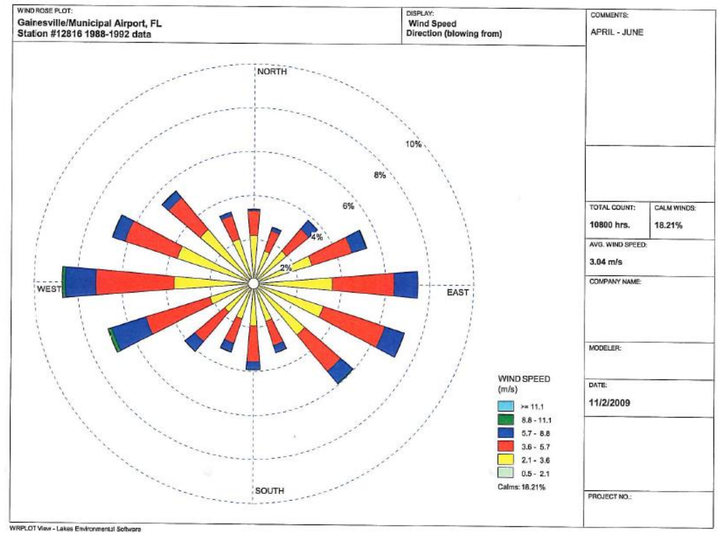
PFIFLA 140149

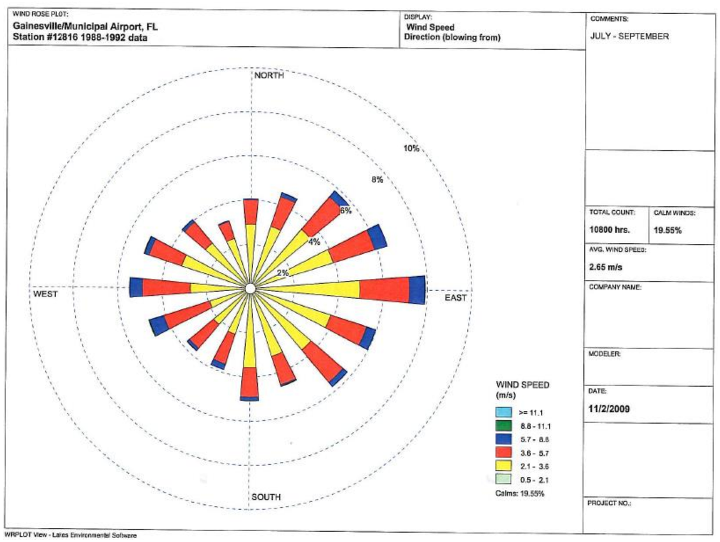
WRPLOT View - Lakes Environmental Software

FIGURE II.A.6
FIVE-YEAR WIND ROSE
GAINESVILLE, FLORIDA

SCHREIBER & YONLEY ASSOCIATES
ENVIRONMENTAL ENGINEERS







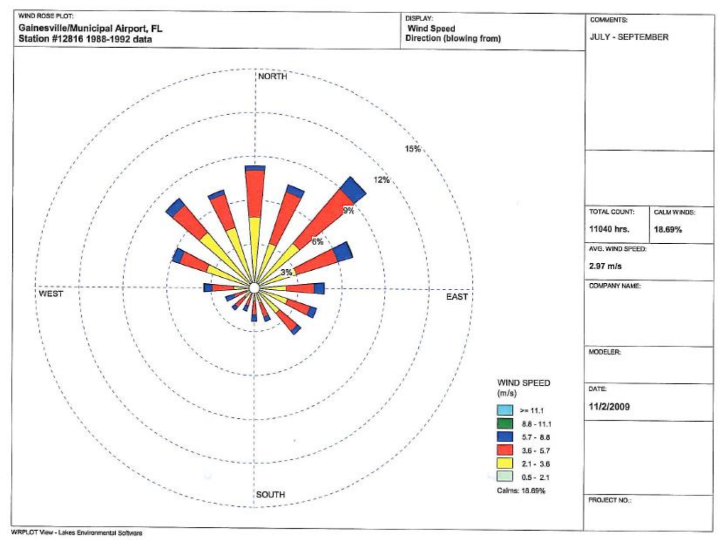
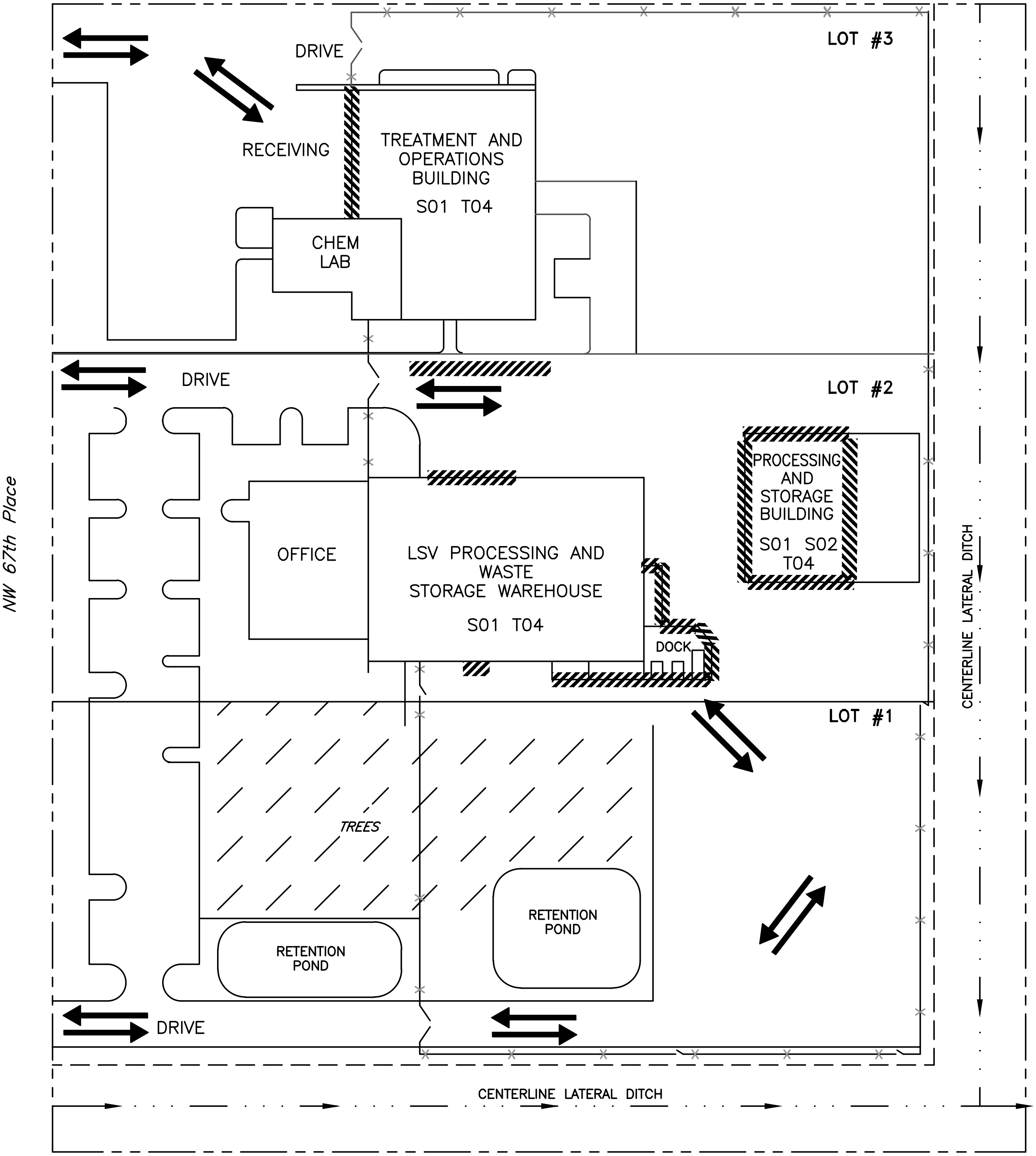


FIGURE II.A.7
QUARTERLY FIVE-YEAR WIND ROSES
GAINESVILLE, FLORIDA
1988 - 1992

SCHREIBER & YONLEY ASSOCIATES
ENVIRONMENTAL ENGINEERS



Traffic Pattern
Property Line
Drainage Easement
Loading Areas

S01	Hazardous Waste Container Storage
S02	Hazardous Waste Tank Storage
T04	Treatment Area

TITLE: FIGURE II.A.8
Traffic Patterns

PREPARED FOR: PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL. 32653

PERMA-FIX ENVIRONMENTAL SERVICES

SCALE: 1=80	APPROVED BY:	DRAWN: SYA
DATE: 10/07/14		REVISED:
PROJECT NUMBER: PFIFLA 140149		DRAWING NUMBER: PF0343-4

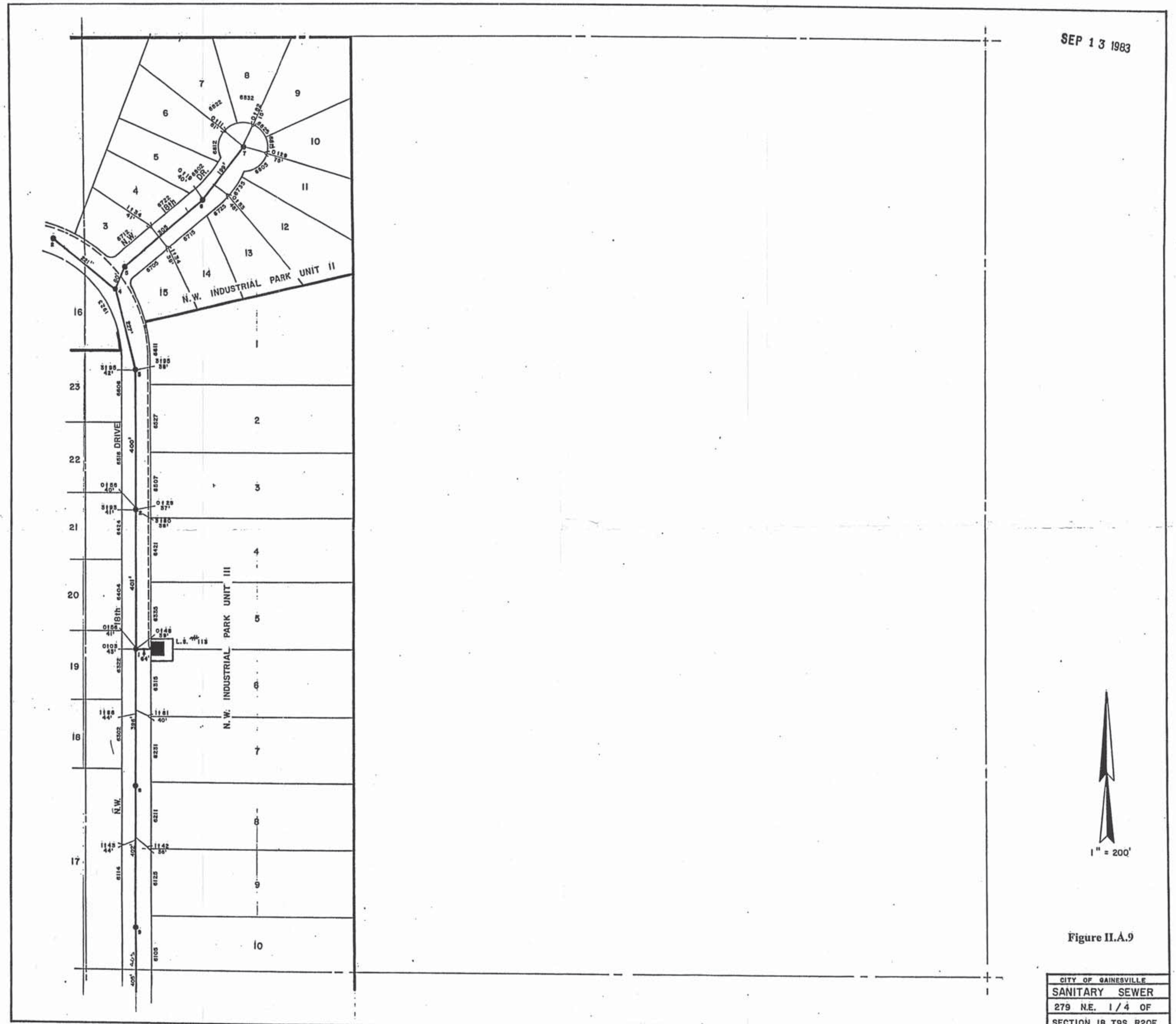


Figure II.A.9

CITY OF GAINESVILLE
SANITARY SEWER
279 N.E. 1/4 OF
SECTION 18 T9S R20E

Figure II.A.10

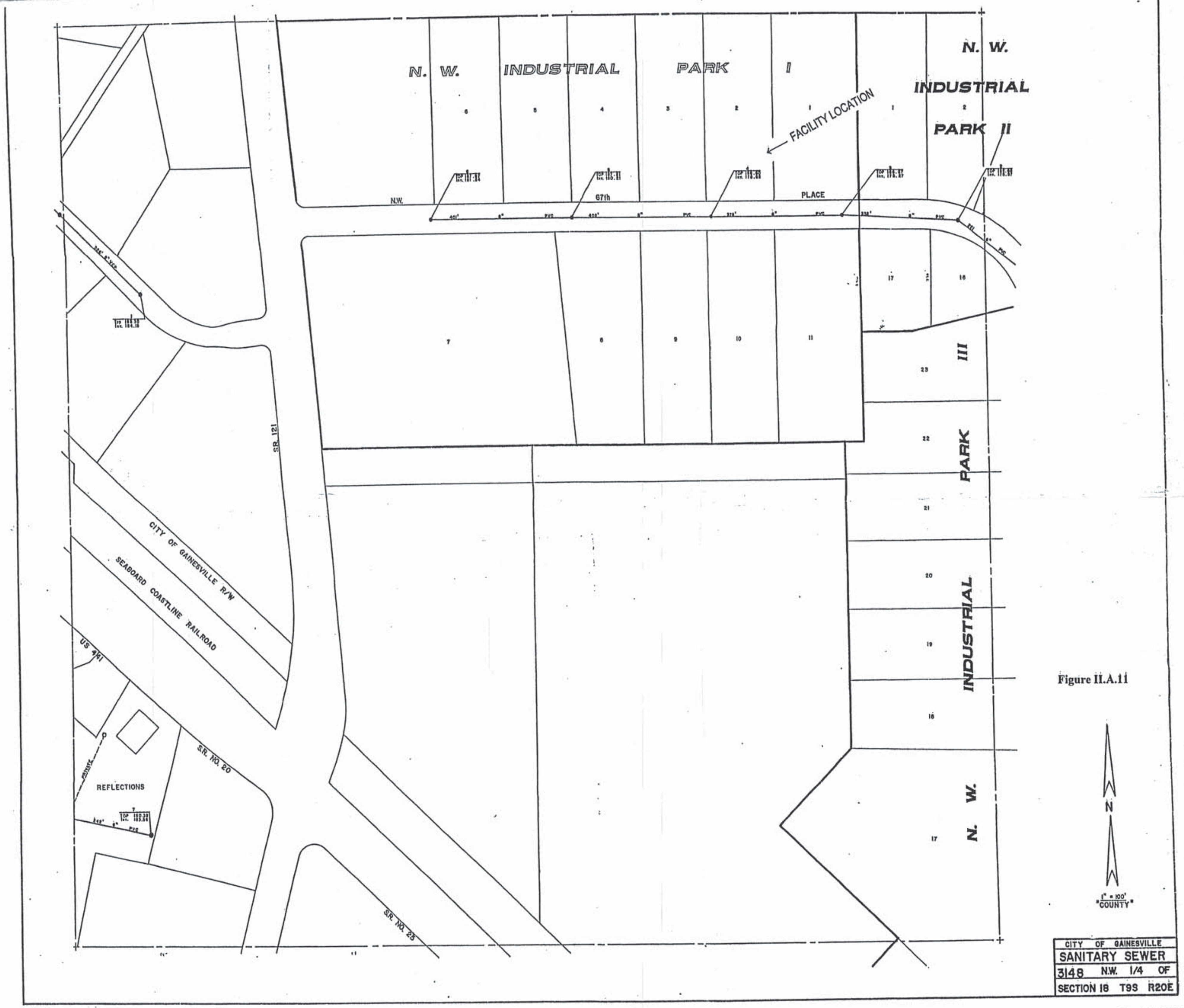


Figure II.A.11

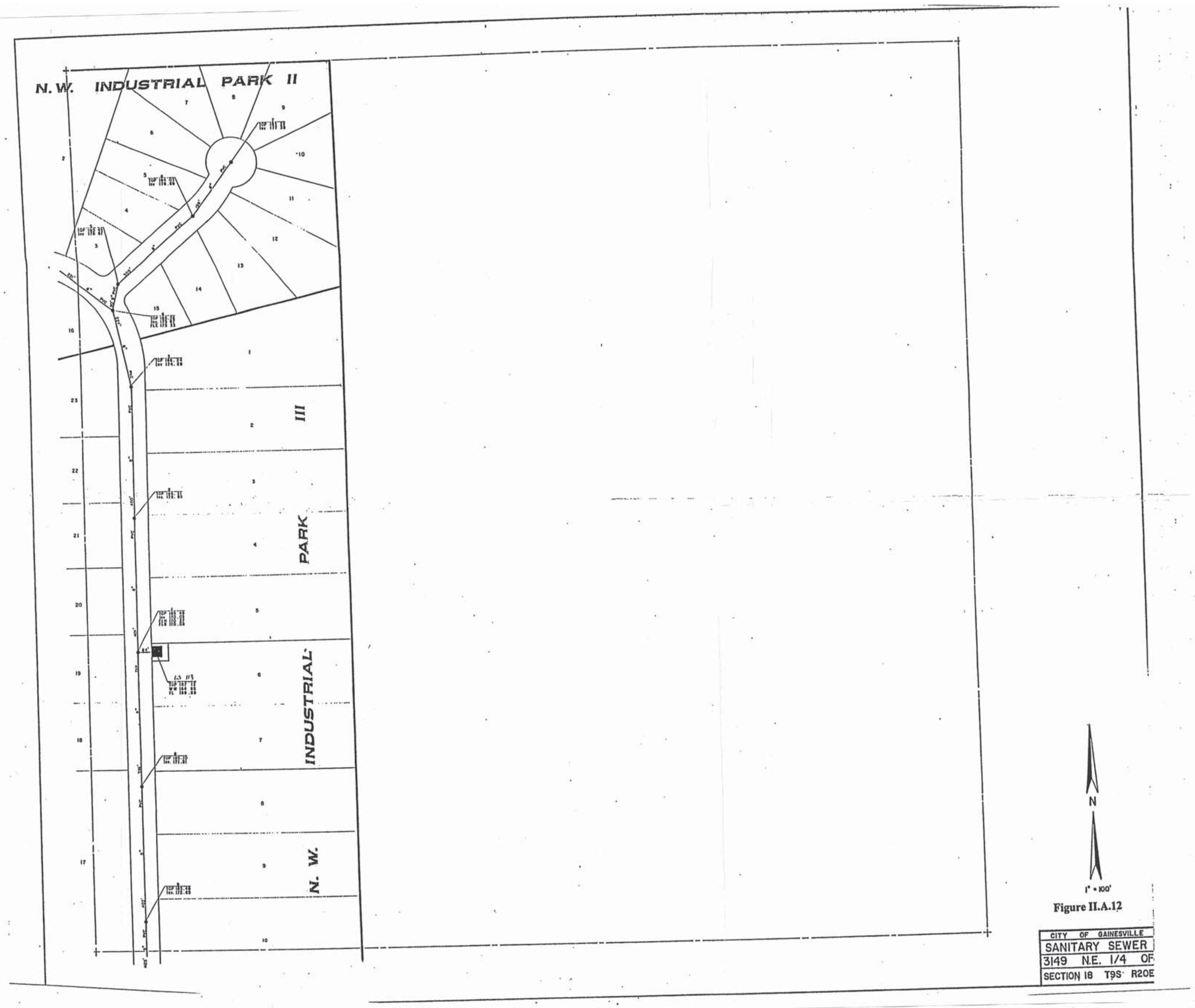


Figure II.A.12

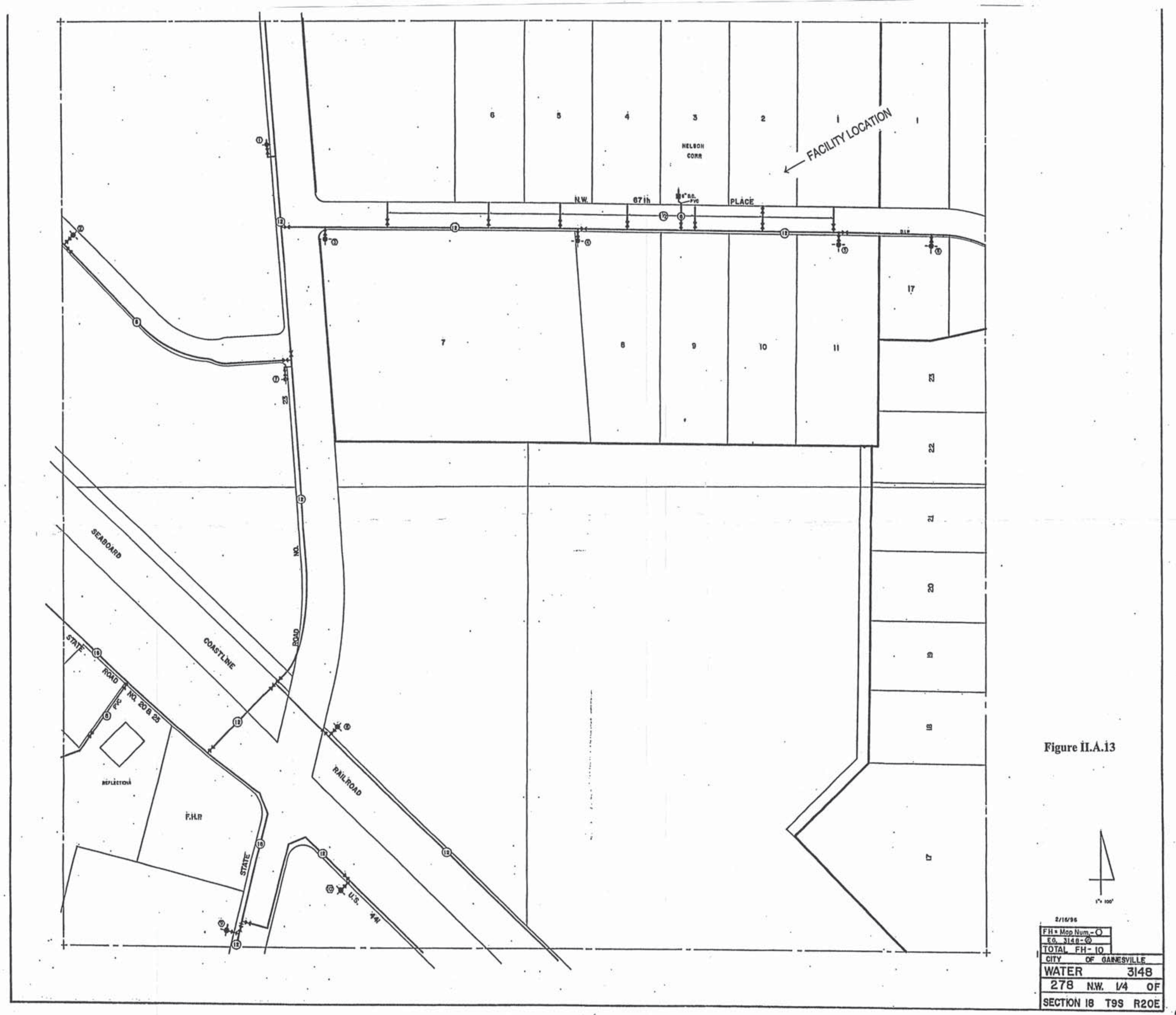


Figure II.A.13

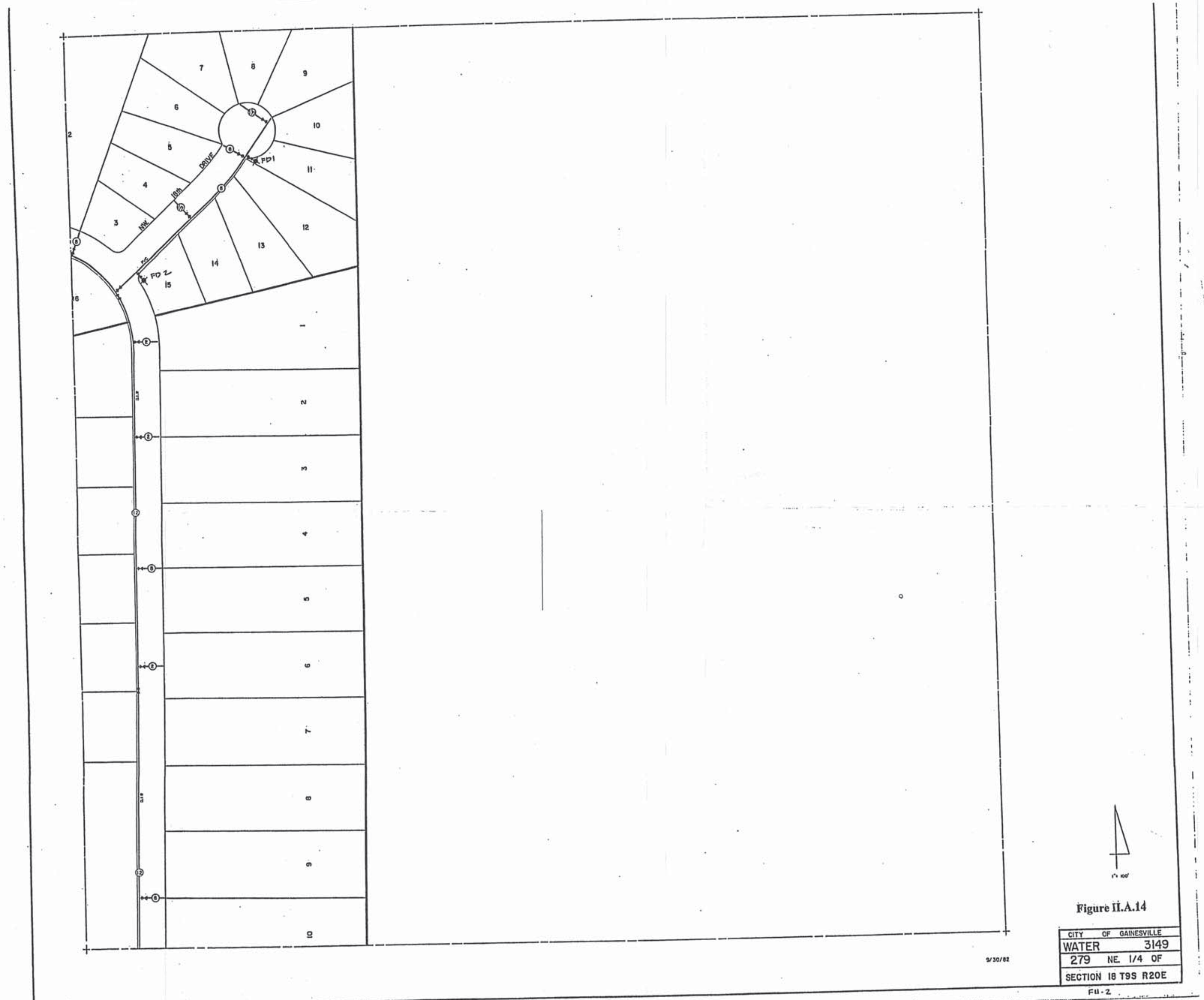


Figure II.A.14

APPLICATION FOR A HAZARDOUS WASTE PERMIT

PART II

B. CONTAINERS

PFF is currently permitted to store up to 72,105 gallons of containerized hazardous waste in the Processing and Storage Building; up to 35,200 gallons of container storage in the Treatment and Operations Building (see Figure I.D.1 in Part I of this application); and up to 54,350 gallons of hazardous waste in the LSV Processing and Waste Storage Warehouse in containers. In addition, permitted container treatment activities include stabilization/solidification (i.e., PF-I process); and treatment in containers, which includes deactivation of reactive wastes (e.g., D003), mercury amalgamation, non-elementary neutralization, and treatment of debris using drum rotator(s).

B1 Containment

The secondary containment system for the Processing and Storage Building consists of curbed and sloped concrete slabs and sumps, which are designed to drain liquids resulting from leaks or spills to sumps for removal. The containment system for the Processing and Storage Building consists of the following:

- An approximately 4-foot 10-inch wide and at least 4-inch high #4 rebar reinforced concrete sloped berm (“rollovers”) extending about 6 feet at forklift entry points to container storage areas;
- A 6-inch wide #4 rebar reinforced concrete curb with a minimum height of 2.5 inches around storage building perimeters;
- Continuous Neoprene® water stops within the concrete curbs and berms;
- Minimum of 20 mils of epoxy sealer at all joints and gaps;
- Polysulfide joint sealant in all floor joints; and,
- Sealant (e.g., Ashford Formula, which is a water-based inorganic silicate material for sealing and hardening of concrete floors), applied to the floor of the storage area to render the floor sufficiently impervious, in accordance with 40 CFR 264.175(b)(1).

The secondary containment system for the Treatment and Operations Building consists of curbed concrete slabs. The containment system for the Treatment and Operations Building consists of the following:

- 6-inch thick and approximately 5.75-inch high #4 rebar reinforced concrete curb near the building wall;
- 6-inch thick and 5.5-inch high #4 rebar reinforced concrete berming around each segregated container storage area;
- Approximately 7-foot wide and 4-inch high #4 rebar reinforced rollover berms for forklift entry/exit points for the container storage areas;
- Minimum of 20 mils of epoxy adhesive sealer at the concrete joints; and,

- Sealant (e.g., Ashford Formula, which is a water-based inorganic silicate material for sealing and hardening of the concrete floor), applied to the floor of the container storage area to render the floor sufficiently impervious, in accordance with 40 CFR 264.175(b)(1).

The container storage area within the LSV Processing and Waste Storage Warehouse is provided with a 5.5-inch thick and 5.5-inch high concrete curbing. The minimum height of the rollover berms for this storage area is 2.75 inches. A sealer and hardener has been applied to the storage area floor.

The floor slab making up the container storage areas in the Treatment and Operations Building, the Processing and Storage Building, and the LSV Processing and Waste Storage Warehouse consists of a concrete base that is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed. In addition, the surface of the concrete base has been applied with a sealant (e.g., Ashford Formula) to ensure the impervious nature of the containment base. The product data for the Ashford Formula is included as Attachment II.B.3. In the future, a sealant other than Ashford Formula may be used to render the floor sufficiently impervious, in accordance with 40 CFR 264.175(b)(1).

The capacities of the containment systems in the Processing and Storage Building, the Treatment and Operations Building, and the LSV Processing and Storage Warehouse are sufficient to contain more than 10% of the volume of the maximum number of containers in each building. Containment calculations are included as Attachment II.B.1. Details of the secondary containment system for the Processing and Storage Building, Treatment and Operations Building, and the LSV Processing and Waste Storage Warehouse are shown on Figure I.D.4, Figure I.D.1, and Figure I.D.7, respectively, in Part I of this application.

Engineering reviews have been conducted on the floor slabs in the container storage areas of each container storage building at the Facility. Copies of the engineering reports for the floors are included as Attachment II.B.3. The October 13, 1997 Floor Slab Inspection letter addresses the concrete pad in the former Nelson Building; referred to in this permit application as the Treatment and Operations Building. The 1989 work sheet addresses the integrity of the concrete pad in the former Quadrex container and tank storage building; referred to in this permit application as the Processing and Storage Building. The concrete slab in the LSV Processing and Storage Warehouse is similar in nature as the other two buildings.

To prevent run-on and accumulation of precipitation, the container storage areas in each building are roofed and sufficiently sided to prevent run-on of stormwater. In addition, the perimeters of the concrete floor slabs are curbed in each building. Finally, site grading directs surface water away from the buildings.

The sloped floors in the Processing and Storage Building will direct any liquid to the sumps. The container storage areas will be inspected at least once a week for accumulation of liquids, and any accumulation will be removed from the container storage area and/or sumps in as timely a manner as possible but no later than within 24 hours of detection by PFF personnel. Material removed from the container storage area and/or sump will be characterized and managed in accordance with applicable regulations. In addition, all containers stored in the Processing and Storage Building are kept off the floor on pallets or, in the case of totes, on built-in legs that prevent tote contact with any standing liquids.

The concrete slab in the Treatment and Operations Building and in the LSV Processing and Storage Warehouse is on a near level gradient. These container storage areas will be inspected at least once a week for accumulation of liquids, which will be remediated in as timely a manner as possible but no later than within 24 hours of detection. Depending on the amount involved, absorbents, submersible pumps, or a vacuum truck will be used to remove any liquids. All containers stored in the Treatment and Operations Building and in the LSV Processing and Storage Warehouse will also be kept off the floor on pallets or, in the case of totes, on built-in legs that prevent tote contact with standing liquids. All material removed from secondary containment areas will be characterized in accordance with 40 CFR 262.11 and stored, treated, or disposed of accordingly.

B2 & 3 Ignitable, Reactive, and Incompatible Wastes

No container of ignitable or reactive waste will be stored within 15 meters (50 feet) of the Facility property line or a public right-of-way. See Figure I.B.2 in Part I of this permit application. Hazardous waste will not be placed in an unwashed container that previously held an incompatible waste or material. A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers or open tanks will be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

In order to ensure compatibility of waste streams intended for co-mingling, PFF will implement the following management procedures prior to mixing potentially incompatible wastes.

- Prior to receipt at the Facility, all hazardous wastes must be profiled and preapproved. See the Facility Waste Analysis Plan (WAP) (Attachment II.A.4 of this permit application) for details on the approval and profile process.
- Containers of incompatible waste identified by the waste profile and/or WAP will be segregated from each other.
- Potentially incompatible wastes will be mixed together in small quantities and observed for undesirable reactions prior to being stored, treated, or otherwise managed together at the Facility. See the WAP for compatibility testing details. Incompatible wastes, or incompatible wastes and materials, will not be placed in the same container (or an unwashed container), unless the requirements of 40 CFR 264.17(b) are complied with.
- Lab Pack packing lists will be reviewed to identify potentially incompatible wastes.
- During Lab Pack decommissioning (transfer of waste from small containers to bulk containers), potentially incompatible wastes will not be bulked together unless compatibility testing indicates that the wastes may be combined i.e., the requirements of 40 CFR 264.17 (b) are complied with. Incoming Lab Pack wastes

determined to be incompatible will be segregated from each other and shipped off site for disposal in separate containers unless treated or deactivated and made compatible. See Figure I.D.1 in Part I of this permit application for an illustration of segregated storage bays.

B4 Condition and Management of Containers

Upon receipt of a shipment of containers, PFF personnel will review the manifest and other documents accompanying the shipment for completeness and accuracy and to identify the shipment and verify its compliance with 40 CFR 264.71 and 40 CFR 264.72. After verification, the containers will be inspected for defects and/or unacceptable conditions, as required in 40 CFR 264.171. If a container is found to be leaking, or is of questionable integrity, the container will be overpacked or its contents transferred into another container in good condition. If, following analysis in accordance with the WAP, the contents of a container are found to be unacceptable, the containerized waste will be rejected and returned to the generator, or sent to an alternate TSD, per the generator's instructions.

A representative sample of the incoming waste will be collected and analyzed in accordance with the Waste Receipt Analysis section of the WAP to determine consistency with the waste profile. Containers of waste will remain in the receiving area portions of the storage areas until accepted for storage in accordance with the WAP. Upon acceptance, containers will be moved to one of the container storage areas in the Processing and Storage Building, Treatment and Operations Building, or LSV Processing and Storage Warehouse. Unacceptable or rejected containers will be stored in one of the container storage areas until transportation to the generator or an alternate TSD can be arranged.

- All containers will be managed as if they contain free liquids until determined by Facility personnel to contain solids through inspection and/or sampling. Containers of hazardous waste will be kept closed except during sampling or when hazardous waste is added or removed. All 55-gallon containers will be palletized upon arrival, and all palletized containers will be banded when double-stacked, except for the chemotherapy drugs and other pharmaceuticals stored in the cage area in Zone 2 of the Processing and Storage Building where pallets of chemotherapy drugs and pharmaceutical waste can be stacked three pallets high.
- Adequate aisle space will be maintained in all areas of the Facility to provide unobstructed movement of personnel, material handling machinery, fire suppression equipment and spill control equipment. Pallets of hazardous waste containers or drums in storage areas that may be stacked up two high (except for chemotherapy drugs and pharmaceutical waste) will be banded and situated so that at least two sides of each pallet are visible and accessible at all times. Pallets or drums are added and removed from the ends of rows by lift trucks.

All containers received from off-site must meet US Department of Transportation (DOT) requirements for the material being shipped in the container. Containers that do not meet

DOT requirements will be overpacked into suitable containers for storage and/or shipment off site.

Examples of containers typically received at the Facility will include:

- 55-gallon steel drums (on standard pallets)[1]
- 55- and 30-gallon poly drums (on standard pallets)[1]
- 30-gallon steel and poly drums (on standard pallets)[1]
- 5-gallon steel and poly drums (on standard pallets)[1]
- DOT overpacked drums containing: glass vials, plastic vials, ½- to 1-gallon glass or plastic containers, and up to 30-gallon plastic carboy containers (on standard pallets)
- DOT specification roll-off containers
- DOT specification fiberboard containers (on standard pallets)
- DOT specification tote tanks (up to 550 gallon capacity)[2]
- DOT specification tanker/trailers (not stored in container storage areas)
- Other DOT-approved (performance-oriented) containers (on standard pallets)

B-25 and B-12 Containers: these are 96 and 48 cubic feet Strong Type A containers used by the Nuclear Waste industry, typical dimensions are 6'W x 4'H x 4'D for the B-25 and 6'W x 2'H x 4'D for the B-12.

Figures I.D.1, I.D.4 and I.D.7 in Part I of this permit application illustrate typical container storage configurations in the container storage areas. These configurations are for illustration purposes only. PFF will only receive containers made of or lined with materials that will not react with and are otherwise compatible with the hazardous waste to be stored.

B5 Inspections

PFF personnel will inspect areas where containers are stored or treated at least once per week. The inspections will cover proper placement of containers for ready access, container conditions, labeling, and inventory control. A detailed inspection log is maintained to ensure compliance with applicable Florida container and tank inspection requirements. Examples of inspection logs are included as Attachment II.B.4. Inspection logs will be maintained in the Facility operating record for a period of at least three years.

B6 and B7 Closure Plan and Closure Cost Estimate

A copy of the Facility Closure Plan and closure cost estimate is included in Section II.K of Part II of this application.

[1]Typical dimensions: 55-gal drum – 36" x 22" dia; 30-gal drum – 27" x 18" dia; 5-gal container – 14" x 10" dia.
[2]Totes are on legs, which keep them off the ground and away from accumulated liquid in containment areas. The dimensions for 450-gallon totes are 4 feet by 4.5 feet (base) by 5 feet, 4 inches (height). 450-gallon totes have 5.5-inch legs. 550-gallon totes have a base that is 3.5 feet by 4 feet and are 6 feet, 3 inches tall. 550-gallon totes sit on 6.5-inch legs.

Attachment II.B.1

Container Storage Area

Containment Calculations

Treatment and Operations Building
Container Storage Area

Containment Calculations

Given:

Base Area (a)	2,331 ft^2 (42'x55.5')
Curb Height (h) (rollovers)	4 in = 4 in / 12 in = 0.33 ft
Pallet Displacement (pd)	(12.48 gal) (80 pallets) = 998.4 gal
100% volume of largest container (LC)	= 718 gal (i.e., B-25 container)
100% volume of total containers (TC)	= 35,200 gal (640, 55-gallon drums)
10% volume of total container = (10%) (TC)	= 3,520
25 year/24 hour storm water volume	= 0 gal (building is totally enclosed)

Containment Capacity Available (CCA):

CCA = (h x a x 7.48 gal/ft^3) - pd

CCA =(0.33 ft x 2,331 ft^2 x 7.48 gal/ft^3) – 998.4

CCA = 4,755 gal

Conclusion

The net available containment volume (4,755 gal) exceeds the volume of the largest container (718 gal) and is in excess of 10% of the maximum volume (3,520 gal) of containerized waste that will be stored in the Treatment and Operations Building container storage area.

Attachment II.B.1 (cont.)

Processing and Storage Building
Container Storage Area

Containment Calculations

<u>Containment Calculations Adjustment for Pallet Displacement</u>

Given:

Zone 1 Containment Capacity	3,241 gal (see attached calculations)
Zone 2 Containment Capacity	5,283 gal (see attached calculations)
Zone 3 Containment Capacity	7,449 gal (see attached calculations)
Pallet Displacement (pd) Total	(12.48 gal) (164 pallets) = 2,046.72 gal
Zone 1 pd	(12.48 gal) (24 pallets) = 299.52 gal
Zone 2 pd	(12.48 gal) (46 pallets) = 574.08 gal
Zone 3 pd	(12.48 gal) (94 pallets) = 1,173.12 gal
100% volume of largest container (LC):	
Zone 1 LC	= 718 gal
Zone 2 LC	= 718 gal
Zone 3 LC	= 718 gal
100% volume of total containers (TC)	= 71,830 gal
Zone 1 TC	= 9,130 gal drum equivalents
Zone 2 TC	= 21,340 gal drum equivalents
Zone 3 TC	= 41,360 gal drum equivalents
550 gal totes and B-25 displacement	= not significant (totes are on legs 5.5 in off the ground, containment curb is 5.75 in)
Other equipment displacement	= not significant (no equipment of significance is kept in containment areas)
25 year/24 hour storm water volume	= 0 gal (building has metal roof with eaves sufficient to prevent rain from blowing in)

<u>Containment Capacity Available (CCA):</u>

Zone 1 CCA

CCA = 3,241 gal – 299.52 gal
CCA = 2,941.48 gal

Zone 1 Conclusion

The net available containment volume (2,941 gal) exceeds the volume of the largest container (718 gal) and is in excess of 10% of the maximum volume (913 gal) of containerized waste that will be stored in Zone 1.

Processing and Storage Building
Container Storage Area

Containment Calculations

Zone 2 CCA

CCA = 5,283 gal – 574.08 gal
CCA = 4,708.92 gal

Zone 2 Conclusion

The net available containment volume (4,709 gal) exceeds the volume of the largest container (718 gal) and is in excess of 10% of the maximum volume (2,134 gal) of containerized waste that will be stored in Zone 2.

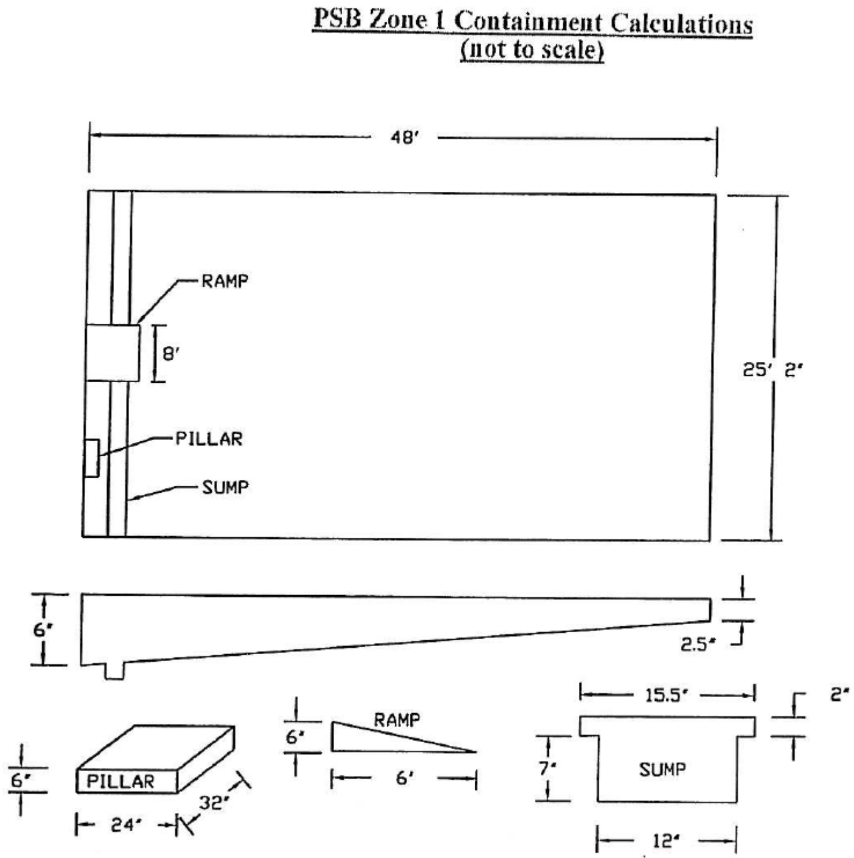
Zone 3 CCA

CCA = 7,449 gal – 1,173.12 gal
CCA = 6,275.88 gal

Zone 3 Conclusion

The net available containment volume (6,276 gal) exceeds the volume of the largest container (718 gal) and is in excess of 10% of the maximum volume (4,136 gal) of containerized waste that will be stored in Zone 3.

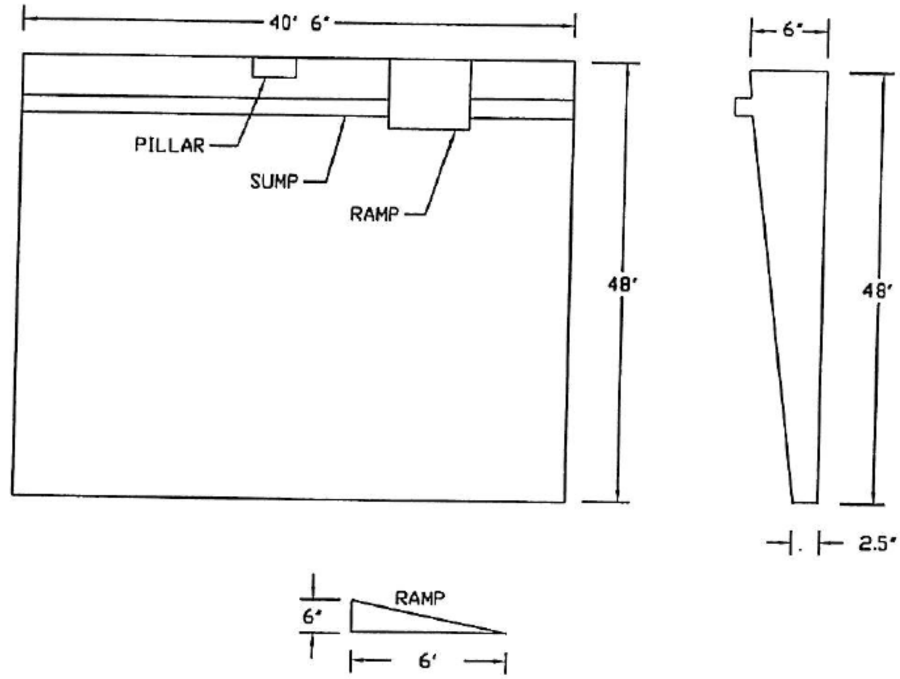
Attachment II.B.1 (cont.)



Zone 1 Volume	=	Floor volume + Sump volume – Ramp volume – Pillar volume
Floor Volume	=	1/6 height (upper base area + lower base area + (4 x area of midsection))
	=	1/6 (48’) ((2.5” x 25’2”) + (6” x 25’2”) + 4(4.25” x 25’2”))
	=	1/6 (576”) (755” + 1,812” + 5,134”)
	=	739,296 cubic inches
Sump Volume	=	Length (Upper area + Lower area)
	=	25’2” ((15.5” x 2”) + (12” x 7”))
	=	302” (31” + 84”)
	=	34,730 cubic inches
Ramp Volume	=	1/2 (Base x Height x Width)
	=	1/2 (6” x 72” x 96”)
	=	20,736 cubic inches
Pillar Volume	=	Base x Height x Width
	=	24” x 6” x 32”
	=	4,608 cubic inches
Zone 1 Volume	=	739,296 + 34,730 – 20,736 – 4,608
	=	748,682 cubic inches ÷ 231 cubic inches per gallon
	=	3,241 gallons

Attachment II.B.1 (cont.)

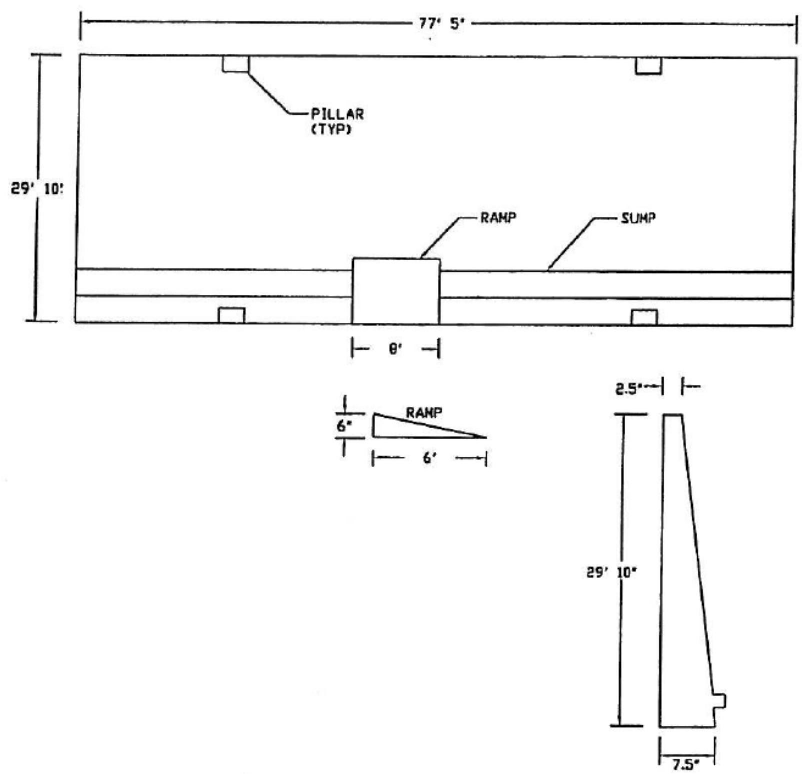
PSB Zone 2 Containment Calculations
(not to scale)



Zone 2 Volume	=	Floor volume + Sump volume – Ramp volume – Pillar volume
Floor Volume	=	1/6 height (upper base area + lower base area + (4 x area of midsection))
	=	1/6 (48') ((2.5" x 40'6") + (6" x 40'6") + 4(4.25" x 40'6"))
	=	1/6 (576") (1,215" + 2,916" + 8,262")
	=	1,189,728 cubic inches
Sump Volume	=	Length (Upper area + Lower area)
	=	40'6" ((15.5" x 2") + (12" x 7"))
	=	486" (31" + 84")
	=	55,890 cubic inches
Ramp Volume	=	1/2 (Base x Height x Width)
	=	1/2 (6" x 72" x 96")
	=	20,736 cubic inches
Pillar Volume	=	Base x Height x Width
	=	24" x 6" x 32"
	=	4,608 cubic inches
Zone 2 Volume	=	1,189,728 + 55,890 – 20,736 – 4,608
	=	1,220,274 cubic inches ÷ 231 cubic inches per gallon
	=	5,283 gallons

Attachment II.B.1 (cont.)

PSB Zone 3 Containment Calculations
(not to scale)



Zone 3 Volume	=	Floor volume + Sump volume – Ramp volume – 4 Pillar volumes
Floor Volume	=	1/6 height (upper base area + lower base area + (4 x area of midsection))
	=	1/6 (29'10") ((2.5" x 77'5") + (7.5" x 77'5") + 4(5" x 77'5"))
	=	1/6 (358") (2,322.5" + 6,967.5" + 18,580")
	=	1,662,910 cubic inches
Sump Volume	=	Length (Upper area + Lower area)
	=	77'5" ((15.5" x 2") + (12" x 7"))
	=	929" (31" + 84")
	=	106,835 cubic inches
Ramp Volume	=	1/2 (Base x Height x Width)
	=	1/2 (7.5" x 72" x 96")
	=	25,920 cubic inches
Pillar Volume	=	Base x Height x Width
	=	24" x 7.5" x 32" x 4
	=	23,040 cubic inches
Zone 1 Volume	=	1,662,910 + 106,835 – 25,920 – 23,040
	=	1,720,785 cubic inches ÷ 231 cubic inches per gallon
	=	7,449 gallons

LSV Processing and Storage Warehouse

Containment Calculations

Base Area = 41.167’ x 83.33’ + 51’ x 30’ - 27’ x 20’ (see attached drawing)
= 3,430 + 1,530 – 540
= 4,960 ft^2

Curb Height = 2.75” (rollover berm height is 2.75”, which is lower than the curb height)

Pallet Displacement (pd) = (12.48 gal) (111 pallets) = 1,385.28 gallons

100% volume of largest container = 718 gallons

100% volume of total containers = 54,340 gallons (988, 55-gal drums)

10% volume of total containers = 5,434 gallons

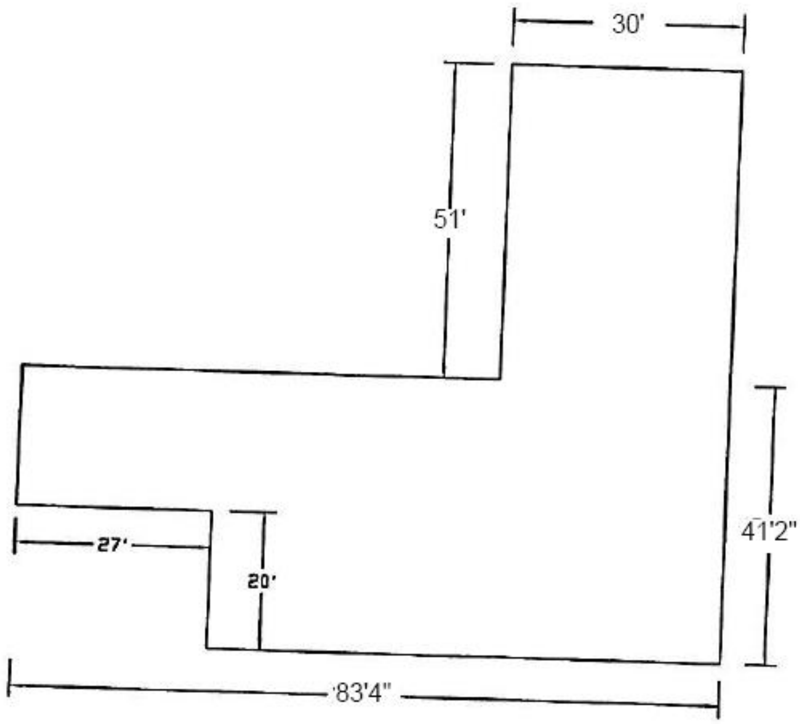
25 year/24 hour storm water volume = 0 gallons (enclosed building)

Containment Capacity Available:
= 2.75/12 x 4,960 x 7.48 gal/ft^3 – 1,385.3
= 8,502.3 – 1,385.3 = 7,117 gallons

Conclusion:

The net available containment volume (7,117 gallons) exceeds the volume of the largest container (718 gallons) and is in excess of 10% of the maximum volume (i.e., 5,434 gallons) of containerized waste to be stored in the container storage area at the LSV Processing and Storage Warehouse.

LSV Processing & Waste Storage Containment Drawing
(not to scale)



Attachment II.B.2

Example Concrete Sealer/Hardener Specifications

ASHFORD FORMULA™
THE FINAL TREATMENT FOR YOUR CONCRETE

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910 1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List) **Ashford Formula**	Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

SECTION I

Manufacturer's Name **Curecrete Chemical Company, Inc.**	Emergency Telephone Number **800-728-2482** International Emergency Number (call collect) **801-629-0667** Telephone Number for Information **801-489-5663**
Address (Number, Street, City, State, and Zip Code) **1203 West Spring Creek Place** **Springville, Utah 84663**	Date Prepared **September 19, 2012**

SECTION II – HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (Optional)

N/A – Water-based, catalytically modified inorganic sodium silicate material.

SECTION III – PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	**230°F (110°C)**	Specific Gravity (H_2O = 1)	**1.1 - 1.2 @ 20°C**
Vapor Pressure (mm Hg.) 25°F (-3.89°C)	**23.756**	Melting Point	**N/A**
Vapor Density (AIR=1) 25°F (-3.89°C)	**0.9996**	Evaporation Rate Butyl Acetate = 1 (Water = 1)	**1**
Solubility in Water	**100%**	pH	**11.3 - 11.6**

Appearance and Odor **Clear liquid, odorless**

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) **N/A**	Flammable Limits **N/A**	LEL	VEL

Extinguishing Media **Non-flammable (water-based)**

Special Fire Fighting Procedures **N/A**

Unusual Fire and Explosion Hazards **N/A**

SECTION V – REACTIVITY DATA

Stability	Unstable		Conditions to Avoid
	Stable	**X**	**N/A**

Incompatibility (Materials to Avoid) **Strong acids**			
Hazardous Decomposition or By Products **N/A**			
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	**X**	**N/A**

SECTION VI – HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? **If atomized.** Skin? **N/A** Ingestion? **Irritation of intestinal tract.**
Health Hazards (Acute and Chronic)	**Avoid direct contact with eyes and mucous membranes (caustic). Breathing of atomized mist may cause bronchial irritation (caustic). Use low-pressure sprayer. Extended exposure may dry natural oils of skin and cause skin irritation (caustic).**
Carcinogenicity:	NTP? **N/A** IARC Monographs? **N/A** OSHA Regulated? **N/A**
Signs and Symptoms of Exposure	**Burning and itching in nose and throat (inhalation if atomized). Pain, redness and tearing (eye exposure), itching or burning (prolonged skin exposure).**
Medical Conditions Generally Aggravated by Exposure	**Asthma and lung diseases, skin diseases.**
Emergency and First Aid Procedures	**Flush eyes with water for 15 minutes. If ingested, do not induce vomiting. Drink large amounts of milk or water. Call a physician immediately. Remove contaminated clothing.**

SECTION VII – PRECAUTIONS FOR SAFE HANDLING USE

Steps to Be Taken in Case Material is Released or Spilled	**Clean up with water.**
Waste Disposal Method	**Observe all local, state and federal regulations. May be flushed down a sanitary sewer with large volumes of water.**
Precautions to Be Taken in Handling and Storing	**N/A**
Other Precautions	**Floors may become slippery during application of the Ashford Formula.**

SECTION VIII – CONTROL MEASURES

Respiratory Protection (Specify Type) **Use NIOSH approved mist respirator if atomized.**		
Ventilation **Not required unless atomized.**	Local Exhaust Use with adequate ventilation.	Special
	Mechanical (General)	Other
Protective Gloves **Use rubber gloves where extended contact may occur.**	Eye Protection **Avoid contact with eyes.**	
Other Protective Clothing or Equipment **N/A**		
Work/Hygienic Practices **Wash hands after handling. Wash contaminated clothing before reuse.**		

Attachment II.B.3

Nelson Building Floor Slab Inspection

BODO AND ASSOCIATES, INC.
Consulting Engineers

13 October 1997

Perma-Fix of Florida, Inc.
Attention: **Mr. George Harder**
1940 NW 67th Place
Gainesville, FL 32653

RE: **Floor Slab Inspection**
Nelson Building, Perma-Fix Plant
Gainesville, Florida

Gentlemen:

At your request Bodo and Associates, Inc. performed an evaluation of the floor at the Nelson Building located at the Perma-Fix Plant in Gainesville, Florida. This letter presents our findings and opinions.

The purpose of our work was to assess the capacity of the existing floor slab to support the loads due to storage of hazardous and radioactive waste. The materials are stored in drums on pallets with four drums per pallet. Each drum weighs a maximum of 800 lb when full. Two pallets may be stacked on top of each other. The pallets are moved around on a forklift with a rated capacity of 6000 lb.

Five core samples were drilled in order to verify the thickness of the slab. The sampling points were located in the approximate center of the floor area and as near to the four corners as was practical and accessible. The subgrade was also evaluated qualitatively at each of the five locations by measuring the distance that a ¾" diameter steel rod moved through under ten hammer blows.

Visual inspection of the general floor area revealed no significant cracks or other signs of distress. Concrete quality, as seen in the core samples, appeared to be good, with a fairly uniform distribution of coarse aggregate and no large voids or air pockets. The slab has welded wire fabric reinforcement which is generally located near the bottom. Slab thickness varied from 4" to 6½" with the average estimated as 5". The subgrade appeared to be uniform and dense.

726 NW 23rd Avenue New Area Code: 352
◆ (904) 378-8806 ◆ FAX (904) 378-6488
Mailing Address: P.O. Box 698, Gainesville, Florida 32602

Perma-Fix of Florida, Inc.
13 October 1997
Page 2

The slab was analyzed for the loads using procedures derived from *Slab Thickness Design for Industrial Concrete Floors on Grade*, a publication of the Portland Cement Association. The modulus of subgrade reaction was conservatively assumed as 250 pci. The modulus of rupture of concrete was taken as 530 psi.

Results of the numerical analysis imply a factor of safety with respect to flexural fatigue failure of about 1.7 which is the recommended value for moderate-to-heavy traffic. A value of 2.0 would permit unlimited repetitions of the design load.

Based on our observations and analysis we conclude that the slab can be expected to continue to perform satisfactorily as described above.

We appreciate the opportunity to provide our services to you. If you have any questions or require additional assistance, please do not hesitate to call.

Sincerely,
BODO AND ASSOCIATES, INC.

Attila A. Bodo, P.E. 10-20-97
President

DARABI
AND
ASSOCIATES, INC.

Environmental Consultants

Suite A • 730 North Waldo Road, Gainesville, Florida 32601 • Phone: 904/376-6533

December 1, 1989

Mr. Dennis Fleetwood
Quadrex Environmental
1940 N.W. 67th Place
Gainesville, Florida 32606

Dear Dennis:

Attached is the structural review of the slab by Bodo & Associates. Please include this in the package that is being prepared for submittal to the Department of Environmental Regulation.

Sincerely,

DARABI AND ASSOCIATES, INC.

Frank A. Darabi

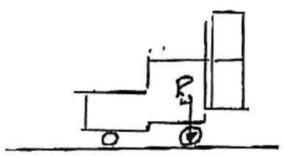
Frank A. Darabi, P.E.
President

FAD/ns[514]

BODO & ASSOCIATES, INC.	
DESIGN CRITERIA	Designed by: DWG Checked by: AAB Date Checked: 29 Nov 89

1. Project Number: 193-00-04
2. Project Name: QUADREX HPS: STORAGE AREA SLAB
3. Location:
   Gainesville, FL
4. General Use of Structure:
   STORAGE AREA
5. Applicable Building Codes, Design Standards and Publications:
   BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI 318-83(86)
   NAVFAC DM 7.2 FOUNDATIONS & EARTH STRUCTURES
   STANDARD BUILDING CODE, 1988
6. Design Loads:
   STORAGE DRUMS : 375#/EA.
   FORK LIFT : 7085#
7. Assumptions:
   f_y = 60 ksi
   f'_c = 5000 psi
   MODULUS OF SUBGRADE REACTION: 300 pci
8. Checklists Required:

4.2.90



20% – 80%
Load Dist'n

$R_w = .8\left[\tfrac{1}{2}(7100^{\#} + 2(375))\right] = 3140^{\#}$ – whl

$R_{u_w} = 1.7 \times 3140^{\#} = 5340^{\#}$ say $6000^{\#}$

$k = 300$ pci   CONCRETE PLACED OVER EXISTING ASPHALT PAVEMENT

FROM FIG 23-8 HIGHWAY ENGINEERING HANDBOOK (ORIGINALLY IN "CONCRETE PAVEMENT DESIGN," 1951, PCA, fig 5 p. 20)

For 6" slab w/ 6000# wheel load & k = 300 psi
the flexural stress in the concrete ~ 310 psi

Modulus of rupture = $7.5\sqrt{f'_c} = 7.5\sqrt{3000} = 410$ psi > 310 psi OK

Therefore the slab should perform satisfactorily.

Attachment II.B.4

Example of Inspection Log

Inspection Details	M	T	W	Th	F
Date					
Time					
Inspector					
Hazardous Waste Container Storage Areas					
Storage areas are clean	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Container exteriors are clean	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Drums are stacked no more than 2 high	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Top level drums are banded	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Aisle spacing is adequate	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Storage areas are free from leaks or spills	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Containers are free from damage	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Signs and labels are facing outwards	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Sumps are free of accumulated material	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Incompatible materials are separated	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Discrepancies					
All items are in compliance/no discrepancies	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Discepancies not listed above:					
Discrepancy Location (PSB, LSV, TOB, Other)					

Instructions for inspection:
Log date, time and inspector name. Examine all Hazardous Waste Container Storage Areas (PSB Zones 1-3, TOB Zones 4-12, LSV) for area cleanliness, container cleanliness, appropriate stacking (2 drums high, second level palletized and banded, up to 3 containers high in chemotherapy cage), and evidence of damage to containers. Ensure aisle spacing is adequate for inspection and emergency response. Look for evidence of leaks and spills, and make sure that all labels are facing outward and visible. Ensure that all Hazardous Waste, DOT and Perma-Fix labels are present and legible. Inspect sumps in PSB to ensure that no liquid is accumulated. Answer all inspection questions, indicating yes or no to each statement. An answer of "No" indicates a discrepancy and requires additional steps below.

Instructions for discrepancies:
Note the location of each discrepancy, including location (PSB, LSV, TOB, Dock, Other) and the zone number if applicable. Note any container numbers related to the discrepancy, and the nature of the discrepancy. E-mail these details to the RSO on a daily basis. Emails are then attached to the weekly work order as documentation of inspection results.

Work Order: ____________________

Appendix II.B.1

Perma-Fix I® Process

Description of Perma-Fix I®Process

The Perma-Fix I® (PF-I) process is used primarily to treat characteristic inorganic hazardous or mixed wastes to meet treatment standards for land disposal. In some instances non-hazardous liquids and sludges are likewise stabilized using the PF-1 process to allow for more efficient handling and disposal. As indicated in Figure I.D.11.2, the inorganic wastes that do not contain organic hazardous constituents in excess of applicable land disposal restriction levels are target waste streams for the PF-I process.

The basis for the PF-I process is the permanent stabilization of the waste. Stabilization is a chemical process that changes the chemical composition and permanently binds the potentially hazardous and leachable components of the hazardous or mixed waste. Waste identified for the PF-I process are evaluated for specific chemical characteristics to identify the appropriate proprietary treatment "recipe" for converting the key waste constituents to a more chemically stable and insoluble form. EPA has determined that stabilization is the best-demonstrated available technology (BDAT) for the treatment of certain listed and characteristic hazardous wastes.

Examples of successfully treated wastes using the PF-I process:

Glass and plastic beads used for paint removal.
Powdered coatings containing cadmium;
Caustic cleaners;
Spent acid sludge;
Acid sludges from lubrication oil manufacturers;
Chromium and cadmium sludge from plating tanks;
Dust contaminated with heavy metals;
Zinc phosphate sludge;
Caustic quench sludge;
Waterfall paint booth sludge;
Lead chromate sludge; and,
Soils contaminated with heavy metals.

Once subjected to the PF-I process, the treated waste is sampled to determine whether it meets the desired treatment standards (e.g., whether the waste no longer exhibits a hazardous waste characteristic identified in 40 CFR Part 261, Subpart C and/or meets applicable land disposal restrictions listed in 40 CFR 268.48). After receiving chemical stabilization treatment, the waste is in a final form that meets the waste acceptance criteria of the authorized disposal facility.

Typically, the PF-I process is applied to wastes in drums. However, larger or smaller containers may be used, depending upon the nature of the waste to be treated. In any event, the waste is usually stabilized in the container to be used to ship the waste off site for disposal. In some instances, the addition of treatment additives will increase volume such that the stabilized waste must be transferred to an additional or larger container prior to disposal.

The PF-I process will generate relatively small quantities of secondary waste consisting primarily of personal protective equipment (PPE) and plastic sheeting used to collect any incidental spillage of the treated waste or waste treatment materials. Secondary waste will be appropriately characterized, treated, or disposed.

Equipment Specification

A skid-mounted hydraulic mixer is used to mix the PF-I waste and treatment additives (Reference Figure I.D.12 “PF-I and PF-2 Process Flow Diagram”). The waste container (drum) serves as the mixing vessel. Only the steel shaft of the mixer enters the top of the drum undergoing treatment.

The operation consists of adding treatment additives to the container and subsequently mixing the additives into the waste. The process is conducted in an area equipped with secondary containment.

All relevant procedures to prevent hazards; inspections, testing, maintenance, and containment requirements addressed in this permit application for containers are applied to the operation of the PF-I process equipment. Appropriate records will be maintained in the Facility Operating Record.

Environmental Performance Standards

Release Prevention

The PF-I process area and equipment are located, designed, constructed, operated and maintained in a manner that will ensure protection of human health and the environment. The hydrogeologic, geologic, and meteorologic factors of concern for the Facility site and surrounding areas are addressed in Section A of this permit application. For purposes of ensuring protection of human health and the environment, PFF will operate the PF-I process in conformance with applicable container standards. Appropriate secondary containment is incorporated into the design and operation of the equipment. No run-on and run-off of precipitation or liquids from the PF-I process area are likely because this treatment is conducted in secondary containment in an enclosed building.

See Part II, Section B of this permit application for details regarding containment; management of ignitable, reactive, and incompatible wastes; condition and management of containers; inspections; and prevention of run on and accumulation of precipitation in the Treatment and Operations Building, Processing and Storage Building, and/or LSV Process Area where PF-I process operations will take place.

Prevention of Releases to Groundwater or Subsurface Environment

Releases to groundwater or the subsurface environment from the PF-I process are extremely unlikely for the following reasons.

- The containers to be treated contain relatively small volumes of material and the operation is a batch process; i.e., waste will be treated in 55-gallon drums.
- The process is located within a secondary containment system designed to meet the requirements of 40 CFR 264, Subpart I. The containment system is designed to contain the volume of the largest container, or 10% of the total volume of containers permitted for the area, whichever is larger. The containment system floor is applied with a sealer/hardener material to make the concrete surface impermeable to the materials processed.
- The PF-I process area containment system is inspected at least once per week in accordance with the Facility inspection plan. Leaks or spills are cleaned up within 24 hours of discovery or as soon as it is practicable and safe to do so.
- The system is located within a building; i.e., the system is physically separated from the subsurface environment and groundwater.
- PFF maintains a Contingency Plan to provide a framework for PFF response to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the system.

Prevention of Releases to Surface Water, Wetlands, or Soil Surface

Releases to surface water, wetlands, or soil surface from the PF-I treatment process are extremely unlikely for the following reason.

- The containers to be treated contain relatively small volumes of material and the operation is a batch process; i.e., waste will be treated in up to 55-gallon drums.
- The process is located within a secondary containment system designed to meet the requirements of 40 CFR 264, Subpart I. The containment system is designed to contain the volume of the largest container, or 10% of the total volume of containers permitted for the area, whichever is larger. The containment system floor is applied with a sealer/hardener material to make the concrete surface impermeable to the materials processed.
- The PF-I process area containment system is inspected at least once per week in accordance with the Facility inspection plan. Leaks or spills are cleaned up within 24 hours of discovery or as soon as it is practicable and safe to do so.
- The system is located within a building; i.e., the system is physically separated from the subsurface environment and groundwater.
- PFF maintains a Contingency Plan to provide a framework for PFF response to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the system. See Attachment II.A.2 to Part II.A of this permit application.

Prevention of Releases to Air

Releases to air from the PF-I process are extremely unlikely for the following reasons:

- The system is located within a building.
- Containers will be kept closed at all times except during treatment or removal of waste from containers.
- Organic vapors are not anticipated because the wastes to be treated are classified as inorganic wastes. (The PF-I process will be used to treat characteristic inorganic hazardous wastes having an average VOC content of less than 500 ppmw.)
- Particulate emissions generation during the addition of treatment chemicals are minimized by wetting or other means (as appropriate).
- Particulate emissions after treatment are minimal because of the consistency of the treated waste and solidification of the matrix.
- Any fugitive particulate emissions generated during treatment will be captured by a dust collector and HEPA filter system connected to the enclosed room in which the PF-I treatment process is conducted.
- Screening the wastes for reactive cyanide and sulfide will prevent generation of fumes from reactive wastes.

Monitoring and Inspections

PFF personnel monitor the PF-I process during processing operations. The system is operated manually (or automated equipment is manually operated). The PF-I process area is visually inspected at least once per week for evidence of leaks or spills. The inspection is in accordance with the requirements of the Facility inspection plan. The secondary containment system is also inspected at least once per week for evidence of cracks or breaches in containment as specified in the Facility inspection plan.

Potential Pathways of Exposure of Humans or Environmental Receptors

PFF workers within the Treatment and Operations Building are the most likely human receptors for chemicals or chemical constituents released from the PF-I process. The exposure is anticipated to be minimal because personnel are provided with appropriate personal protective equipment (PPE) including, as applicable, respirators. The primary pathway for human receptors from the PF-I process is air, specifically, air emissions (particulates) generated by addition of treatment chemicals. Where appropriate, water may be added to the wastes or treatment chemicals prior to loading to minimize the generation of particulates.

Personnel operating the system (or personnel present for any other reason) are required to wear PPE selected to address the potential hazards identified for the wastes to be managed and the operating parameters of the system. The PPE selected is in accordance with OSHA standards and may include use of particulate respirators (as appropriate).

Environmental receptors such as soil, surface water, groundwater, and air are unlikely to be impacted by the PF-I process because of the containment system and location of the treatment area within a building physically separated from soils and protected from precipitation, run-on and run-off.

Effectiveness of the PF-I Process

EPA has determined that stabilization, which is the basis for the PF-I process, is the best-demonstrated available technology (BDAT) for the treatment and pre-treatment of certain listed and characteristic hazardous and mixed wastes. Perma-Fix has been conducting the PF-I process for many years and has considerable experience on which to determine optimal formulations for a wide variety of wastes.

Appendix II.B.2

Deactivation Process

Description of Deactivation Process

Unlike all other processes described in this application, there is no single, straightforward description for the "deactivation" that PFF will perform. The definition of D003 from 40 CFR 261.23 lists eight properties of a "reactive" waste. Each of the eight properties requires a different treatment to change the chemical structure of the waste so that it is no longer reactive. PFF will not treat explosives that are specified in 40 CFR 261.23(a)(8).

With the exception of plating sludges that might contain cyanides, it is anticipated, based on market knowledge, that the majority of reactive wastes PFF will receive would be in lab packs. The actual volume of waste would be very small. D003 wastes that will be deactivated will be mixed wastes. Typical waste volumes to be treated would be 100 to 1,000-ml bottles of liquid and 100 to 1,000-gram bottles of solids. Each container from the lab pack will be treated separately. No bulking for treatment shall be done.

A typical waste to be deactivated could be a 1,000-gram container of a reactive metal, such as aluminum powder. Aluminum powder is spontaneously combustible if allowed to become wet (i.e., a pile of aluminum powder/dust/shavings wet by rain). A treatment option for this waste could be mixing the powder with Portland cement to make a monolithic slab or changing the elemental aluminum to a non-reactive oxide by mixing it with water in quantities that would prevent spontaneous combustion.

Another example would be anhydrous calcium chloride, which generates excessive amounts of heat when wetted. Treatment for this material would be to slowly add the material to a mass of water sufficient to absorb the heat generated without dangerously raising the temperature of the water.

As can be seen from these two examples, each reactive waste will require the development of a specific treatment chemistry for the waste.

Physical Characteristics, Materials of Construction, and Dimensions of the Unit

The deactivation work is performed in a glove box large enough for two technicians to work in. The glove box is 76 inches wide, 28 inches deep, and 38 inches high, set on legs, placing the glove box at a working height of approximately 32 inches. The glove box has a sealed door on each end for passing materials in and out of the box.

The glove box is constructed of stainless steel and is fitted with a clear Lexan front equipped with two sets of gloves. The glove material is Hypalon but may be changed depending on its compatibility with the material to be treated.

The glove box is operated under an inert atmosphere. The exhaust from the glove box is handled differently depending on the waste to be treated. For example, if the material being deactivated releases an acid gas during treatment, the exhaust from the glove box will go through a scrubber before going to the RTO.

Decontamination Procedures

When not in use, the glove box is stored in the Treatment and Storage Building. It will be cleaned inside and out to remove any chemical and/or radiological contamination before it is removed from the treatment area. The cleaning residues generated will be disposed of as radioactive waste.

There may be times when chemical-specific cleaning will be necessary. An example would be the neutralization of perchloric acids. Because perchloric acids can form explosive perchlorates, perchloric acids will not be neutralized in the 300-gallon neutralization tank. These acids will be neutralized one container (typically 2.5 liter or smaller) at a time inside the glove box in an inert atmosphere. After the neutralization is completed and the glove box is decontaminated, an indicating solution will be sprayed on the interior surfaces of the glove box. The indicating solution will turn black on contact with perchlorates. If perchlorates are indicated, the glove box will be cleaned until the presence of perchlorates is not detected.

Environmental Performance Standards

Release Prevention

The deactivation process area and equipment is located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. The hydrogeologic, geologic, and meteorologic factors or concerns for the Facility site and surrounding areas are addressed in Section A of the permit application. For purposes of ensuring protection of human health and the environment, PFF conducts the deactivation process in conformance with applicable container standards. Appropriate secondary containment is incorporated into the design and operation of the equipment. Run-on and run-off of precipitation are controlled as the deactivation process is conducted in an enclosed building. Section B of Part II of this permit application provides details regarding containment, management of reactive wastes, condition and management of containers, inspections, and prevention of run-on and accumulation of precipitation in the Treatment and Operations Building, and/or LSV Process Area where the deactivation process is conducted.

Prevention of Releases to Groundwater or Subsurface Environment

Releases to groundwater or the subsurface environment from the deactivation process are extremely unlikely for the same reasons described for the PF-I process in Appendix II.B.1.

Prevention of Releases to Surface Water, Wetlands, or Soil Surface

Releases to surface waters, wetlands, or soil surface from the deactivation process are extremely unlikely for the same reasons described for the PF-I process in Appendix II.B.1.

Prevention of Releases to Air

Releases to air from the deactivation process are extremely unlikely for the following reasons.

- The deactivation process is conducted inside a glove box inside an enclosed building area, which is provided with an air pollution control system.
- Containers will be kept closed at all times, except during treatment.
- It is not anticipated that there will be any particulate emissions. However, particulate emissions, if generated, will be discharged to an enclosed treatment area provided with HEPA filter air treatment.
- Organic emissions, if any, will be vented to the RTO.

Monitoring and Inspections

The deactivation process will be monitored by PFF personnel during treatment operations, which will be conducted manually.

The deactivation process area will be visually inspected each operating day for evidence of leaks or spills. The secondary containment system will also be inspected each operating day for evidence of cracks or breaches in containment, as specified in the Facility inspection plan.

Potential Pathways of Exposure of Humans or Environmental Receptors

The deactivation process will reduce the potential of exposure of humans/environmental receptors since the reactive characteristic of the waste is eliminated by the treatment. The primary pathway of exposure for human receptors will be inhalation during treatment. PFF workers within the Treatment and Operations Building and/or LSV Process Area are the most likely human receptors for chemicals or chemical constituents released from the deactivation process. This exposure will be minimal since appropriate deactivation chemicals will be selected for addition into the container based on a bench test performed for a particular waste stream. During the bench test, observations will be made to ensure that deactivation of reactive wastes will not result in reactions that create any condition specified in 40 CFR 264.17(b).

If necessary, personnel performing the deactivation process (or other persons in the immediate vicinity of the treatment process when being conducted) will be required to wear personal protective equipment (PPE) selected to address potential hazards. The PPE selected will be in accordance with OSHA standards.

Appendix II.B.3

Mercury Amalgamation

Mercury Amalgamation

Process Description

Perma-Fix of Florida (PFF) treats elemental mercury using a process designed to meet the specifications of the technology-based treatment standard (AMLGM) for the Elemental Mercury Contaminated with Radioactive Materials treatability subcategory in 40 CFR 268.40. The process amalgamates liquid, elemental mercury contaminated with radioactive materials utilizing inorganic reagents such as copper, zinc, nickel, gold, and/or sulfur. PFF's specific treatment approach is a proprietary process that produces a non-liquid, semi-solid amalgam, thereby reducing potential emissions of elemental mercury vapors to the air.

Sorting

Sorting and separation is performed in a ventilated enclosure within the TOB and/or LSV processing area. PFF will receive only lab pack quantities of elemental mercury. However, experience has shown that lab packs may consist of various devices (e.g., switches and thermometers) that may require minor dismantling for mercury removal. The emptied devices will be managed as RCRA debris.

In addition, lab packs may be received occasionally in damaged condition. Damaged lab packs and their over-packed containers will be processed to segregate mercury-contaminated debris and/or packing material. The mercury-contaminated debris and/or solids will be managed as explained in the subsection titled "Secondary Wastes".

Once a drum's contents are unloaded or unpacked, elemental mercury will be consolidated into a single container. All secondary wastes shall be segregated, bulked, and containerized in accordance with applicable regulatory container management practices. Upon completion of sorting and separation, samples of material may be taken and analyzed chemically. All waste materials at this time may be removed and placed in storage awaiting final treatment and/or disposal.

Mercury Amalgamation

Up to one-gallon quantities of elemental mercury are processed at any one time. As described above, reagents will be added as required by the treatment-specific proprietary recipe to achieve a successful amalgam. The amalgamation process is conducted in the ventilated enclosure using a mixing vessel.

Treatment Effectiveness

The mercury amalgamation process results in a non-liquid, semi-solid amalgam. RCRA LDR does not specify a numerical treatment standard to confirm amalgamation for radioactive elemental mercury, but specifies amalgamation as the specified treatment technology. The amalgamated waste will be sampled and analyzed per the TCLP method to ensure it passes the mercury toxicity level prior to disposing it in a Subpart D landfill.

Secondary Wastes

Secondary wastes generated during the mercury amalgamation process may include such items as non-RCRA empty containers, RCRA debris, and solids.

Non-RCRA waste materials will be collected, consolidated, and stored until sufficient quantities are gathered for shipment to an off-site facility

RCRA debris will be collected and stored. The debris will either be treated on site using the already permitted chemical extraction process for debris treatment (268.45) or shipped off site to an off-site hazardous waste treatment and/or disposal facility.

RCRA non-debris solids/sludge will be containerized and shipped to an off-site hazardous waste treatment or disposal facility.

Any liquids generated during the mercury amalgamation process will be managed according the liquid's constituents of concern and in compliance with appropriate treatment standards.

Waste Code Tracking

PFF assigns and tracks waste codes for treatment residuals in accordance with 40 CFR 261. When hazardous debris that exhibits the characteristic of ignitability, corrosivity, or reactivity is deactivated by treatment using one of the technologies identified in Table 1 of 40 CFR 268.45 (and described in the permit application), the treated debris becomes a non-hazardous waste. Residue from the deactivation of ignitable, corrosive, or reactive characteristic hazardous debris (other than cyanide-reactive wastes) that is not contaminated with a listed hazardous waste constituent retains the appropriate characteristic waste code unless it is deactivated.

Toxicity characteristic debris treatment residuals remain subject to the waste code(s) and treatment standards for the toxic constituent(s) for which the debris exhibited the toxicity characteristic. Residuals from the treatment of debris contaminated with listed waste remains subject to the treatment standards and waste codes assigned for those constituents or wastes. Hazardous debris that has been treated using one of the physical and/or chemical extraction technologies in conformance with 40 CFR 268.45 and the treated debris does not exhibit a characteristic of hazardous waste identified in 40 CFR 261, Subpart C is not a hazardous waste and will not be assigned any waste codes.

<u>Mixer Vessel</u>

The mixing vessel is designed to produce 5 gallons of amalgam. The ideal waste to reagent ratio is estimated to range from 1:1 to 1:4. The optimal reagent content may vary for particular waste streams. The duration of the amalgamation process depends on the rate of addition and volume of reagent to waste mercury batch. The small batch nature of the process will minimize the total volume of waste in the system at any one time.

Any fugitive emissions will go through a dedicated air control system in addition to the air pollution control devices in place for the process area. The dedicated air control system for the mercury amalgamation process will be used (e.g., a HEPA system and an activated carbon bed impregnated with sulfur for the capture of mercury vapor).

Maintenance

Facility personnel will conduct a preventative and corrective maintenance program for the mercury amalgamation process system components. The preventative maintenance program will be based on information supplied by the equipment vendors regarding the expected life of process components and by a periodic historical review of maintenance records. Corrective maintenance will be conducted on an as-needed basis. Additionally, the system will be maintained and operated in accordance with good engineering practice.

Environmental Performance Standards

Release Prevention

The mercury amalgamation process is located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. For purposes of ensuring protection of human health and the environment, PFF has designed and will operate the mercury amalgamation equipment in conformance with applicable tank standards. Appropriate secondary containment and air emission controls are incorporated into the design and operation of the equipment. Any liquids from the mercury amalgamation area will be controlled.

Prevention of Releases to Groundwater or Subsurface Environment

Releases to groundwater or the subsurface environment from the mercury amalgamation process are extremely unlikely for the following reasons.

- Relatively small volumes (i.e., approximately one gallon) of waste are treated in the batch process.
- The mercury amalgamation process is conducted within secondary containment systems designed to collect any liquid spills. The containment system is coated with a chemically resistant material that is compatible with the waste streams designated for processing.
- The treatment areas will be inspected each operational day. Leaks or spills from the system will be cleaned up as soon as it is practicable and safe to do so, but within 24 hours of discovery.
- The treatment areas are located within buildings physically separated from the subsurface environment, groundwater, and precipitation.
- The Facility maintains a Contingency Plan to provide a framework for facility response to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the system.

Prevention of Releases to Surface Water, Wetlands, or Soil Surface

Releases to surface water, wetlands, or soil surface are also extremely unlikely for the reasons listed above.

Prevention of Releases to Air

Releases to air from the mercury amalgamation process are extremely unlikely for the following reasons.

- The amalgamation process system uses a dedicated air emissions control system designed to remove mercury vapors (e.g. sulfur-impregnated activated carbon).
- The treatment will be conducted within building areas equipped with additional emission control devices.
- Limiting the time the waste is exposed to the atmosphere prior to processing minimizes emissions at the loading point.
- The process results in a non-liquid, semi-solid amalgam, thereby reducing potential emissions of elemental mercury vapors to the air during unloading activities.

Monitoring and Inspections

PFF personnel will monitor the mercury amalgamation process during processing operations. Loading and unloading is conducted manually (or by automated equipment that is manually controlled). The mercury amalgamation process area will be visually inspected each operating day for evidence of leaks or spills. The secondary containment system will also be inspected each operating day for evidence of cracks or breaches in containment.

Potential Pathways of Exposure of Humans or Environmental Receptors

PFF workers within the treatment areas are the most likely human receptors for chemicals or chemical constituents released from the mercury amalgamation process. The exposure is anticipated to be minimal because of the dedicated emission control devices provided for the area and because very low amounts of mercury (i.e., one gallon) are processed at a time. The primary pathway for human exposures from the mercury treatment process is air emissions.

Operating personnel (or personnel present in the treatment areas for any other reason) will be required to wear personal protective equipment (PPE) selected to address the potential hazards identified for the wastes to be managed, and the operating parameters of the system. The PPE selected will be in accordance with OSHA standards.

Environmental receptors such as soil, surface water, groundwater, and air are unlikely to be impacted due to the air controls specific to the mercury process, the process area air controls, the containment system, and the location of the process within a building, which prevents contact with precipitation run on and run-off and soil.

Appendix II.B.4

Non-Elementary Neutralization

Non-Elementary Neutralization

Process Description

PFF performs non-elementary neutralization in a 300-gallon treatment tank that is also used for elementary neutralization or in smaller containers. Elementary neutralization means neutralization of wastes that are hazardous only because they exhibit the corrosive characteristic (i.e., D002), or they are listed only for corrosivity. The elementary neutralization unit is exempt from RCRA permitting per 40 CFR 270.1(c)(2)(v). The non-elementary neutralization is performed on wastes that are hazardous based on corrosivity criteria (i.e., D002) and also carry other hazardous waste code(s). The process involves a 300-gallon neutralization tank equipped with an air-powered stirring paddle, a pH meter, and a temperature monitoring device. The process involves the following:

- Acids and bases received are bulked into totes.
- A sample of the acid or base in the tote is taken to the lab for recipe development.
- Using bench scale tests, the lab will develop a neutralization recipe (i.e. how much neutralizing agent is needed for the amount of material to be neutralized).
- Treatment technicians will perform the task using the 300-gallon neutralization tank (or in smaller containers) as follows:
    - The required quantity of neutralizing agent is placed into the neutralization tank.
    - The tote containing the acid or base to be neutralized is placed adjacent to the neutralization tank. A metering pump is connected to the tote and the tank.
    - The metering pump then starts pumping the material to be neutralized from the tote into the 300-gallon tank.
    - The operation is continued until the pH of the treated waste is greater than 2.0 and less than 12.5, generating a liquid waste that is radioactive only (non-RCRA).

The non-elementary neutralization (N-EN) tank system is generally used in the Treatment and Operations Building (TOB). This system is portable and can be used in the TOB and/or LSV Process Area. There is a market for D002 corrosive wastes that also contain RCRA-regulated organics and/or metals. For example, mixed waste generators routinely create acidic wastes containing chromium. The N-EN process would be conducted exactly as described above. The only difference is that the liquid resulting from the N-EN process would still be a RCRA-regulated material. These liquid wastes will then receive further processing based on the RCRA-regulated material(s) present.

Waste Code Tracking

The waste to be treated by non-elementary neutralization will have a D002 hazardous waste code and at least one other hazardous waste code. The treated liquid resulting from the process will not carry the D002 waste code, but will be a hazardous waste based on the original code other than D002.

Maintenance

Facility personnel will conduct a preventative and corrective maintenance program for the non-elementary neutralization process system components. The preventative maintenance program is based on information supplied by the equipment vendors regarding the expected life of process components and by a periodic historical review of maintenance records. Corrective maintenance will be conducted on an as-needed basis. Additionally, the system will be maintained and operated in accordance with good engineering practice.

Environmental Performance Standards

Release Prevention

The non-elementary neutralization process is located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. For purposes of ensuring protection of human health and the environment, PFF has designed and will operate the process equipment in conformance with applicable tank standards. Appropriate secondary containment and air emission controls will be incorporated into the design and operation of the equipment. Any accidental spills are contained in the secondary containment area.

Prevention of Releases to Groundwater or Subsurface Environment

Releases to groundwater or the subsurface environment from the non-elementary neutralization process are extremely unlikely for the following reasons.

- Relatively small volumes (i.e., less than 300 gallons) of waste are treated in the batch process.
- The process is conducted within secondary containment systems designed to collect any liquid spills. The containment system is coated with a chemically resistant material compatible with the waste streams designated for processing.
- The treatment areas will be inspected each operational day. Leaks or spills from the system will be cleaned up as soon as it is practicable and safe to do so, but within 24 hours of discovery.
- The treatment areas are located within buildings physically separated from the subsurface environment, groundwater, and precipitation.
- The Facility maintains a Contingency Plan to provide a framework for facility response to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the system.

Prevention of Releases to Surface Water, Wetlands, or Soil Surface

Releases to surface water, wetlands, or soil surface are also extremely unlikely for the reasons listed above.

Prevention of Releases to Air

Releases to air from the non-elementary neutralization process are prevented by conducting the treatment within building areas equipped with emission control devices or sufficient ventilation.

Monitoring and Inspections

PFF will monitor the non-elementary neutralization process during processing operations. Loading and unloading is conducted manually (or by automated equipment that is manually controlled). The process area will be visually inspected each operating day for evidence of leaks or spills. The secondary containment system will also be inspected each operating day for evidence of cracks or breaches in containment.

Potential Pathways of Exposure of Humans or Environmental Receptors

PFF workers within the treatment areas are the most likely human receptors for chemicals or chemical constituents released from the non-elementary neutralization process. The exposure is anticipated to be minimal because emission control devices or sufficient ventilation is provided for the area and because very low amounts of waste (i.e., less than 300 gallons) are processed at a time. The primary pathway for human exposures from this treatment process is inhalation of air emissions.

Operating personnel (or personnel present in the treatment areas for any other reason) will be required to wear personal protective equipment (PPE) selected to address the potential hazards identified for the wastes to be managed, and the operating parameters of the system. The PPE selected will be in accordance with OSHA standards.

Environmental receptors such as soil, surface water, groundwater, and air are unlikely to be impacted due to the process area air controls, the containment system, and the location of the process within a building, which prevents contact with precipitation run-on and run-off and soil.

APPLICATION FOR A HAZARDOUS WASTE PERMIT

PART II

C. TANK SYSTEM

C1 Tank System and Ancillary Equipment Description

The Perma-Fix of Florida (PFF) facility (Facility) in Gainesville, Florida may use an aboveground 3,000-gallon tank to accumulate and store mixed liquid wastes solely that are ultimately transported off-site for energy recovery. The tank was constructed in 1999. The tank is installed horizontally on steel supports in a concrete block secondary containment structure inside the Processing and Storage Building. (See Figure I.D.4 of this application for the tank location.) The tank is connected to the liquid scintillation vial (LSV) processing system located in the LSV Processing and Waste Storage Warehouse. The connection is through piping running from the LSV processing area to the tank. See Figures I.D.5 and I.D.6 in Part I of this application for process flow diagrams. See Figure II.C.1 (attached) for the piping diagram.

The feed system associated with the 3,000-gallon bulk storage tank consists of the following equipment:

- Type 5, air driven, dual diaphragm pump;
- Pump suction line with ball valve;
- Pump discharge line with ball valve;
- Main fluid discharge control ball valve;
- Discharge hose connection;
- Main pump cutoff ball valve; and,
- Piping from the pump to the bulk tank.

The materials stored in the 3,000-gallon tank consist of the scintillation fluids, and solvent-based liquid carriers used for scintillation fluids, rinse solvents and other mixed organics (e.g., ethanol) used to clean the vial glass. Major compounds that may individually constitute up to 25% of the supplemental fuel include ethanol, toluene, and xylenes. Toluene and xylenes are contained in scintillation fluids, and ethanol is the primary solvent of choice, although conditions may occur requiring the use of other rinse solutions (isopropyl alcohol, detergents, etc.). Figures I.D.7, I.D.8, I.D.9, and I.D.10 in Part I of this permit application show the location of the LSV processing area and associated equipment.

C2 Tank System Integrity

The integrity of the existing tank has been certified by Lewis Engineering and Consulting, Inc., (see Appendix A). The certification by Richard Lewis, a professional engineer, found the tank to be structurally sound. The certification process included a review of

Facility records for the tank system, a visual inspection of the tank, and an ultrasonic thickness survey of the tank walls. The visual inspection found no leaks or exterior corrosion of the tank. The ultrasonic survey found that the head and shell thickness was nominally 0.25 inch.

Figures II.C.2 and II.C.3 provide design details of the tank.

The storage tank is located within the walls of the secondary containment system. Foundation support for the full storage tank is provided by the concrete floor of the containment structure and underlying soil. Foundation calculations for the storage tank are provided in Appendix B. Based on this review, the tank foundation is designed to maintain the load of a full tank in a satisfactory manner. The tank is supported by three carbon steel support frames. The foundation appears to be adequate to resist anticipated frost heave.

Ancillary equipment is provided with secondary containment. The piping from the LSV Processing area is contained in a sealed concrete pipe valley. The pipe valley is overlaid with a steel grid making the piping available for inspection by Facility personnel at all times.

C3 Corrosion Protection

The tank system and its appurtenances are not directly exposed to the weather. Since the tank and associated fixtures are made of stainless steel, they are not painted. Exposed piping is galvanized and not painted. The P.E. certification report (Appendix A) indicates that there has been no deterioration of the tank.

Surface protection for the secondary containment has been provided. This protection consists of application of a sealant (e.g., Ashford Formula) to the containment floors. This application seals cracks and voids in the structure surfaces and hardens the concrete surface to provide good resistance to splashes and spillage that may occur in the containment area.

C4 Secondary Containment System Assessment

The following paragraphs give a detailed comparison between current containment system features and applicable requirements. For brevity, “secondary containment” as used here means features that meet the requirements of 40 CFR 264.193.

A. <u>Materials compatibility</u> (40 CFR 264.193(c)(1))
The primary waste material collected and stored in the tank system consists of toluene, xylenes, ethanol, or other selected rinse solvents/solutions. The primary hazardous characteristic of the waste is ignitability. These wastes are considered compatible with the system materials of construction (primarily concrete, stainless and galvanized steel, and the concrete sealer/hardener).

B. Strength and Foundation (40 CFR 264.193(c)(2))

The most critical strength requirement for the floor slab of the tank containment structure is its service as foundation support for the tank when full. Pressures on the soils below the floor slab are well below acceptable levels (see Appendix B). Satisfactory service with practically no cracking of the slab or the containment walls is further evidence of the adequacy of the system. As previously stated, the foundation support is adequate to prevent failure due to settlement, compression, uplift, or pressure gradients. The carrying capacity of the floor under the tank supports is enhanced by increased concrete thickness and steel reinforcing.

C. Leak Detection (40 CFR 264.193(c)(3))

All components of this system are accessible for visual inspection. Leak detection is provided by a documented daily visual inspection of the tank system (see Appendix E) on each day it contains hazardous waste. Overfill protection is provided by a high-level alarm that emits an audible alarm and shuts off the feed pump when the tank level reaches 80% capacity (i.e., 4 feet). Normal operating practice will be to keep the tank level below 4.0 feet.

D. Liquid Removal (40 CFR 264.193(c)(4))

Liquid removal from the secondary containment is accomplished by a vacuum pump that removes liquid from a blind sump within the containment to the tank or other container. The containment floor is sloped to the blind sump.

E. External Liner System (40 CFR 264.193(d) and (e)(1))

As documented in Appendix D, the secondary containment for the tank system has a design capacity (4,870 gallons) sufficient to hold more than 100 percent of the tank's capacity (3,000 gallons).

Inspection of the facility in January 1988 demonstrated that the secondary containment floor slab and walls were free of cracks and gaps (see Appendix D). The impermeable sealant/hardener described in Appendix C had been applied to the floor. The containment completely surrounds the tank and is capable of preventing both lateral and vertical migration of the waste.

C5 Inspection Requirements

The bulk tank, its associated equipment, and containment are inspected each day the tank contains hazardous waste in accordance with applicable requirements of 40 CFR 264.195. Detailed inspection logs are maintained in the Facility Operating Record for at least three years from the date of inspection. An example inspection log is included in Appendix E to this section.

C6 Closure Plan

A copy of the Facility Closure Plan is included in Section K of this permit application.

C7 Description of Safety Systems and Controls

40 CRF 264.31 requires facilities to be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents. The following addresses the equipment and procedures employed by PFF to facilitate compliance with 40 CFR 264.31.

All flanges and openings on the tank have been sealed to minimize the emission of volatile organic chemicals (VOCs). This sealing is accomplished by using rubber seals on doors/latches wherever there are openings (i.e., hinged hatch and manway shown in Figure II.C.2). In addition, even though the mixed waste storage tank is exempt from 40 CFR 264 Subpart CC VOC emission control requirements while storing mixed waste per 40 CFR 264.1080(b)(6), the tank is designed and will be operated in a manner consistent with Subpart CC Level 1 emission controls. Specifically, the following controls will be maintained:

- Fixed Roof; and,
- Vent pipe with a spring-loaded pressure relief valve.

The tank is equipped with mechanical pressure and temperature gauges, as well as a fill gauge. Overfill protection is provided by an intrinsically safe high-level alarm. The alarm emits an audible signal and shuts off power to the tank feed pump when the tank level reaches 80% of its capacity.

In addition, the tank is grounded to prevent risks associated with potential electrical surges and is located within containment in the Processing and Storage Building to prevent releases to the soil or surface water. Exposure to the sun and extreme temperatures is not an issue because the tank is under a roof, which protects it from direct sunlight.

C8 Diagram of Piping, Instrumentation, and Process Flow

A process flow diagram is presented in Figure I.D.5. The piping diagram is provided as Figure II.C.1.

C9 Spills and Overflow Protection

The tank feed lines are utilized only in a batch mode and are not prone to fluid loss. Detailed inventory logs are maintained for each process batch, with any potential losses occurring in the transfer of fluids being readily identified. The overflow protective device is interlocked to the fluid feed system to prevent overfilling. The tank has a high-level alarm that shuts off the feed pump when the tank reaches 80% capacity. The feed system will not function, and an alarm will sound. The high-level alarm is inspected each day the tank contains hazardous waste to ensure its operability.

The bulk tank is compatible with flammable liquids and is permanently grounded via a dedicated grounding system.

C10 Ignitable, Reactive, or Incompatible Wastes in Tanks

The 3,000-gallon storage tank is a dedicated tank and will only receive mixed liquid wastes. PFF operating procedures, including waste profile review prior to acceptance and evaluation upon arrival at PFF, are designed to prevent the addition of incompatible wastes that could cause failure of the tank system.

Specifically, PFF will not place incompatible wastes, or incompatible wastes and materials, in the same tank per the requirements of 40 CFR 264.17(b). Wastes designated as D002 will not be managed in the tank system. Stored waste is protected from any material or condition that may cause the waste to react or ignite. The tank content is tested prior to each shipment for disposal. (See Section 6, Waste Analysis Plan.) The fluids pumped into and out of the tank are controlled through a manifold system.

The tank location meets the requirement of 40 CFR 264.198 (b) regarding maintenance of protective distance from the public way or adjoining property line that can be built upon.

C11 Response to Leaks or Spills

Should there be a leak or spill from the storage tank and/or its secondary containment or if the tank system is unfit for use, the following will be performed:

PFF will immediately stop flow to the tank or to the secondary containment and inspect the system to determine the cause of release.

If the release was from a tank system, hazardous waste will be removed from the tank as much as possible to prevent further release within 24 hours of release detection. If can be demonstrated that this time frame is not feasible, then waste removal from the tank will be conducted at the earliest practicable time. Inspections and repair to the tank system will be performed after removal of waste.

Accumulated liquids will be removed from the secondary containment as soon as it is practicable and safe to do so; but no later than 24 hours after detection.

Upon detection of a release, a visual inspection of the release will be immediately conducted to prevent further migration of the leak, or spill to soils or surface water. If visual inspection reveals contamination of soil or surface water, the contaminated media will be removed and property disposed of. Proper disposal will require waste characterization of the contaminated soil or surface water.

PFF will prevent further migration of the leak or spill.

In accordance with 40 CFR 264.196(d), any release of hazardous waste into the environment, except as provided in paragraph (d)(2), will be reported to the hazardous waste section of the FDEP's N.E. District Office within 24 hours of its detection. A report of a release in excess of the reportable quantity (RQ) as specified in 40 CFR Part 302 will satisfy this requirement. In addition, reporting is not required if the leak or spill is confined in the tank secondary containment system, as explained on page 25455 of the Federal Register dated July 14, 1986. Any leak or spill of hazardous waste of less than one (1) pound that is immediately contained and cleaned up will be exempt from the reporting requirement.

A written report in accordance with the requirements of 40 CFR 264.196(d) (3) will be sent to the FDEP within 30 days of detection of a reportable release.

PFF will perform the repairs, or provide secondary containment, as required, prior to returning the tank system to service.

If repairs are extensive, PFF will obtain a certification from a qualified professional engineer registered in the state of Florida, prior to returning the tank system to service. A copy of such certification will be kept in the facility operating record until the closure of the facility, in accordance with 40 CFR 264.196(f).

APPENDIX A

WASTE STORAGE TANK
EVALUATION AND CERTIFICATION

[NOTE: Certification refers to "attached shop drawing." This drawing is the same as Figure II.C.2 included with this permit application.]

Lewis Engineering and Consulting, Inc.

2106 NW 67th Place, Suite #2
Gainesville, FL 32653
Richard O. Lewis, P. E.
(352) 375-7687
Facsimile: (352) 375-7689

November 19, 2004

Mr. Ken Shoemake
Environmental, Health and Safety Manager
PermaFix Environmental Services
1940 N.W. 67th Place
Gainesville, FL 32653

Subj: Inspection and Certification of 3,000 Gallon Stainless Steel Storage Tank

Dear Mr. Shoemake:

A visual and ultrasonic thickness inspection of the 3,000 gallon Type 316 stainless steel solvent storage tank was performed on November 4, 2004. Information provided regarding the tank manufactured by Tampa Tank, Inc. in 1999 and installed at PermaFix was that it had never been put into service since date of installation. A design submittal prepared by the tank manufacturer, Drawing No. D-99085-01, was utilized in conducting the tank inspection and verifying that the tank complied with the manufacturer's specifications.

It was readily apparent via visual inspection of the interior and exterior of the tank that it had never been in service. All surfaces were in the as-manufactured condition aside from the presence of dust on the exterior of the tank. All dimensions recorded complied with the tank dimensions specified in the shop drawing. The tank length was measured to be 21'-0", the diameter was 5'-0", and the head and shell thickness as determined by pulse echo ultrasonic thickness testing, calibrated for austenitic stainless steel, was nominally 0.250 inch. All appurtenances and supports were located as indicated on the shop drawing.

On the basis of this inspection and testing, I certify that the 3,000 gallon stainless steel tank is in new condition, and that the attached shop drawing by the tank manufacturer accurately reflects the as-built construction of the tank.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering *the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Very truly yours,

Richard O. Lewis

Richard O. Lewis, P.E.
NOVEMBER 19, 2004

Attachment: Tank Shop Drawing

APPENDIX B

FOUNDATION CALCULATIONS

DESIGN CALCULATIONS PERMA-FIX FLORIDA

No. 5505 Engineer's Computation Pad

Tank Weight

W_s = Weight of shell
$= G_{cs} \times (t_s \times \pi D \times L)$
$= 0.283\ (.25 \times \pi \times 5 \times 21) \times 144$
= 3360 lb.

G_{cs} = 0.283 lb/in³
t_s = 0.25 in
D = 5'
L = 21'

W_e = Weight of tank ends
$= G_{cs} \times (t_e \times \pi \frac{D^2}{4}) \times 2$
$= 0.283\ (.25 \times \pi \times \frac{25}{4})\ 144 \times 2$
= 400 lb.

t_e = 0.25 in

W_T = Weight of tank = 3360 + 400 = 3760 lb.

Tank Contents Weight

W_c = Full tank at Specific Gravity of 1.05
$= \pi \frac{D^2}{4} \times L \times S.G. \times 62.4$
$= 3.1416 \times \frac{25}{4} \times 21 \times 1.05 \times 62.4$
= 27000 lb.

Tank Fittings including Tank Support Weights

W_F = 15% of tank weight
= 3760 × 0.15 = 560 lb.

No. 5505 Engineer's Computation Pad

Tank Support Bearing Pressure

3 Carbon Steel Supports Used with a concrete surface bearing area of 12" × 7'8"

$$\text{Bearing Pressure} = \frac{W_T + W_c + W_F}{1' \times 7.67' \times 3}$$

$$= \frac{3760 + 27000 + 560}{3 \times 7.67 \times 144}$$

$$= 9 \text{ psi}$$

Compressive Strength of Concrete = 3000 psi

$\therefore$ OK.

Soil Bearing Load

$$\text{Soil Load} = W_T + W_c + W_F + W_{conc.\,base} + W_{walls} + W_{FOOTINGS}$$

$$W_{CONC.\,BASE} = 4" \times 38.67' \times 9.00 \times \frac{1}{12} \times \frac{150\text{ lb}}{ft^3} = 17400 \text{ lb}$$

$$W_{FOOTINGS} = 8" \times 7.75' \times 1'8" \times \frac{150\text{ lb}}{ft^3} \times 3 = 3870 \text{ lb}$$

$$W_{walls} = 8' \times (2 \times (38'8 + 7'8")) \times \frac{78\text{ lb}}{ft^2} = 57800 \text{ lb}$$

$$\text{Area of Base} = 38.67 \times 9 = 348 \text{ ft}^2$$

$$\text{Soil Bearing Pressure} = \frac{\text{Soil Load}}{\text{Area}}$$

$$= \frac{3760 + 27000 + 560 + 17400 + 57800 + 3870}{348}$$

$$= \frac{110390}{348} = 317 \text{ lb/ft}^2$$

Average bearing capacity of soil = 2000-4000 lb/ft²

$\therefore$ OK

3000 Gallon Tank

Tank built 1983, Installed September, 1983

Bodo Ultrasonic Measurements September, 1995

Average shell thickness = 0.228 in.

Average corrosion rate

$$= \frac{0.250 - 0.228}{12} = 0.0018 = 0.002 \text{ in/year}$$

Minimum Structural Thickness = 0.125 in.

$$\text{Estimated tank life} = \frac{\text{Lowest Thickness} - \text{min. struct. Thick.}}{\text{Avg. Corrosion rate}}$$

Lowest thickness reading (1995) = 0.210 in.

$$\text{Estimated tank life} = \frac{0.210 - 0.125}{0.002} = 42.5 \text{ years.}$$

APPENDIX C

EXAMPLE CONCRETE SURFACE SEALER AND HARDENER SPECIFICATIONS

ASHFORD FORMULA™
THE FINAL TREATMENT FOR YOUR CONCRETE

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910 1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List) **Ashford Formula**	Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

SECTION I

Manufacturer's Name **Curecrete Chemical Company, Inc.**	Emergency Telephone Number **800-728-2482** International Emergency Number (call collect) **801-629-0667** Telephone Number for Information **801-489-5663**
Address (Number, Street, City, State, and Zip Code) **1203 West Spring Creek Place** **Springville, Utah 84663**	Date Prepared **September 19, 2012**

SECTION II – HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (Optional)

N/A – Water-based, catalytically modified inorganic sodium silicate material.

SECTION III – PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	**230°F (110°C)**	Specific Gravity (H_2O = 1)	**1.1 - 1.2 @ 20°C**
Vapor Pressure (mm Hg.) 25°F (-3.89°C)	**23.756**	Melting Point	**N/A**
Vapor Density (AIR=1) 25°F (-3.89°C)	**0.9996**	Evaporation Rate Butyl Acetate = 1 (Water = 1)	**1**
Solubility in Water	**100%**	pH	**11.3 - 11.6**

Appearance and Odor **Clear liquid, odorless**

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) **N/A**	Flammable Limits **N/A**	LEL	VEL

Extinguishing Media **Non-flammable (water-based)**

Special Fire Fighting Procedures **N/A**

Unusual Fire and Explosion Hazards **N/A**

SECTION V – REACTIVITY DATA

Stability	Unstable		Conditions to Avoid
	Stable	**X**	**N/A**

Incompatibility (Materials to Avoid) **Strong acids**			
Hazardous Decomposition or By Products **N/A**			
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	**X**	**N/A**

SECTION VI – HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? **If atomized.** Skin? **N/A** Ingestion? **Irritation of intestinal tract.**
Health Hazards (Acute and Chronic)	**Avoid direct contact with eyes and mucous membranes (caustic). Breathing of atomized mist may cause bronchial irritation (caustic). Use low-pressure sprayer. Extended exposure may dry natural oils of skin and cause skin irritation (caustic).**
Carcinogenicity:	NTP? **N/A** IARC Monographs? **N/A** OSHA Regulated? **N/A**
Signs and Symptoms of Exposure	**Burning and itching in nose and throat (inhalation if atomized). Pain, redness and tearing (eye exposure), itching or burning (prolonged skin exposure).**
Medical Conditions Generally Aggravated by Exposure	**Asthma and lung diseases, skin diseases.**
Emergency and First Aid Procedures	**Flush eyes with water for 15 minutes. If ingested, do not induce vomiting. Drink large amounts of milk or water. Call a physician immediately. Remove contaminated clothing.**

SECTION VII – PRECAUTIONS FOR SAFE HANDLING USE

Steps to Be Taken in Case Material is Released or Spilled	**Clean up with water.**
Waste Disposal Method	**Observe all local, state and federal regulations. May be flushed down a sanitary sewer with large volumes of water.**
Precautions to Be Taken in Handling and Storing	**N/A**
Other Precautions	**Floors may become slippery during application of the Ashford Formula.**

SECTION VIII – CONTROL MEASURES

Respiratory Protection (Specify Type) **Use NIOSH approved mist respirator if atomized.**		
Ventilation **Not required unless atomized.**	Local Exhaust Use with adequate ventilation.	Special
	Mechanical (General)	Other
Protective Gloves **Use rubber gloves where extended contact may occur.**	Eye Protection **Avoid contact with eyes.**	
Other Protective Clothing or Equipment **N/A**		
Work/Hygienic Practices **Wash hands after handling. Wash contaminated clothing before reuse.**		

APPENDIX D

SECONDARY CONTAINMENT CERTIFICATION

DARABI
AND
ASSOCIATES, INC.
Environmental Consultants
Suite A, 730 North Waldo Road, Gainesville, Florida 32601 Phone: 904/376-6533

January 21, 1988

Mr. Ashwin Patel
Hazardoure Waste Section
Dept. of Environmental Regulation
3426 Bills Road
Jacksonville, Fl 32207

RE: Quadrex HPS
Secondary Containment Certification

Dear Mr. Patel:

Please be advised that we have examined and reviewed the secondary containment holding capacity for the 3000 gallon storage tank at the Quadrex Facility in Gainesville, Florida.

Our calculations indicate that the secondary containment should have a total capacity of 4152 gallons to contain the content of the tank (3000 gallons) and rainfall generated from a 25 year, 24 hour storm (7.66 inches or 1152 gallons). The secondary containment is capable of holding 4871 gallons of liquid.

The secondary containment structural integrity has been reviewed by the structural engineering consulting firm of Bodo and Associates. Their certificate is attached for your review.

Should you have any questions or require any additional information, please let me know.

Sincerely,

DARABI & ASSOCIATES, INC.

Frank A. Darabi

Frank Darabi, P.E.
President

FD/sb

xc: Ben Warren

3720 N.W. 43rd Street
Gainesville, Florida
Tel: (904) 378-8806

BODO & ASSOCIATES
Consulting Engineers

Mailing Address:
P.O. Box 698
Gainesville, FL 32602

January 11, 1988

Mr. Frank A. Darabi, PE
Darabi and Associates, Inc.
Suite A
730 North Waldo Road
Gainesville, FL 32601

RE: Containment Structure at Quadrex HPS
Gainesville, Florida

Dear Frank:

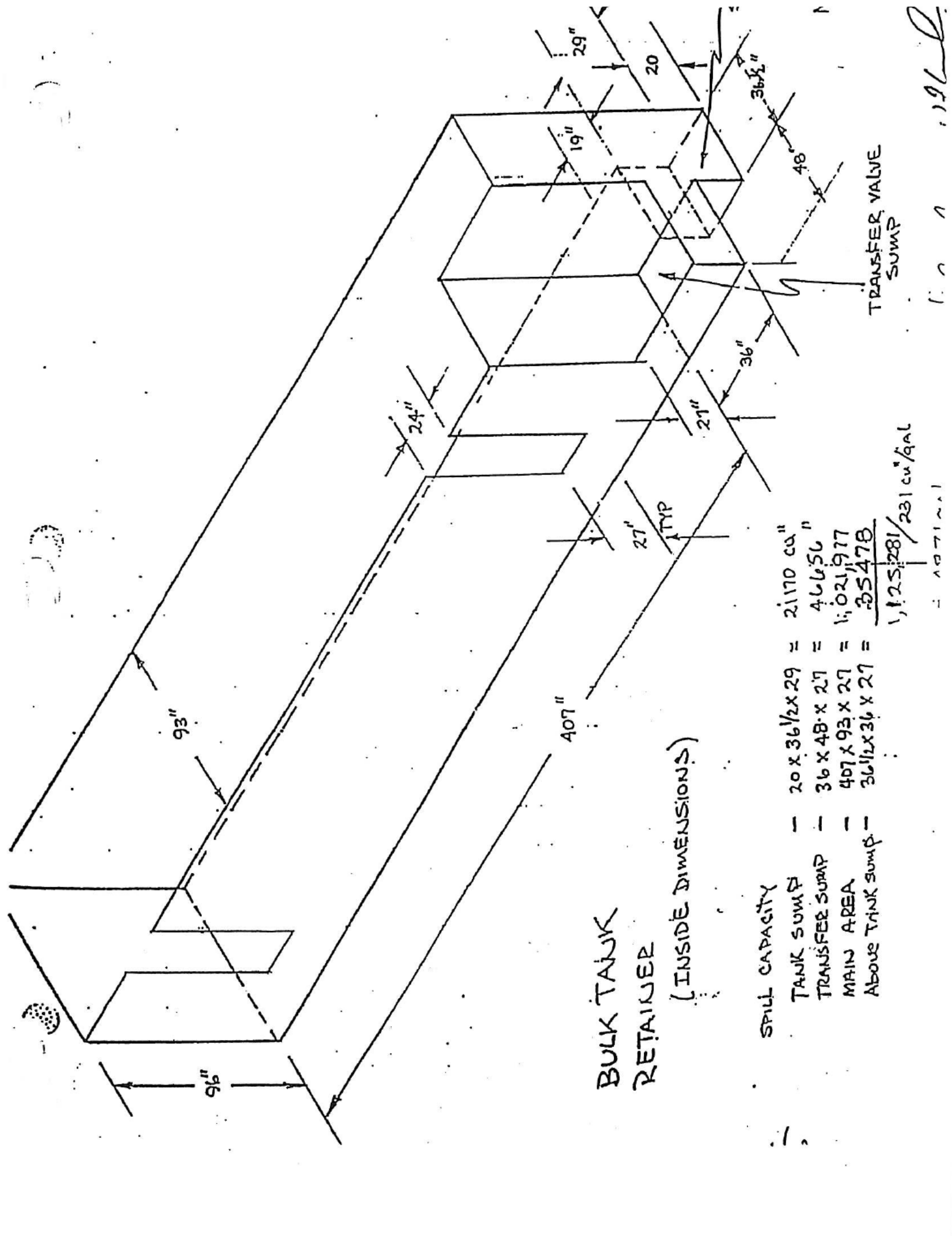
Pursuant to your request and authorization, Bodo & Associates, Inc. performed a structural evaluation of the existing containment structure referenced above. The evaluation was limited to a determination of the adequacy of the existing wall to withstand the lateral fluid pressure that would result from a rupture of the storage tank. Information and details of the structure were provided by you.

Based on our investigation we conclude that the wall will safely resist a lateral pressure due to a liquid height of 19 inches.

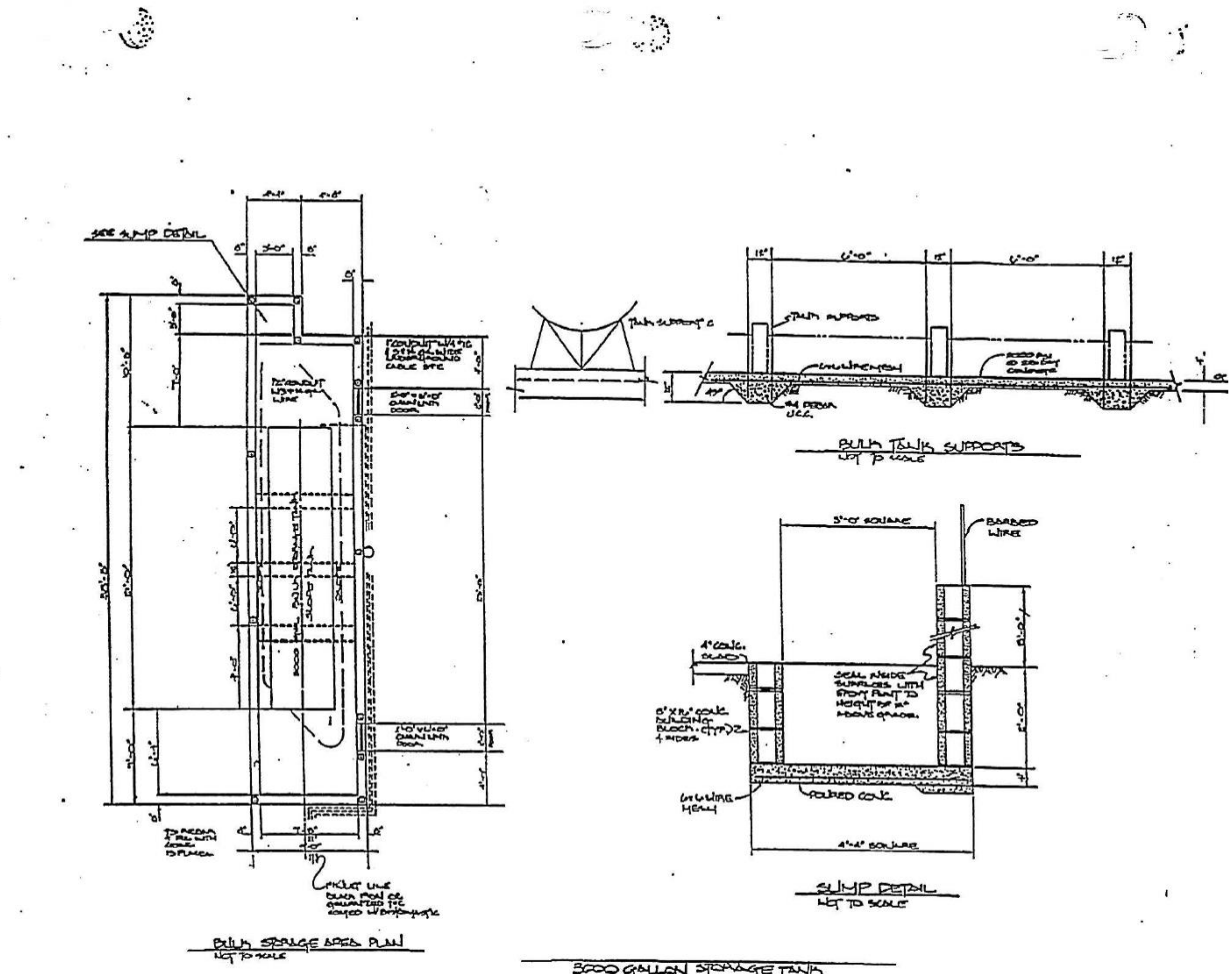
We appreciate this opportunity to provide our services to you. If you have any questions, or require any additional assistance, please do not hesitate to call.

Sincerely,
BODO & ASSOCIATES, INC.

Attila A. Bodo, PE
President



BULK TANK RETAINER
(INSIDE DIMENSIONS)
SPILL CAPACITY
TANK SUMP - 20 x 36½ x 29 = 21170 cu"
TRANSFER SUMP - 36 x 48 x 27 = 46656 "
MAIN AREA - 407 x 93 x 27 = 1,021,977
ABOVE TANK SUMP - 36½ x 36 x 27 = 35478
1,125,281 / 231 cu"/gal
TRANSFER VALVE SUMP
29"
20
36½"
19"
48"
36"
24"
27"
27" TYP
93"
407"
96"


SEE SUMP DETAIL
BULK TANK SUPPORTS
NOT TO SCALE
BARBED WIRE
4" CONC. SLAB
POURED CONC.
4'-4" SQUARE
SUMP DETAIL
NOT TO SCALE
BULK STORAGE AREA PLAN
NOT TO SCALE
3000 GALLON STORAGE TANK

APPENDIX E

EXAMPLE INSPECTION LOG

Inspection Details	M	T	W	Th	F
Date					
Time					
Inspector					
Hazardous Waste Bulk Tank					
Tank containment area is clean	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Tank is free from leaks	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Tank is free from corrosion	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Tank is properly grounded	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Containment is free from precipitation	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Containment is free from any accumulation	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Plumbing in good condition	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Concrete bunker in good condition	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Transfer pump and overflow devices functional	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Overflow alarm is functional	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Discrepancies					
All items are in compliance/no discrepancies	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No
Discepancies not listed above:					

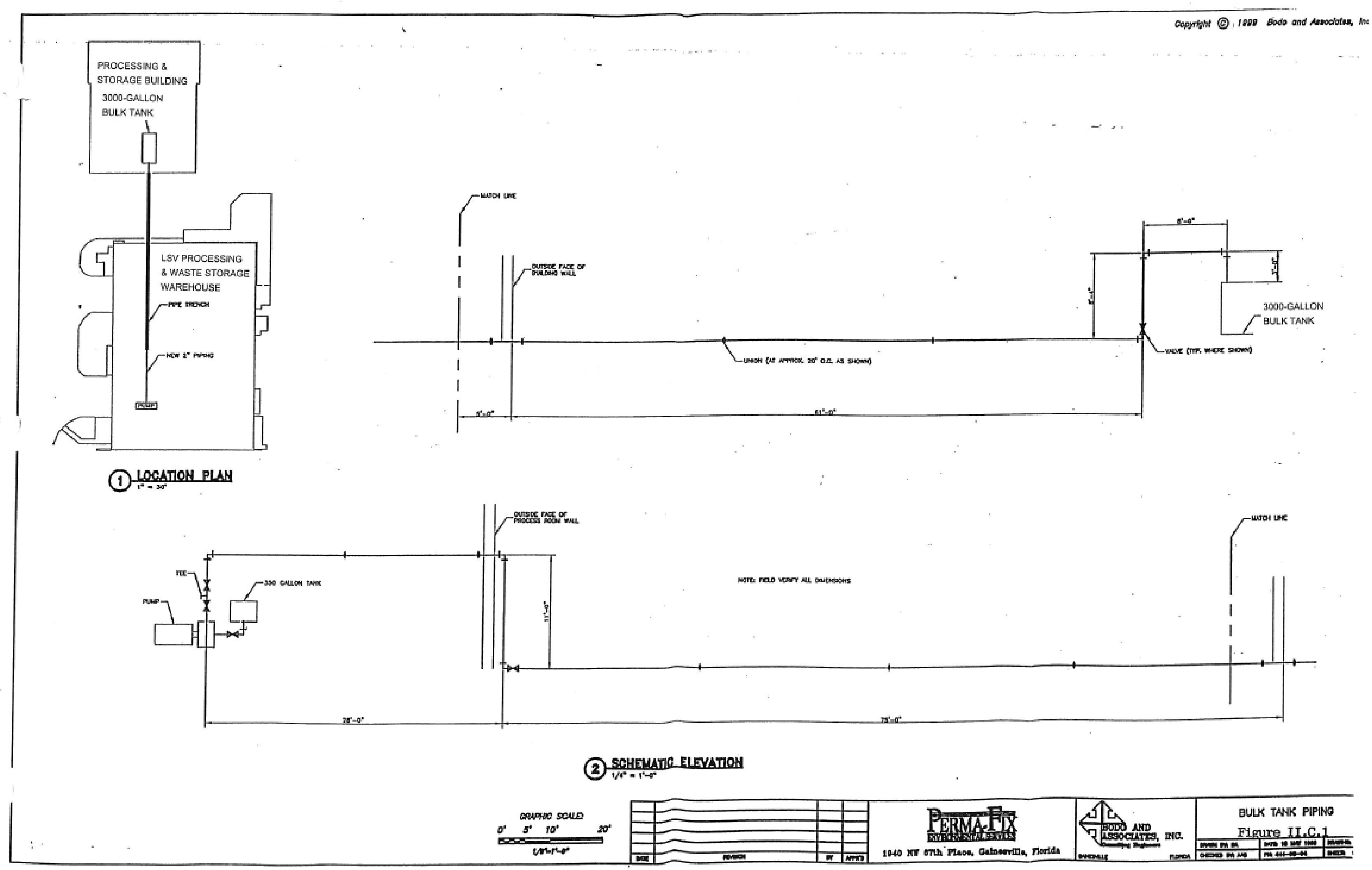
Instructions for inspection:

Log date, time and inspector name. Examine the Hazardous Waste Bulk Tank for area cleanliness, tank cleanliness and integrity, including evidence of damage. Look for evidence of leaks, spills and accumulated precipitation. Inspect plumbing, concrete, transfer pump and overflow devices. Answer all inspection questions, indicating yes or no to each statement. An answer of "No" indicates a discrepancy and requires additional steps below.

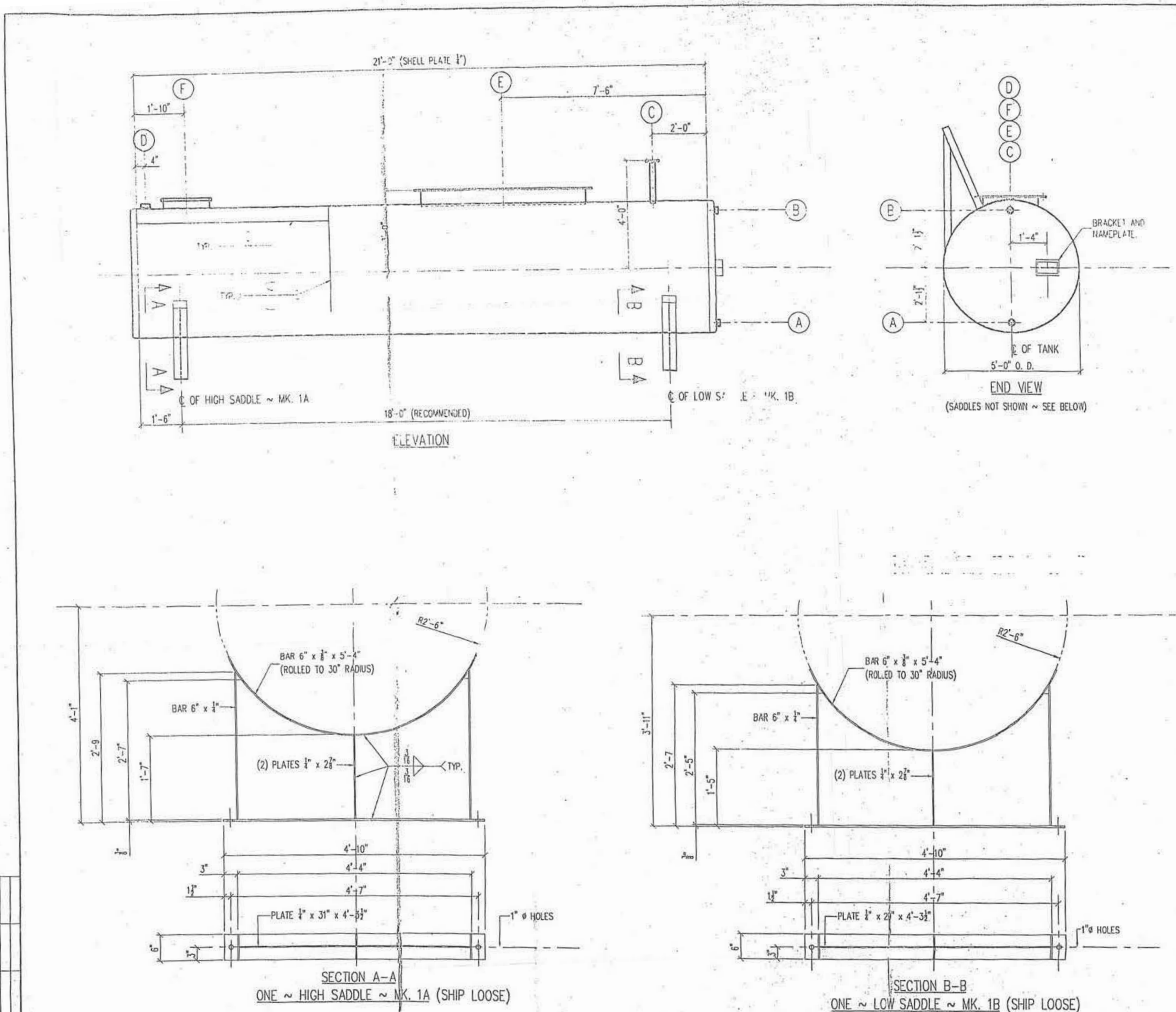
Instructions for discrepancies:

Note the nature of each discrepancy. E-mail these details to the RSO on a daily basis. Emails are then attached to the weekly work order as documentation of inspection results.

Work Order: ____________________



Copyright © 1999 Bodo and Associates, Inc
PROCESSING & STORAGE BUILDING
3000-GALLON BULK TANK
LSV PROCESSING & WASTE STORAGE WAREHOUSE
PIPE TRENCH
NEW 2" PIPING
PUMP
1 LOCATION PLAN
1" = 30'
MATCH LINE
OUTSIDE FACE OF BUILDING WALL
UNION (AT APPROX. 20' O.C. AS SHOWN)
VALVE (TYP. WHERE SHOWN)
3000-GALLON BULK TANK
OUTSIDE FACE OF PROCESS ROOM WALL
TEE
PUMP
350 GALLON TANK
NOTE: FIELD VERIFY ALL DIMENSIONS
MATCH LINE
28'-0"
75'-0"
2 SCHEMATIC ELEVATION
1/4" = 1'-0"
GRAPHIC SCALE
0' 5' 10' 20'
PERMA-FIX ENVIRONMENTAL SERVICES
1940 NW 67th Place, Gainesville, Florida
BODO AND ASSOCIATES, INC.
BULK TANK PIPING
Figure II.C.1



NOZZLE SCHEDULE				
MARK	QTY.	PIPE SIZE & SCHEDULE	FLANGE & FACING	COMMENTS
A	ONE	2" - 3000# HALF COUPLING THREADED		GAGE FITTING
B	ONE	2" - 3000# HALF COUPLING THREADED		GAGE FITTING
C	ONE	2" SCH. 80S	R. F., SLIP-ON	W/FLAME ARRESTER - WHESSOE VAREC 5400-2-6 PER DWG. D-99085-02.
D	ONE	3" - 3000# HALF COUPLING THREADED		X
E	ONE	24" x 72" NECK = ¼" THK.	FLG. = ¼" COVER = ¼"	HINGED HATCH W/ GASKET AND BOLTING. PER DWG. D-99085-02.
F	ONE	20" DIA NECK = 6" HIGH	MFG'S STD.	HINGED MANHOLE W/ VITON GASKET ~ KNAPPCO LE20" MODLE ~ LE-4440-6

TANK DATA	
DESIGNED AND FABRICATED PER: NONE CODE	
NUMBER OF TANKS REQ'D.: ONE	TANK CONTENTS: TOLUENE
NOMINAL CAPACITY: 3,000 GAL. (U.S.)	TANK CONTENTS: XYLENE
DESIGN PRESSURE: ATMOSPHERIC	TANK CONTENTS: ETHANOL
DESIGN TEMPERATURE: AMBIENT	SPECIFIC GRAVITY: 0.86 TOLUENE
WIND VELOCITY: N/A	SPECIFIC GRAVITY: 0.865 XYLENE
PLATE STRESS: 20,000 P.S.I.	SPECIFIC GRAVITY: 0.7942 ETHANOL
RADIOGRAPHY: NONE	OPERATING PRESSURE: ATMOSPHERIC
JOINT EFFICIENCY: 80%	OPERATING TEMPERATURE: AMBIENT
SEISMIC ZONE: ZONE 0	CORROSION ALLOWANCE: NONE

SPECIFIC HEAD DATA	
HEAD TYPE: FLAT - FLANGED	HEAD DIA.: 60" O. D.
NOMINAL THICKNESS: 1/4"	KNUCKLE RADIUS: 1 1/2"
MATERIAL: A-240, TYPE 316L S/S	STRAIGHT FLANGE: 1 1/2"

NOTES:

1. NOZZLES TO HAVE FLANGE BOLT HOLES STRADDLE MAIN CENTERLINES.
2. REPADS ARE NOT REQUIRED.
3. REMOVE ALL SLAG AND WELD SPATTER GRIND IF NECESSARY.
4. FLAME ARRESTER FOR NOZZLE "C" SHALL BE SHIPPED LOOSE.
5. TWO (2) SHOP STD. LIFTING LUGS (316 S/S).
6. SEE DWG. NO'S. D-99085-02 FOR NAMEPLATE.
7. ALL NOZZLES TO BE PROTECTED FOR SHIPMENT.

Figure II.C.2

MATERIAL OF CONSTRUCTION (UNLESS OTHERWISE NOTED)
PLATE: ASTM A-240, TYPE 316 S/S
SHAPES: A-240, TYPE 316 S/S
PIPE: A312, TYPE 316 S/S
FLANGES: A182, TYPE 316 S/S
COUPLINGS: A182, TYPE 316 S/S
GASKETS: VITON FILLED/TEFLON ENVELOPE
BOLTING: TYPE 316 S/S

INTERIOR FINISH: NONE.

EXTERIOR FINISH: CLEAN MILL FINISH.

STATUS	BY	DATE	REV.	DESCRIPTION	BY/CHK	DATE
RELEASED TO FIELD						
RELEASED FOR FABRICATION						
APPROVAL RECEIVED						
ISSUED FOR APPROVAL	RSU	10-14-99				
CHECKED	RSU	10-11-99				
DRAWING	ROW	9-28-99				

DATE: 10-14-99
CUST: 3P
SHOP:

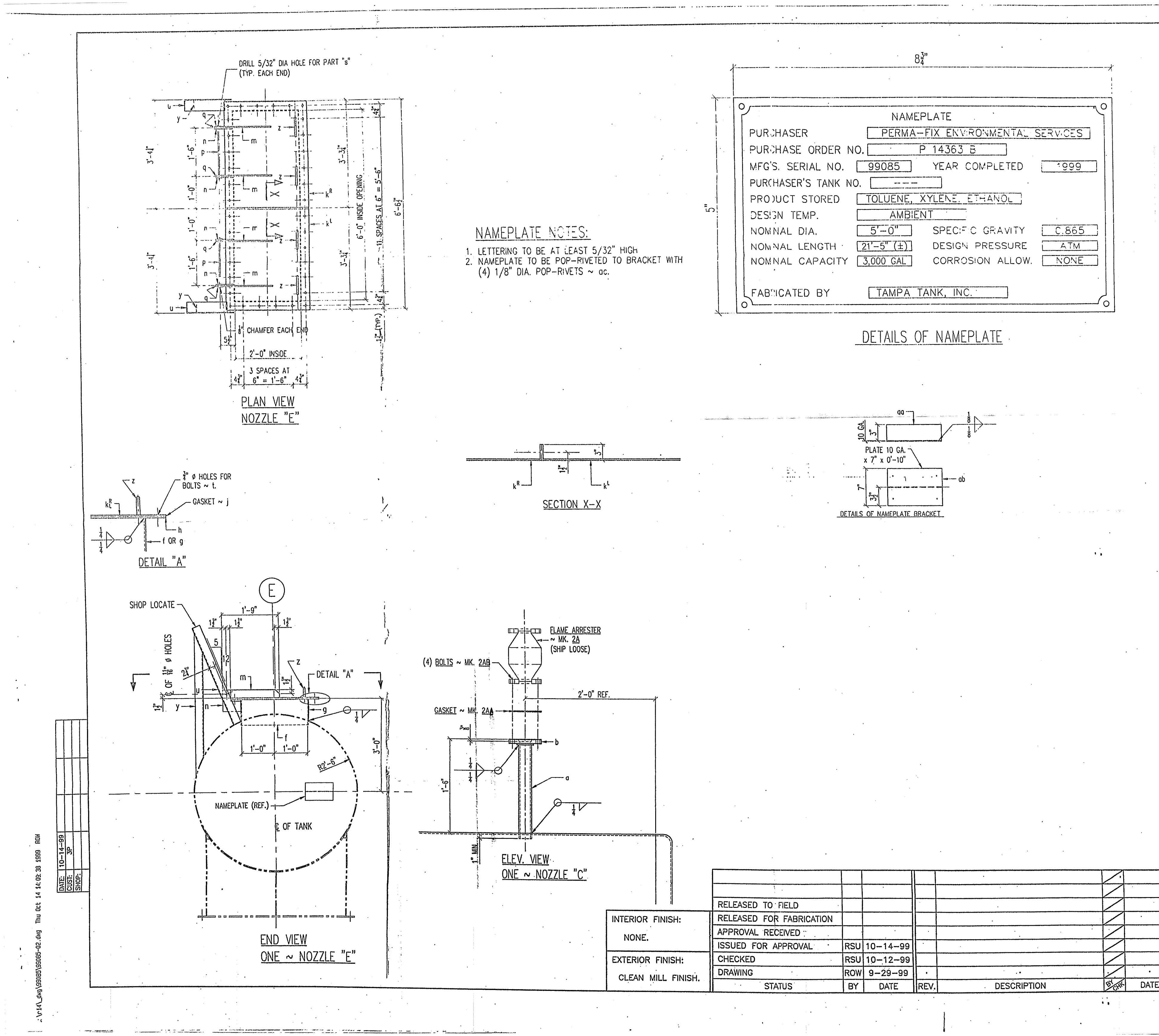
TAMPA TANK, INC.
TAMPA, FLORIDA

ARRANGEMENT AND DETAILS OF HORIZONTAL STORAGE TANK
60" DIA. x 21'-0" (3,000 GALLON)

CUSTOMER: PERMA-FIX ENVIRONMENTAL SERVICES
1940 N. W. 67th PLACE
GAINESVILLE, FLORIDA 32653

JOB SITE: PERMA-FIX ENVIRONMENTAL SERVICES
1940 N. W. 67th PLACE
GAINESVILLE, ALACHUA COUNTY, FLORIDA 32653

CUSTOMER'S P.O. NO.: P 14363 B	
FIELD WORK NUMBER -	
CONTRACT NUMBER TTI - 99085	
SHEET NUMBER 1 OF 1	
DRAWING NO.: D-99085-01	REV. 0



BILL OF MATERIAL				
QTY	PART	QTY	DESCRIPTION	MATERIAL
-	-	-	2" NOZZLE ASSEMBLY (AT NOZZLE "C")	-
	a	1	PIPE 2" SCH. 80S x 1'-7 1/2"	A312, TYPE 316 S/S
	b	1	FLANGE 2" - 150# R. F., SLIP-ON	A182, TYPE 316 S/S
ONE	2AA	-	GASKET 1/8" THK. x 6" O. D. x 2 3/8" I. D. W/(4) 3/4" ø HOLES	VITON FILLED/
	-	-	ON 4 3/4" DIA. BOLT CIRCLE	TEFLON ENVELOPE
ONE	2A	-	2" FLAME ARRESTER 150# R. F. FLANGE - WHESSOE VAREC	316 S/S
	-	-	5400-2-6 SERIES WITH 316 S/S HOUSING, CORE, AND	-
	-	-	ELEMENT (SHIP LOOSE)	-
4	2AB	-	BOLT 5/8" ø x 2 1/2" HEX. HEAD W/(1) HEX. NUT EACH.	316 S/S
-	-	-	24" x 72" HATCH ASSEMBLY (AT NOZZLE "E")	-
	f	2	NECK - PLATE 1/4" x 11 1/2" x 24"	A-240, TYPE 316 S/S
	g	2	NECK - PLATE 1/4" x 11 1/2" x 72"	A-240, TYPE 316 S/S
	h	1	FLANGE - PLATE 1/4" x 30 1/2" x 78 1/2" (SHOP LAYOUT)	A-240, TYPE 316 S/S
	j	1	GASKET 3/16" THK. x 30 1/2" x 78 1/2" (LAYOUT TO MATCH DRILL	VITON FILLED/
	-	-	WITH PART "h")	TEFLON ENVELOPE
	k^R_L	1/1	COVER PLATE - PLATE 1/4" x 30 1/2" x (39" + 2 3/4") (SHOP TO	A-240, TYPE 316 S/S
	-	-	MATCH DRILL WITH PART "h")	-
	m	4	HINGE - BAR 3" x 3/8" x 1'-9"	A-240, TYPE 316 S/S
	n	4	HINGE - PLATE 3/8" x 6 5/8" x 0'-8 1/4"	A-240, TYPE 316 S/S
	p	2	HINGE PIN - BAR 5/8" ø x 1'-9"	316 S/S
	q	8	5/8" FENDER WASHER	316 S/S
	s	4	COTTER PIN ~ 1/8" ø x 2" LONG	316 S/S
	t	40	BOLT 5/8" ø x 1 1/2" HEX. HEAD W/(1) HEX. NUT EACH.	316 S/S
	z	4	HINDLES ~ BAR 5/8" ø x (3" + 6" + 3")	316 S/S
-	-	-	COVER STOP (AT NOZZLE "E")	-
	u	2	ANGLE 3 x 3 x 1/4 x 3'-2 5/8"	316 S/S
	y	2	ANGLE 3 x 3 x 1/4 x 4'-4 3/8" (SHOP LAYOUT)	316 S/S
-	-	ONE	NAMEPLATE SUPPORT ASSEMBLY	-
	aa	1	PLATE 10GA. x 3" x 0'-10"	316 S/S
	ab	1	PLATE 10GA. x 7" x 0'-10"	316 S/S
	ac	4	1/8" DIA. POP-RIVETS	316 S/S
-	-	ONE	NAMEPLATE	-
	-	1	BLANK PLATE SIZE = 22GA. x 5" x 0'-8 3/4"	316 S/S

Figure II.C.3

TAMPA TANK, INC.
TAMPA , FLORIDA

DETAILS OF NOZZLES "C" AND "E" AND NAMEPLATE
FOR HORIZONTAL STORAGE TANK
60" DIA. x 21'-0" (3,000 GALLON)

CUSTOMER: PERMA-FIX ENVIRONMENTAL SERVICES
1940 N. W. 67th PLACE
GAINESVILLE, FLORIDA 32653

JOB SITE: PERMA-FIX ENVIRONMENTAL SERVICES
1940 N. W. 67th PLACE
GAINESVILLE, ALACHUA COUNTY, FLORIDA 32653

CUSTOMER'S P.O. NO.: P 14363 B
FIELD WORK NUMBER: -
CONTRACT NUMBER: TTI - 99085
SHEET NUMBER: 1 OF 1
DRAWING NO.: D-99085-02
REV.: 0

APPLICATION FOR HAZARDOUS WASTE PERMIT

PART II

I MISCELLANEOUS UNIT

I.1 Description of Miscellaneous Unit

This section describes the Perma-Fix® II process that may be identified as a miscellaneous unit regulated under 40 CFR 264 Subpart X. The unit will be used to physically and/or chemically treat hazardous wastes and/or non-RCRA radioactive wastes. This section of the permit application is intended to address the regulations for miscellaneous units applicable to this process.

PFF conducts thermal desorption and/or chemical oxidation/reduction in a treatment unit. The operation is a proprietary process known as Perma-Fix® II (PF-II). A detailed description of the existing batch unit and its operation follows. The batch thermal desorber is planned to be replaced with a continuous unit, which is described in Attachment II.I.7. In addition, the supporting PF-II ancillary equipment, including the associated air pollution control systems, are planned for upgrade or replacement.

Process Description

The PF-II process typically consists of three primary steps used to treat organic contaminated soils, sludge, or other process waste (e.g. waste media not classified as debris or <60 mm particle size). Wastes selected for PF-II treatment require compliance with the treatment standards identified in 40 CFR Parts 268.40, 268.48, or 268.49 prior to land disposal. Dependent upon generator waste profile information and/or PFF process control analyses, PF-II treated waste may require PF-I treatment (metals stabilization) to ensure total compliance with the identified regulations.

PF-II treatment candidates are identified using the information provided by generators on waste (material) profile forms and accompanying support documentation such as land disposal restriction (LDR) notification forms. Example material profile and LDR forms are included as Attachments II.I.5 and II.I.6. Upon arrival at the facility, wastes are evaluated for proper management (storage and/or treatment) per the Waste Management Decision Trees of Figures I.D.11.1 – I.D.11.4.

See Figure I.D.1 in Part I of this application for the general layout of the Treatment and Operations Building and the location of the PF-II process equipment and container storage areas. See Attachment II.I.3 of this permit application section for a detailed description and illustrations of equipment.

The PF-II process is conducted inside the Treatment and Operations Building (TOB). Emissions from treatment activities inside the TOB are controlled using a negative pressure ventilated system consisting of a dust collector, four HEPA filters (each rated at

1,000 cfm), and a regenerative thermal oxidizer (RTO). These units are collectively referred to as the “air emissions control system”.

Feed Stock Preparation

Containers of hazardous waste requiring PF-II treatment are delivered to the TOB by powered lift trucks or drum dollies.

PF-II candidate waste streams are visually and physically screened for nonconforming items (e.g., items identified as debris according to 40 CFR 268.45). Non-debris solids (PF-II waste) are consolidated separately for the PF-II treatment. All drum unloading activities take place at ambient temperature while the TOB is under negative pressure.

Waste Treatment

Preconditioning

The first treatment step of the PF-II process usually involves pre-conditioning of the waste. Select solvents (as determined through preliminary data review or bench testing) are added to the waste and mixed to remove soluble organics that typically prohibit successful thermal operations. Some waste streams that have a high solubility potential (i.e., paint-related materials), are drastically reduced in volume during the pre-conditioning stage. This reduction is beneficial since it minimizes the solids destined for land disposal. Wastes that do not require pre-conditioning (e.g., lightly contaminated soils) are sent directly to thermal desorption.

The pre-conditioning activities are conducted using the pneumatic drum tumbler. The pneumatic drum tumbler is an end-over-end rotation device that can accommodate 55- or 85-gallon container(s). Approximately one-third of the tumbling vessel is filled with PF-II waste. An equivalent volume of a select solvent is added to the vessel. The tumbling vessel is closed appropriately using a bung-top lid. A pressure relief device is placed in the bunghole. The waste and solvent are tumbled for a predetermined amount of time (to achieve sufficient solvent extraction). The vessel’s bung top lid is removed and replaced with a perforated lid. The vessel is drained of its liquid-phase contents into a catch-pan.

The process is repeated with a follow-up pre-conditioning step using a solvent with an opposing chemical polarity. Typically, the solvents of choice are hexane followed by water. In certain cases, other more effective solvents are selected through bench testing.

Thermal Desorption

Figure I.D.2 provides a process schematic for the thermal desorption step of the PF-II process. Wastes selected for thermal desorption are transferred from their holding container (normally a 55-gallon drum) into 5-gallon buckets using a shovel. The buckets are transported to the catwalk that runs parallel to the reactor vessel. Buckets of PF-II waste solids are loaded into the top of the reactor vessel’s feed-hopper. The hopper is unloaded into the reactor vessel by opening a pneumatic guillotine valve at the bottom of the hopper. If appropriate, water may be added to the reactor vessel and thoroughly mixed with the waste to form a homogeneous mixture or slurry[1]. The slurry is mixed and heated in the reactor vessel. Non-contact steam circulated through a temperature control jacket is used to heat the reactor vessel and its contents[2]. During this phase of the process, the liquid portions of the waste evaporate, and water and organic constituents pass through the heat exchanger (condenser) where part of the vaporized waste is condensed (liquid phase) and part remains in the vapor phase.

The vapor phase and condensate (liquid phase) are discharged into an accumulator tank. From there, the vapor phase is immediately drawn into an absorber. The absorber is a tank with a small diameter to height ratio that contains a low vapor pressure (high boiling point) solvent (e.g., water or kerosene). The vapor phase coming from the accumulator tank is mixed with the solvent and allowed to diffuse through the solvent, which absorbs the organic constituents contained in the vapor phase.

The process of heating the waste and removing the water and/or organic constituents from the vaporized waste continues until the free water and organic constituents have been stripped from the waste and collected in the accumulation and absorber tanks. The absorber tank vents to the air emission control system. This system operates under a vacuum and an inert atmosphere (e.g., nitrogen blanket) to prevent explosions and fires.

Once the thermal desorption step is complete, the condensate and liquid treatment residuals are collected from the accumulator and absorber tanks; containerized; characterized; and sent off site to a permitted waste management facility. The treated waste solids are containerized. Prior to container closure, a sample of the treated solid residuals is obtained and analyzed for compliance with the land disposal treatment standard. The containerized waste solids are placed in storage pending the results of the analytical tests.

If the PFF process control analyses determine the waste has not been successfully treated, the waste residuals may undergo additional cycles of pre-conditioning and thermal treatment or undergo chemical oxidation/reduction.

If successful treatment of the organic constituents is determined by the PFF laboratory screening analysis, the residual waste may require treatment for inorganic contaminates using the PF-I process. The waste solids remain in storage until the PF-I treatment is conducted. Once all applicable land disposal treatment standards are met, treated wastes are stored until a sufficient number of containers are obtained to support a shipment for

[1] Alternatively, some waste may already be in slurry form when introduced into the reactor vessel and will not require the addition of water. In addition, certain wastes may require the addition of surfactants or organic solvents (e.g., hexane) to the waste slurry to mobilize contaminants and facilitate the treatment process. This step is conducted, when needed, during the pre-conditioning stage of the PF-II process.

[2] Alternatively, hot water or cold water can be circulated through the system to control the temperature in the reactor vessel.

disposal to a permitted waste management facility. Treated wastes will not be stored for more than a year.

Chemical Oxidation

If chemical oxidation treatment is required, the type and amount of oxidizer to be used is selected by bench tests carried out on that particular waste stream. The possible oxidizers are: peroxydisulfate salts (solid or in solution), persulfuric acid, and/or hydrogen peroxide. Water is added to the reactor vessel if deemed necessary to dissolve the oxidizer. Mixing is resumed, and the temperature of the vessel is raised enough to allow the oxidation reaction to begin (approximately 75 to 85ºC). Any vapors created during this step are condensed in the condenser, and the condensate is discharged into the accumulator tank.

An example oxidation chemical reaction is as follows:

$$\text{organics} + H_2O + S_2O_8^{-2} \rightarrow CO_2 + 2HSO_4^- + \text{inorganics}$$

$$\text{organics} + H_2O_2 \rightarrow CO_2 + H_2O + \text{inorganics}$$

Example using sodium peroxydisulfate and toluene as the organic contaminant:

$$C_7H_8 + 14H_2O \rightarrow 7CO_2 + 36H^+ + 36e^- \qquad \text{(oxidation)}$$

$$18Na_2S_2O_8 + 36H^+ + 36e\text{-} \rightarrow 36NaHSO_4 \qquad \text{(reduction)}$$

$$C_7H_8 + 14H_2O + 18Na_2S_2O_8 \rightarrow 7CO_2 + 36NaHSO_4 \qquad \text{(redox)}$$

Example using hydrogen peroxide:

$$C_7H_8 + 14H_2O \rightarrow 7CO_2 + 36H^+ + 36e^- \qquad \text{(oxidation)}$$

$$18H_2O_2 + 36H^+ + 36e\text{-} \rightarrow 36H_2O \qquad \text{(reduction)}$$

$$C_7H_8 + 18H_2O_2 \rightarrow 7CO_2 + 22H_2O \qquad \text{(redox)}$$

Water is also capable of reducing the oxidizer:

$$H_2O + S_2O_8^{-2} \rightarrow \tfrac{1}{2}\,O_2 + 2HSO_4^-$$

Oxygen is produced during the oxidation step. Through bench tests, it has been determined that the amount of volatile and semi-volatile organic compounds left in the stream after the thermal desorption step is very low; consequently, the amounts of off-gasses produced from the oxidation of chlorinated organic compounds, namely hydrochloric acid and chlorine gas, are also very low.

The time required to complete the oxidation process depends on temperature, the waste stream composition, and the amount of water added. Before the reaction is assumed to be complete, a sample of the aqueous phase is titrated to determine the concentration of unreacted oxidizer. When the oxidizer has been depleted, the oxidation step is considered complete.

Upon completion of the oxidation step, the reactor vessel is allowed to cool, and, if necessary, either calcium hydroxide or sodium hydroxide is added to adjust the pH of the mixture to within a range that minimizes corrosion of the PF-II process equipment. The reactor vessel may be heated to the boiling point of water to dry the slurry as appropriate for further treatment and/or disposal. The water condensed from the drying of the oxidized stream is discharged into the accumulator tank. Condensed/separated organic liquids recovered from the vaporized organic constituents are collected in the accumulator and absorber tanks and pumped into drums when the treatment run is complete. An inert atmosphere (e.g., nitrogen blanket) is provided at all times during treatment operations to prevent explosions and fires.

The non-volatile residual solids remaining in the reactor vessel are discharged into 55-gallon drums through a pneumatic guillotine valve located beneath the reactor vessel. Prior to container closure, a sample of the treated residual solids is obtained and analyzed for compliance with the appropriate treatment standard. The containerized residual solids are placed in proper storage awaiting analytical determination.

If the PFF process control analyses determine the residual solids have not been successfully treated for organics, the residual solids will undergo additional cycles of pre-conditioning and thermal treatment or undergo the chemical oxidation step again.

If analysis indicates successful treatment of the organic constituents, the residual solids may require treatment for inorganic contaminates using the PF-I process. The residual solids remain in storage until the PF-I treatment is conducted. Once all applicable treatment standards are met, the residual solids are stored until a sufficient number of containers are obtained to support a shipment for disposal to a permitted waste management facility. The residual solids storage period will not exceed one year.

Process Residuals Management

The various steps in the PF-II process may generate several types of waste. These wastes will be characterized in accordance with the requirements of 40 CFR 262. Waste characterization may include the application of knowledge of the PF-II process and/or analytical testing pursuant to the Facility’s Waste Analysis Plan. Generally, PFF will “carry through” all listed waste codes to each of the residual wastes generated by the PF-II process. In other words, PF-II residual wastes will be generated and manifested with the same listed waste codes assigned to the waste prior to its treatment. Appropriate characteristic waste codes will be retained or assigned to the residual wastes at the waste stream’s final point of generation (prior to its being shipped off site). The anticipated disposition of residual wastes is discussed in further detail below.

- Wastes treated to meet the land disposal restrictions for hazardous waste constituents by thermal desorption, chemical oxidation, and/or stabilization/solidification, will be shipped to a permitted waste facility for disposal;
- The condensed volatiles separated by the thermal desorption process will be shipped to a permitted waste facility for energy recovery;
- The segregated debris is containerized in 55-gallon drums and placed in storage in the container storage area located in the TOB awaiting debris treatment and/or final packaging and shipment to a permitted waste management facility.
- RCRA empty containers originating from the PF-II activities are compacted, consolidated and managed as non-RCRA radioactive waste. The non-RCRA radioactive waste is stored until sufficient quantities are collected, at which point the waste is sent to a permitted waste management facility for final disposal.

Decontamination Procedures

Decontamination of PF-II process equipment will be conducted whenever it would be inappropriate for treated wastes to come in contact with residuals from wastes previously treated in the equipment (e.g., when potentially incompatible wastes are involved or high radio-isotopic activity levels require decontamination to minimize cross-contamination).

When necessary, PF-II process equipment will be decontaminated as follows:

The feed hopper surfaces, the interior of the reactor vessel, and the contact surfaces of the unloading valve will be scraped, wiped, and rinsed. The recovered solids collected in the reactor vessel will be scraped, swept, and/or wiped out through the unloading valve at the bottom of the reactor.

When necessary, the PF-II process organic constituent recovery system (i.e., condenser, accumulator, absorber, and associated piping) will be decontaminated as follows:

The accumulator and absorber tank will be emptied. Next, approximately 55 gallons of water will be heated and evaporated in the reactor vessel, flushing all the condensing surfaces in the organic constituent recovery system. If further decontamination is necessary, the accumulator and absorber tanks will be rinsed with water until no phasing or discoloration is detected in any of the units.

Physical Characteristics, Materials of Construction, and Dimensions of the Unit

A list and description of equipment currently contained in the design of the PF-II process system is included as Attachment II.I.1.

The PF-II process equipment is designed, located, constructed, operated, maintained, monitored, inspected, and closed in accordance with the applicable requirements of 40 CFR 264. A copy of the inspection schedule for the PF-II processing area and equipment is included as Attachment II.I.2 of this section. All relevant procedures to prevent hazards, inspections, testing, and maintenance and closure procedures and containment requirements addressed in this permit application for tanks and containers are applied to the construction and operation of the PF-II process equipment as well. Records of inspections, etc. will be maintained in the Facility Operating Record. The PF-II process equipment and location has been addressed in the Facility Closure Plan included in this permit application.

Reactor Vessel

The reactor vessel is designed to process 150 to 200 gallons of slurry. The ideal waste to water ratio is estimated to range from 1:1 to 1:2. However, the optimal water content may vary for particular waste streams. The duration of the desorption process and the oxidation process depends on the organic contaminant loading of the particular wastes as well as the processing temperatures. The PF-II process duration will also depend on the rate of addition and volume of oxidizer used, if the oxidization step is carried out. The small batch nature of the process will minimize the total volume of waste in the system at any one time. An inert atmosphere (e.g., nitrogen blanket) is provided at all times during treatment operations to prevent explosions and fires.

The jacket on the reactor vessel (plough share) unit has a design pressure of 72 psi and a design temperature of 304°F. The jacket is constructed of 304 stainless steel (SS), which is compatible with steam or hot water. To prevent damage to the jacket from excess pressure, a pressure reducing station exists separating it from the boiler. A pressure relief valve set at 65 psi exists downstream of the reactor vessel jacket and upstream of the pressure reducing station. A pressure relief valve has been installed on the boiler generating the steam for the jacket as well. The pressure relief valve is set to release at 125 psi. At a set pressure of 125 psi, the maximum temperature the boiler will be able to produce is 353°F. If the boiler pressure goes above 125 psi, or the jacket pressure downstream of the pressure reducing station exceeds 65 psi, the pressure relief valves will vent excess pressure (steam) to the atmosphere. The pressure relief valves are tested on an annual basis, with documentation in the Facility Operating Record.

The reactor vessel itself is designed to operate at atmospheric pressure. The reactor vessel and its internal components (e.g., mixing shovels) are constructed of 304 SS, which is compatible with the wastes to be processed.

Boiler

The boiler has a design pressure of 125 psi and a design temperature of 350°F. To prevent damage to the boiler from excess pressure, a pressure relief valve has been installed on the boiler, which will prevent operation at pressures greater than 125 psi. For safety reasons, the boiler has a set operating pressure of 115 psi, which allows the boiler to generate steam with a maximum temperature of 353°F. Between the boiler and the PF-II unit, a pressure reduction station has been installed that steps-down the steam pressure from 125 to 58 psi. This station is equipped with a 65 psi pressure relief valve. Steam from the reduction station then travels to the PF-II unit where it is regulated to a working pressure of 58 psi. The pressure relief valve will be calibrated on an annual basis and replaced as needed.

Condenser

The shell and tubes of the condenser have a design pressure of 150 psi and a design temperature of 250°F. The unit was hydrostatically tested at 225 psi. The shell (non-waste contact) side of the condenser is constructed of carbon steel, which is compatible with the cooling water to be circulated through the condenser. The tube (waste contact) side of the condenser is constructed of 316 SS, which is compatible with the waste to be processed.

The centrifugal pump with a maximum head pressure of approximately 30 psi is used to circulate water through the shell of the condenser. The pressure generated by the circulation pump is well below the design pressure of 150 psi for the shell of the condenser.

Accumulator

The accumulator tank has a design pressure of 14.7 psi. The tank is constructed of 304 SS, which is compatible with the material being contained in the accumulator. The accumulator operates at ambient temperature and receives liquids from the condenser with temperatures between approximately 85°F and 120°F. These low temperatures are well within the design limits of the tank. The accumulator is "hard-piped" to the absorber tank by an ejector.

Absorber

The absorber tank is designed to operate at atmospheric pressure. The tank is constructed out of 304 SS, which is compatible with the waste and the absorber medium used in the tank.

The absorber operates at ambient temperature and receives liquids with organic constituents from the accumulator tank with temperatures between approximately 85°F and 120°F. These temperatures are well within the design limits of the tank.

I.2 Environmental Performance Standards

Release Prevention

The hydrogeologic, geologic, and meteorological factors of concern for the PFF Facility site and surrounding areas are addressed in Section A of this permit application. For purposes of ensuring protection of human health and the environment, PFF will operate the PF-II process equipment in conformance with applicable container and tank standards. Appropriate secondary containment and air emission controls are incorporated into the design and operation of the equipment. See Part II, Section B of this permit application for details regarding containment; management of ignitable, reactive, and incompatible wastes; condition and management of containers; inspections; and prevention of run on and accumulation of precipitation in the Treatment and Operations Building where the PF-II process operations take place.

<u>Prevention of Releases to Groundwater or Subsurface Environment</u>

Releases to groundwater or the subsurface environment from the PF-II treatment process are extremely unlikely for the following reasons:

- The process will manage relatively small volumes of material; i.e., each treatment batch is approximately 150 to 200 gallons of waste.
- The unit is located within a secondary containment system designed to meet the requirements of 40 CFR 264, Subparts I and J. The containment system is designed to contain the entire volume of the waste being treated plus the volume of containers staged for processing. A sealant (e.g., Ashford Formula, which is a concrete sealer and hardener) has been applied to the containment system floor and walls. Containment calculations are included as Attachment II.I.4. In the future, sealants other than Ashford Formula may be used to provide a sufficiently impervious floor, in accordance with 40 CFR 264.175(b)(1).
- The PF-II process area will be inspected each operating day. Leaks or spills from the system will be cleaned up immediately upon detection or as soon as it is practicable and safe to do so.
- The system is located within the TOB; i.e., the system is physically separated from the subsurface environment and groundwater.
- PFF maintains a Contingency Plan to provide a framework for PFF responses to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the PF-II process.

<u>Prevention of Releases to Surface Water, Wetlands, or Soil Surface</u>

Releases to surface water, wetlands, or soil surface from the PF-II process are also extremely unlikely for the reasons listed above.

<u>Prevention of Releases to Air</u>

Releases to air from the PF-II process are extremely unlikely for the following reasons:

- The system is located within an enclosure inside the TOB. The enclosure is equipped with an emissions control system. The emissions control system is designed to handle the volume of organic emissions anticipated from the process. See air emissions control system description below.

- Organic vapors released from the waste streams in the reactor vessel during processing will be routed to a condenser. Liquids from the condenser will be transferred to the separator, while uncondensed vapors are routed through the absorber tank, which absorbs additional vapors.
- Emissions at the reactor vessel loading point are minimized by limiting the time the containers are open prior to processing.
- Emissions during unloading of the reactor vessel are minimal because the potential air contaminants will be significantly removed or destroyed during processing.

Air Emissions Control System

PFF has installed and operates an organic emissions control system consisting of a regenerative (heat recovering) thermal oxidizer designed to control the emission of volatile organic compounds (VOCs) from the LSV processing area and the PF-II treatment operations enclosure in the TOB. The oxidizer will use thermal energy to destroy VOCs. The following provides an overview of the current system. Figures I.D.13 through I.D.15 are system layout, P&ID, and general arrangement drawings detailing this system.

Process VOCs are delivered to the air emission control system fan. This fan provides the motive force for the system. From the fan, the airstream moves to a switching valve for distribution into one of two heat recovery chambers filled with ceramic media to provide heat transfer. Recovery of up to 95% of thermal energy is accomplished using ceramic media. The airstream travels upward through the ceramic media and is preheated by the heat previously absorbed (retained in the ceramic media) to a temperature of approximately 1,300°F prior to entry into the combustion chamber. In the combustion chamber, the temperature is raised to approximately 1,500°F by a burner, and the VOCs in the airstream are destroyed.

After destruction in the combustion chamber, the cleaned hot gases (airstream) pass downward through the second heat recovery chamber, where heat is absorbed by the ceramic media. The cooled airstream then discharges from the heat recovery chamber through a valve to the exhaust stack.

The destruction efficiency specified in the system design is 95% minimum. The system is based on the following design criteria:

Process	LSV Processing	PF-II Treatment Area	Combined
Airflow	4,000 CFM	3,600 CFM	7,600 CFM
Temperature	70°F	70°F	70°F
VOC Concentration	571 ppm	500 ppm (est.)	500 ppm[1]

[1] It should be noted that the assumptions used for the design criteria (i.e., air flow and VOC concentration) are purposely conservative to ensure the effectiveness of the thermal oxidizer.

The regenerative thermal oxidizer was designed, installed, and is operated in accordance with the applicable requirements of 40 CFR 264 Subpart AA (Air Emission Standards for Process Vents). See also Section II.R of this permit application.

Monitoring and Inspections

The PF-II process will be monitored by PFF personnel during process operations. The PF-II process area and equipment will be visually inspected each operating day for evidence of leaks or spills. The inspection will be in accordance with the requirements of the PFF inspection plan. The secondary containment system will also be inspected each operating day for evidence of cracks or breaches in containment as specified in the PFF inspection plan.

I.3 Potential Pathways of Exposure of Humans or Environmental Receptors

PFF workers within the PF-II treatment enclosure are the most likely human receptors of exposure to chemicals or chemical constituents released from the PF-II process. The exposure is anticipated to be minimal because of the negative pressure maintained in the process area and the air emission control system provided for the PF-II process area. The primary pathway for human exposure from the PF-II process is air emissions (volatiles or particulates) generated during the loading and unloading of the preconditioning and reactor vessels.

Personnel operating the system (or personnel present in the PF-II treatment enclosure for any other reason) are required to wear personal protective equipment (PPE) selected to address the potential hazards identified for the wastes to be managed and the operating parameters of the system. The PPE selected will be in accordance with OSHA standards.

Environmental receptors outside of the PF-II treatment enclosure, such as soil, surface water, groundwater, and air, are unlikely to be impacted by the PF-II system due to the air pollution control system, the containment system, and the location of process equipment within a building that physically separates the process area from groundwater, the subsurface environment, and precipitation.

I.4 Effectiveness of Perma-Fix II Process

Experience has shown that >95% of target organic constituents concentrations are removed during the pre-conditioning phase of the PF-II process. Wastes introduced into the reactor following preconditioning have minimal volatile organic emissions. The wastes are primarily wetted sludge. As stated, the organic constituents are removed through solvent extraction during preconditioning. Analytical screening has shown LDR universal treatment standard levels are frequently achieved by pre-conditioning prior to thermal desorption.

The manufacturer’s specifications for the reactor vessel and condenser indicate a 67% recovery efficiency for freon. Bench scale testing has indicated worst-case heat exchanger (condenser) efficiencies for typical organic constituents of 69% to 90%. The operation of the accumulator and absorber tanks (liquid-liquid extraction) substantially improves the organic constituent removal/recovery efficiency. Current test results indicate that the thermal desorption and liquid-liquid extraction process will remove more than 90% of the organics contained in the pretreated wastes. This efficiency level has been achieved with low volatility organics such as PCBs as well. It is anticipated that subsequent chemical oxidation, when selected, will effectively destroy the remaining residual organic constituents. VOC emissions from the process will be vented to and/or captured and destroyed by the air emissions control system. The thermal oxidizer will reduce VOCs a minimum of 95%.

The effectiveness of the PF-II process is dependent on the complexity of individual waste streams and individual hazardous waste organic constituents. Waste streams are subjected to the PF-II process until a sample of the treated waste indicates that it meets applicable land disposal restriction treatment levels. Experience has shown that preconditioning of the waste streams followed by thermal desorption has been highly successful and repeat processing cycles are rare. In fact, chemical oxidation is almost never required following the two initial treatment steps.

The treatment steps of the PF-II process (i.e., thermal desorption, condensation, organic separation and absorption, and chemical oxidation) are established technologies comprising the technology-based treatment standards of 40 CFR 268.42, Table 1 (CHOXD, DEACT, LLEXT, and RORGS).

I.5 Applicable Tank Standards

The PF-II process contains several components that have been certified in accordance with certain tank standards, as specified in 40 CFR 264.192. This certification is included as Attachment II.I.3 to this permit application section. Management practices for ignitable, reactive, and incompatible wastes at the facility have been designed to minimize the potential for fires, explosions, gaseous emission, leaching, or other discharge of hazardous waste or hazardous waste constituents that could result from the mixing of incompatible wastes or materials if tank systems ruptured or failed. PFF will not place incompatible wastes or incompatible wastes and materials in the same tank or tank-like system per the requirements of 40 CFR 264.17(b). In addition, hazardous waste will not be placed in a tank or tank-like system that previously held an incompatible waste or material and has not been decontaminated per the requirements of 40 CFR 264.17(b).

Where ignitable or reactive waste will be stored or treated in a tank or tank-like system, the permittee will comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon as required in the NFPA code[3].

[3] National Fire Protection Association (NFPA), "Flammable and Combustible Liquids Code," Tables 2-1 through 2-6, 1990. NFPA Tables 2-1 through 2-6, 1977 or 1981, are incorporated by reference into 40 CFR 260.11.

In addition, ignitable or reactive waste will not be placed in tank or tank-like systems, unless the waste is treated, rendered, or mixed before or immediately after placement in the tank system so that:

- The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under 40 CFR 261.21 or 261.23 and the requirements of 40 CFR 264.17(b) are complied with; or
- The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react; or
- The tank system is used solely for emergencies.

New Tank Standards – Tank Assessment

An as-built written certification by an independent, qualified, registered professional engineer for the PF-II process components for handling hazardous waste was submitted to the FDEP in October 2000. (See Attachment II.I.3.)

External Corrosion Protection

The PF-II process equipment is located indoors; hence, it is protected from the weather.

Tank Installation and Testing

Prior to placement of a tank or tank-like system in hazardous waste service, an independent, qualified installation inspector or an independent, qualified registered professional engineer inspected the tank system for the following items:

- weld breaks;
- punctures;
- scrapes of protective coatings;
- cracks;
- corrosion;
- other structural damage or inadequate construction/installation.

This inspection report is included as Attachment II.I.3.

Dimensions and Capacity

Details regarding dimensions and capacity of the PF-II process unit and components are included in the engineering certification provided as Attachment II.I.3 and in Attachment II.I.1 of this permit application section.

Descriptions of Feed Systems, Safety Cut-offs, Bypass Systems, and Pressure Controls

The PF-II process includes enclosed vessels equipped with loading and unloading ports and vents. The reactor vessel is loaded at the top, and contents are piped through downstream equipment via hard piping. The unloading of treatment residuals from the reactor vessel is accomplished from the bottom of the unit. As appropriate, manways are used for inspection and cleaning operations.

Piping between components is regulated by valves (or equivalent devices). Typically, the rigid lines are attached to the tanks by flange couplings. The pressure control system for components consists of thief hatches with a combination of normal venting and a vacuum breaker. A nitrogen purge system is used to minimize the potential for fires or explosions. Additional details of feed systems, safety cutoff, bypass systems, and pressure controls for tank systems are provided in this narrative and Attachment II.I.3 of this section.

Piping, Instrumentation, and Process Flow

Details of piping, instrumentation, and process flow for the PF-II system are provided in Attachment II.I.3 of this section.

The normal process flow for the batch treatment is summarized in the process description provided above. See also Figures I.D1, I.D.2, and I.D.12 in Part I of this permit application.

High/Low Pressure Piping

The PF-II process incorporates the use of flexible hoses as well as semi-rigid or rigid piping. Hazardous waste transfer on-site will be classified as low-pressure transfer.

Ancillary Equipment

Ancillary equipment consists of piping between the PF-II system components as well as loading and unloading equipment and other container management equipment used in association with the process. Additional details regarding ancillary equipment are provided in Attachment II.I.3 and Figure I.D.12.

Containment of Releases

The PF-II process line is located within secondary containment in accordance with the applicable requirements of 40 CFR 264.192. PFF operating procedures include inspections designed to identify spilled liquids in a timely manner. Detailed inspection logs are maintained in the Facility Operating Record for a period of at least three years. After discovery, spilled liquids will be removed from the collection area in as timely a manner as is necessary to prevent overflow of the collection system. Spilled liquids will be identified by visual observation, review of Facility records, and, if necessary, by chemical analysis. If required, analyses will be conducted in accordance with the Facility Waste Analysis Plan.

Attachment II.I.1

Perma-Fix® II Equipment List and Description

PERMA-FIX® II EQUIPMENT LIST AND DESCRIPTION

Equipment required

1. Reactor Vessel (Plough Share)
2. Condenser
3. Accumulator
4. Absorber
5. Boiler
6. Cooling Tower
7. Air Compressor
8. Pumps
9. Dust Collector
10. Pneumatic Drum Tumbler
11. Regenerative Thermal Oxidizer (air emissions control system)

Equipment "specifications"

1. Reactor Vessel (Plough Share)

- Lodige Mixer model FKM 1200D (batch) model built under license of Lodige of Germany by Matsuzaka Co., Ltd. Japan. 304 stainless steel construction.
- Mixer features 6 plough share shovels with half shovels at each end, treatment of shovel surface: none.
- Jacket for heating or cooling down mixture is rated at 72 psi with an effective area of 33 sq ft. Total capacity: 317 gallons;
- Working capacity of mixture: 158 gallons.
- Pressure relief valve.
- Emissions from vessel to be controlled via a hood placed over the charging hopper and venting to a HEPA filter (particulate control) and thermal oxidizer (organic emissions control).

2. Condenser

- Built by Ohmstede Co.
- 65 SQ. FT. shell and tube heat exchanger.
- TP316L stainless steel tubes, tube sheets and heads,
- carbon steel shell, 10" dia. × 48" long tube sheet.
- Number of tubes: 83.
- Number of passes: 1.
- Vertical mount with (4) lug supports.
- Both sides designed for 150 psi @ 250 F.

PERMA-FIX® II EQUIPMENT LIST AND DESCRIPTION (continued)

3. Accumulator

- 110-gallon vertical SS tank.
- Mounted on 4 legs.
- Emissions from this tank are vented to the absorber tank.

4. Absorber

- Approximately 35-gallon vertical SS tank, 12” dia. x 72” straight side, welded dishes top and bottom.
- Tank fitted with equipment to detect the interphase between organic and aqueous layer and to activate pump for removing contents and “hard piped” to the absorber tank.
- This tank may be packed with steel packing, Raschig rings, Pull rings, or Intalox saddles.

5. Boiler

- 25 HP Parker Boiler
- 125 psi steam, horizontal tube-type design
- Output: 836,875 Btu/hr
- Steam output: 863 lbs/hr
- Heating surface: 132 sq. ft

6. Cooling Tower

- Marley Aquatower Model # 4821 - 20 ton, single cell induced draft cooling tower
- 1 HP TEFC 230/460
- 50 gpm of water cooled from 95 to 80° F (wet bulb temperature)

7. Air Compressor

- Sullair model V200-100 H/A 100 HP Rotary.
- Operating pressure of 120/130 psig.

8. Pumps

- 3, air-operated centrifugal pumps for the transfer of liquids.

9. Dust Collector

- Manufactured by American Air Filter.
- Cartridge filter approximately 3 ft. x 3 ft. x 8 ft.

PERMA-FIX® II EQUIPMENT LIST AND DESCRIPTION (continued)

10. Pneumatic Drum Tumbler

- Manufactured by Morse Mfg. Co., Inc.
- Capable of rotating up to two drums of up to 85 gallons end over end.

11. Thermal Oxidizer (air emissions control system)

- Manufactured by Turner Envirologic
- Natural gas-fired burner
- 95% VOC minimum reduction efficiency (EPA method 25A)

Attachment II.I.2

Perma-Fix® II Inspection Schedule

INSPECTION SCHEDULE
PERMA-FIX® II PROCESSING AREA/EQUIPMENT

Equipment used in the Perma-Fix® II process will be visually inspected at least once each operating day for cracks, leaks, corrosion, bulging, erosion, or other deterioration. An internal inspection of the reactor vessel and accumulator tank will be conducted by an independent engineer on a yearly basis*.

SPECIFIC ITEM	TYPES OF PROBLEMS EXPECTED	FREQUENCY OF INSPECTIONS
Secondary containment	Spills, cracks, deterioration, uneven settlement	Each operational day
Piping system (includes valves, pipes, flanges, fittings, hoses)	Corrosion, bulging, cracks, deterioration, discoloration, leaks	Each operational day
Condenser	Leaks, cracks, deterioration, discoloration	Each operational day
Accumulator tank (tank shell, top, bottom, manhole)	Corrosion, bulging, cracks, deterioration, discoloration, leaks	Each operational day
Reactor vessel (plough share unit) (Heating/cooling jacket, discharge valve, cleanout doors, locks, and hinges)	Discoloration, cracks, leaks, deterioration of locks and hinges, corrosion	Each operational day
Accumulator tank (internal inspection)	Pitting, seam integrity, holes, depressions, thickness, cracking	Yearly*
Reactor vessel (internal inspection)	Pitting, seam integrity, holes, depressions, thickness, cracking	Yearly*
Absorber tank	Leaks, cracks, deterioration, discoloration	Daily

*If the Perma-Fix II processing was not conducted for a year, facility may not conduct the yearly inspection. This inspection, however, will be conducted prior to reusing the equipment.

Attachment II.I.3

Certification Report

[Due to the bulk of the entire report, only the appropriate text portion is included herewith. The entire as-built certification and report was transmitted to FDEP on October 26, 2000 as indicated on the attached cover letter.]

Jones Edmunds & Associates, Inc.
CONSULTING ENGINEERS AND SCIENTISTS
JEA

October 26, 2000

Ashwin Patel
Supervisor, Hazardous Waste Section
Department Of Environmental Protection
7825 Baymeadows way, Suite B200
Jacksonville, FL 32256-7590

Re: As-Built Certification of Perma-Fix Facility: Phase III of Construction Activities

Dear Mr. Patel:

I am submitting the attached as-built certification statement and documentation for Perma-Fix of Florida, Gainesville. As noted in the certification, the phase III construction activities of this project have been completed and inspected, as of October 18, 2000.

Phase III of the construction activities included the following items:

- Perma-Fix II process equipment, incl. Plough-Share Unit, Vacuum Pump, and associated ancillary equipment
- Perma-Fix I process equipment (mixer) and work area enclosure
- Ventilation Ducting System for Perma-Fix I &II system (incl. ducting connection to the RTO, plough-share, absorber & dust control equipment)
- Air Pollution Control System for Perma-Fix I &II system (incl. pulse-back filter, condenser, absorber, cartridge filter, HEPA filter & RTO)
- Air pollution control & ventilation system for the Quonset Hut
- Minor Modifications to the Perma-Fix II unit and the Quonset Hut, as described in the attached certification report.

The RTO will now be able to operate at full load condition provided the PFII process is operated at full load capacity of 3000 pounds per day, and the LSV process is also being operated at full load capacity.

The newly constructed hazardous waste facility utilizing the Perma-Fix I and II processes for treatment, meet all the performance and regulatory requirements as of October 26, 2000, and is therefore ready to operate, pending final FDEP approval.

407 South Washington Avenue, Suite 1 • Titusville, Florida 32796• Telephone (407) 269-2950 • FAX (407) 269-2951

If there any questions or comments related to this submittal, please call me at (407) 269-2950 or (407) 468-5551.

Sincerely,

Suresh Chandnani, P.E.
Project Manager
JEA Inc.

Enclosures

Cc: Steven Douglas-PFF
Larry McNamara-PFF
Raymond Whittle-PFF
Ben Warren-PFF
Scott Ellis-SYA

PERMA-FIX PF I AND PF II PROCESS FACILITY AND EQUIPMENT SYSTEM INSPECTION AND AS-BUILT CERTIFICATION

INTRODUCTION

Lewis Engineering and Consulting, Inc. (LEC) Gainesville, Florida, was requested in October, 2000, to perform a survey and inspection of the Perma-Fix PF II process facility and equipment located at their Gainesville, Florida site for the purpose of certifying the as-built construction of the physical plant and the PF I and PF II process equipment. Several tasks were performed in the course of completing this project, including, (1) installed equipment was inspected and compared with vendor information submitted to *Perma-Fix* for individual components or component systems for compliance verification of materials of construction, (2) dimensions were measured and recorded for preparation of drawings that would properly describe the physical plant and the relative location of the process equipment, and (3) process schematics were prepared illustrating the flow of materials through the PF II treatment process, and the supporting utilities, steam and cooling water, to the process equipment.

The majority of the PF II process equipment is newly acquired and installed, but two of the components were existing from previous applications and remained as important elements of the PF II process. Those two units are the *Lodige* Plough-Share unit and the *Ohmstede* shell and tube condenser. LEC had on two previous occasions conducted inspections of the *Lodige* Plough-Share unit for the purpose of certifying the condition and serviceability. Reports of those inspections and certifications were published to *Perma-Fix* on November 9, 1998 and June 30, 2000. Those two inspections separately focused on the internal construction of the Plough-Share, and the integrity of the cooling jacket, respectively.

DOCUMENTATION

As an aid to review of the as-built certification, a series of photographs of the PF II facility were recorded and are included in this report along with seven drawings depicting various elements of the facility's construction. Those drawings are included at the following tabs in the report document:

PF I & II SYSTEM DRAWINGS

Tab 1: PERMAFIX PF II PROCESS SCHEMATIC
Tab 2: STEAM/CONDENSATE SYSTEM SCHEMATIC
Tab 3: COOLING WATER SYSTEM SCHEMATIC
Tab 4: PF I & II EQUIPMENT BLDG OVERVIEW
Tab 5: PF I & II FLOOR PLAN
Tab 6: PF II PRIMARY PROCESS EQUIPMENT ELEV(ATION) VIEW
Tab 7: PF I & II QUONSET HUT VENT(ILATION) LAYOUT

Figures 1 through 20 immediately following this narrative description show the various component elements of the PF I and PF II process, and the physical plant containing the equipment. The sample room area, roll-up door open, and closed, is shown in **Figures 1 and 2**, respectively. The drum conveyor tunnel adjoins the sample room with the entrance air-lock shown at the right in **Figure 2**. A side view of the drum conveyor tunnel as it intersects the side of the Quonset Hut that houses the PF II process equipment, and the exit air-lock from the tunnel, is shown in **Figure 3**. The portion of the drum conveyor tunnel parallel to the side of the Quonset hut is shown in **Figure 4**.

Drums of material for processing enter the Quonset hut via the conveyor tunnel and are held for initial processing, as necessary, in the Drum Mixing Station shown in **Figure 5**. At the left is the internal air-lock where drums exit the Quonset Hut. The external air-lock for the drum exit is shown in **Figure 6**.

The PF II process equipment is most readily reviewed by comparison of the physical equipment photographs with the drawing PF II PROCESS SCHEMATIC at the first tab. The processing equipment begins with the Plough-Share unit shown in **Figure 7**. This unit is located on top of a support frame at an elevation that allows drums for removal of processed material to be located beneath the discharge knife gate. Specific terminology regarding the component parts of the Plough-Share is provided in the drawing included at the tab titled PF II PRIMARY PROCESS ELEVATION VIEW.

The Plough-Share inspection report included under the tab titled PLOUGH-SHARE

UNIT 11/9/98 INSPECTION describes the internal condition of the Plough-Share which was noted by inspection of the unit and review of the *Lodige* assembly drawing attached to the November 9, 1998 inspection report to be constructed primarily of Type 304 stainless steel (T304 SS). All internal surface components were found to be in excellent physical condition at that time. The external insulation was not removed at that time which prevented inspection and testing of the carbon steel heating/cooling jacket. The insulation was removed in June, 2000, so that the carbon steel jacket could be inspected. The jacket was surveyed via ultrasonic non-destructive testing (NDT) methods and the internal jacket annulus space was inspected visually and recorded on video tape using a flexible light-guide boroscope. A report of those findings and recommendations submitted to *Perma-Fix* on June 30, 2000, is included at the tab titled PLOUGH-SHARE UNIT 6/30/00 INSPECTION.

The Plough-Share was externally modified as compared to the configuration documented at the time of the November 9, 1998 and June 30, 2000 inspections. As shown in **Figure 7**, a large insulated cylindrical vessel is attached at the top left, and a dark carbon steel hopper is fitted to the top right. The cylindrical vessel is the PulseBack Filter manufactured by *MAC Equipment, Inc.* A detailed description of the function of the unit, and its construction are attached at the tab titled MAC EQUIPMENT PULSE FILTER SYSTEM. Inspection of the system confirmed that the unit supplied and installed on the Plough-Share unit was in conformance with the vendor's drawing and product specifications.

All volatilized gases liberated by the thermal desorption process in the steam heated Plough-Share are vented to the top of the *Ohmstede* vertical shell-and-tube condenser. A schematic is attached at the tab titled STEAM/CONDENSATE SYSTEM SCHEMATIC that identifies the boiler system external to the building that supplies steam for heating the Plough-Share and receives spent steam and condensate from the system. A portion of the steam feed is directed to the Pulse-Back Filter which is indicated in the schematic.

The condenser is described in the drawing included at the tab titled OHMSTEDE CONDENSER. All internal construction components in contact with the PF II process stream, specifically the tubes and tubesheets, are constructed from T316L SS. The gases enter at the top flanged port and condensed liquids and gases exit at the bottom side flanged port. A valved bottom drain for additional liquids removal is provided. Cooling water enters the shell at the bottom and exits at the top. The condenser is shown in several views in **Figures 8 through 12**. A schematic of the cooling water system illustrating the external package Marley cooling tower and the cooling water supply/return piping to the PF II process is included at the tab titled COOLING WATER SYSTEM SCHEMATIC.

Removal of volatilized gases from the Plough-Share is generated by the package *Squire-Cogswell* vacuum/absorber system shown in **Figures 9 and 10**. Vendor documentation provided with the package system are attached at the tab titled SQUIRE-COGSWELL VACUUM/ABSORBER. Gases and condensed liquids flow first into the stainless steel accumulator tank. Gas flow continues from the accumulator tank via the vacuum pump to the stainless steel kerosene absorber tank. All process lines and both tanks in the *Squire-Cogswell* system are constructed from T304SS. Gases not absorbed in the absorber tank vent from the top of the absorber tank via welded T304SS Sch.05 pipe to the fan induced exhaust ventilation system. The portion of the stainless steel piping exhaust system within the interior of the Quonset Hut is shown in **Figure 12**.

The balance of the PF II process is the exhaust ventilation system. Vertical drops from the exterior piping system into the open space of the Quonset Hut are shown in **Figure 13**. A description of the exhaust ventilation system in included at the tab titled PFI & II QUONSET HUT VENT LAYOUT. A 4200 CFM fan induced draft gathers PF II dust from the Infeed Hopper and unabsorbed gases from the Vacuum/Absorber system, and interior space air from the Quonset Hut, and draws them through an *AAF OptiFlo* Cartridge Filter system and an *AAF Astrocel* HEPA filter bank. Vendor information on the design and construction of the cartridge filter system is included at the tab titled AAF OPTIFLOW 2RC8 CARTRIDGE FILTER, and the hardware and filter media for the HEPA system is included at the tab titled HEPA FILTER.

The relative location of these systems are shown in the drawing at tab PF I & II FLOOR PLAN, and in the ventilation system drawing previously noted. The cartridge filter system is shown in **Figure 14**, and the Fan and HEPA filter module are shown in **Figure 15**. All of the piping for the exhaust ventilation system is welded Sch.05 T304SS. Exhaust gases exiting the fan are discharged via welded T304SS duct piping to the RTO unit. That piping and the RTO unit are shown in **Figures 16 through 18**.

Ventilation air to the Quonset Hut and PF II process is supplied by a 3,000 CFM fan shown in **Figures 19 and 20**. Spiral formed 16 gage T304SS pipe delivers air from the supply fan to the Sample Room and the Quonset Hut as indicated in the Ventilation System drawing.

CONCLUSIONS

1. Thorough review of the Quonset Hut physical plant, the PF II process equipment and the vendor information and specifications has shown that the PF II process system as constructed complies with the materials specified for all components and component systems, and that the equipment is physically connected with respect to process streams and utilities as indicated in the attached drawings.

2. All of the PF II gas transfer and wetted system piping and components are constructed from either T304 or T316L stainless steel. Steam, steam condensate and cooling water piping and component hardware are constructed typically with carbon steel piping and ductile iron fittings.

3. The supply and exhaust ventilation system piping is constructed from T304SS, either spiral formed and welded for the supply air system, or all welded Sch 05 pipe for the PF II process and Quonset Hut airspace exhaust ventilation.

4. It is the opinion of the undersigned that the documentation provided in this as-built certification of the facility and process equipment faithfully and accurately describes the equipment as installed.

As required by EPA 40 CFR 270.11(d):

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Respectfully submitted,

Richard O. Lewis

Richard O. Lewis, P.E.
October 23, 2000 10/23/00

Attachment II.I.4

Secondary Containment Calculations

Attachment II.I.4

Perma Fix® II Processing Area
Secondary Containment Calculations

List of equipment situated inside secondary containment, with a minimum height of 4":

Unit	Volume, gal.
Reactor Vessel	317
Absorber tank	35
Condenser	16
Accumulator tank	110
Jib Crane	----
Drum Tumbler	160 (maximum)
Skid mixer	----
Gravity rollers	----
Up to 20 drums of waste	1,100
Liquid Collection Tote	550
Total	2,288

The volume these units displace is considered negligible, since only legs and support rails are in contact with the floor, except for the 20 drums of waste.

List of equipment situated inside secondary containment not elevated from the floor:

Up to twenty 55-gallon drums staged for processing displacing a total of approximately 120 gallons.

Approximate dimensions of Quonset Hut:

$34.5' \times 34.25' = 1{,}181.625\ ft^2$

Spill volume contained by 4" berm:

$1181.625\ ft^2 \times 4/12\ ft = 393.9\ ft^3$

$393.9\ ft^3 \times 7.48\ gal/ft^3 = 2{,}946\ gal$

Actual spill volume contained by 4" berm:

2,946 gal - 120 gal (volume displaced by 20 drums) = 2,826 gal

Percent of total unit volume contained by the secondary containment:

2,826 / 2,288 = 1.235 (or 123%)

Attachment II.I.4

Conclusion:

Adequate capacity exists to contain 10% of the total potential volume of waste (228.8 gal and the volume of the largest liquid container (550 gal) to be placed in the Perma-Fix II® process area. Occasionally, B-25 (720 gallons capacity) and B-12s (360 gallons capacity) containers of waste solid may be present in the Treatment and Operations Building for consolidation activities. Since these containers hold non-liquid wastes, containment is not required; hence, these containers are not included in the above calculations.

Attachment II.I.5

Example Waste Profile

WASTE PROFILE

*Perma-Fix Nuclear Services: DSSI * M&EC * Perma-Fix of Florida * Perma-Fix Northwest*

Profile Number: ____

Generator Information:

EPA ID# ____
Generator Name ____
Generator Address ____
City/State/Zip ____
Telephone ____
Fax ____

Billing Information:

☐ Electronic users: check here to copy Generator info, if same.

Broker/Site ____
Address ____
City/St/Zip ____
Telephone ____
Fax ____

Check all that apply

☐ Hazardous Waste - *Include LDR-UHC Constituent Form*
- ☐ *Mercury >260 PPM*
- ☐ *Oxidizers*
- ☐ *Elemental Mercury*
- ☐ *Reactives - specify:* ____

☐ TSCA Regulated PCB
- ☐ *PCB Bulk Products*
- ☐ *PCB Remediation Waste*
- ☐ *PCB Articles*

☐ Radioactive Waste

☐ Non-Hazardous Waste
☐ Universal Waste
☐ Used Oil Filter
☐ Used Oil

Please provide a detailed description of the process that generated this waste. Attach additional sheets if needed. Note: for a line break, press alt-return.

____

Characterization Method: *(check ONE only)* ☐ Laboratory Analysis ☐ MSDS ☐ Generator Knowledge

Physical Description: *(check all that apply)* ☐ Solid ☐ Liquid ☐ Sludge ☐ Debris ☐ Labpack *(add inventory form)*
☐ Other: ____

Volume: ____ *(include units: 30 liters, 5 gal., etc)*
Gross Weight: ____ *(include units: 75 lbs, 10 kg, etc.)*
Container Type: ____
Total Number of Containers: ____

Overpacked: ☐ Yes ☐ No

US DOT Hazardous Material: ☐ Yes ☐ No

Proper Shipping Name: ____

DOT Hazard Class: ____ *primary* ____ *subsidiary*

☐ This waste stream is subject to the Land Disposal Restriction of 40 CFR 268.
(If checked, complete a Land Disposal Restriction Notification form)
☐ This waste stream contains Benzene.
(If checked, complete the Benzene NESHAP Worksheet)
☐ This waste stream consists of off-spec used oil.
☐ This is a CERCLA waste.

For Broker Use Only

I certify the following:
The packages used to ship this material meet the requirements of 40 CFR 173 Subpart B (HazMat). This material will be inspected for consistency with the preapproved profile at the time of transportation.

Name	Date

CHEMICAL PROPERTIES AND COMPOSITION:

Percent Free Liquid: ____ % (None=0%, all=100%)
Percent Settled Solids: ____ % (None=0%, all=100%)
Viscosity: ____ Centistokes

pH Actual: ____ **OR** Range: ____ to ____
Specific Gravity Actual: ____ **OR** Range: ____ to ____

CERTIFICATION

I certify that all hazards, known or suspected, have been disclosed on this profile. Further I understand that a surcharge may be imposed for any material which is rejected or requires additional handling due to the material being inconsistent with the pr

Name	Title	Date

Perma-Fix Use Only

☐ Accepted ☐ Accepted with the following conditions: ____

☐ Rejected for the following reasons: ____

Designated Facility:
☐ DSSI
☐ M&EC
☐ PF Florida
☐ PFNW

Perma-Fix has all of the necessary permits and licenses for the waste that has been characterized and identified by this approved profile and accepted by Perma-Fix.

Name	Title	Date

Attachment II.I.6

Example Land Disposal Restriction and Certification Form

LAND DISPOSAL RESTRICTION & CERTIFICATION FORM

DSSI ▪ M&EC ▪ Perma-Fix of Florida ▪ Perma-Fix Northwest

Generator Name ______ Generator USEPA ID No. ______

Generator Address ______ City/ST/Zip ______

State Manifest No. ______ Manifest Doc. No. ______

Instructions

1 In Column 1 identify all USEPA hazardous waste codes that apply to this waste shipment.
2 In Column 2, choose the appropriate treatability group: Non-Wastewater (NWW) or Wastewater (WW).
3 In Column 3, enter the appropriate Subcategory, if applicable, and also enter "Contaminated Soil" or "Debris" if the waste can be treated using one of the alternative treatment technologies provided by 268.49(c) (soil) or 268.45 (debris).
4 In Column 4, circle the letter of the appropriate LDR management categories on the back of this form.
5 In Column 5, enter the Reference Number(s) from the LDR-UHC Constituent Table for any constituents subject to treatment in your waste stream.

Go to LDR-UHC Contituent Table

Manifest Line Item #	1. USEPA HAZARDOUS WASTE CODES		2. NWW or WW	3. SUBCATEGORY	4. HOW MUST THE WASTE BE MANAGED (Check one) A	B	C	D	E	F	G	H	Soil Only					5. REFERENCE NUMBER(s) of Hazardous Constituents contained in the waste.
11.A			NWW										Does			is subject to		
			WW										Does Not			complies with		
11.B			NWW										Does			is subject to		
			WW										Does Not			complies with		
11.C			NWW										Does			is subject to		
			WW										Does Not			complies with		
11.D			NWW										Does			is subject to		
			WW										Does Not			complies with		

I hereby certify that all information submitted on this and all associated documents is complete and accurate to the best of my knowledge and information.

Generator Name	Title	Date

A. THIS RESTRICTED WASTE REQUIRES TREATMENT TO THE APPLICABLE STANDARD. This waste must be treated to the applicable performance based treatment standard set forth in 40CFR Part 268 Subpart C, 268.32, Subpart D, 268.40 or RCRA Section 3004(d) prior to land d

B. THIS HAZARDOUS DEBRIS MAY BE TREATED USING THE DEBRIS ALTERNATIVE TREATMENT STANDARDS OF 40 CFR 268.45. I certify under penalty of law that I personally have examined and am familiar with the waste and that the statement above is true and that thiswaste m

C. THIS RESTRICTED WASTE HAS BEEN TREATED TO THE APPLICABLE TREATMENT STANDARD(S). I certify under penalty of law that I personnaly have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this ce

D. THIS RESTRICTED DEBRIS HAS BEEN TREATED IN ACCORDANCE WITH 40 CFR 268.45. I certify under penalty of law that the debris has been treated in accordance with the requirements of 40 CFR 268.45. 1 am aware that there are significant penalties for making fals

E. THIS LAB PACK DOES NOT CONTAIN ANY WASTES IDENTIFIED AT APPENDIX IV TO PART 268. I certify under penalty of law that I personally have examined and am familiar with the waste and that the statement above is true and that this lab pack will be sent to a co

F. THIS RESTRICTED WASTE HAS BEEN TREATED TO REMOVE THE HAZARDOUS CHARACTERISTIC. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to remove the hazardous characteristic. This decharacterized

G. THIS RESTRICTED WASTE HAS BEEN TREATED TO REMOVE THE HAZARDOUS CHARACTERISTIC AND BEEN TREATED FOR UNDERLYING HAZARDOUS CONSTITUENTS. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to re

H. THIS RESTRICTED WASTE IS SUBJECT TO AN EXEMPTION FROM LAND DISPOSAL. (Please include the date the waste is subject to the prohibitions in Column 5) This waste is subject to an exemption from a prohibition on the type of land disposal method utilized for t

S. THIS CONTAMINATED SOIL ***(DOES / DOES NOT***) CONTAIN LISTED HAZARDOUS WASTE AND ***(DOES / DOES NOT)*** EXHIBIT A CHARACTERISTIC OF HAZARDOUS WASTE AND ***(IS SUBJECT TO / COMPLIES WITH***) THE SOIL TREATMENT STANDARDS AS PROVIDED BY 268.49(c) OR THE UNIVERSAL TREATMENT

Resource Guide
Underlying Hazardous Constituent (UHC)
Land Disposal Restriction (LDR) Constituents

Ref #:	Hazardous Constituent	CAS NO.	NWW (mg/kg)	WW (mg/kg)	Concentration 11a	11b	11c	11d
1	Acenaphthene	83-32-9	3.4	0.059				
2	Acenaphthylene	208-96-8	3.4	0.059				
3	Acetone	67-64-1	160	0.28				
4	Acetonitrile	75-05-8	38	5.6				
5	Acetophenone	96-86-2	9.7	0.01				
6	2-Acetylaminofluorene	53-96-3	140	0.059				
7	Acrolein	107-02-8	NA	0.29				
8	Acrylonitrile	107-13-1	84	0.24				
9	Acrylamide	79-06-1	23	19				
10	Aldrin	309-00-2	0.066	0.021				
11	4-Aminobiphenyl	92-67-1	NA	0.13				
12	Aniline	62-53-3	14	0.81				
13	Anthracene	120-12-7	3.4	0.059				
14	Aramite	140-57-8	NA	0.36				
15	alpha-BHC	319-84-6	0.066	0.00014				
16	beta-BHC	319-85-7	0.066	0.00014				
17	delta-BHC	319-86-8	0.066	0.023				
18	gamma-BHC (Lindane)	58-89-9	0.066	0.0017				
19	Benz(a)anthracene	56-55-3	3.4	0.059				
20	Benzal chloride	98-87-3	6	0.055				
21	Benzene	71-43-2	10	0.14				
22	Benzo(a)pyrene	50-32-8	3.4	0.061				
23	Benzo(b)fluoranthene	205-99-2	6.8	0.11				
24	Benzo(k)fluoranthene	207-08-9	6.8	0.11				
25	Benzo(g,h,i)perylene	191-24-2	1.8	0.0055				
26	bis(2-Chloroethoxy)methane	111-91-1	7.2	0.036				
27	bis(2-Chloroethyl)ether	111- 44-4	6	0.033				
28	bis(2-Chloroisopropyl) ether	39638-32-9	7.2	0.055				
30	Bromodichloromethane	75-27-4	1 5	0.35				
31	Bromomethane (Methyl bromide)	74-83-9	15	0.11				
32	4-Bromophenyl phenyl ether	101-55-3	15	0.055				
33	n-Butyl alcohol	71-36-3	2.6	5.6				
34	Butyl benzyl phthalate	85-68-7	28	0.017				
35	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	88-85-7	2.5	0.066				
36	Carbon disulfide	75-15-0	4.8*	3.8				
37	Carbon tetrachloride	56-23-5	6	0.057				
38	Chlordane (alpha and gamma isomers)	57-74-9	0.26	0.0033				
39	p-Chloroaniline	106-47-8	16	0.46				
40	Chlorobenzene	108-90-7	6	0.057				
41	Chlorobenzilate	510-15-6	NA	0.1				
42	2-Chloro-1, 3-butadiene (Chloroprene)	126-99-8	0.28	0.057				
43	Chlorodibromomethane	124-48-1	15	0.057				
44	Chloroethane	75-00-3	6	0.27				
45	Chloroform	67-66-3	6	0.046				
46	p-Chloro-m-cresol	59-50-7	14	0.018				
47	2-Chloroethyl vinyl ether	110-75-8	NA	0.062				
48	Chloromethane (Methyl chloride)	74-87-3	30	0.19				
49	2-Chloronaphthalene	91-58-7	5.6	0.055				
50	2-Chlorophenol	95-57-8	5.7	0.044				

51	3-Chloropropylene (Allyl Chloride)	107-05-1	30	0.036					
52	Chrysene	218-01-9	3.4	0.059					
53	o-Cresol (2-Methyl phenol)	95-48-7	5.6	0.11					
54	m-Cresol (3-Methyl phenol)	108-39-4	5.6	0.77					
55	p-Cresol (4-Methyl phenol)	106-44-5	5.6	0.77					
56	Cyclohexanone	108-94-1	0.75 *	0.36					
57	o,p'-DDD	53-19-0	0.087	0.023					
58	p,p'-DDD	72-54-8	0.087	0.023					
59	o,p'-DDE	3424-82-6	0.087	0.031					
60	p,p'-DDE	72-55-9	0.087	0.031					
61	o,p'-DDT	789-02-6	0.087	0.0039					
62	p,p'-DDT	50-29-3	0.087	0.0039					
63	Dibenz(a,h)anthracene	53-70-3	8.2	0.055					
64	Dibenz(a,e)pyrene	192-65-4	NA	0.061					
65	1,2-Dibromo-3-chloropropane	96-12-8	15	0.11					
66	1,2-Dibromoethane (Ethylene dibromide)	106-93-4	15	0.028					
67	Dibromomethane	74-95-3	15	0.11					
68	m-Dichlorobenzene (1,3-Dichlorobenzen	541-73-1	6	0.036					
69	o-Dichlorobenzene (1,2-Dichlorobenzene	95-50-1	6	0.088					
70	p-Dichlorobenzene (1,4-Dichlorobenzene	106-46-7	6	0.09					
71	Dichlorodifluoromethane	75-71-8	7.2	0.23					
72	1,1-Dichloroethane	75-34-3	6	0.059					
73	1,2-Dichloroethane	107-06-2	6	0.21					
74	1,1-Dichloroethylene	75-35-4	6	0.025					
75	trans-1,2-Dichloroethylene	156-60-5	30	0.054					
76	2,4-Dichlorophenol	120-83-2	14	0.044					
77	2,6-Dichlorophenol	87-65-0	14	0.044					
78	2,4-Dichlorophenoxyacetic acid (2.4-D)	94-75-7	10	0.72					
79	1,2-Dichloropropane	78-87-5	18	0.85					
80	cis-1,3-Dichloropropylene	10061-01-5	18	0.036					
81	trans-1,3-Dichloropropylene	10061-02-6	18	0.036					
82	Dieldrin	60-57-1	0.13	0.017					
83	Diethyl phthalate	84-66-2	28	0.2					
84	p-Dimethylaminoazobenzene	60-11-7	NA	0.13					
85	2,4-Dimethyl phenol	105-67-9	14	0.036					
86	Dimethyl phthalate	131-11-3	28	0.047					
87	Di-n-butyl phthalate	84-74-2	28	0.057					
88	1,4-Dinitrobenzene	100-25-4	2.3	0.32					
89	4,6-Dinitro-o-cresol	534-52-1	160	0.28					
90	2,4-Dinitrophenol	51-28-5	160	0.12					
91	2,4-Dinitrotoluene	121-14-2	140	0.32					
92	2,6-Dinitrotoluene	606-20-2	28	0.55					
93	Di-n-octyl phthalate	117-84-0	28	0.017					
94	Di-n-propylnitrosamine	621-64-7	14	0.4					
95	1,4-Dioxane	123-91-1	170	12					
96	Diphenylamine	122-39-4	13	0.92					
97	Diphenylnitrosamine	86-30-6	13	0.92					
98	1,2-Diphenylhydrazine	122-66-7	NA	0.087					
99	Disulfoton	298-04-3	6.2	0.017					
100	Endosulfan I	959-98-9	0.066	0.023					
101	Endosulfan II	33213-65-9	0.13	0.029					
102	Endosulfan sulfate	1031-07-8	0.13	0.029					
103	Endrin	72-20-8	0.13	0.0028					
104	Endrin aldehyde	7421-93-4	0.13	0.025					
105	2-Ethoxyethanol (FO05)+			INCIN					

106	Ethyl acetate	141-78-6	33	0.34				
107	Ethyl benzene	100-41-4	10	0.057				
108	Ethyl ether	60-29-7	160	0.12				
109	Ethyl methacrylate	97-63-2	160	0.14				
110	Ethylene oxide	75-21-8	NA	0.12				
111	Famphur	52-85-7	15	0.017				
112	Fluoranthene	206-44-0	3.4	0.068				
113	Fluorene	86-73-7	3.4	0.059				
114	Heptachlor	76-44-8	0.066	0.0012				
115	Heptachlor epoxide	1024-57-3	0.066	0.016				
116	Hexachlorobenzene	118-74-1	10	0.055				
117	Hexachlorobutadiene	87-68-3	5.6	0.055				
118	Hexachlorocyclopentadiene	77-47-4	2.4	0.057				
119	HxCDDs (All Hexachlorodibenzo-p-dioxir	NA	0.001	0.000063				
120	HxCDFs (All Hexachlorodibenzofurans)	NA	0.001	0.000063				
121	Hexachloroethane	67-72-1	30	0.055				
122	Hexachloropropylene	1888-71-7	30	0.035				
123	Indeno (1,2,3-c,d) pyrene	193-39-5	3.4	0.0055				
124	Iodomethane	74-88-4	65	0.19				
125	Isobutyl alcohol (Isobutanol)	78-83-1	170	5.6				
126	Isodrin	465-73-6	0.066	0.021				
127	Isosafrole	120-58-1	2.6	0.081				
128	Kepone	143-50-0	0.13	0.0011				
129	Methacrylonitrile	126-98-7	84	0.24				
130	Methanol	67-56-1	0.75 *	5.6				
131	Methapyrilene	91-80-5	1.5	0.081				
132	Methoxychlor	72-43-5	0.18	0.25				
133	3-Methylchloroanthrene	56-49-5	15	0.0055				
134	4,4-Methylene bis (2-chloroaniline)	101-14-4	30	0.5				
135	Methylene chloride	75-09-2	30	0.089				
136	Methyl ethyl ketone	78-93-3	36	0.28				
137	Methyl isobutyl ketone	108-10-1	33	0.14				
138	Methyl methacrylate	80-62-6	160	0.14				
139	Methyl methanesulfonate	66-27-3	NA	0.018				
140	Methyl parathion	298-00-0	4.6	0.014				
141	Naphthalene	91-20-3	5.6	0.059				
142	2-Naphthylamine	91-59-8	N/A	0.52				
143	o- Nitroaniline	88-74-4	14	0.27				
144	p-Nitroaniline	100-01-6	28	0.028				
145	Nitrobenzene	98-95-3	14	0.068				
146	5-Nitro-o-toluidine	99-55-8	28	0.32				
147	o-Nitrophenol	88-75-5	13	0.028				
148	p-Nitrophenol	100-02-7	29	0.12				
149	2-Nitropropane (FO05)+			INCIN				
150	N-Nitrosodiethylamine	55-18-5	28	0.4				
151	N-Nitrosodimethylamine	62-75-9	2.3	0.4				
152	N-Nitroso-di-n-butylamine	924-16-3	17	0.4				
153	N-Nitrosomethylethylamine	10595-95-6	2.3	0.4				
154	N-Nitrosomorpholine	59-89-2	2.3	0.4				
155	N-Nitrosopiperidine	100-75-4	35	0.013				
156	N-Nitrosopyrrolidine	930-55-2	35	0.013				
157	Parathion	56-38-2	4.6	0.014				
158	Total PCBs	1336-36-3	10	0.1				
159	Pentachlorobenzene	608-93-5	10	0.055				
160	PeCDDs (All Pentachlorodibenzo-p-dioxi	NA	0.001	0.000063				

161	PeCDFs (All Pentachlorodibenzofurans)	NA	0.001	0.000035				
162	Pentachloroethane	76-01-7	6	0.055				
163	Pentachloronitrobenzene	82-68-8	4.8	0.055				
164	Pentachlorophenol	87- 86-5	7.4	0.089				
165	Phenacetin	62-44-2	16	0.081				
166	Phenanthrene	85-01-8	5.6	0.059				
167	Phenol	108-95-2	6.2	0.039				
168	Phorate	298-02-2	4.6	0.021				
169	Phthalic acid	100-21-0	28	0.055				
170	Phthalic anhydride	85-44-9	28	0.055				
171	Pronamide	23950-58-5	1.5	0.093				
172	Propanenitrile (Ethyl cyanide)	107-12-0	360	0.24				
173	Pyrene	129-00-0	8.2	0.067				
174	Pyridine	110-86-1	16	0.014				
175	Safrole	94-59-7	22	0.081				
176	Silvex (2,4,5-TP)	93-72-1	7.9	0.72				
177	1,2,4,5-Tetrachlorobenzene	95-94-3	14	0.055				
178	TCDDs (All Tetachlorodibenzo-p-dioxins)	NA	0.001	0.000063				
179	TCDFs (All Tetrachlorodibenzofurans)	NA	0.001	0.000063				
180	1,1,1,2-Tetrachloroethane	630-20-6	6	0.057				
181	1, 1,2,2-Tetrachloroethane	79-34-5	6	0.057				
182	Tetrachloroethylene	127-18-4	6	0.056				
183	2,3,4,6-Tetrachlorphenol	58-90-2	7.4	0.03				
184	Toluene	108-88-3	10	0.08				
185	Toxaphene	8001-35-2	2.6	0.0095				
186	Tribromomethane (Bromoform)	75-25-2	15	0.63				
187	1,2,4-Trichlorobenzene	120-82-1	19	0.055				
188	1, 1, 1 -Trichloroethane	71-55-6	6	0.054				
189	1, 1,2-Trichloroethane	79-00-5	6	0.054				
190	Trichloroethylene	79-01-6	6	0.054				
191	Trichloromonofluoromethane	75-69-4	30	0.02				
192	2,4,5-Trichlorophenol	95-95-4	7.4	0.18				
193	2,4,6-Trichlorophenol	88-06-2	7.4	0.035				
194	2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	93-76-5	7.9	0.72				
195	1,2,3-Trichloropropane	96-18-4	30	0.85				
196	1,1,2-Trichloro- 2,2,2-trifluoroethane	76-13-1	30	0.057				
197	tris-(2,3-Dibromopropyl) phosphate	126-72-7	0.1	0.011				
198	Vinyl chloride	75-01-4	6	0.27				
199	Xylenes	1330-20-7	30	0.32				
200	Antimony	7440-36-0	1.15*	1.9				
201	Arsenic	7440-38-2	5.0 *	1.4				
202	Barium	7440-39-3	21 *	1.2				
203	Beryllium	7440-41-7	1.22 *	0.82				
204	Cadmium	7440-43-9	0.11 *	0.69				
205	Chromium (Total)	7440-47-3	0.60 *	2.77				
206	Cyanides (Total)	57-12-5	590	1.2				
207	Cyanides (Amenable)	57-12-5	30	0.86				
208	Fluoride	16984-48-8	NA	35				
209	Lead	7439-92-1	0.75 *	0.69				
210	Mercury (retort residues)	7439-97-6	0.2 *	NA				
211	Mercury (all others)	7439-97-6	0.025 *	0.15				
212	Nickel	7440-02-0	11 *	3.98				
213	Selenium	7782-49-2	5.7 *,**	0.82				
214	Silver	7440-22-4	0.14	0.43				
215	Sulfide	18496-25-8	NA	14				

216	Thallium	7440-28-0	0.2	1.4					
217	Vanadium	7440-62-2	1.6*,**	4.3					
218	Zinc	7440-66-6	4.3*,**	2.61					
220	Aldicarb sulfone	1646-88-4	0.28	0.056					
221	Barban	101-27-9	1.4	0.056					
222	Bendiocarb	22781-23-3	1.4	0.056					
224	Benomyl	17804-35-2	1.4	0.056					
225	Butylate	2008-41-5	1.4	0.042***					
226	Carbaryl	63-25-2	0.14	0.006					
227	Carbenzadim	10605-21-7	1.4	0.056					
228	Carbofuran	1563-66-2	0.14	0.006					
229	Carbofuran phenol	1563-38-8	1.4	0.056					
230	Carbosulfan	55285-14-8	1.4	0.028					
231	m-Cumenyl methylcarbamate	64-00-6	1.4	0.056					
233	Diethylene glycol, dicarbamate	5952-26-1	1.4	0.056					
235	Dithiocarbarnates (total)	137-30-4	28	0.028					
236	EPTC	759-94-4	1.4	0.042					
237	Formetanate hydrochloride	23422-53-9	1.4	0.056					
241	Methiocarb	2032-65-7	1.4	0.056					
242	Methomyl	16752-77-5	0.14	0.028					
243	Metolcarb	1129-41-5	1.4	0.056					
244	Mexacarbate	315-18-4	1.4	0.056					
245	Molinate	2212-67-1	1.4	0.042					
246	Oxarnyl	23135-22-0	0.28	0.056					
247	Pebulate	1114-71-2	1.4	0.042					
249	Physostigmine	57-47-6	1.4	0.056					
250	Physostigmine salicylate	57-64-7	1.4	0.056					
251	Prornecarb	2631-37-0	1.4	0.056					
252	Propharn	122-42-9	1.4	0.056					
253	Propoxur	114-26-1	1.4	0.056					
254	Prosulfocarb	52888-80-9	1.4	0.042					
255	Thiodicarb	59669- 26-0	1.4	0.019					
256	Thiophanate-methyl	23564-05-8	1.4	0.056					
258	Triallate	2303-17-5	1.4	0.042					
259	Triethylamine	101-44-8	1.5	0.081					
260	Vernolate	1929-77-7	1.4	0.042					

* "Concentration in mg/l TCLP"

** Not Underlying Hazardous Constituents. (See 60 FR, Jan. 3,1995)

*** The preamble to the final rule (61 FR 15584) clearly indicates that the wastewater treatment standard for thiocarbamate constituents has been revised to 0.042mg/l. However, the ' 268.48 universal treatment standards table still shows 0.003 mg/l.

I These UTS levels are effective on August 24, 1998 as established in 63 FIR 28556-28753, the finalized Phase IV-Part 2 land disposal restrictions (LDR) rule.

ATTACHMENT II.I.7

PROPOSED PERMA-FIX® II PROCESS

ATTACHMENT II.I.7

PROPOSED PERMA-FIX® II PROCESS

The existing batch Perma-Fix® II (PF-II) treatment equipment is planned to be replaced with continuous PF-II treatment equipment and feed preparation equipment in the Treatment and Operations Building (TOB). The existing Quonset Hut will be replaced with a Perma-Con structure. The permitted container storage area in the TOB will not be affected by this modification since different container storage zones and the containment will remain the same. The new PF-II process details are outlined herein.

PROCESS DESCRIPTION

The first step in the PF-II process will be the feed preparation activities to be conducted using a screen, a shredder, a crusher, and a pug mill. Figure II.I.1 provides a general layout of these units, along with the thermal desorber (i.e., continuous PF-II process). Any combination of these feed preparation units will be used to ensure that feed input into the thermal desorber is less than or equal to ½" size.

Vibrating Screen

The screen will be used to separate material to a top size of less than ½" for feeding to the thermal desorber. It uses a slightly tilted vibrating screen deck to accomplish the separation. A two-deck screen will be specified that can be run as a single screen deck by removing one of the screens. In the two-screen mode, it can do a coarse cut (e.g., more than 2", going perhaps to the crusher) and less than 2" but more than ½" (which may go the shredder for further size reduction).

The screen will be filled by dumping waste containers onto an apron using a drum hoist and bridge crane. A spreading feeder will be incorporated with the apron to assist in the feed of product. Wet, sticky material will have to be mixed first in the raw (or bulking) pug mill with a drying/bulking agent (e.g., coarse alumina silicate).

Discharge will be into 55-gallon drums or B-25 boxes from three separate chutes, each discharging a different size (e.g., <½"; between ½" and 2", and >2"). Particulate matter emissions will be exhausted via a side draft hood to a HEPA filter and then to RTO.

Crusher

A jaw crusher will be used for such feeds as concrete to reduce top size to less than ½" for feeding to the thermal desorber and to appropriate size for feeding the stabilizing pug mill, in conjunction with the other feed prep equipment (e.g., shredder and vibrating screen). The crusher has a fixed plate and a moving/pivoting plate that traps and breaks the feed due to rotation of an eccentric shaft. Crushing is an iterative, repetitive process, involving screening to remove and return oversize material back to the crusher. A single pass through the crusher may reduce the amount of oversize to 30%; the second pass would reduce it to 10%, etc.

The crusher will be filled by dumping waste containers into a top hopper using a drum hoist and bridge crane. The hopper will be capable of holding a load of at least 1.5 drums of material. The hopper will be open, easily detachable, and equipped with a chip shield or door over it. Wet, sticky material will have to be mixed first in the raw (or bulking) pug mill with a drying/bulking agent (e.g., coarse alumina silicate) prior to feeding the material into the crusher. Discharge will be into containers up to 55-gallon size or B-25 boxes via a transition chute. Particulate matter will be exhausted through a side draft hood to a HEPA filter, and then to the RTO.

Shredder

A shredder will be used to reduce top size to less than ½" for feeding to the thermal desorber. It will also be used to supply the appropriate size (e.g., 2" top size) to feed the stabilizing pug mill. The shredder will be used in conjunction with the other feed prep equipment, such as a crusher and vibrating screen. Shredding and screening are iterative, repetitive processes.

The shredder will be filled by dumping waste containers into a top hopper. The hopper will be capable of holding a load of at least 1.5 drums of material. The hopper will be open and easily detachable. Wet, sticky material will have to be mixed first in the raw (or bulking) pug mill with a drying/bulking agent (i.e., coarse alumina silicate). Discharge will be into containers up to 55-gallon size or B-25 boxes via a transition chute. Particulate matter will be exhausted through a side draft hood to a HEPA filter, and then to the RTO.

Pug Mills

Two dual-shaft, batch pug mills will be used, one for blending raw/incoming waste with bulking agents (e.g., alumina silicate), and the other for stabilizing thermally processed material or material that does not need to be thermally processed.

The pug mills will have a capacity between 48 to 96 cu ft (350 to 700 gallons) per batch. They will be capable of handling up to 2" top size and material from fine to coarse and dry to wet. Both will be provided with water spray bars. The pug mills will be equipped with variable frequency drives (VFD) to allow slow start, particularly when wetting dusty or reactive material.

For the raw waste pug mill, blending of raw wet waste with a bulking agent will produce little in the way of dust. However, any particulate matter generated will be exhausted through a side draft hood to a HEPA filter, and then to the RTO.

In the stabilizing pug mill, water and stabilizing regents will be added and blended with thermal desorber product or waste that does not need to be thermally processed. The stabilizing pug mill will be equipped with a retractable hood, with an 8" duct for exhaust, which will be through a carbon filter, and then a HEPA filter.

The pug mills will be filled by dumping waste containers using a drum hoist and bridge crane. Discharge will be into containers up to 55-gallon size or B-25 boxes, through a liquid-tight slide gate valve and a chute.

The feed preparation operations (screen, crusher, shredder, raw waste pug mill) are independent, and are carried out in batch mode. The unit operations may or may not operate simultaneously. This overall process is intended to be highly flexible. The feed preparation operations are iterative processes aimed at achieving required feed material size and consistency. The following matrix describes the potential material flow between different units.

	Prepares Material for the Following Other Unit Operations					
Unit Operation	Vibrating Screen	Crusher	Shredder	Raw Waste Pug Mill	Stabilizing Pug Mill	Thermal Desorber
Vibrating Screen	N/A	YES	YES	YES	YES	YES
Crusher	YES	N/A	YES	YES	YES	YES
Shredder	YES	YES	N/A	YES	YES	YES
Raw Waste Pug Mill	YES	YES	YES	N/A	YES	YES
Stabilizing Pug Mill	NO	NO	NO	NO	N/A	NO
Thermal Desorber	NO	NO	NO	NO	YES	N/A

Thermal Desorption

Figure II.I.2 provides a process flow diagram for the thermal desorption unit (i.e., thermal desorber), which will be electrically heated, with an hourly treatment capacity of 125 lbs. The thermal desorber will be a 3' diameter and 25' long rotary vessel. The thermal desorber is designed to operate at temperatures up to 1,400°F. Normal operating temperature is expected to be 1,200°F. The thermal desorber will be purged with nitrogen while in operation to prevent fires/explosions.

The vapor phase resulting from the thermal desorber will pass through a FeCr alloy filter prior to two water-cooled condensers. The condensate will be collected in an approximately 94-gallon condenser tank associated with each condenser. The uncondensed portion will be routed to the RTO.

The non-volatile residual solids from the thermal desorber will be cooled. The discharged solids may either be treated through the PF-I process or be disposed of off-site without PF-I treatment.

PF-II EQUIPMENT LIST AND DESCRIPTION

The equipment associated with the continuous PF-II process includes the reactor vessel, condensers, condensate tanks, cooling tower, air compressor, pumps, mist eliminator, and thermal oxidizer. The existing cooling tower, air compressors, pumps, and thermal oxidizer will be incorporated in the new process. The description of the new equipment is as follows.

Reactor Vessel

- Lochhead Haggerty electrically heated thermal desorber, 3' dia x 25' long, with AVESTA 253MA alloy tube suitable for 1,400°F service
- Lochhead Haggerty rotary cooler for product, 2' dia x 12' long
- Maximum power input for electric heating elements 100 kW
- Rated capacity, 3,000 lb/day for waste with 20% moisture and 20% organic
- Emissions controlled by condenser, particulate filter, mist eliminator, HEPA filter, and regenerative thermal oxidizer

Condensers and High Temperature Filter

- FeCr alloy metal filter dust collector upstream of condensers, duplex type
- Lochhead Haggerty condenser, 2-stage
- 4" diameter x 4' long tubes for the first condenser, and 12" diameter x 5'10" long tubes for the second condenser
- Shell and tube, carbon steel jacket
- Single pass, condensate exits into condensate tank
- Vertical mount

Condensate Tanks

- Two 24" dia x 4' long and 94-gallon horizontal SS tanks

Mist Eliminator

- 12" long x 6" OD coalescing type, downstream of condensers, inside condensate storage tank

ENVIRONMENTAL PERFORMANCE STANDARDS

Release Prevention

The hydrogeologic, geologic, and meteorological factors of concern for the PFF Facility site and surrounding areas are addressed in Section A of this permit application. For purposes of ensuring protection of human health and the environment, PFF will operate the PF-II process equipment in conformance with applicable container and tank standards. Appropriate secondary containment and air emission controls will be incorporated into the design and operation of the equipment.

Prevention of Releases to Groundwater or Subsurface Environment

Releases to groundwater or the subsurface environment from the PF-II treatment process are extremely unlikely for the following reasons:

- The process will manage relatively small volumes of material; i.e., approximately 125 lb per hour.

- The unit will be located within a secondary containment system designed to meet the requirements of 40 CFR 264, Subparts I and J. The containment system is designed to contain the entire volume of the waste being treated plus the volume of containers staged for processing. Ashford Formula, which is a concrete sealer and hardener, has been applied to the containment system floor and walls.

- The PF-II process area will be inspected each operating day in accordance with the Facility inspection plan. Leaks or spills from the system will be cleaned up immediately upon detection or as soon as it is practicable and safe to do so.

- The system is located within the TOB; i.e., the system is physically separated from the subsurface environment and groundwater.

- PFF maintains a Contingency Plan to provide a framework for PFF responses to emergencies such as spills, fires, or explosions. This plan provides procedures to respond to threats to human health or the environment from the PF-II process.

<u>Prevention of Releases to Surface Water, Wetlands, or Soil Surface</u>

Releases to surface water, wetlands, or soil surface from the PF-II process are also extremely unlikely for the reasons listed above.

<u>Prevention of Releases to Air</u>

Releases to air from the PF-II process are extremely unlikely for the following reasons:

- The system will be located within an enclosure inside the TOB. The enclosure will be equipped with an emissions control system. The emissions control system is designed to handle the volume of organic emissions anticipated from the process. See air emissions control system description below.
- Organic vapors released from the waste streams in the reactor vessel during processing will be routed to two condensers. Liquids from the condensers will be transferred to containers, while uncondensed vapors will be routed through the RTO.
- Emissions at loading points will be minimized by limiting the time the containers are kept open prior to processing.
- Emissions during unloading of the reactor vessel are minimal because the potential air contaminants will be significantly removed during processing.

Air Emissions Control System

PFF has installed and operates an organic emissions control system consisting of a regenerative (heat recovering) thermal oxidizer designed to control the emission of VOCs from the LSV processing area and the PF-II treatment operations enclosure in the TOB. The RTO will use thermal energy to destroy VOCs. The following provides an overview of the current system.

Process VOCs are delivered to the air emission control system fan. This fan provides the motive force for the system. From the fan, the air stream moves to a switching valve for distribution into one of two heat recovery chambers filled with ceramic media to provide heat transfer. Recovery of up to 95% of thermal energy is accomplished using ceramic media. The air stream travels upward through the ceramic media and is preheated by the heat previously absorbed (retained in the ceramic media) to a temperature of approximately 1,300°F prior to entry into the combustion chamber. In the combustion chamber, the temperature is raised to approximately 1,500°F by a burner, and the VOCs in the air stream are destroyed.

After destruction in the combustion chamber, the cleaned hot gases (air stream) pass downward through the second heat recovery chamber, where heat is absorbed by the ceramic media. The cooled air stream then discharges from the heat recovery chamber through a valve to the exhaust stack.

The RTO was designed, installed, and is operated in accordance with the applicable requirements of 40 CFR 264 Subpart AA (Air Emission Standards for Process Vents). See also Section II.R of this permit application.

Monitoring and Inspections

PFF personnel will monitor the PF-II process during process operations. The PF-II process area and equipment will be visually inspected each operating day for evidence of leaks or spills. The inspection will be in accordance with the requirements of the PFF inspection plan. The secondary containment system will also be inspected each operating day for evidence of cracks or breaches in containment as specified in the PFF inspection plan.

POTENTIAL PATHWAYS OF EXPOSURE OF HUMANS OR ENVIRONMENTAL RECEPTORS

PFF workers within the PF-II treatment enclosure are the most likely human receptors of exposure to chemicals or chemical constituents released from the PF-II process. The exposure is anticipated to be minimal because of the negative pressure maintained in the process area and the air emission control system provided for the PF-II process area. The primary pathway for human exposure from the PF-II process is air emissions (volatiles or particulates) generated during the loading and unloading of the feed preparation equipment and reactor vessels.

Personnel operating the system (or personnel present in the PF-II treatment enclosure for any other reason) are required to wear PPE selected to address the potential hazards identified for the wastes to be managed and the operating parameters of the system. The PPE selected will be in accordance with OSHA standards.

Environmental receptors outside of the PF-II treatment enclosure, such as soil, surface water, groundwater, and air, are unlikely to be impacted by the PF-II system due to the air pollution control system, the containment system, and the location of process equipment within a building that physically separates the process area from groundwater, the subsurface environment, and precipitation.

EFFECTIVENESS OF PERMA-FIX II PROCESS

The effectiveness of the PF-II process is dependent on the complexity of individual waste streams and individual hazardous waste organic constituents. Waste streams are subjected to the PF-II process until a sample of the treated waste indicates that it meets applicable land disposal restriction treatment levels. Experience has shown that preconditioning of the waste streams followed by thermal desorption has been highly successful and repeat processing cycles are rare.

APPLICABLE TANK STANDARDS

The PF-II process contains several components that have been certified in accordance with certain tank standards, as specified in 40 CFR 264.192. Management practices for ignitable, reactive, and incompatible wastes at the facility have been designed to minimize the potential for fires, explosions, gaseous emission, leaching, or other discharge of hazardous waste or hazardous waste constituents that could result from the mixing of incompatible wastes or materials if tank systems ruptured or failed. PFF will not place incompatible wastes or incompatible wastes and materials in the same tank or tank-like system per the requirements of 40 CFR 264.17(b). In addition, hazardous waste will not be placed in a tank or tank-like system that previously held an incompatible waste or material and has not been decontaminated per the requirements of 40 CFR 264.17(b).

Where ignitable or reactive waste will be stored or treated in a tank or tank-like system, the permittee will comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon as required in the NFPA code[4].

In addition, ignitable or reactive waste will not be placed in tank or tank-like systems, unless the waste is treated, rendered, or mixed before or immediately after placement in the tank system so that:

- The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under 40 CFR 261.21 or 261.23 and the requirements of 40 CFR 264.17(b) are complied with; or
- The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react; or
- The tank system is used solely for emergencies.

[4] National Fire Protection Association (NFPA), "Flammable and Combustible Liquids Code," Tables 2-1 through 2-6, 1990. NFPA Tables 2-1 through 2-6, 1977 or 1981, are incorporated by reference into 40 CFR 260.11.

New Tank Standards – Tank Assessment

An as-built written certification by a qualified, professional engineer registered in the state of Florida for the PF-II process components for handling hazardous waste will be submitted to the FDEP after the construction is completed.

External Corrosion Protection

The PF-II process equipment is located indoors; hence, it is protected from the weather.

Tank Installation and Testing

Prior to placement of a tank or tank-like system in hazardous waste service, an independent, qualified installation inspector or a qualified professional engineer will inspect the tank system for the following items:

- weld breaks;
- punctures;
- scrapes of protective coatings;
- cracks;
- corrosion;
- other structural damage or inadequate construction/installation.

Descriptions of Feed Systems, Safety Cut-offs, Bypass Systems, and Pressure Controls

The PF-II treatment process includes enclosed vessels equipped with loading and unloading ports and vents. The reactor vessel is loaded at the top, and contents are piped through downstream equipment via hard piping. An auger will be used to unload the treatment residues from the reactor vessel into the stabilization pug mill or into a container. As appropriate, man ways are used for inspection and cleaning operations.

Piping between components will be regulated by valves (or equivalent devices). Typically, the rigid lines will be attached to the tanks by flange couplings. The pressure control system for components will consist of thief hatches with a combination of normal venting and a vacuum breaker. A nitrogen purge system will be used to minimize the potential for fires or explosions.

Piping, Instrumentation, and Process Flow

Details of piping and instrumentation will be provided as as-built drawings to FDEP. A conceptual process flow diagram for the PF-II system is provided in Figure II.I.2.

Containment of Releases

The PF-II process line is located within secondary containment in accordance with the applicable requirements of 40 CFR 264.192. PFF operating procedures include inspections designed to identify spilled wastes in a timely manner. Detailed inspection logs are maintained in the Facility Operating Record for a period of at least three years. After discovery, spilled liquids will be removed from the collection area in as timely a manner as is necessary to prevent overflow of the collection system. Spilled wastes will be identified by visual observation, review of Facility records, and, if necessary, by chemical analysis. If required, analyses will be conducted in accordance with the Facility WAP.

FACILITY CLOSURE PLAN UPDATE

The facility Closure Plan (i.e., Part K of the permit application) will be updated to include the new PF-II equipment, and this updated Closure Plan will be submitted to FDEP prior to operating such equipment.

SUBPART AA, BB, AND CC AIR EMISSION STANDARDS

Parts R and S of the current permit application will be revised appropriately to include the modified PF-II process and will be submitted to FDEP prior to operating the new PF-II equipment.

Perma Fix® II Processing Area
Secondary Containment Calculations

List of equipment situated inside secondary containment, with a minimum height of 4":

Unit	Volume, gal.
Condensate storage tanks	188
Drum Tumbler	160 (maximum)
Pug Mills (2)	980 (for both)
Up to 20 drums of waste	1,100
Liquid Collection Tote	550
Total	2,978

The volume these units displace is considered negligible, since only legs and support rails are in contact with the floor, except for the 20 drums of waste.

List of equipment situated inside secondary containment not elevated from the floor:

Up to twenty 55-gallon drums staged for processing displace a total of approximately 207 gallons at 6" berm height.

Approximate dimensions of feed prep room and compactor room:

40' x 40' + 10' x 35' + 15' x 28' = 2,370 ft^2

Spill volume contained by a minimum of 4" berm:

2,370 ft^2 x 4/12 ft = 790 ft^3

790 ft^3 x 7.48 gal/ft^3 = 5,909 gal

Actual spill volume contained by 4" berm:

5,909 gal - 207 gal (volume displaced by 20 drums) = 5,702 gal

Percent of total unit volume contained by the secondary containment:

5,908 / 2,978 = 1.91 (or 191%)

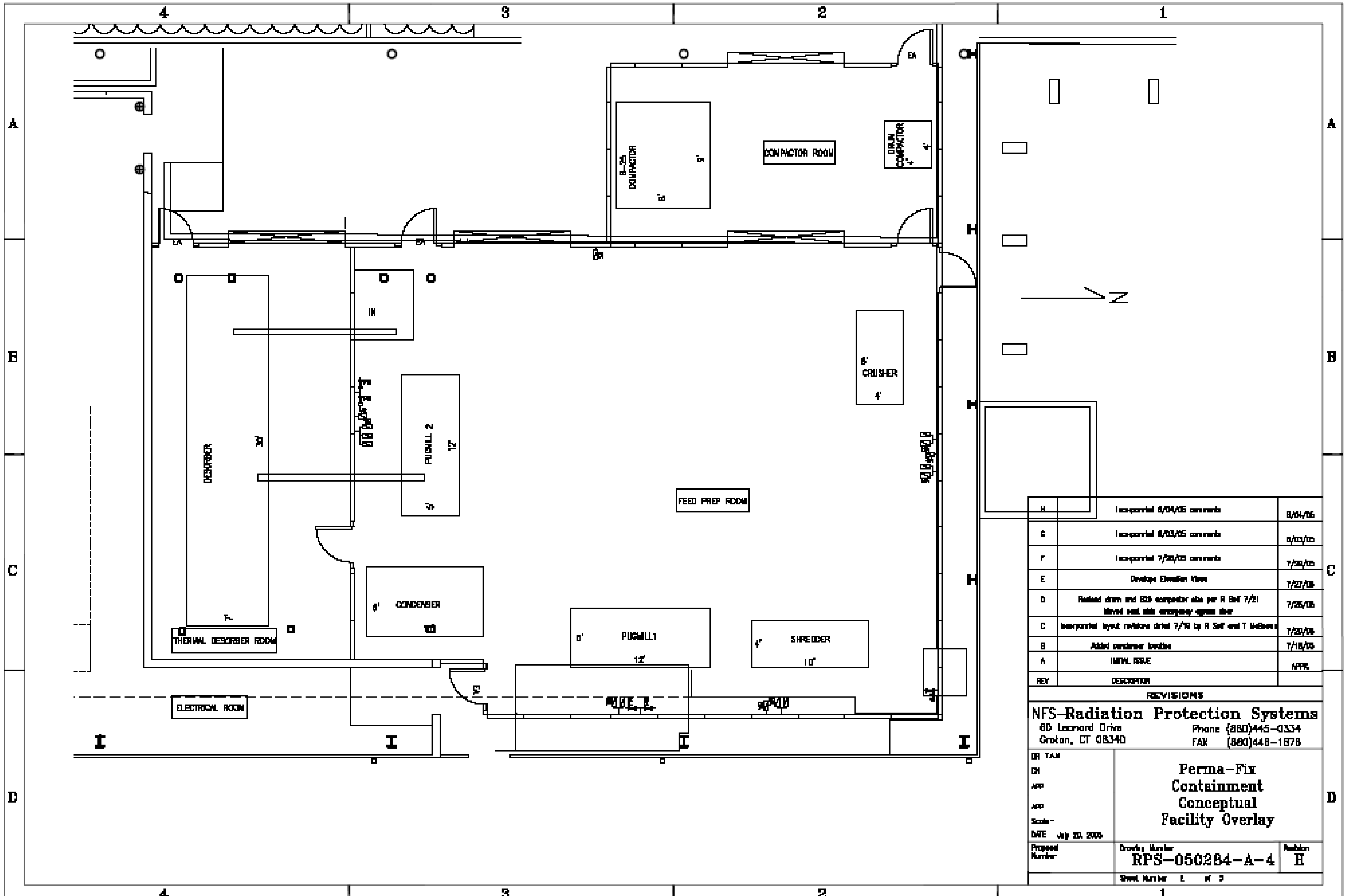
Conclusion:

Adequate capacity exists to contain 10% of the total potential volume of waste and the volume of the largest liquid container (550 gal) to be placed in the Perma-Fix II® process area. Occasionally, B-25 (720 gallon capacity) and B-12s (360 gallon capacity) containers of waste solid may be present in the TOB for consolidation activities. Since these containers hold non-liquid wastes, containment is not required; hence, these containers are not included in the above calculations.

FIGURE II.I.1

PROPOSED PF-II PROCESS LAYOUT

FIGURE II.I.1
PROPOSED PF-II PROCESS LAYOUT



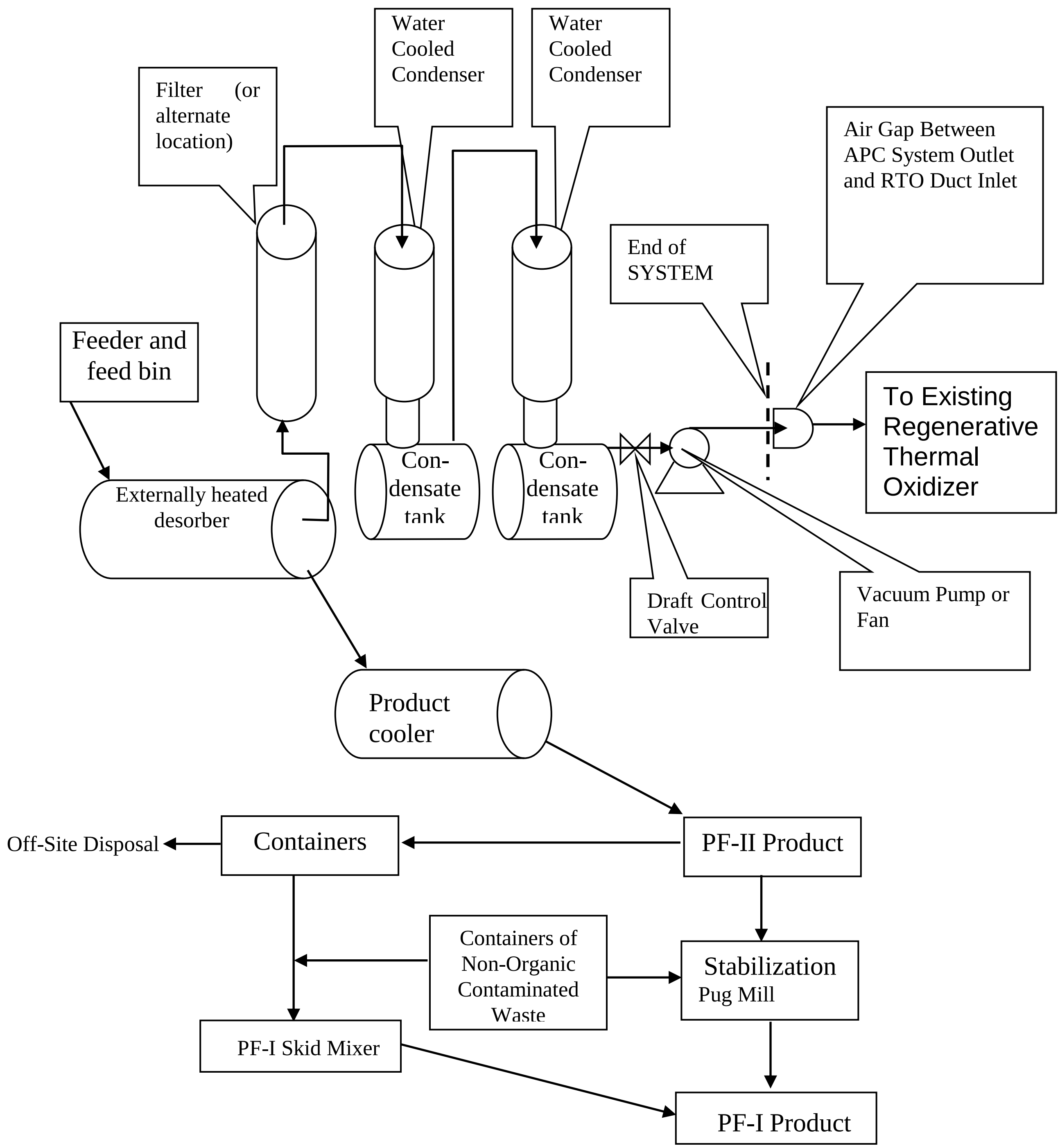
ATTACHMENT II.I.7

FIGURE II.I.2

PROCESS FLOW DIAGRAM

FIGURE II.I.2

PROCESS FLOW DIAGRAM
PF-II AND PF-1 PROCESSES



APPLICATION FOR HAZARDOUS WASTE PERMIT

PART II

K CLOSURE PLAN

K1 Introduction

This section contains a discussion of the steps that shall be taken should PFF decide to partially or completely close hazardous waste operations at the Facility during the intended operating life. Procedures to be used for an unplanned partial closure are, as applicable, similar to the procedures outlined for final closure.

The Closure Plan has been prepared to meet the requirements of Subpart G of 40 CFR 264. This written plan for closure of hazardous waste management units will be amended, and written notification of or request for a permit modification to authorize the change in the approved Closure Plan will be submitted to the FDEP, whenever:

- Changes in operating plans or Facility design affect the Closure Plan; or,
- In conducting partial or final closure activities, unexpected events require a modification of the approved Closure Plan.

Any modifications to this Closure Plan after the Part B permit is renewed for PFF will be made in accordance with the requirements of 40 CFR 270.42 and Rule 62-730.290, F.A.C. Copies of the approved Closure Plan for the Facility will be maintained at the Facility office until the FDEP has notified PFF of satisfactory closure after reviewing the closure certification.

PFF will submit the notification or request for a permit modification including a copy of the amended Closure Plan, for approval by FDEP, at least sixty (60) days prior to any proposed change in Facility design or operation, or no later than sixty (60) days after an unexpected event has occurred which has affected the Closure Plan. If an unexpected event occurs during the partial or final closure period, PFF will notify FDEP as soon as possible and will submit a request for a permit modification no later than thirty (30) days after the unexpected event; or will not submit a permit modification request (if agreed to by FDEP), and changes to the approved Closure Plan will be documented in the Closure Report. PFF will attempt to meet or discuss with FDEP prior to submitting a permit modification regarding any rule changes that could affect the closure plan.

A closure schedule is provided in Section K4, Table K-2. PFF will close hazardous waste tank and container management units in accordance with this Closure Plan unless an alternate partial or final Closure Plan has been approved by FDEP. In accordance with 40 CFR 264.112(e), this Closure Plan shall not preclude PFF from removing hazardous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final Closure Plan at any time before or after notification of partial or final closure.

At the time of closure, all regulated hazardous waste management units and ancillary equipment will be decontaminated and left in place, or dismantled and disposed of properly. Within 180 days of receipt of the final waste shipment, the complete waste inventory will be taken for off-site treatment, storage, or disposal, as appropriate. Closure of the permitted units will be completed within 180 days of initiation of closure. In accordance with the requirements of 40 CFR 264.115, PFF will submit to FDEP, by registered mail, a certification that the hazardous waste facility has been closed in accordance with specifications in the approved Closure Plan. The certification, to be submitted within 60 days of the completion of final closure, will be signed by PFF and by a qualified professional engineer registered in the state of Florida.

PFF will close the facility in a manner that minimizes the need for further maintenance; controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground, surface waters, or atmosphere; and complies with the closure requirements of 40 CFR 264, Subpart G.

A description of the closure procedures to be used to close the existing hazardous waste container storage areas and tank is located in Section K7. Closure procedures for the proposed units (i.e. Continuous PF-II process) are also presented in Section K7. Closure of the hazardous waste container storage areas and tank and the proposed Continuous PF-II process will be conducted such that no post-closure care shall be necessary.

In the event that the clean closure criteria presented in Section K6 cannot be achieved, a closure/post-closure plan will be submitted to the FDEP. The Closure Cost Estimate presented in Attachment K-2 conservatively assumes that hazardous waste inventory will be treated or disposed of off-site; closure activities will be carried out by third party personnel; and decontaminated equipment will remain on-site. This scenario assumes a “worst case” closure situation.

There is no on-site disposal activity of hazardous waste at the Facility; therefore, there is no disposal capacity to be exhausted. It is anticipated that the Facility will remain in operation at least until the year 2050.

K2 FACILITY DESCRIPTION

The Facility is located in Gainesville, Florida. The street and the mailing address for the operation is:

<u>Perma-Fix of Florida, Inc.</u>
1940 N.W. 67th Place
Gainesville, Florida 32653

A copy of the Closure Plan or the most recent plan revision is maintained at the Facility. It is intended that all closure work will be completed and final with processing and/or removal of all hazardous waste, followed by cleaning and decontamination of the Facility and equipment used in hazardous waste receipt, storage, processing, transfer, and handling; and disposing of wastes generated during closure activities.

K2.1 Identification of RCRA Permitted Units

Closure procedures will be performed on the following units which are/will be utilized for the storage and treatment of hazardous waste during operation of the RCRA facility:

Processing and Storage Building

Container Storage Area
3,000-Gallon Storage Tank

LSV Building

110-Gallon LSV Fluids Tank Underneath the Outfeed Belt
275-Gallon Test Tank521-Gallon Portable Debris Vat (Dip Tank)
Shredder
Container Storage Area

Treatment and Operations Building

317-Gallon Reactor Vessel
120-Gallon Accumulator Tank
30-Gallon Absorber Tank
16-Gallon Condenser
Container Storage Area
300-Gallon Non-Elementary Neutralization Tank
Maximum 55-Gallon Capacity Deactivation Unit
Maximum 170-Gallon Capacity Dual Drum Rotator
Maximum 15-Gallon Mercury Amalgamation Unit

The last four units listed above for the TOB are portable and can be used in the PSB and LSV buildings.

The locations of the existing and proposed units are shown in Figures K1, K2, and K3 (see also Figure I.B.2 in Part I of this application). The proposed units are vibrating screen, crusher, shredder, pug mills when a continuous PF-II process is constructed.

Ancillary equipment scheduled for closure will consist of the following:

- Pumps;
- Piping;
- Hoses;
- Connectors;
- Valves; and
- Flanges.

Other equipment scheduled for closure will consist of the following:

- Grinders;
- Strainers;
- Forklifts;
- Conveyors;
- Screens; and,
- Sorting Table.

K2.2 Operating Records

The operating records associated with the Closure Plan include:

- Closure Plan (A copy of the Closure Plan and current amendments is maintained in the Facility Operating Record.);
- Closure Cost Estimate (The Closure Cost Estimate and all amendments or annual adjustments for inflation will be maintained in the Facility Operating Record.); and
- Financial Assurance document(s) to cover the closure cost estimate.

K3 MAXIMUM CLOSURE INVENTORY

The required estimate for maximum waste inventory at the time of closure is based on the condition that Facility tanks and container storage areas are full of material. The maximum capacity of the existing Facility is 166,574 gallons of hazardous waste. The tabulated compilation of this maximum inventory is tabulated in Table K-1 below.

TABLE K-1

MAXIMUM INVENTORY

DESCRIPTION	CAPACITY (Gal)
EXISTING UNITS	
Container Storage Area (Processing and Storage Building) 1311 equivalent 55 gallon drums	72,105
Storage Tank (Processing and Storage Building)	3,000
Storage Tanks (LSV Processing Area)	385
Container Storage Area (Treatment and Operations Building)	35,200
640 equivalent 55 gallon drums	
Reactor Vessel (Treatment and Operations Building)	317
Treatment Tank (Condenser)	16
Treatment Tank (Accumulator Tank, Treatment and Operations Building)	120
Treatment Tank (Absorber Tank, Treatment and Operations Building	30
Debris Treatment Vat (Dip Tank)	521
Container Storage Area (LSV Processing and Waste Storage Warehouse)	54,340
Portable Non-elementary Neutralization Tank	300
Portable Deactivation Unit	55
Portable Dual Drum Rotator	170
Portable Mercury Amalgamation Unit	15
TOTAL	166,574

K4 CLOSURE TIME SCHEDULES

An outline of the Closure Time Schedule is summarized as follows:

Closure Activity	Timing Requirements
Remove all hazardous waste from unit being closed	Within 90 days after receipt of the known final volume of waste
Complete closure plan activities	Within 180 days after receipt of the known final volume of waste
Submit certificate of closure completeness	Within 60 days of completion of facility closure work

If it is expected that closure activities will take longer than 180 days to complete, PFF will apply for an extension to the closure period from the FDEP. This request will be made at least 30 days prior to expiration of the allowable 180-day period.

Table K-2 below presents a facility closure schedule for the different closure activities. As indicated in Table K-2, some of the closure activities will be occurring simultaneously.

TABLE K-2

FACILITY CLOSURE SCHEDULE

Closure Activity	Days Elapsed
Notification in writing to FDEP of intent to begin closure activities.	-45
Receipt of known final volume of hazardous waste into container or tank management unit or receipt of FDEP approval of Closure Plan, whichever is later[1].	0
Begin treatment and/or removal of all hazardous wastes from container or tank unit(s)[2].	30
Complete treatment and/or removal of all hazardous wastes from container or tank unit(s).	90
Complete removal and decontamination of ancillary equipment, miscellaneous units, tanks, and empty containers that have contacted hazardous waste.	120
Complete decontamination of secondary containment structures.	135
Conduct soil sampling activities.	165
Complete final closure activities.	180
Submit certification to FDEP (signed by PFF and a qualified professional engineer) that the hazardous waste management units have been closed in accordance with the specifications of the approved Closure Plan.	240

[1]If an unexpected event during closure of a hazardous waste management unit requires modification of the approved Closure Plan, PFF will request a permit modification within 30 days of the unexpected event.

[2]In event that there is a reasonable possibility that the hazardous waste management unit will receive additional hazardous wastes, PFF will initiate closure activities no later than one year after the date on which the unit received the most recent volume of hazardous waste as specified under 40 CFR 264.112(d)(2).

K5 AMENDMENTS TO CLOSURE PLAN

PFF can foresee possible future needs for modifications to this Closure Plan. These could be associated with changes in Facility design or in operating plans. Specific requirements for amending the Closure Plan, if applicable, are contained in 40 CFR 264.112(c)(2) and (3) and will be met. Written requests for approval of Closure Plan amendments, if required, will be in accordance with 40 CFR 264.112(c). If an unexpected event affects the Closure Plan, a written request for a modification to the Plan will be submitted within 60 days of the event.

K6 CLOSURE PERFORMANCE STANDARDS

Closure procedures will be performed on the RCRA units, identified in Section K2.1, which are utilized for the processing and/or storage of hazardous waste during operation of the Facility.

The RCRA units will be closed in a manner that will eliminate the need for further post-closure maintenance or remediation and will be protective of human health and the environment. The potential for release of hazardous waste or hazardous waste constituents to groundwater, surface water, soil, or to the atmosphere after final closure of the Facility will be eliminated as a result of successful implementation of this Closure Plan.

During closure, all wastes that exist on-site will be shipped off-site for proper treatment and/or disposal. The contaminated equipment will either be decontaminated as appropriate to provide for future reuse, recycled as scrap, or disposed of off-site. The decontamination residues generated will be disposed of off-site for proper treatment and/or disposal.

If, due to naturally-occurring or pre-hazardous waste operating conditions, the following clean closure standards cannot be applied, an alternate (hybrid) closure standard may be established for individual units. PFF will submit to the FDEP copies of analytical results obtained during closure activities and proceed with additional investigations around suspect sample locations, if deemed necessary. Any additional subsurface investigations will define the extent and magnitude, as is practical, for that unit.

Additional investigation procedures will be similar to those specified in Attachment K-1 and will continue until the extent of potential contamination is assessed. Once the additional investigation activities are completed, the resulting data will be evaluated to determine if a risk assessment will be performed or if corrective action activities will be implemented. Closure verification data, analytical results, and certification reports will be submitted to the FDEP.

Prior to conducting additional investigation activities or performing a risk assessment, PFF will submit a written work plan to FDEP, and a permit modification request will be made if advised by FDEP.

All final rinsewater samples will exhibit constituent concentrations that meet Florida's groundwater standards and minimum criteria listed in Chapter 62-777, Florida Administrator Code (F.A.C.). For the parameters that are not listed in these Chapters, final rinsewater samples shall exhibit constituent concentrations that are protective of human health and the environment.

Adequate protection of human health and the environment may be demonstrated either by using Florida's risk assessment methodology found in Rule 62-780.650, F.A.C., or alternatively PFF may use Florida's groundwater and/or soil cleanup Target Levels listed in Chapter 62-777, F.A.C.

K6.1 Tank Closure Standards

In order to verify that the tanks have been properly decontaminated, the tanks shall be considered clean-closed when sampling verifies that each final rinsate sample exhibits constituent concentrations below those levels listed in "Table I: Groundwater and Surface Water Cleanup Target Levels for Chapter 62-777, F.A.C." (See Table K-3 for a summary of closure performance standards for tanks). FDEP guidance or rules pertaining to acceptable rinsate levels available at the time of closure may be used in lieu of Table I.

Final rinsate samples will be collected and analyzed for constituents identified in 40 CFR 261 Appendix VIII that have been stored at the facility as well as any degradation and reaction products. To achieve the clean closure standard, each tank and associated ancillary equipment will be initially emptied of all hazardous wastes (i.e., liquids and solids). Subsequently, each tank and associated equipment will be cleaned and rinsed adequately to achieve the clean closure standard. Rinsates generated during tank and equipment cleaning will be managed as a hazardous waste, with the exception of final rinsates that meet the clean closure performance standard.

TABLE K-3

CLOSURE PERFORMANCE STANDARDS

UNIT	CLOSURE PERFORMANCE STANDARDS	
	Media Sampled	**Closure Standard**
Tanks	Rinsewater	Table I Groundwater and Surface Water Cleanup Target Levels for Chapter 62-777, F.A.C., or the risk Assessment Methodology provided in Chapter 62-780, F.A.C.
Container Storage Area's Secondary Containment	Rinsewater	Table I Groundwater and Surface Water Cleanup Target Levels for Chapter 62-777, F.A.C., or the risk Assessment Methodology provided in Chapter 62-780, F.A.C.
	Concrete	Table II Soil Cleanup Target Levels for Chapter 62-777, F.A.C., or the Risk Assessment Methodology provided in Chapter 62-780, F.A.C.
Subsurface Investigations	Soil	Table II Soil Cleanup Target Levels for Chapter 62-777, F.A.C., naturally-occurring background concentrations, or the Risk Assessment Methodology provided in Chapter 62-780, F.A.C.
Ancillary Equipment & Miscellaneous RCRA Units	Rinsewater	Table I Groundwater and Surface Water Cleanup Target Levels for Chapter 62-777, F.A.C., or the Risk Assessment Methodology provided in Chapter 62-780, F.A.C.

Following final tank and equipment rinsing, the following options, dependent upon rinsate analysis, may be exercised.

1) If the final rinsate meets the clean closure standard, no end use restrictions shall be placed on decontaminated tanks or process equipment, and closure of each tank unit will be deemed final.
2) Tanks or process equipment that cannot meet the clean closure standard will be recycled as scrap metal.

The secondary containment structures associated with tanks will also undergo decontamination activities and will be decontaminated to the standards identified in Section K6.2. Detailed closure procedures for tanks are further discussed in Section K7.1.1.

K6.2 Secondary Containment Closure Standards

In order to verify that secondary containment areas have been properly decontaminated, the units shall be considered clean-closed when sampling verifies that either 1) the final rinsewater demonstrates compliance with either Table I Groundwater and Surface Water Cleanup Target Levels for Chapter 62-777, F.A.C., or the Risk Assessment Methodology provided in Chapter 62-780, F.A.C., or 2) concrete samples demonstrate clean closure upon meeting the Table II Soil Cleanup Target Levels for Chapter 62-777, F.A.C. See Table K-3 for a summary of closure performance standards for secondary containment areas.

Final rinsate samples or concrete samples will be collected and analyzed for hazardous constituents identified in 40 CFR 261, Appendix VIII that have been previously stored at the facility. To achieve the clean closure standard, the secondary containment areas will be decontaminated by scrubbing down all surfaces, and subsequently pressure washing and rinsing the surfaces.

Rinsates generated during decontamination activities will be managed as a hazardous waste, with the exception of the final rinsates that meet the clean closure standard.

Following final rinsing, the following options, dependent upon rinsate analysis and/or concrete analysis, may be exercised.

1) If the final rinsate or concrete samples meet the clean closure criteria, no end use restrictions shall be placed on the decontaminated units, and closure of the unit will be deemed final.
2) Concrete that cannot meet the clean closure criteria will be removed and disposed of. If the concrete is not contaminated by a known listed waste and if it passes TCLP, concrete will be managed as a non-hazardous waste.

Detailed closure procedures for secondary containment areas are further discussed in Section K7.1.2.

K6.3 Ancillary Equipment and Miscellaneous RCRA Units Closure Standards

In order to verify that ancillary equipment and miscellaneous RCRA units have been properly decontaminated, the equipment shall be considered clean-closed when field sampling verifies that the final rinsate sample exhibits constituent concentrations below the Table I Groundwater and Surface Water Cleanup Target Levels for Chapter 62-777, F.A.C., or the Risk Assessment Methodology provided in Chapter 62-780, F.A.C. See Table K-3 for a summary of closure performance standards for ancillary equipment.

Final rinsate samples will be collected and analyzed for constituents identified in 40 CFR 261, Appendix VIII that have been previously stored at the facility. To achieve the clean closure standard, the ancillary equipment and miscellaneous RCRA units will be initially emptied of all hazardous wastes (i.e., liquids and solids). Subsequently, the equipment will be cleaned and rinsed adequately to achieve the clean closure standard. Rinsates generated during equipment cleaning will be managed as a hazardous waste, with the exception of final rinsates that meet the clean closure standard. Following final equipment rinsing, the following options, dependent upon rinsate analysis, may be exercised.

1) If the final rinsate meets the clean closure standard, no end use restrictions shall be placed on decontaminated equipment, and closure of the ancillary equipment or miscellaneous RCRA unit will be deemed final.
2) Equipment (composed of steel) that cannot meet the clean closure standard will be recycled as scrap metal. Non-ferrous equipment will be recycled to the extent feasible as non-hazardous waste; otherwise, it will be disposed of as hazardous waste.

Detailed closure procedures for ancillary equipment and miscellaneous RCRA units are further discussed in Section K7.1.3.

K6.4 Subsurface Investigation Closure Standards

Subsurface investigations will be conducted at the secondary containment areas where hazardous wastes were previously stored. In order to verify that the soil underlying these areas has not been impacted with hazardous waste or hazardous waste constituents, the soil underlying these units shall be considered clean-closed when representative soil samples exhibit constituent concentrations below the Table II Soil Cleanup Target Levels for Chapter 62-777, F.A.C., naturally-occurring background concentrations, or the Risk Assessment Methodology provided in Chapter 62-780, F.A.C. See Table K-3 for a summary of closure performance standards for subsurface investigations. To meet the clean closure criteria, any contaminant remaining in the soil below Table II Soil Cleanup Target Levels must not leach contaminants into groundwater above Groundwater Cleanup Target Levels (GCTLs), if GCTLs for such contaminant is listed in Table I of Chapter 62-777, F.A.C.

Soil samples will be collected and analyzed for constituents identified in 40 CFR 261, Appendix VIII that have been previously stored at the facility. To verify clean closure of the secondary containment areas, a subsurface investigation will be conducted at these areas as presented in Attachment K-1.

Following receipt of analytical results, the following options may be exercised.

1) If the soil results meet the clean closure standard, no end use restrictions shall be placed on the units.
2) If soil results exceed the clean closure standard, additional subsurface investigations will be performed to define the extent and magnitude of constituent contamination, or the Facility may utilize the Risk Assessment Methodology provided in Chapter 62-780, F.A.C.
3) Upon defining the extent and magnitude of constituent contamination, a risk assessment will be performed or corrective action activities will be conducted.

Detailed subsurface investigation activities are discussed in detail in Attachment K-1.

K7 CLOSURE PROCEDURES

The following subsections outline the procedures for partial and final closure of the units at the Facility. During partial and final closure of the units, a decontamination area/station will be set up for the cleaning of equipment used during closure (tools, machines, material handling equipment, etc.). Shower facilities, cleaning equipment, and decon supplies will be available to workers performing closure activities. All potentially contaminated rinsewater, debris, and personal protective equipment (PPE) will be containerized in a tank(s), or deposited in containers for subsequent characterization and management at an off-site treatment, storage, or disposal facility (TSDF). A separate Closure Sampling and Analysis Plan is presented in Attachment K-1.

K7.1 Partial Closure Activities

Required partial closure notices will be submitted as specified in 40 CFR 264.112(d) to the following:

Waste and Air Resources Management Administrator
Florida Department of Environmental Protection
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7577

K7.1.1 Tank Closure

Standard tank cleaning activities associated with tank closure shall consist of the following procedures.

- Drain all liquid materials from the tank through the lowest fitting on the tank. Transfer the liquid contents to a different container for transportation off-site.

- Test for explosive vapors and oxygen content using standard instrument procedures before entering in a tank.
- Remove any solids that may have settled out of the liquid at the bottom of the tank. This may include the use of self-priming, high-clearance centrifugal pump(s) or rental vacuum pump unit(s). Some more compacted solids may have to be removed manually within the tank and transferred to externally located roll-off bins for temporary on-site storage and final disposal at an off-site TSDF. Removal procedures will follow standard confined space entry procedures.
- Use a high-pressure wash with detergent for cleaning the interior of each tank and associated fittings and piping. After use, transfer the potentially contaminated rinse water to a transport container for transport off-site.
- Open the tank access ports. Allow the tank to dry out.
- Inspect the tank interior for visual cleanliness. Repeat the above steps, if necessary.
- Analyze the final rinse water, using methods outlined in Attachment K-1, to check for the presence of constituents identified in Section K6.1. The tank will be certified as clean-closed (decontaminated) when analytical results on the final rinse water indicate that levels of constituents are below the closure criteria identified in Table K-3.

The tank cleaning procedures listed above will also be followed during final closure to decontaminate the associated tank appurtenances (piping, fittings, nozzles, valves, pumps etc.). A partial closure of these items may occur during the normal operations of the Facility and may include washing in parts washers and/or power washing and other methods to remove visible signs of contamination prior to reuse or scrapping for metal recovery.

Following cleaning/decontamination activities, one of the options identified in Section K6.1 will be initiated.

K7.1.2 Container Storage Facilities and Secondary Containment Area Closure

Standard cleaning activities associated with container storage facilities and secondary containment areas closure shall consist of the following procedures.

- Process all existing wastes stored in containers or ship the containers to an off-site RCRA permitted TSDF.
- Dispose of all empty containers through an authorized drum recycler/disposal facility.
- Examine the containment structures for evidence of cracks, stains, spills, or residuals, as well as review past operating records for information on past spills or leaks. These activities will form the basis for selection of sampling locations.
- Decontaminate the units by scrubbing down all surfaces and subsequently pressure washing the surfaces with detergent solution followed by a clean water rinse.
- Collect a final rinse water sample and analyze the sample, using methods outlined in Attachment K-1, to check for the presence of constituents identified in Section K6.1. The structures will be deemed clean-closed when analytical results on the final rinse water indicate that levels of constituents are below the closure criteria identified in Table K-3, or PFF may elect to forgo collecting a rinse water sample and collect a concrete sample.

The concrete sample will be collected and analyzed utilizing the methods outlined in Attachment K-1, to check for the presence of constituents identified in Section K6.1. The structures will be deemed clean-closed when analytical results of the concrete indicate that levels of constituents are below the closure criteria identified in Table K-3.

Following cleaning/decontamination activities, one of the options identified in Section K6.2 will be initiated.

K7.1.3 Ancillary Equipment and Miscellaneous Unit Closures

Routine operational replacement of ancillary equipment, such as filter canisters and baskets, shredders, grinders, pumps, valves, piping, hoses and fittings, etc., may require removal and partial closure during the life of the Facility. This section addresses the "partial closure" of these items during the normal routine operations of the Facility, prior to reuse, recycle for scrap metal recovery, or disposal as non-hazardous waste. Additionally, this section addresses the closure of the miscellaneous RCRA unit (i.e., Perma-Fix® II process).

ANCILLARY EQUIPMENT

Standard cleaning activities associated with ancillary equipment replacement include the following procedures.

- Isolate and remove all liquid holdup from the equipment through the fitting(s) situated at the lowest level to ensure proper drainage. A vacuum pump may be used, if necessary. Transfer the liquid contents to a tank/container that is in hazardous waste service for further processing and/or proper disposal.
- Remove any solids/slurry that may have settled out at the bottom sections, using a vacuum pump, if necessary. Transfer the solids/slurry contents to a tank/container that is in hazardous waste service for further processing and/or proper disposal.
- Cleaning of the parts and/or equipment using parts washers; recirculation of virgin, waste, or recycled solvents such as alcohols, ketones, aliphatic hydrocarbons, etc.; and/or high-pressure wash with detergent solution and other methods to remove visible signs of contamination.
- Inspect the equipment for visual cleanliness. Repeat the above steps, if necessary. Visual cleanliness will be the adequate closure criteria for ancillary equipment, prior to disposal as scrap metal.
- If rinse water is used, analyze the rinse water, using methods outlined in Attachment K-1, to check for presence of constituents identified in Section K6.1. The equipment will be deemed clean-closed when analytical results of the final rinse water indicate that levels of constituents are below the closure criteria identified in Table K-3.
- Equipment that meets the clean closure criteria will be removed from service. Equipment that does not meet the criteria will have the cleaning steps repeated until it meets the requirements, or will be disposed at an off-site facility as hazardous waste, or it will be disposed of as scrap metal.

Cleaning solutions, rinse waters, and other liquids resulting from cleaning activities will be collected and sent off site for proper treatment or disposal. Following cleaning and decontamination, the parts and/or equipment will be available for reuse, recycle for scrap metal recovery, or disposal as non-hazardous waste.

MISCELLANEOUS UNIT CLOSURE

- Drain all liquid materials from each piece of equipment listed in Attachment II.I.1 that is associated with the Perma-Fix® II process (i.e., miscellaneous unit). Drain liquids from the lowest fitting on the equipment or tank.
- Transfer the liquid contents to a different container (if required) for transport off-site.
- Remove any hazardous waste solids or liquids that may remain in the unit. This may include the use of self-priming, high-clearance centrifugal pump(s) or rental vacuum pump unit(s). Compacted sludge solids may have to be removed manually from each piece of the unit and transported to externally located roll-off bins for temporary on-site storage and final disposal at an off-site TSDF. Removal procedures will follow standard confined space entry procedures and will be conducted by qualified individuals.
- Pressure wash with appropriate detergent for cleaning and decontaminating the interior of each piece of equipment and all associated valves, fittings, piping, and pumps.
- Transfer the potentially contaminated rinse/wash water to a transport container for transport off-site.
- Open all access ports, drains, valves, etc. Allow the equipment's interior and exterior to dry out.
- Test for explosive vapors and oxygen content using standard instrument and industrial hygiene/safety procedures.
- Inspect the interior of each tank, reservoir, or piece of ancillary equipment.
- Gather a composite final rinsewater sample from the miscellaneous unit.
- Analyze the final rinsewater, using methods outlined in Attachment K-1, to check for the presence of constituents identified in Section K6.1. The miscellaneous unit will be deemed clean-closed (i.e., decontaminated) when analytical results of the final rinse water indicate that levels of hazardous constituents are below the closure performance standard specified in Table K-3.
- Equipment that meets the clean closure criteria will be removed from service. Equipment that does not meet the criteria will have the cleaning steps repeated until it meets the requirements or will be disposed at an off-site facility as hazardous waste, or it will be disposed of as scrap metal.

Cleaning solutions, rinse waters, and other liquids resulting from cleaning activities will be collected and sent off-site for proper treatment or disposal. Following cleaning and decontamination, the parts and/or equipment will be available for reuse, recycle for scrap metal recovery, or disposal as non-hazardous waste.

K7.1.4 Subsurface Investigation Activities

As a means of demonstrating that hazardous constituents have not impacted soils underlying and surrounding the container storage facilities, a subsurface investigation will be conducted at these units.

Detailed subsurface investigation activities are provided in Attachment K-1.

K7.2 Final Closure Activities

It is anticipated that the Facility will remain open and in operation until at least the year 2050. Final closure activities will follow the procedures presented in this section.

Final closure activities will basically follow the same procedures described in Section K7. However, prior to final closure of the Facility, the FDEP will be notified of the intent to close the Facility. After receiving approval from the Agency to implement the Closure Plan, final closure will start and waste will no longer be accepted at the Facility. A qualified professional engineer will provide general oversight over the Closure Activities.

No environmental impact on surrounding land surfaces and soil areas is expected, because of the widespread use of concrete for secondary containment, use of welded flanged steel piping, frequent inspection of operations, and prompt corrective action, if necessary, after inspections.

The miscellaneous residues from facility decontamination work, including debris, absorbents, supplies, and used personal protective clothing will be collected and accumulated on-site in containers. Containers will be sent off-site for treatment or disposal, as appropriate, to permitted hazardous waste facilities.

PFF will submit a certification of final closure per the requirements of 40 CFR 264.115. All supporting documentation for the certification will be made available to the Director of FDEP upon request, until PFF is released from financial assurance requirements. Supporting documents to be maintained will minimally consist of the following:

(a) A copy of the certification of closure prepared by the qualified professional engineer registered in the state of Florida;
(b) Results of all sampling and analyses;
(c) Activities conducted by the professional engineer or his/her designee(s) during site visits and inspections;
(d) Field reports documenting each site visit;
(e) List of Facility records that were reviewed in preparing the certification report; and,
(f) Photographic documentation.

K8 CLOSURE COST ESTIMATE

The Closure Cost Estimate is presented as Attachment K-2 to this Closure Plan. This Cost Estimate has been prepared utilizing CostPro® software (Version 6.0). It should be noted that non-default values were used in the Closure Cost Estimate in certain instances to estimate labor and disposal costs as well as to estimate the time it will take to conduct certain closure activities. In every instance, the non-default labor cost and time estimates are based on the actual, recent experience of an engineering firm (Schreiber, Yonley & Associates) conducting these activities. A note to that effect has been added to the appropriate CostPro® worksheet.

The Closure Cost Estimate shall be reviewed whenever a change in the closure plan increases or decreases the cost of closure. Copies of the original Closure Cost Estimate, or a revised cost estimate (if applicable), and the latest annual inflation adjusted estimate required by 40 CFR 264.142(b) shall be kept at the Facility during its operating life.

The cost of closure for the Facility is detailed in Attachment K-2. It does not include the closure cost for proposed units (i.e. vibrating screen, crusher, shredder, pug mills) associated with the continuous PF-II process. The closure cost of the Facility will be revised after construction of these proposed units and prior to their operation.

K9 POST-CLOSURE PLAN

A Post Closure Plan is not required at this time since there is no hazardous waste disposal unit at the facility. However, if “clean closure” in accordance with 40 CFR 264.197(b) cannot be achieved for closure of the tank, then PFF will submit a closure/post-closure plan in accordance with the requirements for landfills (§264.310).

Attachment K-1

Closure Sampling and Analysis Plan

CLOSURE SAMPLING AND ANALYSIS PLAN

1.0 PURPOSE

The purpose of this plan is to provide an outline of the sampling and analysis that will be performed during closure of the Facility and also define the criteria for "clean" closure.

2.0 MEDIA TO BE SAMPLED AND ANALYZED

Samples of soil, rinse water, and possibly concrete will be collected during the performance of closure activities.

Sampling will be done in accordance with FDEP's Standard Operating Procedures (SOPs) located at http://www.dep.state.us/water/sas/sop/sops.htm. Analyses will be performed in accordance with the appropriate most-recent USEPA SW-846 or standard ASTM methods at the time of partial or final closure.

Soil, rinsewater, and concrete samples (if applicable) will be analyzed for 40 CFR 261 Appendix VIII constituents that have been stored at the Facility.

3.0 FIELD SAMPLING PROCEDURES

3.1 Rinsate Samples

The rinsate sampling procedure will consist of collecting samples of the final rinsate from each tank, secondary containment areas, and ancillary equipment.

Rinsewater samples will be collected utilizing standard sample collection techniques and placed into an appropriate sample jar. QA/QC samples will also be collected as described in Section 5.0. Appropriate personnel protective equipment (PPE) and sample collection procedures will be utilized in order to minimize exposure and potential cross-contamination of samples.

3.2 Concrete Samples

Concrete samples may be collected as a means of verifying clean closure of concrete surfaces. Concrete chip samples, if collected, will be obtained utilizing a drill with a concrete bit or a hammer and chisel. The concrete dust and chips will be collected and placed into an appropriate sample jar. QA/QC samples will be collected as described in Section 5.0.

3.3 Subsurface Investigation

Subsurface investigation activities will be conducted at the following areas:

- Processing and Storage Building (see Figure K-1);

- LSV Processing and Waste Storage Warehouse (see Figure K-2); and,
- Treatment and Operations Building (see Figure K-3).

Soil boring samples will be collected utilizing standard soil sample collection techniques at the locations identified on Figures K-1 through K-3. The proposed soil borings are located so as to provide qualitative information for characterizing the shallow surface where hazardous waste could have potentially migrated. The proposed soil borings will extend to a depth of two feet. Biased samples will be taken in concrete areas that exhibit cracks or breaches in the concrete at the time of closure. Two soil samples will be collected throughout the two-foot sampling interval; one immediately beneath the ground surface, at the soil surface (at zero to six inches) and the second at a depth from approximately eighteen inches to two feet. The sample collected from the lower interval (18-24 inches) will be preserved and retained at the laboratory and analyzed only if the first soil sample result indicates concentrations above the Closure Performance Standard (Section K6).

If the eighteen-inch to two-foot depth sample at any of the given locations indicate concentrations above the Closure Performance Standards, additional soil samples will be collected during a subsequent sampling event at intervals to be determined in the field until the extent of vertical and horizontal contamination has been determined**.**

Prior to conducting additional subsurface investigations, a written work plan will be submitted to FDEP for review and approval. In lieu of a work plan proposal, FDEP may require that assessment and remediation (if needed) be performed in accordance with Chapter 62-780, F.A.C.

4.0 SAMPLING METHODS, EQUIPMENT, AND DECONTAMINATION PROCEDURES

Split spoon, stainless steel tube, and/or other comparable sampling equipment will be used to collect the soil samples. Water samples will be collected with a Coliwasa or similar device. Concrete chip samples will be collected using a drill with a concrete bit or a chisel and hammer. Proper cleaning and decontamination of all sampling implements that contact the samples will be ensured to prevent cross-contamination and assure valid analytical results.

Workers who clean or use the sampling implements shall wear protective gloves to protect themselves and to prevent the equipment from being contaminated. During the decontamination procedures, all rinsate material will be accumulated and characterized whether hazardous waste or not, in accordance with all applicable regulations.

4.1 Sample Preservation and Holding Times

The samples will be collected in accordance with FS 1006 (Preservation, Holding Times and Container Types).

5.0 QA/QC

5.1 QA/QC Plan for Field Sampling

In order to ensure reliable sampling results, trip blanks, field blanks, and duplicate samples will be taken in accordance with FDEP's SOPs, FQ1210 (Quality Control Blanks) and FQ 1220 (Field Duplicates). Strict chain-of-custody procedures (FS1009 Sample Documentation and Evidentiary Custody) would be followed in transferring the samples to the selected analytical laboratory.

5.2 QA/QC Plan for Laboratory Analysis

In order to ensure reliable analytical results, an independent laboratory that has been certified by the Florida Department of Health Environmental Laboratory Certification Program will be retained to perform the analyses on all rinsewater, concrete, and soil samples collected for closure purposes, unless such certification is not specifically required per Rule 62-160.300 F.A.C.

Attachment K-2

Closure Cost Estimate

PERMA-FIX of FLORIDA(RCRA)
FLD980711071

Address: 1940 NW67th Place
Gainesville
FLORIDA
32653

Contact: Kurt Fogleman
352-395-1356

Comments: RCRA closure cost-2014

Activity	Units	Closure Cost
Container Storage Area	3	$3,340,929.20
Tank Systems	3	$205,060.55
		$3,545,989.75

Additional Costs $0.00

Total Estimated Cost **$3,545,989.75**

Container Storage Areas Summary (CS_02-1)

Removal of Waste (CS-03)	$4,857.07	
Demolition and Removal of Pads (CS-04)	$0.00	
Removal of Process Equipment (CS-05)	$0.00	
Removal of Soil (CS-06)	$0.00	
Backfill and Grading (BF-01)	$0.00	
Decontamination (DC-01)	$1,867.87	
Sampling and Analysis (SA-02)	$9,405.83	
Monitoring Well Installation (MW-01)	$0.00	
Transportation (TR-01)	$0.00	
Treatment and Disposal (TD-01)	$783,293.98	
User Defined Cost (UD-01)	$0.00	
Subtotal of Closure Costs	$799,424.75	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	$79,942.48	
Certification of Closure (CS-07)	$4,118.00	
Subtotal	$883,485.23	
Percentage of Contingency Allowance	20.0	%
Contingency Allowance	$176,697.05	
Landfill Closure (Cover Installation) (CI-02)	$0.00	
TOTAL COST OF CLOSURE	$1,060,182.28	

Container Storage Areas Inventory (CS_01-1)

MAXIMUM PERMITTED CAPACITY		
Volume of liquid waste	72,105.0	gal
Volume of solid waste	0.0	yd3
Percent of loose solid debris	0.0	%
Percent of drummed solid waste	0.0	%
Percent of baled waste or other monolithic waste	0.0	%
Volume of loose solid debris	0.0	yd3
Volume of solid waste in drums	0.0	yd3
Volume of monolithic waste	0.0	yd3
SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD		
Length (excluding any curbs or berm)	90.0	ft
Width (excluding any curbs or berm)	75.0	ft
Surface Area of Containment System Pad	6,750.0	ft2
Surface Area of Containment System Pad in yd2	750.0	yd2
VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD		
Thickness	0.0	ft
Volume of Containment System Pad	0.0	ft3
Volume of Containment System Pad in yd3	0.0	yd3
SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM		
Inside Perimeter	330.0	ft
Height	0.5	ft
Surface Area of Containment System Berm	165.0	ft2
Surface Area of Containment System Berm in yd2	18.3	yd2
VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM		
Thickness	0.0	ft
Volume of Containment System Berm	0.0	ft3
Volume of Containment System Berm in yd3	0.0	yd3
SURFACE AREA OF OTHER STRUCTURES		
Surface Area of Other Structures	0.0	ft2
Surface Area of Other Structures in yd2	0.0	yd2
VOLUME OF OTHER STRUCTURES		
Volume of Other Structures	0.0	yd3

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** PSB Container Storage 11/10/2014

VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Contaminated Soil to be Removed	0.0	ft3
Volume of Contaminated Soil to be Removed in yd3	0.0	yd3

AREA OF SITE TO BE GRADED WITHOUT SOIL REMOVAL

Length	0.0	ft
Width	0.0	ft
Area of Site to be Graded Without Soil Removal	0.0	ft2
Area of Site to be Graded Without Soil Removal in yd2	0.0	yd2

Container Storage Areas Removal of Waste (CS_03-1)

REMOVAL OF LOOSE SOLID DEBRIS		
Volume of loose debris waste	0.0	yd3
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per yd3	$2.06	per yd3
Cost to Remove Loose Solid Debris	$0.00	
REMOVAL OF DRUMMED WASTE		
Number of Drums	1,311	Drums
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per drum	$3.57	
Cost to Remove Waste in Drums	$4,680.27	
REMOVAL OF SOLID MONOLITHIC WASTE		
Number of monolithic forms	0.0	Forms
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per form	$14.26	per Form
Cost to Remove Monolithic Waste	$0.00	
DRY SWEEP STORAGE PROCESS, HANDLING AREA		
Surface area to dry sweep	6,750.0	ft2
Surface area to dry sweep in thousand square feet (MSF)	6.8	MSF
Labor and equipment cost per ft2	$26.00	per MSF
Cost to Dry Sweep Area	$176.80	
TOTAL COST OF WASTE REMOVAL	$4,857.07	

Container Storage Areas Certification of Closure (CS_07-1)

Number of units requiring certification of closure	1	Units
Cost of certification of closure per unit	$4,118.00	
TOTAL COST OF CERTIFICATION OF CLOSURE	$4,118.00	

Decontamination Summary (DC_01-1)

Decontamination of Unit by Steam Cleaning or Pressure Washing (DC-02)	$1,867.87
Decontamination of Unit by Sandblasting (DC-03)	$0.00
Decontamination of Heavy Equipment (DC-04)	$0.00
TOTAL COST OF DECONTAMINATION	$1,867.87

Decontamination by Steam Cleaning or Pressure Wash (DC_02-1)

Area of unit to be decontaminated	6,915.0	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$65.77	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0041	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	28.4	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	$1,867.87	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	6,915.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	$83.85	per Drum
Cost of drums needed to contain decontamination fluid	$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	$1,867.87	

Notes: Work rate for steam cleaning or pressure wash of 0.0041hour/ft2 is more realistic and was obtained from the previous CostPro version.

Sampling and Analysis Inventory (SA_01-1)

Number of Drilling and Subsurface Soil Samples (2.5-inch boring)	8	Samples
Number of Drilling and Subsurface Soil Samples (4-inch boring)	0	Samples
Number of Concrete Core Samples	4	Samples
Number of Wipe Sample Locations	0	Sample Location
Number of Surface Water and Liquid Sample Locations	1	Sample Location
Number of Soil, Sludge, and Sediment Soil Samples	0	Sample Location
Number of Groundwater Sample Locations	0	Sample Location
Number of Lysimeters to be Sampled	0	Lysimeters

Sampling and Analysis Summary (SA_02-1)

Drilling and Subsurface Soil Sample - 2.5-Inch-Diameter-Holes (SA-03)	$5,766.37
Drilling and Subsurface Soil Sample - 4-Inch-Diameter-Holes (SA-04)	$0.00
Concrete Core Sample (SA-05)	$2,935.64
Wipe Sample (SA-06)	$0.00
Surface Water and Liquid Sample (SA-07)	$703.82
Soil, Sludge, and Sediment Sample (SA-08)	$0.00
Groundwater Sample (SA-09)	$0.00
Soil-Pore Liquid Sample (SA-10)	$0.00
Analysis of Subsurface Soil Sample (SA-11)	$0.00
TOTAL SAMPLING AND ANALYSIS COST	$9,405.83

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-1)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	8	Borings
Enter depth of boreholes (sum of all)	16	ft
Choose the appropriate drilling method	Auger Boring - Level D	
Labor and equipment cost per work hour	$102.72	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.3050	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	4.9	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	$503.33	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$5,263.04	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR CLOSURE - 2.5-INCH-DIAMETER-HOLES	$5,766.37	
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR POST-CLOSURE CARE PER EVENT - 2.5-INCH-DIAMETER-HOLES	$5,766.37	per Event

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** PSB Container Storage 11/10/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	8	$718.42	0	$2,873.68
Metals (SW 6010), per each metal	Both	$13.73	64	$27.46	0	$878.72
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	8	$377.66	0	$1,510.64

Facility:	PERMA-FIX of FLORIDA (RCRA)	Unit:	PSB Container Storage	11/10/2014

Concrete Core Samples (SA_05-1)

COLLECTION OF CORE SAMPLES

Number of corings to be drilled	4	Coring Samples
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$76.03	per Work Hour
Work rate to drill each core sample to a 6-inch depth	1.0000	Work hrs per Sample
Number of hours required to drill 3-inch-diameter boring	4.0	Work hrs
Cost of Collection per Sampling Event	$304.12	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$2,631.52	per Event

SAMPLING EVENTS

Number of sampling events	1	Events per yr
TOTAL COST OF SAMPLING AND ANALYSIS OF CORE SAMPLES	$2,935.64	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** PSB Container Storage 11/10/2014

Concrete Core Samples (SA_05)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	4	$718.42	0	$1,436.84
Metals (SW 6010), per each metal	Both	$13.73	32	$27.46	0	$439.36
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	4	$377.66	0	$755.32

Surface Water and Liquid Samples (SA_07-1)

COLLECTION OF SURFACE WATER AND LIQUID SAMPLES

Number of sampling locations	1	Sample Location
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$91.88	per Work Hour
Work rate required to collect samples from one sampling location	0.5000	Work hrs per Sample
Number of hours required to collect all samples	0.5	Work hrs
Cost of Collection per Sampling Event	$45.94	per Event

ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES

Cost of Analysis per Sampling Event	$657.88	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES	$703.82	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** PSB Container Storage 11/10/2014

Surface Water and Liquid Samples (SA_07)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base neutral & acid extractable organics (SW 3510/SW 8270)	Liquid	$359.21	1	$718.42	0	$359.21
Metals (SW 6010), per each metal	Both	$13.73	8	$27.46	0	$109.84
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	1	$377.66	0	$188.83

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	$774,407.70
Treatment and Disposal of Decontamination Fluids (TD-03)	$8,886.28
Total Cost of Treatment and Disposal	$783,293.98

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	PSB Container Storage	11/10/2014

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL		
Solid Waste Type (Optional: Enter Name)		
Volume in yd3 of solid waste to be treated and disposed of	0.0	yd3
Treatment and disposal costs per yd3	$0.00	per yd3
Cost to Treat and Dispose of Solid Waste	$0.00	
LIQUID WASTE TREATMENT AND DISPOSAL		
Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	72,105.0	gal
Treatment and disposal costs per gallon	$10.74	per Gallon
Cost to Treat and Dispose of Liquid Waste	$774,407.70	
DRUMMED WASTE TREATMENT AND DISPOSAL		
Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	1,311	Drums
Treatment and disposal costs per drum	$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	$774,407.70	

Notes: Treatment & Disposal Cost includes Transportation cost also. Treatment & Disposal Cost/gal is derived as weighted average cost of 7425 gals of LSV waste@ 15/gal;11275 gals of mixed waste liquids @15/gal; 7425 gals of mixed waste solids @ 60.90/gal; 22055 gals of HW liquid fuel @ 0.37/gal; 6875 gals of HW solids for fuel blending @2.05/gal; 9075 gals of Haz debris @1.05/gal; and 7975 gal of high water-low BTU wastewater @1.25/gal.

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** PSB Container Storage 11/10/2014

Treatment and Disposal of Decon Fluid (TD_03-1)

Volume of decontamination fluid generated from closure activities

Volume of decontamination fluid from Primary Unit	0.0	gal
Volume of decontamination fluid generated by steam cleaning or pressure washing (DC-02)	6,915.0	gal
Volume of decontamination fluid from heavy equipment (DC-04)	0.0	gal
Total Volume of Decontamination Fluid	6,915.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$77.41	per Work Hour
Work rate to pump decontamination fluid to a holding tank	0.0001	Work hr per gal
Number of hours required to pump decontamination fluid to a holding tank	0.6915	Work hrs
Subtotal of labor and equipment costs to pump decontamination fluid to a holding tank	$53.53	
Number of days required to rent a holding tank	1	Days
Holding tank rental fee (10,000 gal tank per day)	$189.00	per Day
Number of tanks required	1	Tanks
Subtotal of tank rental costs	$189.00	
Cost for treatment and disposal	$1.25	per Gallon
Treatment and disposal costs for bulk liquid	$8,643.75	
TOTAL COST TO TREATMENT AND DISPOSE OF DECONTAMINATION FLUID AS A BULK LIQUID	$8,886.28	

Notes: Treatment and Disposal cost includes Transportation also.

Container Storage Areas Summary (CS_02-1)

Removal of Waste (CS-03)	$2,355.00	
Demolition and Removal of Pads (CS-04)	$0.00	
Removal of Process Equipment (CS-05)	$0.00	
Removal of Soil (CS-06)	$0.00	
Backfill and Grading (BF-01)	$0.00	
Decontamination (DC-01)	$756.36	
Sampling and Analysis (SA-02)	$7,938.01	
Monitoring Well Installation (MW-01)	$0.00	
Transportation (TR-01)	$0.00	
Treatment and Disposal (TD-01)	$685,884.16	
User Defined Cost (UD-01)	$0.00	
Subtotal of Closure Costs	$696,933.53	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	$69,693.35	
Certification of Closure (CS-07)	$0.00	
Subtotal	$766,626.88	
Percentage of Contingency Allowance	20.0	%
Contingency Allowance	$153,325.38	
Landfill Closure (Cover Installation) (CI-02)	$0.00	
TOTAL COST OF CLOSURE	$919,952.26	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB Container Storage 11/10/2014

Container Storage Areas Inventory (CS_01-1)

MAXIMUM PERMITTED CAPACITY

Volume of liquid waste	35,200.0	gal
Volume of solid waste	0.0	yd3
Percent of loose solid debris	0.0	%
Percent of drummed solid waste	0.0	%
Percent of baled waste or other monolithic waste	0.0	%
Volume of loose solid debris	0.0	yd3
Volume of solid waste in drums	0.0	yd3
Volume of monolithic waste	0.0	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD

Length (excluding any curbs or berm)	52.3	ft
Width (excluding any curbs or berm)	52.3	ft
Surface Area of Containment System Pad	2,735.3	ft2
Surface Area of Containment System Pad in yd2	303.9	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD

Thickness	0.5	ft
Volume of Containment System Pad	1,367.6	ft3
Volume of Containment System Pad in yd3	50.7	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM

Inside Perimeter	209.0	ft
Height	0.3	ft
Surface Area of Containment System Berm	62.7	ft2
Surface Area of Containment System Berm in yd2	7.0	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM

Thickness	0.0	ft
Volume of Containment System Berm	0.0	ft3
Volume of Containment System Berm in yd3	0.0	yd3

SURFACE AREA OF OTHER STRUCTURES

Surface Area of Other Structures	0.0	ft2
Surface Area of Other Structures in yd2	0.0	yd2

VOLUME OF OTHER STRUCTURES

Volume of Other Structures	0.0	yd3

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB Container Storage 11/10/2014

VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Contaminated Soil to be Removed	0.0	ft3
Volume of Contaminated Soil to be Removed in yd3	0.0	yd3

AREA OF SITE TO BE GRADED WITHOUT SOIL REMOVAL

Length	0.0	ft
Width	0.0	ft
Area of Site to be Graded Without Soil Removal	0.0	ft2
Area of Site to be Graded Without Soil Removal in yd2	0.0	yd2

Container Storage Areas Removal of Waste (CS_03-1)

REMOVAL OF LOOSE SOLID DEBRIS

Volume of loose debris waste	0.0	yd3
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per yd3	$2.06	per yd3
Cost to Remove Loose Solid Debris	$0.00	

REMOVAL OF DRUMMED WASTE

Number of Drums	640	Drums
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per drum	$3.57	
Cost to Remove Waste in Drums	$2,284.80	

REMOVAL OF SOLID MONOLITHIC WASTE

Number of monolithic forms	0.0	Forms
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per form	$14.26	per Form
Cost to Remove Monolithic Waste	$0.00	

DRY SWEEP STORAGE PROCESS, HANDLING AREA

Surface area to dry sweep	2,735.3	ft2
Surface area to dry sweep in thousand square feet (MSF)	2.7	MSF
Labor and equipment cost per ft2	$26.00	per MSF
Cost to Dry Sweep Area	$70.20	
TOTAL COST OF WASTE REMOVAL	$2,355.00	

Container Storage Areas Certification of Closure (CS_07-1)

Number of units requiring certification of closure	1	Units
Cost of certification of closure per unit	$0.00	
TOTAL COST OF CERTIFICATION OF CLOSURE	$0.00	

Notes: Page A-10 of CostPro user manual states that if a number of units of the same type are being closed in the same manner at the same time the user may choose the cost of certification only once for all similar units. Certification cost is included in the PSB container storage area.

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB Container Storage 11/10/2014

Decontamination Summary (DC_01-1)

Decontamination of Unit by Steam Cleaning or Pressure Washing (DC-02)	$756.36
Decontamination of Unit by Sandblasting (DC-03)	$0.00
Decontamination of Heavy Equipment (DC-04)	$0.00
TOTAL COST OF DECONTAMINATION	$756.36

Decontamination by Steam Cleaning or Pressure Wash (DC_02-1)

Area of unit to be decontaminated	2,798.0	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$65.77	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0041	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	11.5	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	$756.36	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	2,798.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	$83.85	per Drum
Cost of drums needed to contain decontamination fluid	$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	$756.36	

Notes: Work rate for steam cleaning or pressure wash of 0.0041hour/ft2 is more realistic and was obtained from the previous CostPro version.

Sampling and Analysis Inventory (SA_01-1)

Number of Drilling and Subsurface Soil Samples (2.5-inch boring)	8	Samples
Number of Drilling and Subsurface Soil Samples (4-inch boring)	0	Samples
Number of Concrete Core Samples	2	Samples
Number of Wipe Sample Locations	0	Sample Location
Number of Surface Water and Liquid Sample Locations	1	Sample Location
Number of Soil, Sludge, and Sediment Soil Samples	0	Sample Location
Number of Groundwater Sample Locations	0	Sample Location
Number of Lysimeters to be Sampled	0	Lysimeters

Notes:

Sampling and Analysis Summary (SA_02-1)

Drilling and Subsurface Soil Sample - 2.5-Inch-Diameter-Holes (SA-03)	$5,766.37
Drilling and Subsurface Soil Sample - 4-Inch-Diameter-Holes (SA-04)	$0.00
Concrete Core Sample (SA-05)	$1,467.82
Wipe Sample (SA-06)	$0.00
Surface Water and Liquid Sample (SA-07)	$703.82
Soil, Sludge, and Sediment Sample (SA-08)	$0.00
Groundwater Sample (SA-09)	$0.00
Soil-Pore Liquid Sample (SA-10)	$0.00
Analysis of Subsurface Soil Sample (SA-11)	$0.00
TOTAL SAMPLING AND ANALYSIS COST	$7,938.01

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-1)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	8	Borings
Enter depth of boreholes (sum of all)	16	ft
Choose the appropriate drilling method	Auger Boring - Level D	
Labor and equipment cost per work hour	$102.72	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.3050	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	4.9	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	$503.33	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$5,263.04	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR CLOSURE - 2.5-INCH-DIAMETER-HOLES	$5,766.37	
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR POST-CLOSURE CARE PER EVENT - 2.5-INCH-DIAMETER-HOLES	$5,766.37	per Event

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB Container Storage 11/10/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	8	$718.42	0	$2,873.68
Metals (SW 6010), per each metal	Both	$13.73	64	$27.46	0	$878.72
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	8	$377.66	0	$1,510.64

Concrete Core Samples (SA_05-1)

COLLECTION OF CORE SAMPLES

Number of corings to be drilled	2	Coring Samples
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$76.03	per Work Hour
Work rate to drill each core sample to a 6-inch depth	1.0000	Work hrs per Sample
Number of hours required to drill 3-inch-diameter boring	2.0	Work hrs
Cost of Collection per Sampling Event	$152.06	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$1,315.76	per Event

SAMPLING EVENTS

Number of sampling events	1	Events per yr
TOTAL COST OF SAMPLING AND ANALYSIS OF CORE SAMPLES	$1,467.82	

Concrete Core Samples (SA_05)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	2	$718.42	0	$718.42
Metals (SW 6010), per each metal	Both	$13.73	16	$27.46	0	$219.68
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	2	$377.66	0	$377.66

Surface Water and Liquid Samples (SA_07-1)

COLLECTION OF SURFACE WATER AND LIQUID SAMPLES

Number of sampling locations	1	Sample Location
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$91.88	per Work Hour
Work rate required to collect samples from one sampling location	0.5000	Work hrs per Sample
Number of hours required to collect all samples	0.5	Work hrs
Cost of Collection per Sampling Event	$45.94	per Event

ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES

Cost of Analysis per Sampling Event	$657.88	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES	$703.82	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB Container Storage 11/10/2014

Surface Water and Liquid Samples (SA_07)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base neutral & acid extractable organics (EPA 625)	Liquid	$359.21	1	$718.42	0	$359.21
Metals (SW 6010), per each metal	Both	$13.73	8	$27.46	0	$109.84
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	1	$377.66	0	$188.83

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	$682,176.00
Treatment and Disposal of Decontamination Fluids (TD-03)	$3,708.16
Total Cost of Treatment and Disposal	$685,884.16

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB Container Storage 11/10/2014

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	0	
Volume in yd3 of solid waste to be treated and disposed of	0.0	yd3
Treatment and disposal costs per yd3	$0.00	per yd3
Cost to Treat and Dispose of Solid Waste	$0.00	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	35,200.0	gal
Treatment and disposal costs per gallon	$19.38	per Gallon
Cost to Treat and Dispose of Liquid Waste	$682,176.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	640	Drums
Treatment and disposal costs per drum	$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	$682,176.00	

Notes: Treatment & Disposal Cost includes Transportation cost also. Treatment & Disposal and Transportation Cost/gal is derived as weighted average cost of 16610 gals of mixed waste liquids @15/gal; 6875 gals of mixed waste solids @ 60.90/gal; 2365 gals of Haz debris @1.05/gal; 3575 gal of high water-low BTU wastewater @1.25/gal ; and 5775 gals of hazardous solids/toxics @1.25/gal.

Treatment and Disposal of Decon Fluid (TD_03-1)

Volume of decontamination fluid generated from closure activities

Volume of decontamination fluid from Primary Unit	0.0	gal
Volume of decontamination fluid generated by steam cleaning or pressure washing (DC-02)	2,798.0	gal
Volume of decontamination fluid from heavy equipment (DC-04)	0.0	gal
Total Volume of Decontamination Fluid	2,798.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$77.41	per Work Hour
Work rate to pump decontamination fluid to a holding tank	0.0001	Work hr per gal
Number of hours required to pump decontamination fluid to a holding tank	0.2798	Work hrs
Subtotal of labor and equipment costs to pump decontamination fluid to a holding tank	$21.66	
Number of days required to rent a holding tank	1	Days
Holding tank rental fee (10,000 gal tank per day)	$189.00	per Day
Number of tanks required	1	Tanks
Subtotal of tank rental costs	$189.00	
Cost for treatment and disposal	$1.25	per Gallon
Treatment and disposal costs for bulk liquid	$3,497.50	
TOTAL COST TO TREATMENT AND DISPOSE OF DECONTAMINATION FLUID AS A BULK LIQUID	$3,708.16	

Notes: Treatment and Disposal Cost includes Transportation cost.

Container Storage Areas Summary (CS_02-1)

Removal of Waste (CS-03)	$3,646.76	
Demolition and Removal of Pads (CS-04)	$0.00	
Removal of Process Equipment (CS-05)	$0.00	
Removal of Soil (CS-06)	$0.00	
Backfill and Grading (BF-01)	$0.00	
Decontamination (DC-01)	$1,282.52	
Sampling and Analysis (SA-02)	$9,619.32	
Monitoring Well Installation (MW-01)	$0.00	
Transportation (TR-01)	$0.00	
Treatment and Disposal (TD-01)	$1,016,356.45	
User Defined Cost (UD-01)	$0.00	
Subtotal of Closure Costs	$1,030,905.05	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	$103,090.50	
Certification of Closure (CS-07)	$0.00	
Subtotal	$1,133,995.55	
Percentage of Contingency Allowance	20.0	%
Contingency Allowance	$226,799.11	
Landfill Closure (Cover Installation) (CI-02)	$0.00	
TOTAL COST OF CLOSURE	$1,360,794.66	

Container Storage Areas Inventory (CS_01-1)

MAXIMUM PERMITTED CAPACITY		
Volume of liquid waste	54,340.0	gal
Volume of solid waste	0.0	yd3
Percent of loose solid debris	0.0	%
Percent of drummed solid waste	0.0	%
Percent of baled waste or other monolithic waste	0.0	%
Volume of loose solid debris	0.0	yd3
Volume of solid waste in drums	0.0	yd3
Volume of monolithic waste	0.0	yd3
SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD		
Length (excluding any curbs or berm)	68.0	ft
Width (excluding any curbs or berm)	68.0	ft
Surface Area of Containment System Pad	4,624.0	ft2
Surface Area of Containment System Pad in yd2	513.8	yd2
VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD		
Thickness	0.0	ft
Volume of Containment System Pad	0.0	ft3
Volume of Containment System Pad in yd3	0.0	yd3
SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM		
Inside Perimeter	272.0	ft
Height	0.5	ft
Surface Area of Containment System Berm	136.0	ft2
Surface Area of Containment System Berm in yd2	15.1	yd2
VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM		
Thickness	0.0	ft
Volume of Containment System Berm	0.0	ft3
Volume of Containment System Berm in yd3	0.0	yd3
SURFACE AREA OF OTHER STRUCTURES		
Surface Area of Other Structures	0.0	ft2
Surface Area of Other Structures in yd2	0.0	yd2
VOLUME OF OTHER STRUCTURES		
Volume of Other Structures	0.0	yd3

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV Container Storage 11/10/2014

VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Contaminated Soil to be Removed	0.0	ft3
Volume of Contaminated Soil to be Removed in yd3	0.0	yd3

AREA OF SITE TO BE GRADED WITHOUT SOIL REMOVAL

Length	0.0	ft
Width	0.0	ft
Area of Site to be Graded Without Soil Removal	0.0	ft2
Area of Site to be Graded Without Soil Removal in yd2	0.0	yd2

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV Container Storage 11/10/2014

Container Storage Areas Removal of Waste (CS_03-1)

REMOVAL OF LOOSE SOLID DEBRIS

Volume of loose debris waste	0.0	yd3
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per yd3	$2.06	per yd3
Cost to Remove Loose Solid Debris	$0.00	

REMOVAL OF DRUMMED WASTE

Number of Drums	988	Drums
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per drum	$3.57	
Cost to Remove Waste in Drums	$3,527.16	

REMOVAL OF SOLID MONOLITHIC WASTE

Number of monolithic forms	0.0	Forms
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per form	$14.26	per Form
Cost to Remove Monolithic Waste	$0.00	

DRY SWEEP STORAGE PROCESS, HANDLING AREA

Surface area to dry sweep	4,624.0	ft2
Surface area to dry sweep in thousand square feet (MSF)	4.6	MSF
Labor and equipment cost per ft2	$26.00	per MSF
Cost to Dry Sweep Area	$119.60	
TOTAL COST OF WASTE REMOVAL	$3,646.76	

Container Storage Areas Certification of Closure (CS_07-1)

Number of units requiring certification of closure	1	Units
Cost of certification of closure per unit	$0.00	
TOTAL COST OF CERTIFICATION OF CLOSURE	$0.00	

Notes: Page A-10 of CostPro user manual states that if a number of units of the same type are being closed in the same manner at the same time the user may choose the cost of certification only once for all similar units. Certification cost is included in the PSB container storage area.

Decontamination Summary (DC_01-1)

Decontamination of Unit by Steam Cleaning or Pressure Washing (DC-02)	$1,282.52
Decontamination of Unit by Sandblasting (DC-03)	$0.00
Decontamination of Heavy Equipment (DC-04)	$0.00
TOTAL COST OF DECONTAMINATION	$1,282.52

Decontamination by Steam Cleaning or Pressure Wash (DC_02-1)

Area of unit to be decontaminated	4,760.0	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$65.77	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0041	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	19.5	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	$1,282.52	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	4,760.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	$83.85	per Drum
Cost of drums needed to contain decontamination fluid	$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	$1,282.52	

Notes: Work rate for steam cleaning or pressure wash of 0.0041hour/ft2 is more realistic and was obtained from the previous CostPro version.

Sampling and Analysis Inventory (SA_01-1)

Number of Drilling and Subsurface Soil Samples (2.5-inch boring)	8	Samples
Number of Drilling and Subsurface Soil Samples (4-inch boring)	0	Samples
Number of Concrete Core Samples	4	Samples
Number of Wipe Sample Locations	0	Sample Location
Number of Surface Water and Liquid Sample Locations	1	Sample Location
Number of Soil, Sludge, and Sediment Soil Samples	0	Sample Location
Number of Groundwater Sample Locations	0	Sample Location
Number of Lysimeters to be Sampled	0	Lysimeters

Sampling and Analysis Summary (SA_02-1)

Drilling and Subsurface Soil Sample - 2.5-Inch-Diameter-Holes (SA-03)	$5,979.86
Drilling and Subsurface Soil Sample - 4-Inch-Diameter-Holes (SA-04)	$0.00
Concrete Core Sample (SA-05)	$2,935.64
Wipe Sample (SA-06)	$0.00
Surface Water and Liquid Sample (SA-07)	$703.82
Soil, Sludge, and Sediment Sample (SA-08)	$0.00
Groundwater Sample (SA-09)	$0.00
Soil-Pore Liquid Sample (SA-10)	$0.00
Analysis of Subsurface Soil Sample (SA-11)	$0.00
TOTAL SAMPLING AND ANALYSIS COST	$9,619.32

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-1)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	8	Borings
Enter depth of boreholes (sum of all)	16	ft
Choose the appropriate drilling method	Auger Boring - Level C	
Labor and equipment cost per work hour	$146.29	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.3050	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	4.9	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	$716.82	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$5,263.04	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR CLOSURE - 2.5-INCH-DIAMETER-HOLES	$5,979.86	
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR POST-CLOSURE CARE PER EVENT - 2.5-INCH-DIAMETER-HOLES	$5,979.86	per Event

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV Container Storage 11/10/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	8	$718.42	0	$2,873.68
Metals (SW 6010), per each metal	Both	$13.73	64	$27.46	0	$878.72
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	8	$377.66	0	$1,510.64

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV Container Storage 11/10/2014

Concrete Core Samples (SA_05-1)

COLLECTION OF CORE SAMPLES

Number of corings to be drilled	4	Coring Samples
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$76.03	per Work Hour
Work rate to drill each core sample to a 6-inch depth	1.0000	Work hrs per Sample
Number of hours required to drill 3-inch-diameter boring	4.0	Work hrs
Cost of Collection per Sampling Event	$304.12	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$2,631.52	per Event

SAMPLING EVENTS

Number of sampling events	1	Events per yr
TOTAL COST OF SAMPLING AND ANALYSIS OF CORE SAMPLES	$2,935.64	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV Container Storage 11/10/2014

Concrete Core Samples (SA_05)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	4	$718.42	0	$1,436.84
Metals (SW 6010), per each metal	Both	$13.73	32	$27.46	0	$439.36
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	4	$377.66	0	$755.32

Surface Water and Liquid Samples (SA_07-1)

COLLECTION OF SURFACE WATER AND LIQUID SAMPLES

Number of sampling locations	1	Sample Location
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$91.88	per Work Hour
Work rate required to collect samples from one sampling location	0.5000	Work hrs per Sample
Number of hours required to collect all samples	0.5	Work hrs
Cost of Collection per Sampling Event	$45.94	per Event

ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES

Cost of Analysis per Sampling Event	$657.88	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES	$703.82	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV Container Storage 11/10/2014

Surface Water and Liquid Samples (SA_07)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base neutral & acid extractable organics (SW 3510/SW 8270)	Liquid	$359.21	1	$718.42	0	$359.21
Metals (SW 6010), per each metal	Both	$13.73	8	$27.46	0	$109.84
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	1	$377.66	0	$188.83

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	$1,010,180.60
Treatment and Disposal of Decontamination Fluids (TD-03)	$6,175.85
Total Cost of Treatment and Disposal	$1,016,356.45

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	0	
Volume in yd3 of solid waste to be treated and disposed of	0.0	yd3
Treatment and disposal costs per yd3	$0.00	per yd3
Cost to Treat and Dispose of Solid Waste	$0.00	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	54,340.0	gal
Treatment and disposal costs per gallon	$18.59	per Gallon
Cost to Treat and Dispose of Liquid Waste	$1,010,180.60	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	988	Drums
Treatment and disposal costs per drum	$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	$1,010,180.60	

Notes: Treatment & Disposal Cost includes Transportation cost also. Treatment & Disposal and Transportation Cost/gal is derived as weighted average cost of 11440 gals of mixed waste liquids @ 15/gal; 13200 gals of mixed waste solids @ 60.90/gal; 11550 gals of Haz debris @1.05/gal; 10175 gal of high water-low BTU wastewater @1.25/gal ; and 7975 gals of hazardous solids/toxics @1.25/gal.

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV Container Storage 11/10/2014

Treatment and Disposal of Decon Fluid (TD_03-1)

Volume of decontamination fluid generated from closure activities

Volume of decontamination fluid from Primary Unit	0.0	gal
Volume of decontamination fluid generated by steam cleaning or pressure washing (DC-02)	4,760.0	gal
Volume of decontamination fluid from heavy equipment (DC-04)	0.0	gal
Total Volume of Decontamination Fluid	4,760.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$77.41	per Work Hour
Work rate to pump decontamination fluid to a holding tank	0.0001	Work hr per gal
Number of hours required to pump decontamination fluid to a holding tank	0.476	Work hrs
Subtotal of labor and equipment costs to pump decontamination fluid to a holding tank	$36.85	
Number of days required to rent a holding tank	1	Days
Holding tank rental fee (10,000 gal tank per day)	$189.00	per Day
Number of tanks required	1	Tanks
Subtotal of tank rental costs	$189.00	
Cost for treatment and disposal	$1.25	per Gallon
Treatment and disposal costs for bulk liquid	$5,950.00	
TOTAL COST TO TREATMENT AND DISPOSE OF DECONTAMINATION FLUID AS A BULK LIQUID	$6,175.85	

Notes: Treatment and Disposal cost includes transportation cost.

Facility: PERMA-FIX of FLORIDA (RCRA)	**Unit:** LSV processing tank system	11/10/2014	

Tank Systems Summary (TS_02-1)

Removal of Waste (TS-03)	$52.78	
Tank System Purging (ignitable waste only) (TS-04)	$49.59	
Flushing the Tank and Piping (TS-05)	$105.57	
Excavation, Disassembly, and Loading (TS-06)	$5,496.36	
Demolition and Removal of Containment System (TS-07)	$0.00	
Removal of Soil (TS-08)	$0.00	
Backfill and Grading (BF-01)	$0.00	
Decontamination (DC-01)	$190.73	
Sampling and Analysis (SA-02)	$2,861.79	
Monitoring Well Installation (MW-01)	$0.00	
Transportation (TR-01)	$1,692.00	
Treatment and Disposal (TD-01)	$15,439.96	
User Defined Cost (UD-01)	$0.00	
Subtotal of Closure Costs	$25,888.78	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	$2,588.88	
Certification of Closure (TS-09)	$4,118.00	
Subtotal	$32,595.66	
Percentage of Contingency Allowance	20.0	%
Contingency Allowance	$6,519.13	
Landfill Closure (Cover Installation) (CI-02)	$0.00	
TOTAL COST OF CLOSURE	$39,114.79	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	LSV processing tank system	11/10/2014

Tank Systems Inventory (TS_01-1)

UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Type of tank system	Underground	
Height or length of tank	0.0	ft
Diameter of tank	0.0	ft
Maximum permitted capacity of the tank	906.0	gal
Total length of ancillary piping	400.0	ft
Nominal diameter of ancillary piping	2.0	in
Maximum capacity of ancillary piping	65.3	gal
Maximum capacity of tank and ancillary piping	971.3	gal

SURFACE AREA OF TANK SYSTEM

Surface area of tank (interior and exterior)	350.0	ft2

VOLUME OF TANK SYSTEM TO BE REMOVED

Volume of Tank System to be Removed	129.8	ft3
Volume of Tank System to be Removed in yd3	4.8	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD

Length	0.0	ft
Width	0.0	ft
Surface Area of Secondary Containment System Pad	0.0	ft2
Surface Area of Secondary Containment System Pad in yd2	0.0	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD

Thickness	0.0	ft
Volume of Secondary Containment Pad	0.0	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM

Total Length	0.0	ft
Height	0.0	ft
Surface Area of Secondary Containment System Berm	0.0	ft2
Surface Area of Secondary Containment System Berm in yd2	0.0	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM

Thickness	0.0	ft
Volume of Secondary Containment System Berm	0.0	yd3

SURFACE AREA OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM

Surface Area of Other Structures	0.0	ft2

Surface Area of Other Structures in yd2	0.0	yd2

VOLUME OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM

Volume of Other Structures	0.0	yd3

VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Contaminated Soil to be Removed	0.0	ft3
Volume of Contaminated Soil to be Removed in yd3	0.0	yd3

Notes: This tank system includes 521 gal debris vat 275 gal liq.scintillation fluid test tank and 110 gal outfeed conveyor holding tank. Ancilliary piping surface area = 3.14 x 2/12 x 400ft = 209 ft2. Surface area of the 3 tanks is assumed to be 350 ft2.

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	LSV processing tank system	11/10/2014

Tank Systems Removal of Waste (TS_03-1)

Maximum volume of waste to be removed from the tank and ancillary piping	971.3	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$175.95	per Work Hour
Work rate required to remove waste from tank and ancillary piping	0.0003	Work hr per gal
Number of hours required to remove waste from tank and ancillary piping	0.3	Work hrs
TOTAL COST OF REMOVAL OF WASTE FROM TANK AND ANCILLARY PIPING	$52.78	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	LSV processing tank system	11/10/2014

Tank Systems Purging (TS_04-1)

Maximum capacity of the tank system	906.0	gal
Amount of solid carbon dioxide (dry ice) needed per gal capacity	1.5	lb per 100 gal
Amount of dry ice needed to purge tank system	13.6	lb
Cost of dry ice	$2.64	per Pound
Cost of dry ice needed to purge tank system	$35.90	
Choose the appropriate level of PPE	Protection Level D	
Labor cost per work hour	$68.45	per Work Hour
Work rate required to purge tank	0.0002	Work hr per gal
Number of hours required to purge tank	0.2	Work hrs
Labor Cost to Purge Tank System	$13.69	
TOTAL COST OF TANK SYSTEM PURGING	$49.59	

Flushing the Tank and Piping (TS_05-1)

Maximum capacity of the tank and ancillary piping	971.3	gal
Number of times tank and ancillary piping are flushed	1	
Total volume of flushing solution	971.3	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$175.95	per Work Hour
Work rate required to flush tank and ancillary piping	0.0006	Work hr per gal
Number of hours required to flush tank and ancillary piping	0.6	Work hrs
Subtotal of labor and equipment cost to flush tank and ancillary piping	$105.57	
Flushing solution is contained in:	Bulk	
Number of drums required to contain flushing solution	0	Drums
Cost of one drum	$83.85	
Cost of drums needed to contain flushing solution	$0.00	
TOTAL COST TO FLUSH TANK AND ANCILLARY PIPING	$105.57	

Tank Systems Excavation, Disassembly, and Loading (TS_06-1)

DISASSEMBLY OF ANCILLARY PIPING

Length of ancillary piping to be disassembled	400.0	ft
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$77.17	per Work Hour
Work rate required to disassemble one foot of pipe	0.1500	Work hr per Ft
Number of hours required to disassemble ancillary piping	60.0	Work hrs
Cost of Disassembly of Ancillary Piping	$4,630.20	

EXCAVATION AND LOADING (FOR IN-GROUND AND UNDERGROUND TANKS ONLY)

Capacity of Tank	906.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$541.35	per Work Hour
Work rate required to excavate and load tank per gallon capacity	0.001800	Work hr per gal
Number of hours required to excavate and load tank	1.6	Work hrs
Cost to Excavate and Load Tank	$866.16	

REMOVE TANK (FOR ON-GROUND AND ABOVEGROUND TANKS ONLY)

Capacity of Tank	0.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$0.00	per Work Hour
Work rate required to load tank per gallon capacity	0.000000	Work hr per gal
Number of hours required to load tank	0	Work hrs
Cost to Load Tank	$0.00	
TOTAL COST OF EXCAVATION, DISASSEMBLY, AND LOADING	$5,496.36	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	LSV processing tank system	11/10/2014

Tank Systems Certification of Closure (TS_09-1)

Number of units requiring certification of closure	1	Units
Cost of certification of closure per unit	$4,118.00	
TOTAL COST OF CERTIFICATION OF CLOSURE	$4,118.00	

Decontamination Summary (DC_01-1)

Decontamination of Unit by Steam Cleaning or Pressure Washing (DC-02)	$190.73
Decontamination of Unit by Sandblasting (DC-03)	$0.00
Decontamination of Heavy Equipment (DC-04)	$0.00
TOTAL COST OF DECONTAMINATION	$190.73

Decontamination by Steam Cleaning or Pressure Wash (DC_02-1)

Area of unit to be decontaminated	700.0	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$65.77	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0041	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	2.9	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	$190.73	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	700.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	$83.85	per Drum
Cost of drums needed to contain decontamination fluid	$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	$190.73	

Notes: Work rate for steam cleaning or pressure wash of 0.0041hour/ft2 is more realistic and was obtained from the previous CostPro version.

Sampling and Analysis Inventory (SA_01-1)

Number of Drilling and Subsurface Soil Samples (2.5-inch boring)	1	Samples
Number of Drilling and Subsurface Soil Samples (4-inch boring)	0	Samples
Number of Concrete Core Samples	0	Samples
Number of Wipe Sample Locations	0	Sample Location
Number of Surface Water and Liquid Sample Locations	3	Sample Location
Number of Soil, Sludge, and Sediment Soil Samples	0	Sample Location
Number of Groundwater Sample Locations	0	Sample Location
Number of Lysimeters to be Sampled	0	Lysimeters

Sampling and Analysis Summary (SA_02-1)

Drilling and Subsurface Soil Sample - 2.5-Inch-Diameter-Holes (SA-03)	$750.33
Drilling and Subsurface Soil Sample - 4-Inch-Diameter-Holes (SA-04)	$0.00
Concrete Core Sample (SA-05)	$0.00
Wipe Sample (SA-06)	$0.00
Surface Water and Liquid Sample (SA-07)	$2,111.46
Soil, Sludge, and Sediment Sample (SA-08)	$0.00
Groundwater Sample (SA-09)	$0.00
Soil-Pore Liquid Sample (SA-10)	$0.00
Analysis of Subsurface Soil Sample (SA-11)	$0.00
TOTAL SAMPLING AND ANALYSIS COST	$2,861.79

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-1)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	1	Borings
Enter depth of boreholes (sum of all)	3	ft
Choose the appropriate drilling method	Auger Boring - Level D	
Labor and equipment cost per work hour	$102.72	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.3050	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	0.9	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	$92.45	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$657.88	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR CLOSURE - 2.5-INCH-DIAMETER-HOLES	$750.33	
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR POST-CLOSURE CARE PER EVENT - 2.5-INCH-DIAMETER-HOLES	$750.33	per Event

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** LSV processing tank system 11/10/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	1	$718.42	0	$359.21
Metals (SW 6010), per each metal	Both	$13.73	8	$27.46	0	$109.84
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	1	$377.66	0	$188.83

Surface Water and Liquid Samples (SA_07-1)

COLLECTION OF SURFACE WATER AND LIQUID SAMPLES

Number of sampling locations	3	Sample Location
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$91.88	per Work Hour
Work rate required to collect samples from one sampling location	0.5000	Work hrs per Sample
Number of hours required to collect all samples	1.5	Work hrs
Cost of Collection per Sampling Event	$137.82	per Event

ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES

Cost of Analysis per Sampling Event	$1,973.64	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES	$2,111.46	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	LSV processing tank system	11/10/2014

Surface Water and Liquid Samples (SA_07)
Cost of Analysis per Sampling Event

Method		**Standard**	**Qty**	**Quick**	**Qty**	**Total**
Base neutral & acid extractable organics (SW 3510/SW 8270)	Liquid	$359.21	3	$718.42	0	$1,077.63
Metals (SW 6010), per each metal	Both	$13.73	24	$27.46	0	$329.52
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	3	$377.66	0	$566.49

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	$14,569.50
Treatment and Disposal of Decontamination Fluids (TD-03)	$870.46
Total Cost of Treatment and Disposal	$15,439.96

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	LSV processing tank system	11/10/2014

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL		
Solid Waste Type (Optional: Enter Name)	0	
Volume in yd3 of solid waste to be treated and disposed of	0.0	yd3
Treatment and disposal costs per yd3	$0.00	per yd3
Cost to Treat and Dispose of Solid Waste	$0.00	
LIQUID WASTE TREATMENT AND DISPOSAL		
Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	971.3	gal
Treatment and disposal costs per gallon	$15.00	per Gallon
Cost to Treat and Dispose of Liquid Waste	$14,569.50	
DRUMMED WASTE TREATMENT AND DISPOSAL		
Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	$14,569.50	

Notes: Treatment and Disposal cost includes transportation cost.

Treatment and Disposal of Decon Fluid (TD_03-1)

Volume of decontamination fluid generated from closure activities

Volume of decontamination fluid from Primary Unit	971.3	gal
Volume of decontamination fluid generated by steam cleaning or pressure washing (DC-02)	700.0	gal
Volume of decontamination fluid from heavy equipment (DC-04)	0.0	gal
Total Volume of Decontamination Fluid	1,671.3	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$77.41	per Work Hour
Work rate to pump decontamination fluid to a holding tank	0.0001	Work hr per gal
Number of hours required to pump decontamination fluid to a holding tank	0.16713	Work hrs
Subtotal of labor and equipment costs to pump decontamination fluid to a holding tank	$12.94	
Number of days required to rent a holding tank	1	Days
Holding tank rental fee (10,000 gal tank per day)	$189.00	per Day
Number of tanks required	1	Tanks
Subtotal of tank rental costs	$189.00	
Cost for treatment and disposal	$0.40	per Gallon
Treatment and disposal costs for bulk liquid	$668.52	
TOTAL COST TO TREATMENT AND DISPOSE OF DECONTAMINATION FLUID AS A BULK LIQUID	$870.46	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	LSV processing tank system	11/10/2014

Transportation of Waste (TR_01-1)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of 55-gallon drums	$1,692.00	per Truckload
Cost to transport Waste in Drums	$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	2,089.3	gal
Number of truckloads needed to transport bulk free liquid waste	1	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of bulk liquids	$1,692.00	per Truckload
Cost to Transport Bulk Liquid Wastes	$1,692.00	

TRANSPORATION OF BULK WASTE

Number of waste debris boxes	0	Containers
Number of truckloads needed to transport bulk waste	0	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of bulk waste	$1,692.00	per Truckload
Cost to Transport Bulk Waste	$0.00	
TOTAL COST OF TRANSPORTATION OF WASTE	$1,692.00	

Notes: Bulk waste includes 2089.3 gal of decontamination fluids. Transportation cost for waste is included in the treatment and disposal cost on Form TD_02-1.

Tank Systems Summary (TS_02-1)

Removal of Waste (TS-03)	$0.00	
Tank System Purging (ignitable waste only) (TS-04)	$159.87	
Flushing the Tank and Piping (TS-05)	$316.71	
Excavation, Disassembly, and Loading (TS-06)	$3,942.81	
Demolition and Removal of Containment System (TS-07)	$0.00	
Removal of Soil (TS-08)	$0.00	
Backfill and Grading (BF-01)	$0.00	
Decontamination (DC-01)	$440.66	
Sampling and Analysis (SA-02)	$1,421.45	
Monitoring Well Installation (MW-01)	$0.00	
Transportation (TR-01)	$1,692.00	
Treatment and Disposal (TD-01)	$47,168.56	
User Defined Cost (UD-01)	$0.00	
Subtotal of Closure Costs	$55,142.06	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	$5,514.21	
Certification of Closure (TS-09)	$0.00	
Subtotal	$60,656.27	
Percentage of Contingency Allowance	20.0	%
Contingency Allowance	$12,131.25	
Landfill Closure (Cover Installation) (CI-02)	$0.00	
TOTAL COST OF CLOSURE	$72,787.52	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	PSB processing tank system	11/10/2014

Tank Systems Inventory (TS_01-1)

UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Type of tank system	Aboveground	
Height or length of tank	0.0	ft
Diameter of tank	0.0	ft
Maximum permitted capacity of the tank	3,000.0	gal
Total length of ancillary piping	225.0	ft
Nominal diameter of ancillary piping	0.8	in
Maximum capacity of ancillary piping	5.9	gal
Maximum capacity of tank and ancillary piping	3,005.9	gal

SURFACE AREA OF TANK SYSTEM

Surface area of tank (interior and exterior)	816.0	ft2

VOLUME OF TANK SYSTEM TO BE REMOVED

Volume of Tank System to be Removed	401.8	ft3
Volume of Tank System to be Removed in yd3	14.9	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD

Length	0.0	ft
Width	0.0	ft
Surface Area of Secondary Containment System Pad	0.0	ft2
Surface Area of Secondary Containment System Pad in yd2	0.0	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD

Thickness	0.0	ft
Volume of Secondary Containment Pad	0.0	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM

Total Length	0.0	ft
Height	0.0	ft
Surface Area of Secondary Containment System Berm	0.0	ft2
Surface Area of Secondary Containment System Berm in yd2	0.0	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM

Thickness	0.0	ft
Volume of Secondary Containment System Berm	0.0	yd3

SURFACE AREA OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM

Surface Area of Other Structures	0.0	ft2

Surface Area of Other Structures in yd2	0.0	yd2

VOLUME OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM

Volume of Other Structures	0.0	yd3

VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Contaminated Soil to be Removed	0.0	ft3
Volume of Contaminated Soil to be Removed in yd3	0.0	yd3

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	PSB processing tank system	11/10/2014

Tank Systems Removal of Waste (TS_03-1)

Maximum volume of waste to be removed from the tank and ancillary piping	3,005.9	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$175.95	per Work Hour
Work rate required to remove waste from tank and ancillary piping	0.0003	Work hr per gal
Number of hours required to remove waste from tank and ancillary piping	0.9	Work hrs
TOTAL COST OF REMOVAL OF WASTE FROM TANK AND ANCILLARY PIPING	$158.35	

Tank Systems Purging (TS_04-1)

Maximum capacity of the tank system	3,000.0	gal
Amount of solid carbon dioxide (dry ice) needed per gal capacity	1.5	lb per 100 gal
Amount of dry ice needed to purge tank system	45.0	lb
Cost of dry ice	$2.64	per Pound
Cost of dry ice needed to purge tank system	$118.80	
Choose the appropriate level of PPE	Protection Level D	
Labor cost per work hour	$68.45	per Work Hour
Work rate required to purge tank	0.0002	Work hr per gal
Number of hours required to purge tank	0.6	Work hrs
Labor Cost to Purge Tank System	$41.07	
TOTAL COST OF TANK SYSTEM PURGING	$159.87	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	PSB processing tank system	11/10/2014

Flushing the Tank and Piping (TS_05-1)

Maximum capacity of the tank and ancillary piping	3,005.9	gal
Number of times tank and ancillary piping are flushed	1	
Total volume of flushing solution	3,005.9	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$175.95	per Work Hour
Work rate required to flush tank and ancillary piping	0.0006	Work hr per gal
Number of hours required to flush tank and ancillary piping	1.8	Work hrs
Subtotal of labor and equipment cost to flush tank and ancillary piping	$316.71	
Flushing solution is contained in:	Bulk	
Number of drums required to contain flushing solution	0	Drums
Cost of one drum	$83.85	
Cost of drums needed to contain flushing solution	$0.00	
TOTAL COST TO FLUSH TANK AND ANCILLARY PIPING	$316.71	

Tank Systems Excavation, Disassembly, and Loading (TS_06-1)

DISASSEMBLY OF ANCILLARY PIPING

Length of ancillary piping to be disassembled	225.0	ft
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$77.17	per Work Hour
Work rate required to disassemble one foot of pipe	0.1500	Work hr per Ft
Number of hours required to disassemble ancillary piping	33.8	Work hrs
Cost of Disassembly of Ancillary Piping	$2,608.35	

EXCAVATION AND LOADING (FOR IN-GROUND AND UNDERGROUND TANKS ONLY)

Capacity of Tank	0.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$541.35	per Work Hour
Work rate required to excavate and load tank per gallon capacity	0.000000	Work hr per gal
Number of hours required to excavate and load tank	0.0	Work hrs
Cost to Excavate and Load Tank	$0.00	

REMOVE TANK (FOR ON-GROUND AND ABOVEGROUND TANKS ONLY)

Capacity of Tank	3,000.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$222.41	per Work Hour
Work rate required to load tank per gallon capacity	0.002000	Work hr per gal
Number of hours required to load tank	6	Work hrs
Cost to Load Tank	$1,334.46	
TOTAL COST OF EXCAVATION, DISASSEMBLY, AND LOADING	$3,942.81	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	PSB processing tank system	11/10/2014

Decontamination Summary (DC_01-1)

Decontamination of Unit by Steam Cleaning or Pressure Washing (DC-02)	$440.66
Decontamination of Unit by Sandblasting (DC-03)	$0.00
Decontamination of Heavy Equipment (DC-04)	$0.00
TOTAL COST OF DECONTAMINATION	$440.66

Decontamination by Steam Cleaning or Pressure Wash (DC_02-1)

Area of unit to be decontaminated	1,632.0	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$65.77	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0041	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	6.7	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	$440.66	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	1,632.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	$83.85	per Drum
Cost of drums needed to contain decontamination fluid	$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	$440.66	

Notes: Work rate for steam cleaning or pressure wash of 0.0041hour/ft2 is more realistic and was obtained from the previous CostPro version.

Sampling and Analysis Inventory (SA_01-1)

Number of Drilling and Subsurface Soil Samples (2.5-inch boring)	1	Samples
Number of Drilling and Subsurface Soil Samples (4-inch boring)	0	Samples
Number of Concrete Core Samples	0	Samples
Number of Wipe Sample Locations	0	Sample Location
Number of Surface Water and Liquid Sample Locations	1	Sample Location
Number of Soil, Sludge, and Sediment Soil Samples	0	Sample Location
Number of Groundwater Sample Locations	0	Sample Location
Number of Lysimeters to be Sampled	0	Lysimeters

Sampling and Analysis Summary (SA_02-1)

Drilling and Subsurface Soil Sample - 2.5-Inch-Diameter-Holes (SA-03)	$719.51
Drilling and Subsurface Soil Sample - 4-Inch-Diameter-Holes (SA-04)	$0.00
Concrete Core Sample (SA-05)	$0.00
Wipe Sample (SA-06)	$0.00
Surface Water and Liquid Sample (SA-07)	$701.94
Soil, Sludge, and Sediment Sample (SA-08)	$0.00
Groundwater Sample (SA-09)	$0.00
Soil-Pore Liquid Sample (SA-10)	$0.00
Analysis of Subsurface Soil Sample (SA-11)	$0.00
TOTAL SAMPLING AND ANALYSIS COST	$1,421.45

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-1)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	1	Borings
Enter depth of boreholes (sum of all)	2	ft
Choose the appropriate drilling method	Auger Boring - Level D	
Labor and equipment cost per work hour	$102.72	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.3050	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	0.6	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	$61.63	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$657.88	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR CLOSURE - 2.5-INCH-DIAMETER-HOLES	$719.51	
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR POST-CLOSURE CARE PER EVENT - 2.5-INCH-DIAMETER-HOLES	$719.51	per Event

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	PSB processing tank system	11/10/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	1	$718.42	0	$359.21
Metals (SW 6010), per each metal	Both	$13.73	8	$27.46	0	$109.84
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	1	$377.66	0	$188.83

Surface Water and Liquid Samples (SA_07-1)

COLLECTION OF SURFACE WATER AND LIQUID SAMPLES

Number of sampling locations	1	Sample Location
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$91.88	per Work Hour
Work rate required to collect samples from one sampling location	0.5000	Work hrs per Sample
Number of hours required to collect all samples	0.5	Work hrs
Cost of Collection per Sampling Event	$45.94	per Event

ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES

Cost of Analysis per Sampling Event	$656.00	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES	$701.94	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** PSB processing tank system 11/10/2014

Surface Water and Liquid Samples (SA_07)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Analysis of Lysimeters for soil-pore liquid monitoring	Liquid	$357.33	1	$714.66	0	$357.33
Metals (SW 6010), per each metal	Both	$13.73	8	$27.46	0	$109.84
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	1	$377.66	0	$188.83

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	$45,088.50
Treatment and Disposal of Decontamination Fluids (TD-03)	$2,080.06
Total Cost of Treatment and Disposal	$47,168.56

Facility:	PERMA-FIX of FLORIDA (RCRA)	Unit:	PSB processing tank system	11/10/2014

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL		
Solid Waste Type (Optional: Enter Name)	0	
Volume in yd3 of solid waste to be treated and disposed of	0.0	yd3
Treatment and disposal costs per yd3	$0.00	per yd3
Cost to Treat and Dispose of Solid Waste	$0.00	
LIQUID WASTE TREATMENT AND DISPOSAL		
Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	3,005.9	gal
Treatment and disposal costs per gallon	$15.00	per Gallon
Cost to Treat and Dispose of Liquid Waste	$45,088.50	
DRUMMED WASTE TREATMENT AND DISPOSAL		
Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	$45,088.50	

Treatment and Disposal of Decon Fluid (TD_03-1)

Volume of decontamination fluid generated from closure activities

Volume of decontamination fluid from Primary Unit	3,005.9	gal
Volume of decontamination fluid generated by steam cleaning or pressure washing (DC-02)	1,632.0	gal
Volume of decontamination fluid from heavy equipment (DC-04)	0.0	gal
Total Volume of Decontamination Fluid	4,637.9	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$77.41	per Work Hour
Work rate to pump decontamination fluid to a holding tank	0.0001	Work hr per gal
Number of hours required to pump decontamination fluid to a holding tank	0.46379	Work hrs
Subtotal of labor and equipment costs to pump decontamination fluid to a holding tank	$35.90	
Number of days required to rent a holding tank	1	Days
Holding tank rental fee (10,000 gal tank per day)	$189.00	per Day
Number of tanks required	1	Tanks
Subtotal of tank rental costs	$189.00	
Cost for treatment and disposal	$0.40	per Gallon
Treatment and disposal costs for bulk liquid	$1,855.16	
TOTAL COST TO TREATMENT AND DISPOSE OF DECONTAMINATION FLUID AS A BULK LIQUID	$2,080.06	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	PSB processing tank system	11/10/2014

Transportation of Waste (TR_01-1)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of 55-gallon drums	$1,692.00	per Truckload
Cost to transport Waste in Drums	$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	4,637.9	gal
Number of truckloads needed to transport bulk free liquid waste	1	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of bulk liquids	$1,692.00	per Truckload
Cost to Transport Bulk Liquid Wastes	$1,692.00	

TRANSPORATION OF BULK WASTE

Number of waste debris boxes	0	Containers
Number of truckloads needed to transport bulk waste	0	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of bulk waste	$1,692.00	per Truckload
Cost to Transport Bulk Waste	$0.00	
TOTAL COST OF TRANSPORTATION OF WASTE	$1,692.00	

Notes: Bulk waste includes 4637.9 gal of decontamination fluids.Transportation cost for waste is included in the Treatment and disposal cost on Form TD_02-1.

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB tanks 11/10/2014

Tank Systems Summary (TS_02-1)

Removal of Waste (TS-03)	$52.78	
Tank System Purging (ignitable waste only) (TS-04)	$54.08	
Flushing the Tank and Piping (TS-05)	$105.57	
Excavation, Disassembly, and Loading (TS-06)	$1,033.83	
Demolition and Removal of Containment System (TS-07)	$0.00	
Removal of Soil (TS-08)	$0.00	
Backfill and Grading (BF-01)	$0.00	
Decontamination (DC-01)	$388.04	
Sampling and Analysis (SA-02)	$7,069.58	
Monitoring Well Installation (MW-01)	$0.00	
Transportation (TR-01)	$1,692.00	
Treatment and Disposal (TD-01)	$60,020.19	
User Defined Cost (UD-01)	$0.00	
Subtotal of Closure Costs	$70,416.07	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	$7,041.61	
Certification of Closure (TS-09)	$0.00	
Subtotal	$77,457.68	
Percentage of Contingency Allowance	20.0	%
Contingency Allowance	$15,491.54	
Landfill Closure (Cover Installation) (CI-02)	$0.00	
TOTAL COST OF CLOSURE	$92,949.22	

Facility: PERMA-FIX of FLORIDA (RCRA)	**Unit:** TOB tanks		11/10/2014

Tank Systems Inventory (TS_01-1)

UNIT DESCRIPTION AND MAXIMUM PERMITTED CAPACITY

Type of tank system	Aboveground	
Height or length of tank	0.0	ft
Diameter of tank	0.0	ft
Maximum permitted capacity of the tank	1,023.0	gal
Total length of ancillary piping	50.0	ft
Nominal diameter of ancillary piping	2.0	in
Maximum capacity of ancillary piping	8.2	gal
Maximum capacity of tank and ancillary piping	1,031.2	gal

SURFACE AREA OF TANK SYSTEM

Surface area of tank (interior and exterior)	291.0	ft2

VOLUME OF TANK SYSTEM TO BE REMOVED

Volume of Tank System to be Removed	137.9	ft3
Volume of Tank System to be Removed in yd3	5.1	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD

Length	34.5	ft
Width	24.0	ft
Surface Area of Secondary Containment System Pad	828.0	ft2
Surface Area of Secondary Containment System Pad in yd2	92.0	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD

Thickness	0.5	ft
Volume of Secondary Containment Pad	15.3	yd3

SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM

Total Length	117.0	ft
Height	0.2	ft
Surface Area of Secondary Containment System Berm	23.4	ft2
Surface Area of Secondary Containment System Berm in yd2	2.6	yd2

VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM

Thickness	0.5	ft
Volume of Secondary Containment System Berm	0.4	yd3

SURFACE AREA OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM

Surface Area of Other Structures	0.0	ft2

Surface Area of Other Structures in yd2	0.0	yd2

VOLUME OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM

Volume of Other Structures	0.0	yd3

VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Contaminated Soil to be Removed	0.0	ft3
Volume of Contaminated Soil to be Removed in yd3	0.0	yd3

Notes: This tank system consists of 317-gal reactor vessel 120-gal accumulator tank 30-gal absorber tank 16-gal condenser associated with PF-II treatment 300-gal non-elementary neutralization tank55-gal deactivation tank170-gal drum rotator and 15-gal mercury amalgmation unit. Total surface area for tanks= 201 ft2 for PF-II tanks + 60 ft2 for neutralization tank + 30 ft2 for drum rotator deactivation unit and mercury amalgmation unit.

Tank Systems Removal of Waste (TS_03-1)

Maximum volume of waste to be removed from the tank and ancillary piping	1,031.2	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$175.95	per Work Hour
Work rate required to remove waste from tank and ancillary piping	0.0003	Work hr per gal
Number of hours required to remove waste from tank and ancillary piping	0.3	Work hrs
TOTAL COST OF REMOVAL OF WASTE FROM TANK AND ANCILLARY PIPING	$52.78	

Tank Systems Purging (TS_04-1)

Maximum capacity of the tank system	1,023.0	gal
Amount of solid carbon dioxide (dry ice) needed per gal capacity	1.5	lb per 100 gal
Amount of dry ice needed to purge tank system	15.3	lb
Cost of dry ice	$2.64	per Pound
Cost of dry ice needed to purge tank system	$40.39	
Choose the appropriate level of PPE	Protection Level D	
Labor cost per work hour	$68.45	per Work Hour
Work rate required to purge tank	0.0002	Work hr per gal
Number of hours required to purge tank	0.2	Work hrs
Labor Cost to Purge Tank System	$13.69	
TOTAL COST OF TANK SYSTEM PURGING	$54.08	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB tanks 11/10/2014

Flushing the Tank and Piping (TS_05-1)

Maximum capacity of the tank and ancillary piping	1,031.2	gal
Number of times tank and ancillary piping are flushed	1	
Total volume of flushing solution	1,031.2	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$175.95	per Work Hour
Work rate required to flush tank and ancillary piping	0.0006	Work hr per gal
Number of hours required to flush tank and ancillary piping	0.6	Work hrs
Subtotal of labor and equipment cost to flush tank and ancillary piping	$105.57	
Flushing solution is contained in:	Bulk	
Number of drums required to contain flushing solution	0	Drums
Cost of one drum	$83.85	
Cost of drums needed to contain flushing solution	$0.00	
TOTAL COST TO FLUSH TANK AND ANCILLARY PIPING	$105.57	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB tanks 11/10/2014

Tank Systems Excavation, Disassembly, and Loading (TS_06-1)

DISASSEMBLY OF ANCILLARY PIPING

Length of ancillary piping to be disassembled	50.0	ft
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$77.17	per Work Hour
Work rate required to disassemble one foot of pipe	0.1500	Work hr per Ft
Number of hours required to disassemble ancillary piping	7.5	Work hrs
Cost of Disassembly of Ancillary Piping	$578.78	

EXCAVATION AND LOADING (FOR IN-GROUND AND UNDERGROUND TANKS ONLY)

Capacity of Tank	0.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$541.35	per Work Hour
Work rate required to excavate and load tank per gallon capacity	0.000000	Work hr per gal
Number of hours required to excavate and load tank	0.0	Work hrs
Cost to Excavate and Load Tank	$0.00	

REMOVE TANK (FOR ON-GROUND AND ABOVEGROUND TANKS ONLY)

Capacity of Tank	1,023.0	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$222.41	per Work Hour
Work rate required to load tank per gallon capacity	0.002000	Work hr per gal
Number of hours required to load tank	2.046	Work hrs
Cost to Load Tank	$455.05	
TOTAL COST OF EXCAVATION, DISASSEMBLY, AND LOADING	$1,033.83	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	TOB tanks	11/10/2014

Decontamination Summary (DC_01-1)

Decontamination of Unit by Steam Cleaning or Pressure Washing (DC-02)	$388.04
Decontamination of Unit by Sandblasting (DC-03)	$0.00
Decontamination of Heavy Equipment (DC-04)	$0.00
TOTAL COST OF DECONTAMINATION	$388.04

Decontamination by Steam Cleaning or Pressure Wash (DC_02-1)

Area of unit to be decontaminated	1,433.4	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$65.77	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0041	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	5.9	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	$388.04	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	1,433.4	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	$83.85	per Drum
Cost of drums needed to contain decontamination fluid	$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	$388.04	

Notes: Work rate for steam cleaning or pressure wash of 0.0041hour/ft2 is more realistic and was obtained from the previous CostPro version.

Sampling and Analysis Inventory (SA_01-1)

Number of Drilling and Subsurface Soil Samples (2.5-inch boring)	2	Samples
Number of Drilling and Subsurface Soil Samples (4-inch boring)	0	Samples
Number of Concrete Core Samples	0	Samples
Number of Wipe Sample Locations	0	Sample Location
Number of Surface Water and Liquid Sample Locations	8	Sample Location
Number of Soil, Sludge, and Sediment Soil Samples	0	Sample Location
Number of Groundwater Sample Locations	0	Sample Location
Number of Lysimeters to be Sampled	0	Lysimeters

Sampling and Analysis Summary (SA_02-1)

Drilling and Subsurface Soil Sample - 2.5-Inch-Diameter-Holes (SA-03)	$1,439.02
Drilling and Subsurface Soil Sample - 4-Inch-Diameter-Holes (SA-04)	$0.00
Concrete Core Sample (SA-05)	$0.00
Wipe Sample (SA-06)	$0.00
Surface Water and Liquid Sample (SA-07)	$5,630.56
Soil, Sludge, and Sediment Sample (SA-08)	$0.00
Groundwater Sample (SA-09)	$0.00
Soil-Pore Liquid Sample (SA-10)	$0.00
Analysis of Subsurface Soil Sample (SA-11)	$0.00
TOTAL SAMPLING AND ANALYSIS COST	$7,069.58

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:** TOB tanks	11/10/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-1)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	2	Borings
Enter depth of boreholes (sum of all)	4	ft
Choose the appropriate drilling method	Auger Boring - Level D	
Labor and equipment cost per work hour	$102.72	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.3050	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	1.2	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	$123.26	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	$1,315.76	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR CLOSURE - 2.5-INCH-DIAMETER-HOLES	$1,439.02	
TOTAL COST OF SAMPLING AND ANALYSIS OF DRILLING AND SUBSURFACE SOIL SAMPLES FOR POST-CLOSURE CARE PER EVENT - 2.5-INCH-DIAMETER-HOLES	$1,439.02	per Event

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB tanks 11/10/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base/neutral & acid extractable organics (SW 3550/SW 8270)	Solid	$359.21	2	$718.42	0	$718.42
Metals (SW 6010), per each metal	Both	$13.73	16	$27.46	0	$219.68
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	2	$377.66	0	$377.66

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:** TOB tanks	11/10/2014

Surface Water and Liquid Samples (SA_07-1)

COLLECTION OF SURFACE WATER AND LIQUID SAMPLES

Number of sampling locations	8	Sample Location
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	$91.88	per Work Hour
Work rate required to collect samples from one sampling location	0.5000	Work hrs per Sample
Number of hours required to collect all samples	4.0	Work hrs
Cost of Collection per Sampling Event	$367.52	per Event

ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES

Cost of Analysis per Sampling Event	$5,263.04	per Event

SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES	$5,630.56	

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB tanks 11/10/2014

Surface Water and Liquid Samples (SA_07)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Base neutral & acid extractable organics (SW 3510/SW 8270)	Liquid	$359.21	8	$718.42	0	$2,873.68
Metals (SW 6010), per each metal	Both	$13.73	64	$27.46	0	$878.72
Volatile organic analysis (SW 5030/SW 8240)	Both	$188.83	8	$377.66	0	$1,510.64

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	$58,826.27
Treatment and Disposal of Decontamination Fluids (TD-03)	$1,193.92
Total Cost of Treatment and Disposal	$60,020.19

Facility: PERMA-FIX of FLORIDA (RCRA) **Unit:** TOB tanks 11/10/2014

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	HEPA filters & filter bags	
Volume in yd3 of solid waste to be treated and disposed of	3.1	yd3
Treatment and disposal costs per yd3	$13,986.54	per yd3
Cost to Treat and Dispose of Solid Waste	$43,358.27	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	1,031.2	gal
Treatment and disposal costs per gallon	$15.00	per Gallon
Cost to Treat and Dispose of Liquid Waste	$15,468.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	$58,826.27	

Notes: Solid waste consists of HEPA filters and filter bags comprising of 83.7 cubic feet. Transportation and disposal cost is 518.02/cubic foot. Transportion cost is included in the Treatment and Disposal cost for the wastes.

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	TOB tanks	11/10/2014

Treatment and Disposal of Decon Fluid (TD_03-1)

Volume of decontamination fluid generated from closure activities

Volume of decontamination fluid from Primary Unit	1,031.2	gal
Volume of decontamination fluid generated by steam cleaning or pressure washing (DC-02)	1,433.4	gal
Volume of decontamination fluid from heavy equipment (DC-04)	0.0	gal
Total Volume of Decontamination Fluid	2,464.6	gal
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	$77.41	per Work Hour
Work rate to pump decontamination fluid to a holding tank	0.0001	Work hr per gal
Number of hours required to pump decontamination fluid to a holding tank	0.24646	Work hrs
Subtotal of labor and equipment costs to pump decontamination fluid to a holding tank	$19.08	
Number of days required to rent a holding tank	1	Days
Holding tank rental fee (10,000 gal tank per day)	$189.00	per Day
Number of tanks required	1	Tanks
Subtotal of tank rental costs	$189.00	
Cost for treatment and disposal	$0.40	per Gallon
Treatment and disposal costs for bulk liquid	$985.84	
TOTAL COST TO TREATMENT AND DISPOSE OF DECONTAMINATION FLUID AS A BULK LIQUID	$1,193.92	

Facility:	PERMA-FIX of FLORIDA (RCRA)	**Unit:**	TOB tanks	11/10/2014

Transportation of Waste (TR_01-1)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of 55-gallon drums	$1,692.00	per Truckload
Cost to transport Waste in Drums	$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	2,464.6	gal
Number of truckloads needed to transport bulk free liquid waste	1	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of bulk liquids	$1,692.00	per Truckload
Cost to Transport Bulk Liquid Wastes	$1,692.00	

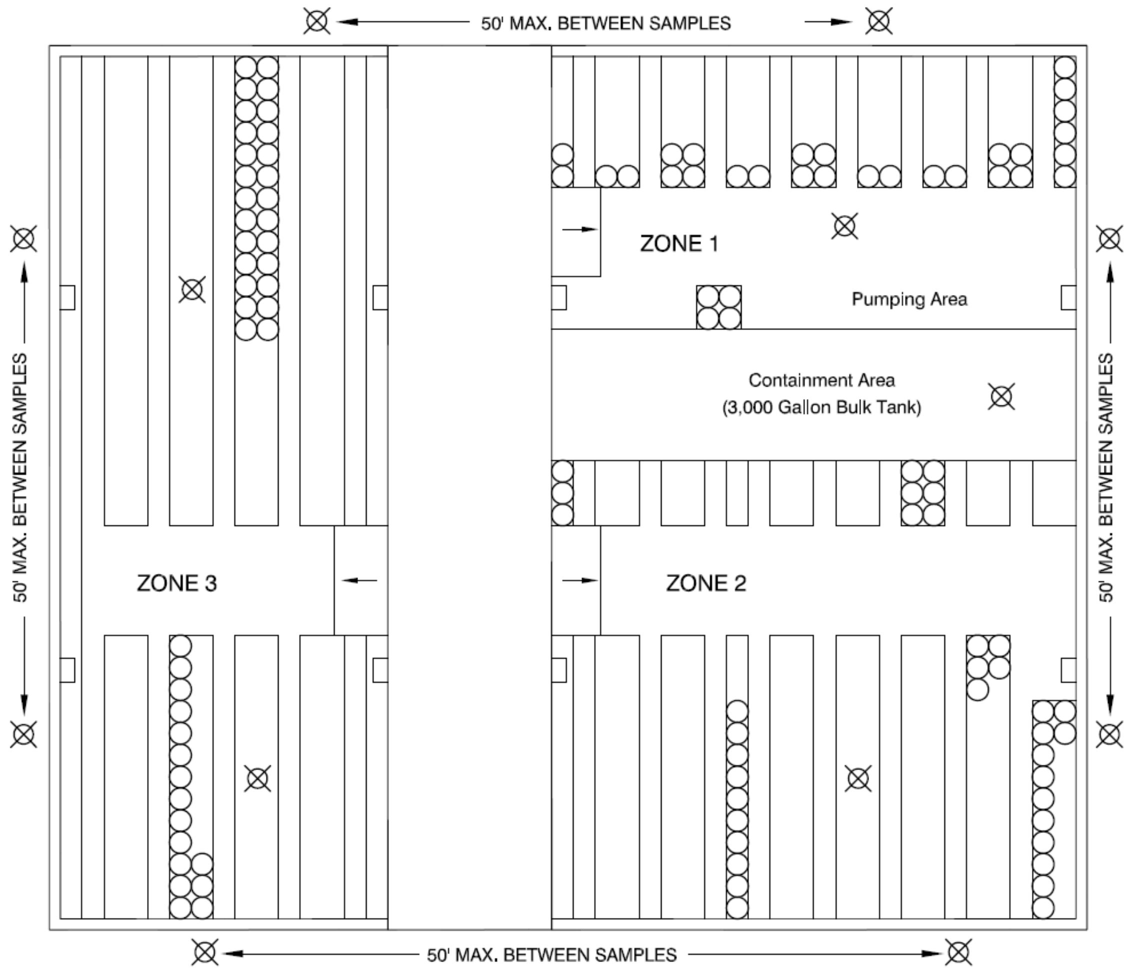
TRANSPORATION OF BULK WASTE

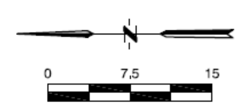
Number of waste debris boxes	0	Containers
Number of truckloads needed to transport bulk waste	0	Truckloads
Type of waste	Hazardous	
Number of miles	300.0	Mi
Cost per mile	$5.64	per Mile
Cost to transport one truckload of bulk waste	$1,692.00	per Truckload
Cost to Transport Bulk Waste	$0.00	
TOTAL COST OF TRANSPORTATION OF WASTE	$1,692.00	

Notes: Bulk waste includes 2464.6 gal of decontamination fluids. Transportation cost for wastes are included in the treatment and disposal cost for wastes on Form TD_02-1.

FIGURE K-1

BORING LOCATION DIAGRAM
PROCESSING AND STORAGE BUILDING





- Sample locations

TITLE: FIGURE K-1		
PROCESSING AND STORAGE BUILDING SAMPLE LOCATIONS		
PREPARED FOR: PERMA-FIX OF FLORIDA, INC. 1940 NW 67th Place Gainesville, FL. 32653		
SCALE: 1=15	APPROVED BY:	DRAWN: SYA
DATE: 11-12-04		REVISED:
PROJECT NUMBER: PF|FLA 040168		DRAWING NUMBER: K-1

PERMA-FIX
ENVIRONMENTAL SERVICES

FIGURE K-2

BORING LOCATION DIAGRAM
LSV PROCESSING AND WASTE STORAGE WAREHOUSE

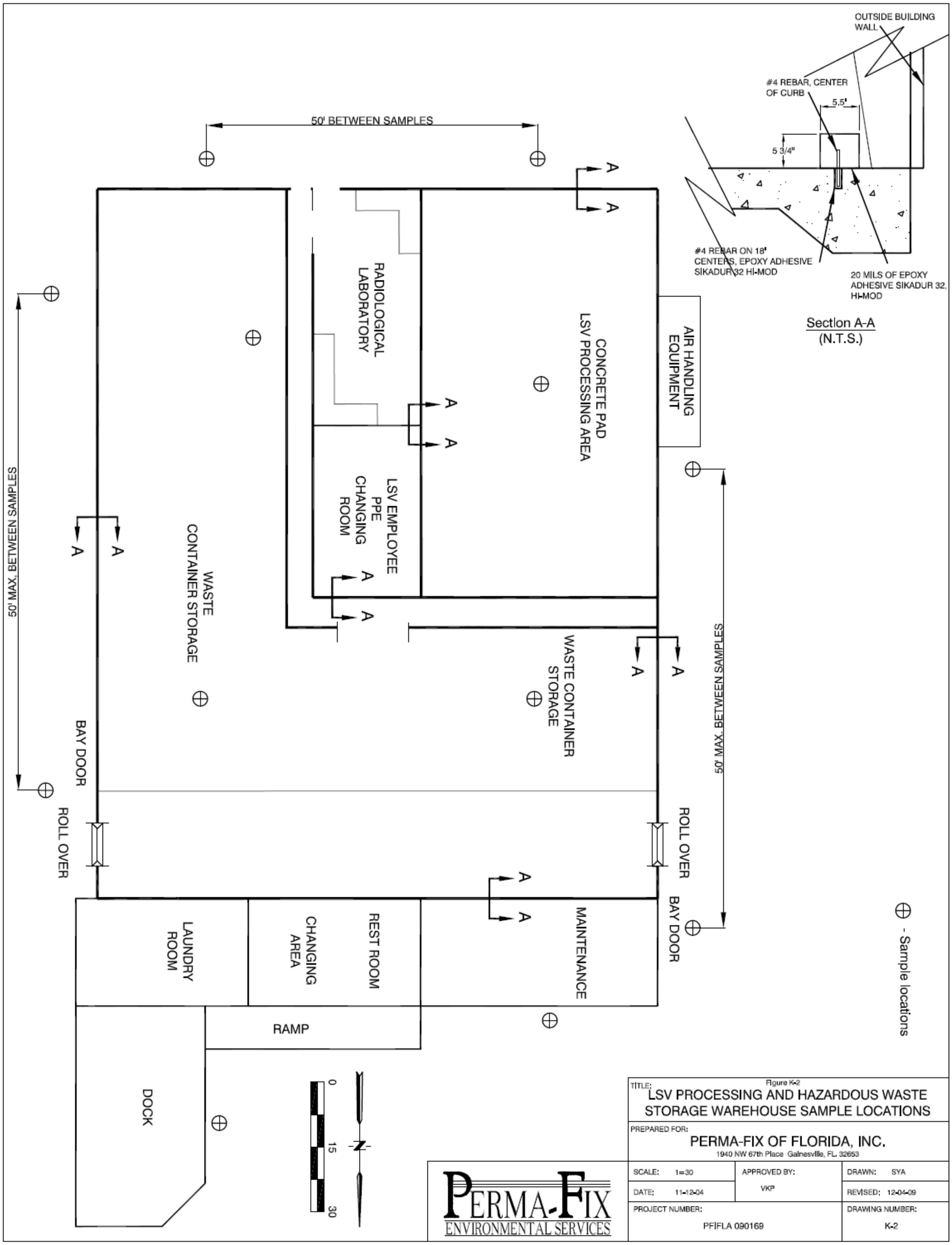
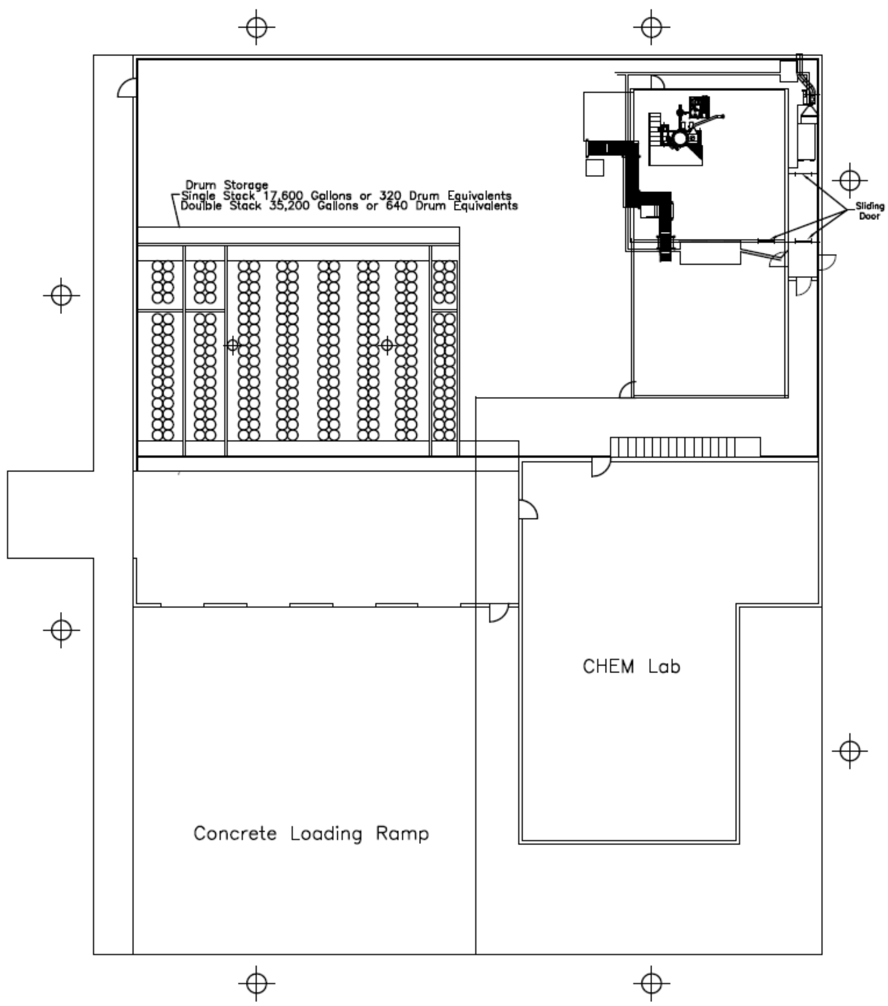

OUTSIDE BUILDING WALL
#4 REBAR, CENTER OF CURB
5.5'
5 3/4"
#4 REBAR ON 18' CENTERS, EPOXY ADHESIVE SIKADUR 32 HI-MOD
20 MILS OF EPOXY ADHESIVE SIKADUR 32, HI-MOD
Section A-A
(N.T.S.)
50' BETWEEN SAMPLES
50' MAX. BETWEEN SAMPLES
RADIOLOGICAL LABORATORY
CONCRETE PAD LSV PROCESSING AREA
AIR HANDLING EQUIPMENT
LSV EMPLOYEE PPE CHANGING ROOM
WASTE CONTAINER STORAGE
WASTE CONTAINER STORAGE
BAY DOOR
ROLL OVER
ROLL OVER
BAY DOOR
LAUNDRY ROOM
CHANGING AREA
REST ROOM
MAINTENANCE
RAMP
DOCK
- Sample locations
0
15
30
N
TITLE:
Figure K-2
LSV PROCESSING AND HAZARDOUS WASTE STORAGE WAREHOUSE SAMPLE LOCATIONS
PREPARED FOR:
PERMA-FIX OF FLORIDA, INC.
1940 NW 67th Place Gainesville, FL 32653
PERMA-FIX ENVIRONMENTAL SERVICES
SCALE: 1=30
DATE: 11-12-04
APPROVED BY: VKP
DRAWN: SYA
REVISED: 12-04-09
PROJECT NUMBER: PFIFLA 090169
DRAWING NUMBER: K-2

FIGURE K-3

BORING LOCATION DIAGRAM
TREATMENT AND OPERATIONS BUILDING



⌖ – Sample Locations
Note: Perimeter sample locations around building to be ≤ 50' between borings

TITLE: Figure K-3 TREATMENT AND OPERATIONS BUILDING SAMPLE LOCATIONS			
PREPARED FOR: PERMA-FIX OF FLORIDA, INC. 1940 NW 67th Place Gainesville, FL. 32653			
PERMA-FIX ENVIRONMENTAL SERVICES	SCALE: NTS	APPROVED BY:	DRAWN: SYA
	DATE: 11-12-04		REVISED:
	PROJECT NUMBER: PFIFLA 040168		DRAWING NUMBER: K-3

P. Information Regarding Potential Releases From Solid Waste Management Units

Facility Name: Perma-Fix of Florida, Inc.

EPA/DEP I.D. No.: FLD980711071

Facility location: Gainesville (city), Florida (state)

1. Are there any of the following solid waste management units (existing or closed) at your facility? A solid waste management unit (SWMU) is a discernable unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include all areas at a facility where solid wastes have been routinely and systematically released.

DO NOT INCLUDE HAZARDOUS WASTE UNITS CURRENTLY SHOWN IN YOUR PART B APPLICATION.

Unit	Yes	No
landfill	☐	☒
surface impoundment	☐	☒
land farm	☐	☒
waste pile	☐	☒
incinerator	☐	☒
storage tank	☒	☐
container storage area	☒	☐
injection wells	☐	☒
wastewater treatment units	☐	☒
transfer station	☐	☒
waste recycling operations	☒	☐
land treatment facility	☐	☒
boiler/industrial furnace	☐	☒
other (units not listed above)	☒	☐

2. If there is a "yes" answer to any of the items in one (1.) above, on separate sheet(s) of paper, provide a description of the wastes that were stored, treated or disposed of in each unit. In particular, focus on whether or not the wastes would be considered hazardous wastes or hazardous constituents under RCRA. (Hazardous wastes are those identified in 40 CFR Part 261. Hazardous constituents are those listed in Appendix VIII of 40 CFR Part 261.) Include any available data on quantities or volumes of wastes disposed of and the dates of disposal. Provide a description of each unit and include capacity, dimensions, and location at the facility. Provide a site plan, if available, and the dates of operation of the unit [40 CFR 270.14(d)(1)].

See RCRA Facility Assessment Report by EPA Contractor A. T. Kearney dated 6/27/90 and attached in permit application Section II.Q.

3. On separate sheet(s) of paper, describe all data available on all prior or current releases of hazardous wastes or constituents to the environment that may have occurred in the past or may still be occurring, for each unit noted in one (1.) above and also for each hazardous waste unit in your Part B application [40 CFR 270.14(d)(2)].

   Provide the following information for each SWMU:

   a. Date of release.
   b. Specifications of all wastes managed at the unit, to the extent available.
   c. Quantity or volume of waste released.
   d. Describe the nature of the release (i.e., spill, overflow, ruptured pipe or tank, etc.)
   e. Location of the unit on the topographic map provided under 40 CFR 270.14(b)(19).
   f. Designate the type of unit.
   g. General dimensions and structural description (supply any available drawings).
   h. Dates of operation. No prior or current releases.

4. On separate sheet(s) of paper, provide for each unit all analytical data that may be available which would describe the nature and extent of the environmental contamination that exists as a result of the prior releases described in three (3.) above. Focus on the concentrations of hazardous wastes or constituents present in contaminated soil or groundwater [40 CFR 270.14(d)(3)].

   Not applicable.

APPLICATION FOR HAZARDOUS WASTE PERMIT

PART II

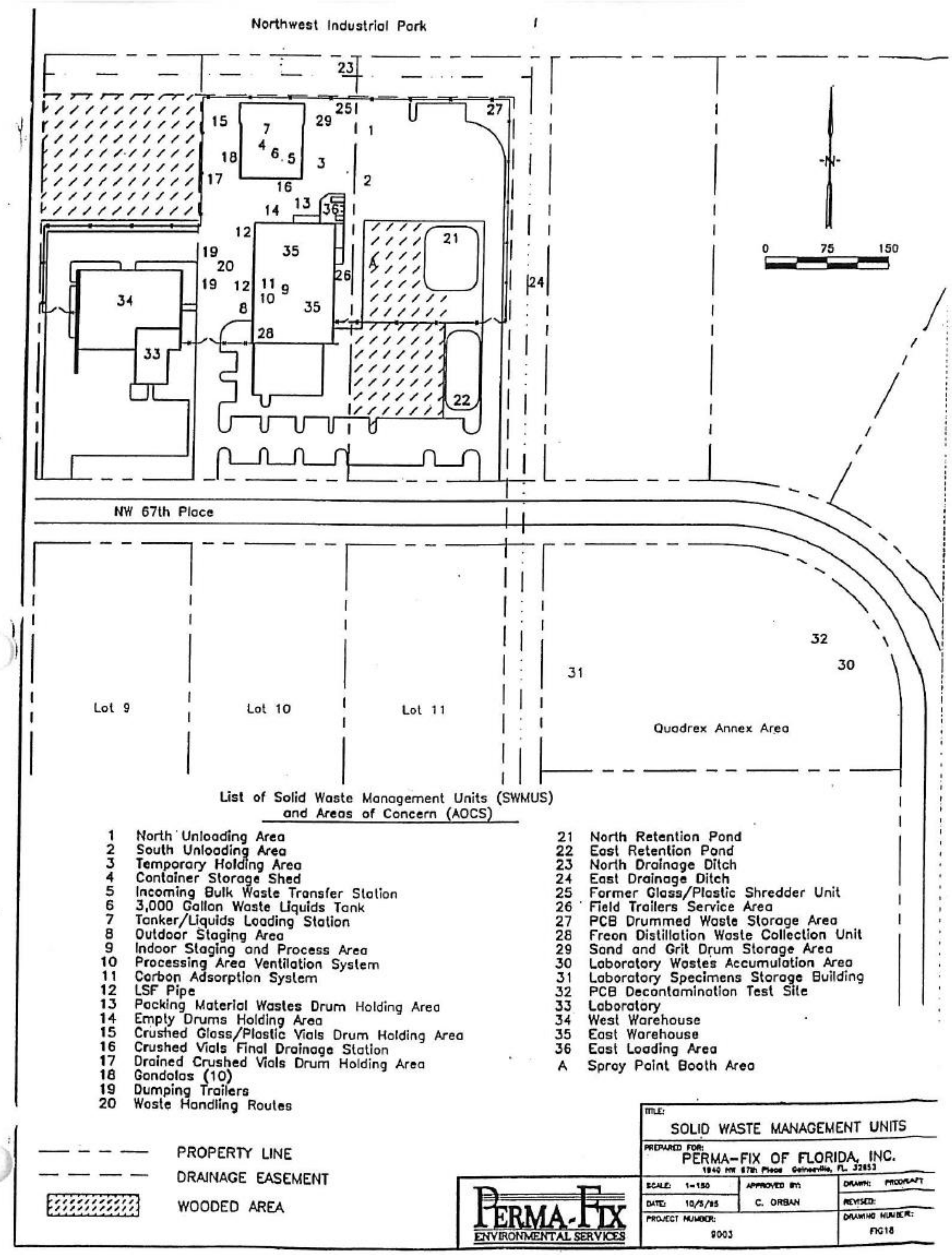
Q. RCRA FACILITY ASSESSMENT

RCRA Facility Assessment conducted by EPA's contractor, A. T. Kearney, is attached.

A Release Assessment Report for Area of Concern A (Paint Spray Booth) and Area of Concern C (Soil Mound Area) prepared by Environmental Science Associates, Inc. and dated June 2001 was submitted to FDEP. This Report had concluded that no further action was warranted for Areas of Concern A and C, based on the results of the laboratory analysis of the soil samples. This investigation was required by the HSWA corrective action section of the hazardous waste permit that was in effect then.

The current hazardous waste permit issued on September 16, 2010 requires no further action for any potential SWMUs at the facility. No releases from any additional SWMUs have been identified after the issuance of this permit.

The current operational facility property was acquired by PFF from Quadrex Corporation on June 17, 1994. The Quadrex Annex Area indicated on the SWMU map on the next page was never owned by PFF. Hence, SWMUs #30, 31, and 32 shown on the attached map are not SWMUs associated with PFF.


Northwest Industrial Park
NW 67th Place
Lot 9
Lot 10
Lot 11
Quadrex Annex Area
-N-
0 75 150
List of Solid Waste Management Units (SWMUS) and Areas of Concern (AOCS)
1 North Unloading Area
2 South Unloading Area
3 Temporary Holding Area
4 Container Storage Shed
5 Incoming Bulk Waste Transfer Station
6 3,000 Gallon Waste Liquids Tank
7 Tanker/Liquids Loading Station
8 Outdoor Staging Area
9 Indoor Staging and Process Area
10 Processing Area Ventilation System
11 Carbon Adsorption System
12 LSF Pipe
13 Packing Material Wastes Drum Holding Area
14 Empty Drums Holding Area
15 Crushed Glass/Plastic Vials Drum Holding Area
16 Crushed Vials Final Drainage Station
17 Drained Crushed Vials Drum Holding Area
18 Gondolas (10)
19 Dumping Trailers
20 Waste Handling Routes
21 North Retention Pond
22 East Retention Pond
23 North Drainage Ditch
24 East Drainage Ditch
25 Former Glass/Plastic Shredder Unit
26 Field Trailers Service Area
27 PCB Drummed Waste Storage Area
28 Freon Distillation Waste Collection Unit
29 Sand and Grit Drum Storage Area
30 Laboratory Wastes Accumulation Area
31 Laboratory Specimens Storage Building
32 PCB Decontamination Test Site
33 Laboratory
34 West Warehouse
35 East Warehouse
36 East Loading Area
A Spray Paint Booth Area
PROPERTY LINE
DRAINAGE EASEMENT
WOODED AREA
PERMA-FIX
ENVIRONMENTAL SERVICES
TITLE:
SOLID WASTE MANAGEMENT UNITS
PREPARED FOR:
PERMA-FIX OF FLORIDA, INC.
SCALE: 1=150
APPROVED BY: C. ORBAN
DATE: 10/5/95
REVISED:
PROJECT NUMBER: 9003
DRAWING NUMBER: FIG18

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

JUN 27 1990

4WD-RCRAFFB

Mr. Bernhardt C. Warren
Vice President, Regulatory Affairs
Quadrex HPS
1940 North West 67th Place
Gainesville, Florida 32606-1649

RE: Final RFA Report, Quadrex
Gainesville, Florida
EPA I.D. Number FLD 980 711 071

Dear Mr. Warren:

Enclosed is the final Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) Report which is the result of the Visual Site Inspection (VSI) performed by our contractor, A.T. Kearney on October 3, 1989.

We have determined that no further investigation will be necessary for the solid waste management units (SWMUs) identified at the Quadrex facility. Therefore by copy of this letter, we are recommending to the Florida Department of Environmental Regulation (FDER) to issue the state RCRA permit without the accompanying HSWA permit.

Should you have any further questions, please contact Ron Dobbs of my staff at (404) 347-3433.

Sincerely yours,

Ron Dobbs for.

Kent Williams, Chief
Florida/Georgia Unit
Waste Engineering Section

Enclosure

cc: Mr. Ashwin Patel, FDER, Jacksonville
w/enclosure

Printed on Recycled Paper

SWMU DATA SHEET

SWMU

Page 1 of 1

September 11, 1997

SWMU NUMBER: 1 PHOTO NUMBER: 1.1

NAME: North Unloading Area

TYPE OF UNIT: Asphalt pad

PERIOD OF OPERATION: 1982 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is a section of the asphalt driveway located in the vicinity of the Container Storage Shed (SWMU 4) in the north section of the facility. A portion of this driveway, approximately 75 feet by 75 feet, is used for truck parking during truck unloading operations. Truck trailers containing drums of hazardous waste or mixed wastes are unloaded via forklifts and a portable ramp. The drums are transferred to the Temporary Holding Area (SWMU 3).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives flammable liquids and mixed wastes. The wastes are received in vials or containers that are overpacked into 55-gallon drums. The mixed wastes are liquid scintillation fluids consisting of solvents (toluene and xylene) and trace amounts of radioactive materials. Occasionally, 55-gallon drums containing bulk flammable liquids are also off-loaded at this pad. These flammable liquids include acetone, benzene, methylene chloride and 1,1,1-trichloroethane.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the file review.

RECOMMENDATION:		
	No Further Action	(X)
	RFA Phase II Sampling	( )
	RFI Necessary	( )

REFERENCES: 5, 26, 43, 53

COMMENTS:

SWMU DATA SHEET

SWMU

Page 1 of 1

September 11, 1997

SWMU NUMBER: 2 PHOTO NUMBER: 2.1

NAME: South Unloading Area

TYPE OF UNIT: Asphalt pad

PERIOD OF OPERATION: 1982 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is a section of the driveway located immediately south of the North Unloading Area (SWMU 1) in the north section of the facility. A portion of the driveway, approximately 75 feet by 75 feet, is used for truck parking during truck unloading operations. Truck trailers containing drums of hazardous waste or mixed wastes are unloaded via forklifts and a portable ramp. The drums are transferred to the Temporary Holding Area (SWMU 3).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit received flammable liquids and mixed wastes. The wastes are received in vials or containers that are overpacked into 55-gallon drums. The mixed wastes are liquid scintillation fluids consisting of solvents (toluene and xylene) and trace amounts of radioactive materials. Occasionally, 55-gallon drums containing bulk flammable liquids are also off-loaded at this pad. These flammable liquids include acetone, benzene, methylene chloride and 1,1,1- trichloroethane.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the file review.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 5, 26, 43, 53

COMMENTS:

SWMU DATA SHEET

SWMU

Page 1 of 1

September 11, 1997

SWMU NUMBER: 3 PHOTO NUMBER: 3.1, 3.2

NAME: Temporary Holding Area

TYPE OF UNIT: Asphalt pad

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The Temporary Holding Area (SWMU 3) is a section of the asphalt lot adjacent to the Container Storage Shed (SWMU 4). The unit consists of five parallel marked rows providing space for rows of pallets stacked two high. Each row is approximately 50 feet long and six feet wide. The rows are spaced approximately two feet apart. Drums containing hazardous and mixed wastes are held at this area until they are labeled. According to a facility representative, this holding period is approximately one day.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives drums filled with vials of liquid scintillation fluids containing solvents (toluene and xylene) and trace amounts of radioactive materials, from either the North or South Unloading Areas (SWMUs 1 and 2). After labeling, the drums are transferred to the Container Storage Shed (SWMU 4). Occasionally, drums containing bulk flammable liquids are held at this unit until they are processed at the Incoming Bulk Waste Transfer Station (SWMU 5) which is housed within the Container Storage Shed (SWMU 4).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling (   )
RFI Necessary (   )

REFERENCES: 5, 43, 53

COMMENTS:

SWMU DATA SHEET

SWMU

Page 1 of 1

September 11, 1997

SWMU NUMBER: 4

PHOTO NUMBER: 3.1, 3.2, 4.1, 4.2, 4.3, 5.1 7.1, 12.3, 14.1, 16.1, 18.1, 20.1, 27.1

NAME: Container Storage Shed

TYPE OF UNIT: RCRA-regulated hazardous waste storage facility currently operated under a temporary operation permit issued by FDER.

PERIOD OF OPERATION: 1983 to present. The unit was expanded in 1987 to comply with RCRA Container Storage Standards.

PHYSICAL DESCRIPTION AND CONDITION:

The present unit is a 50,000-gallon-capacity drum storage shed with a six-inch thick concrete floor. A metal roof covers the unit. There are no walls except at the east and west ends of Zone 3. Secondary containment is provided by concrete curbs and metal-lined concrete sumps. The shed is divided into three zones. Each zone has its own secondary containment. The shed also houses the Incoming Bulk Waste Transfer Station (SWMU 5), 3,000-Gallon Waste Liquid Tank (SWMU 6) and the Tanker/Liquids Loading Station (SWMU 7).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives approximately 90,000 gallons of flammable liquids per year. Included in that waste is approximately 70,000 gallons of liquid scintillation fluids. These fluids consists primarily of toluene or xylene contaminated with trace amounts of radioactive material. Eighty percent of radioactive material contains less than 0.05 microcuries per milliliter of carbon 14 and/or tritium. The remaining 20 percent consists of other isotopes which may require storage at this unit until decay. The scintillation fluids are stored in vials contained in 55-gallon overpack drums. The unit also receives bulk flammable solvents in 55-gallon drums for processing at the Incoming Bulk Waste Transfer Station (SWMU 5).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION:

No Further Action	(X)
RFA Phase II Sampling	( )
RFI Necessary	( )

REFERENCES: 5, 23, 43, 53

COMMENTS: For a complete list of wastes managed by this unit, see Waste Management in Chapter II of this report.

SWMU DATA SHEET

Page 1 of 1

SWMU

September 11, 1997

SWMU NUMBER: 5 PHOTO NUMBER: 5.1, 5.2, 5.3

NAME: Incoming Bulk Waste Transfer Station

TYPE OF UNIT: Drum emptying tank

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is a 500-gallon, open-topped tank elevated above concrete by metal legs. The tank is located in the southeast section of the Container Storage Shed (SWMU 4) adjacent to the 3,000-Gallon Waste Liquids Tank (SWMU 6). Drums containing flammable liquids are emptied into the tank via an overhead hoist. The drums rest on an incline, sloped toward the opening of the tank. A screen covers the tank top to prevent bulk foreign objects from entering the unit. The contents of the tank are pumped into the 3,000-gallon Waste Liquids Tank (SWMU 6) via above-ground metal pipes.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives flammable liquids, contained in 55-gallon drums, from the Temporary Holding Area (SWMU 3). Accordingly to facility representatives, the tank does not receive radioactive materials. Flammable liquids include ethanol, hexane, methyl pyrrole, methylene chloride, acetone and 1,1,1-trichloroethane.

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material. Due to the nature of the operations, vapors and fumes are released to the atmosphere.

RECOMMENDATION: No Further Action (*)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

* Evaluation of the regulatory status of the unit with respect to the air program is suggested.

SWMU DATA SHEET

SWMU

Page 1 of 1

September 11, 1997

SWMU NUMBER: 6 PHOTO NUMBER: 6.1, 6.2

NAME: 3,000-Gallon Waste Liquids Tank

TYPE OF UNIT: RCRA-regulated waste storage tank currently operated under a temporary operation permit issued by FDER.

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is a closed-topped, above-ground, steel tank located in the central section of the Container Storage Shed (SWMU 4). The tank is supported above the concrete by steel feet. Secondary containment is provided by a concrete-block wall eight feet tall. This tank was previously located outdoors, prior to the construction of the Container Storage Shed (SWMU 4) roof. The contents of the tank are transferred to tanker trucks at the Tanker/Liquids Loading Station (SWMU 7) for off-site incineration.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives flammable liquids from the Indoor Staging and Process Area (SWMU 9) via the LSF Pipes (SWMU 12), the Incoming Bulk Waste Transfer Station (SWMU 5) and the Crushed Vials Final Drainage Station (SWMU 16). Flammable liquids include decayed scintillation fluids containing xylene or toluene; crushed-vial drainage fluids consisting mainly of alcohol and trace amounts of solvents; and bulk flammable liquids such as ethanol, hexane, methyl pyrrole, methylene chloride, acetone and 1,1,1-trichloroethane.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 5, 23, 43, 53

COMMENTS:

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SWMU NUMBER: 7 PHOTO NUMBER: 7.1

NAME: Tanker/Liquids Loading Station

TYPE OF UNIT: Tank truck loading pad

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The pad is situated in the east-central section of the Container Storage Shed (SWMU 4). The dimensions of the pad are approximately 50 feet long and 18 feet wide. Secondary containment is provided by two steel trenches at each end of the pad, as well as the secondary containment provided by the Container Storage Shed (SWMU 4). Tank trucks parked at this unit receive flammable liquids, via overhead pipes, from the 3,000-gallon Waste Liquids Tank (SWMU 6) for off-site incineration at a cement kiln.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Trucks parked at the unit receive flammable liquids contained by the 3,000-gallon Waste Liquids Tank (SWMU 6).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI. Some minor spillage (5-10 gallons) of LSF was reported by the facility to FDER on September 28, 1989 (Reference 54); however, no further information was available.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling (   )
RFI Necessary (   )

REFERENCES: 23, 43, 53, 54

COMMENTS: The unit appeared in good condition.

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SWMU NUMBER: 8 PHOTO NUMBER: 8.1, 8.2

NAME: Outdoor Staging Area

TYPE OF UNIT: Undiked asphalt pad

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is a section of the asphalt-covered yard located at the entry of the Indoor Staging and Process Area (SWMU 9) in the west section of the facility. The unit receives overpacked drums containing vials of liquid scintillation fluids from the Container Storage Shed (SWMU 4) prior to processing at the Indoor Staging and Process Area (SWMU 9). The entrance to the Indoor Staging and Process Area (SWMU 9) is a concrete pad. Drums are held at this unit for less than eight hours.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Prior to processing, the unit receives vials containing liquid scintillation fluids. The vials are contained in 55-gallon overpack drums. Vermiculite is used as packing material. Scintillation fluids usually contain xylene or toluene and trace amounts of radioactive material. After processing, the unit receives drums containing crushed vials that had been rinsed with alcohol, and drums containing vermiculite. The vermiculite is transferred to the Packing Material Waste Drum Holding Area (SWMU 13). The crushed vials are transferred to the Crushed Glass/Plastic Vials Drum Holding Area (SWMU 15).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

The VSI team observed dark staining on the concrete pad leading to the Indoor Staging and Process Area (SWMU 9). It appeared that runoff from the unit may drain onto grass-covered areas situated on either side of the unit.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 43, 53

COMMENTS: Evidence of staining is shown in Photographs 8.1 and 8.2., however, the staining appears to be insignificant and does not justify a high release potential.

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SWMU NUMBER: 9 PHOTO NUMBER: 9.1 thru 9.13

NAME: Indoor Staging and Process Area

TYPE OF UNIT: Waste process conveyors, tanks and hoppers

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The area is located inside the Manufacturing Building in the west section of the facility. This unit consists of several component units designed to separate the vials from the packaging materials, separate the liquid from the vials and manage liquids and solids waste streams. These units are the Roller Conveyors (SWMU 9a), the Lift (SWMU 9b), the In-Feed Hopper (SWMU 9c), the Shaker Table (SWMU 9d), the Crusher/Shredder (SWMU 9e), the Rinse Bucket Trough (SWMU 9f), the Three-Chamber Rinse Tank (SWMU 9g), the Drain Table (SWMU 9h) and the LSF Holding Tanks (SWMU 9i). The semi-automated system is manned by five individuals outfitted with respirators and other protective clothing. Jobs include moving drums, inspecting the equipment, moving metal baskets, and vial inspection.

Roller Conveyors (SWMU 9a), Photograph 9.1, 9.2, 9.12

Drums containing vials or carboys of liquid scintillation fluids are transferred between the Outdoor Staging Area (SWMU 8) and the process units via Roller Conveyors (SWMU 9a). The conveyors are also used to transfer drums, containing crushed vials, back to the Outdoor Staging Area (SWMU 8). The metal conveyors are approximately 15 feet long.

Lift (SWMU 9b), Photograph 9.3, 9.5, 9.12

The Lift (SWMU 9b) is a hydraulically-operated conveyor that lifts the drums approximately 10 feet above the ground-floor and dumps the contents of the drums into the In-Feed Hopper (SWMU 9c). The unit is approximately 12 feet tall and 3 feet wide.

In-Feed Hopper (SWMU 9c), Photograph 9.3, 9.4

The contents of the drums are dumped into the In-Feed Hopper (SWMU 9c) by the Lift (SWMU 9b). From the hopper, the vials and packing material discharge into the Shaker Table (SWMU 9d). The metal In-Feed Hopper (SWMU 9c) has a capacity of approximately 50 gallons.

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SWMU NUMBER: 9 PHOTO NUMBER: 9.1 thru 9.13

NAME: Indoor Staging Area and Process Area

Shaker Table (SWMU 9d), Photograph 9.5, 9.6, 9.7, 9.8

The Shaker Table (SWMU 9d) is a vibrating metal table used for separating the vials from the packaging material. The unit is elevated above the concrete floor by a metal platform. Vermiculite sifts through the screens into cloth socks and discharges into 55-gallon drums. The vials remain above the screens and empty into the Crusher/Shredder (SWMU 9e).

Crusher/Shredder (SWMU 9e), Photograph 9.5, 9.7, 9.9

The Crusher/Shredder (SWMU 9e) is housed by a metal frame approximately four feet long, three feet high and two feet wide. Within the unit are 33 cutting discs which crush/shred the vials and liberate the fluids. The vials are again trapped above screens and discharged into metal baskets at the Rinse Basket Trough (SWMU 9f). The liquid drains to the bottom of the unit and is collected by the LSF Holding Tanks (SWMU 9i).

Rinse Basket Trough (SWMU 9f), Photograph 9.9

The Rinse Basket Trough (SWMU 9f) is located at ground-level and holds metal baskets containing the crushed vials. The unit consists of a metal trough approximately six feet long, 1.5 feet wide, and two feet deep. Two metal lips, situated along the top length of the trough, hold the baskets above the bottom of the trough. At this unit, liquids drain from the vials prior to vial rinsing. The contents of the trough are pumped to the LSF Holding Tanks (SWMU 9i) via a small pump.

Three-Chamber Rinse Tank (SWMU 9g), Photograph 9.10, 9.11

After the scintillation fluids have drained from the vials, the baskets are carried to the Three-Chamber Rinse Tank (SWMU 9g). The rinse tank consists of three metal chambers approximately two feet square and three feet deep. The vials are triple-rinsed in alcohol and transferred to the Drain Table (SWMU 9h) immediately adjacent to the unit.

Drain Table (SWMU 9h), Photograph 9.12

The Drain Table (SWMU 9h) is a metal sink and inspection table approximately six feet long, three feet wide and six inches deep. The contents of the baskets are inspected to ensure that all vials are broken. The crushed vials are pushed along the table and into a 55-gallon drum equipped with a plastic pipe. The pipe is inserted through the vials to touch the bottom of the drum. This pipe provides access to the bottom of the drum for alcohol-draining at the Crushed Vials Final Drainage Station (SWMU 16).

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SWMU NUMBER: 9 PHOTO NUMBER: 9.1 thru 9.13

NAME: Indoor Staging Area and Process Area

LSF Holding Tanks (SWMU 9i), Photograph 9.13

The LSF Holding Tanks (SWMU 9i) receive liquids from the Crusher/Shredder (SWMU 9e) via pipes; from carboys via hand-pumps; from the Drain Table (SWMU 9h); and from the Three-Chamber Rinse Tank (SWMU 9g). The two closed-top stainless steel tanks have a combined capacity of 80 gallons. Liquids are held at this unit and tested for radioactivity levels prior to discharge to the 3,000-Gallon Waste Liquids Tank (SWMU 6) via the LSF Pipe (SWMU 12).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Approximately 6,000 gallons of liquid scintillation fluids are processed by this unit per month. Fumes and vapors are vented, via the Process Area Ventilation System (SWMU 10), to the Carbon Adsorption System (SWMU 11).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (*)
Groundwater (*) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material. However, operations conducted at this unit generated alcohol and solvent fumes.

RECOMMENDATION: No Further Action (*)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: The Crusher/Shredder (SWMU 9e) replaced the Former Glass/Plastic Shredder (SWMU 25) unit during 1988.

* Routine inspection of the integrity of the walls and floor of this unit is suggested.

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SWMU NUMBER: 10 PHOTO NUMBER: 10.1

NAME: Processing Area Ventilation System

TYPE OF UNIT: Air purifying system

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The system consists of flexible plastic hoses and various-shaped metal ducts and hoods designed to collect fumes and vapors generated in the Indoor Staging and Process Area (SWMU 9). The hoses are used to trap vapors and fumes from the individual processing components. Air from the room is drawn through filter-covered ducts by a fan. The air is discharged to the atmosphere via the Carbon Adsorption System (SWMU 11). The system is active; however, it was not observed in operation because it was shut down at the time of the VSI.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The system receives air contaminated with solvent and alcohol fumes, generated at the Indoor Staging and Process Area (SWMU 9). The vapors and fumes may contain alcohol, toluene and xylene.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

The unit was inactive during the VSI. No evidence of release was identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 11 PHOTO NUMBER: 11.1, 11.2

NAME: Carbon Adsorption System

TYPE OF UNIT: Air purifying system

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit consists of two metal tanks filled with activated charcoal. The tanks are closed-topped, and are approximately four feet tall and two feet in diameter. The unit is connected to the Process Area Ventilation System (SWMU 10) via metal pipes which are connected to the bottom of the tank. The air rises through the charcoal and is released to the atmosphere. The two tanks are housed in a separate room outside the Process Area.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives air containing organic vapors from the Process Area Ventilation System (SWMU 10). The unit is designed to release to the atmosphere.

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

The unit is designed to release to the atmosphere.

RECOMMENDATION: No Further Action (*)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: * This unit does not have an air permit, although the unit is inspected by the Department of Environmental Safety, Alachua County. Evaluation of the regulatory status of the unit with respect to the air program is suggested.

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SWMU NUMBER: 12 PHOTO NUMBER: 12.1, 12.2, 12.3

NAME: LSF Pipe

TYPE OF UNIT: Waste solvent transfer pipe

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The LSF Pipe (SWMU 12) transfers waste solvent from the Indoor Staging and Process Area (SWMU 9) to the 3,000-Gallon Waste Liquids Tank (SWMU 6) located at the Container Storage Shed (SWMU 4). The above-ground pipe is made of 1.5-inch diameter steel pipe encased in a three-inch-diameter Polyvinylchloride (PVC) pipe. The pipes are encased in a concrete trough. The pipe originates in the west-central section and discharges at the tank in the northwest section of the facility via pumps. The unit is approximately 300 linear feet.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit transfers flammable liquids consisting primarily of xylene, toluene and alcohol.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (*)
Groundwater (*) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling (   )
RFI Necessary (   )

REFERENCES: 53

COMMENTS: * White stains along the pipe connections were noted in the vicinity of the Indoor Staging and Process Area (SWMU 9) in the west section of the facility. See Photograph 12.1. Routine inspection of the integrity of the pipes and trough is suggested.

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SWMU NUMBER: 13 PHOTO NUMBER: 13.1

NAME: Packing Material Wastes Drum Holding Area

TYPE OF UNIT: Staging area

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

This staging area is located on asphalt between the main facility building and the Container Storage Shed (SWMU 4) in the north section of the facility. The asphalt area is approximately 30 feet long and 15 feet wide. Runoff from the unit appears to drain toward a grass strip between the asphalt pad and the facility building.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives drums containing packing material (vermiculite) used to cushion the vials containing liquid scintillation fluid. The contents of the drums are poured into the Dumping Trailers (SWMU 19), transferred off-site to a cement manufacturer and processed into a cement aggregate. Approximately 250 drums, stacked on pallets two high, were observed at this unit during the VSI. The process generates approximately 250 drums per month. It takes approximately 250 drums to fill a Dumping Trailer (SWMU 19).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 14 PHOTO NUMBER: 14.1

NAME: Empty Drums Holding Area

TYPE OF UNIT: Staging area

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is located on the west side of the Packing Material Wastes Drum Holding Area (SWMU 13) in the north section of the facility. The asphalt area is approximately 25 feet by 25 feet. The drums are stored directly on the asphalt.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives empty drums that may contain small amounts of residual liquid from the Packing Material Wastes Drum Holding Area (SWMU 13), the Drained Crushed Vials Drum Holding Area (SWMU 17) and the Indoor Staging and Process Area (SWMU 9). The drums are loaded onto a van-type trailer and transferred off-site to the Drum Service of Florida for reconditioning.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 15 PHOTO NUMBER: 15.1

NAME: Crushed Glass/Plastic Vials Drum Holding Area

TYPE OF UNIT: Staging area

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

This unit is a section of the asphalt located in the northwest corner of the facility in the vicinity of the Container Storage Shed (SWMU 4) and the North Drainage Ditch (SWMU 23). The asphalt area is approximately 40 feet long and 20 feet wide. A drop inlet situated in the vicinity of the unit discharges runoff from the unit to the North Drainage Ditch (SWMU 23). The drop inlet is approximately four feet long by two feet wide, and is made of metal.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives 55-gallon drums containing crushed glass or plastic vials from the Indoor Staging and Process Area (SWMU 9) via forklift. The vials had been rinsed with alcohol and are held at this unit to drain the fluids to the bottom of the drum. According to facility representatives, very small volumes of alcohol are contained by the drum. Approximately 170 drums, stacked on pallets two high, were observed at this unit during the VSI.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

Runoff and pad washings in the vicinity of the units discharge to the North Drainage Ditch (SWMU 23) via a drop inlet. However, since the unit receives drums containing small volumes of alcohol, the likelihood of a release to surface water from this unit is judged to be low.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 16 PHOTO NUMBER: 16.1, 16.2

NAME: Crushed Vials Final Drainage Station

TYPE OF UNIT: Staging area

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

This unit is an asphalt area situated on the south side of the Container Storage Shed (SWMU 4) in the vicinity of the 3,000-Gallon Waste Liquids Tank (SWMU 6). The asphalt pad is approximately 25 feet long and four feet wide. Alcohol that has drained to the bottom of the drum is transferred to the 3,000-Gallon Waste Liquids Tanks (SWMU 6) via a small pump and hose. Each drum has a vertically-placed pipe providing access to the drum bottom. The pump hose is inserted into the pipe for removal of any alcohol that may remain on the bottom of the drum. The drums are stored on pallets at this unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives drums containing plastic vials which have been rinsed in alcohol and allowed to drain. Any drained liquids are removed from the bottom of the drum via a small portable pump and hose. The contents of the drum are pumped to the 3,000-Gallon Waste Liquid Tank (SWMU 6).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: The unit is underlain by asphalt that appeared to be in good condition.

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SWMU NUMBER: 17 PHOTO NUMBER: 17.1

NAME: Drained Crushed Vials Drum Holding Area

TYPE OF UNIT: Staging area

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

This unit is located south of the Crushed Glass/Plastic Vials Drum Holding Area (SWMU 15) in the northwest section of the facility. The asphalt area is approximately 40 feet long and 15 feet wide. The VSI team observed approximately 100 drums stacked on pallets at this unit. The drums are held at this unit until they are loaded into the Dumping Trailers (SWMU 19) via the Gondolas (SWMU 18).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives drums containing crushed vials after the remaining alcohol has been pumped out at the Crushed Vials Final Drainage Station (SWMU 16).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION:
No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 18 PHOTO NUMBER: 18.1, 19.2

NAME: Gondolas

TYPE OF UNIT: Dumpster

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

Ten gondolas are situated along the west side of the Container Storage Shed (SWMU 4) located in the northwest section of the facility. These units are used to transfer the crushed vials from the drums to the Dumping Trailers (SWMU 19). Each unit has an approximate capacity of one cubic yard. The units are made of steel and are elevated above the asphalt by four wheels. Each Gondola (SWMU 18) has a metal cover.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The units receive crushed vials from the drums stored at the Drained Crushed Vials Drum Holding Area (SWMU 17). When the gondolas are full, they are transferred to the Dumping Trailers (SWMU 19) via folklift.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was identified during the VSI or identified in the available file material.

RECOMMENDATION:
No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 19 PHOTO NUMBER: 19.1, 19.2, 20.1

NAME: Dumping Trailers

TYPE OF UNIT: Leased trailers for off-site material transfer

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The units are commercial truck trailers. The trailers are approximately 20 feet long, six feet wide and five feet deep. The aluminum-bodied, open-topped trailers are parked in the west section of the facility. The trailer tops are covered with a rubber tarp.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The units receive crushed plastic, glass vials, or packing materials. Approximately four to five trailers of glass and one trailer of vermiculite are transferred off-site per month. The vials are disposed of off-site at the Clifton Landfill, Garden City, GA. The packing material is transferred off-site to a cement manufacturer.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 20 PHOTO NUMBER: 18.1, 19.1, 19.2, 20.1

NAME: Waste Handling Routes

TYPE OF UNIT: Asphalt lot and driveways

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

This unit represents the various paths traveled by folklifts transferring drums of hazardous wastes, crushed vials and packing materials throughout the facility. These operations are limited to areas west and north of the facility building.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit may receive drippage or spillage containing hazardous constituents. Runoff from these routes may drain onto grass areas surrounding the operations yard. Additionally, runoff and asphalt washings are discharged to the North Drainage Ditch (SWMU 23) via the drop inlet at the Crushed Glass/Plastic Vials Drum Holding Area (SWMU 15).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

As observed during the VSI, water accumulating on this unit is routinely pushed by broom into a drop inlet that discharges to the North Drainage Ditch (SWMU 23). However, since the unit potentially receives only small volumes of volatile constituents, the release potential to surface water is low.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 21 PHOTO NUMBER: 21.1

NAME: North Retention Pond

TYPE OF UNIT: Percolation/evaporation impoundment

PERIOD OF OPERATION: 1982 to present

PHYSICAL DESCRIPTION AND CONDITION:

The pond is located in the northeast section of the facility in the vicinity of the South Unloading Area (SWMU 2) and the Field Trailers Service Area (SWMU 26). The pond is made of soil and is approximately 70 feet long, 25 feet wide and three feet deep. The unit is maintained in grass and was empty during the VSI.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives runoff via direct surface flow from the northeast parking lot, the South Unloading Area (SWMU 2), the Field Trailers Service Area (SWMU 26) and the Spray Paint Booth Area (AOC A). The runoff may contain trace amounts of hazardous constituents.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material. However, the unit is unlined and designed to percolate runoff into the soil.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 22 PHOTO NUMBER: 22.1

NAME: East Retention Pond

TYPE OF UNIT: Percolation/evaporation impoundment

PERIOD OF OPERATION: 1982 to present

PHYSICAL DESCRIPTION AND CONDITION:

The pond is located in the southeast section of the facility. The pond is made of soil and is approximately 20 feet long and 10 feet wide. A concrete swale discharges runoff from the south parking lot into the pond. This pond is partially-overgrown with cattails. During the VSI, the unit was filled with water approximately four inches deep. Overflow from this unit discharges to the East Drainage Ditch (SWMU 24) via an underground PVC pipe.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives runoff via direct surface flow from the south parking lot.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material. However, the unit is unlined and designed to percolate runoff into the soil.

RECOMMENDATION: No Further Action (*)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: *No further action is suggested at this time because no evidence that gasoline, oil, or other foreign contaminants were entering the unit was noted.

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SWMU NUMBER: 23 PHOTO NUMBER: 23.1, 24.1

NAME: North Drainage Ditch

TYPE OF UNIT: Surface drainage

PERIOD OF OPERATION: 1982 to present

PHYSICAL DESCRIPTION AND CONDITION:

The ditch bounds the facility to the north and discharges to the East Drainage Ditch (SWMU 24) bounding the facility to the east. The ditch is approximately eight feet wide and three to four feet deep. The ditch is unlined except in the area where the two ditches meet. This portion of the ditch is lined with concrete. The ditch banks are overgrown with shrubs and small trees.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives runoff from the drop inlet at the Crushed Glass/Plastic Vials Drum Holding Area (SWMU 15), the Waste Handling Routes (SWMU 20), the northeast parking lot and the North Unloading Area (SWMU 1), and the PCB Drummed Waste Storage Area (SWMU 27). The runoff may contain hazardous constituents.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling (   )
RFI Necessary (   )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 24 PHOTO NUMBER: 24.1

NAME: East Drainage Ditch

TYPE OF UNIT: Surface drainage

PERIOD OF OPERATION: 1982 to present

PHYSICAL DESCRIPTION AND CONDITION:

The ditch bounds the facility to the east and flows north. The ditch is approximately eight feet wide and three feet deep. The ditch is unlined except in the area where it meets the North Drainage Ditch (SWMU 23). This portion of the ditch is lined with concrete. The ditch banks are overgrown with shrubs and small trees.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives runoff from the driveway along the east side of the facility.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 25 PHOTO NUMBER: 25.1

NAME: Former Glass/Plastic Shredder Unit

TYPE OF UNIT: Former waste process unit

PERIOD OF OPERATION: 1983 to 1988

PHYSICAL DESCRIPTION AND CONDITION:

The former unit was a wood shredder utilized to shred plastic and glass vials during its period of operation. While active, it was situated in the Indoor Staging and Process Area (SWMU 9). During the VSI, the former unit was located in the north section of the facility. The unit consists of an approximately 40-gallon hopper connected to the shredder. The unit is supported by a metal platform four feet tall.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit received plastic and glass vials containing decayed liquid scintillation fluids. The fluids consisted of xylene or toluene and low-level radioactive wastes.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI. The facility had difficulty ensuring all vials were crushed with this unit.

RECOMMENDATION:

No Further Action	(X)
RFA Phase II Sampling	( )
RFI Necessary	( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 26 PHOTO NUMBER: 26.1, 26.2

NAME: Field Trailers Service Area

TYPE OF UNIT: Asphalt lot

PERIOD OF OPERATION: 1982 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is an asphalt lot approximately 200 feet long and 50 feet wide situated on the east side of the facility building. Field trailers are parked at this unit after completion of off-site hazardous waste remediation activities. Service includes outfitting the trailers for upcoming jobs. According to facility representatives, the trailers are decontaminated at the remediation sites prior to returning to the facility.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

If trailers undergo incomplete decontamination procedures, then runoff in the area may become contaminated with hazardous constituents. Remediation sites where these trailers may have been used include radioactive and PCB-contaminated sites. However, no evidence of incomplete decontamination procedures was observed or reported.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: It is suggested that the facility provide documentation to demonstrate the effectiveness of the decontamination procedures.

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SWMU NUMBER: 27 PHOTO NUMBER: 27.1, 27.2, 27.3

NAME: PCB Drummed Waste Storage Area

TYPE OF UNIT: Self-contained cargo container

PERIOD OF OPERATION: 1985 to present

PHYSICAL DESCRIPTION AND CONDITION:

The self-contained metal cargo container is 20 feet long, 10 feet wide and seven feet high. The container is located at the northeast parking lot in the northeast section of the facility. The unit has the capacity to hold 24 55-gallon drums. Within the metal container is a metal secondary containment system with metal curbs approximately four inches high. Most of the drums are elevated above the metal floor by small drum dollies.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit stores oils and other wastes containing PCBs from the PCB Decontamination Test Site (SWMU 32) located at the Annex. Approximately 15 drums were observed at this unit during the VSI.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: The self-contained unit appeared to be in good condition.

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SWMU NUMBER: 28 PHOTO NUMBER: 28.1

NAME: Freon Distillation Waste Collection Unit

TYPE OF UNIT: Still bottoms collection unit

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit consists of a one-gallon plastic container utilized to collect still bottoms from the protective clothing washing machine. This unit is located in the vicinity of the Indoor Staging and Process Area (SWMU 9). The bucket is underlain by a plastic-lined wooden tray.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives still bottoms from the freon clothes washer. The still bottoms may contain xylene and toluene from protective clothing worn by employees in the Indoor Staging and Process Area (SWMU 9).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: The unit is located indoors and is underlain by concrete that appeared to be in good condition.

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SWMU NUMBER: 29 PHOTO NUMBER: 29.1

NAME: Sand and Grit Drum Storage Area

TYPE OF UNIT: Drummed waste and product storage area

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

An asphalt area measuring approximately 200 square feet is utilized to store drums containing sand and grit. The unit is located outside the northeast corner of the Container Storage Shed (SWMU 4).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

This unit is a one-time temporary storage area for drums containing sand and grit. According to facility representatives, this material does not contain any hazardous constituents. During September 1989, one of the facility's clients shipped LSF vials in overpack drums utilizing sand and grit as packing material. The facility accepted the shipment, processed the vials, and has stored the drums containing sand and grit at this area since that time. This area is normally used for storing drums of alcohol.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53, 59

COMMENTS: It is suggested that the facility provide documentation indicating the non-hazardous nature of the sand and grit.

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SWMU NUMBER: 30 PHOTO NUMBER: 30.1, 30.2

NAME: Laboratory Wastes Accumulation Area

TYPE OF UNIT: Satellite accumulation area

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit consists of a small surface area at a lab table for storage of small lab-specimen wastes and a drum for collecting other lab wastes. The unit is located indoors in the Annex.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives waste specimens containing solvents, mixed wastes and PCBs. The specimen bottles are hand-carried to the Laboratory Specimens Storage Building (SWMU 31) located outdoors and west of the Annex. PCB wastes are transferred to the PCB Drummed Waste Storage Area (SWMU 27).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION:
No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS:

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SWMU NUMBER: 31 PHOTO NUMBER: 31.1, 31.2

NAME: Laboratory Specimens Storage Building

TYPE OF UNIT: Less-than-90-day storage

PERIOD OF OPERATION: 1983 to present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is a corregated-metal building approximately ten feet long, ten feet wide and eight feet tall. The floor is constructed of wood and the shed is elevated above a concrete slab by metal skids. The shed is located outdoors approximately 200 feet west of the Annex. Small bottles of waste specimens are stored on metal shelves. Within 90 days, the wastes are hand-carried to the Container Storage Shed (SWMU 4) for disposal.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit receives laboratory specimens containing solvents, mixed wastes and PCBs. There were over 200 specimen bottles at this unit during the VSI. Facility representatives did not provide detailed information pertaining to the operation of the unit.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material. The lab is expected to be moved to the main facility building during December 1989.

RECOMMENDATION: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCES: 53

COMMENTS: It is suggested that the facility provide details pertaining to wastes and waste management at this unit.

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SWMU

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SWMU NUMBER: 32 PHOTO NUMBER: None

NAME: PCB Decontamination Test Site

TYPE OF UNIT: Demonstration room

PERIOD OF OPERATION: 1985 to present

PHYSICAL DESCRIPTION AND CONDITION:

A room adjoining the laboratory measuring approximately 200 square feet, located at the Annex, was periodically used to demonstrate a PCB treatment system under a permit issued by EPA. The last period of use was indicated to have been May-July 1988 (Reference 9). At the time of the VSI, the room was used for office furniture storage.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit received PCB wastes. The demonstration was viewed by EPA representatives. Facility representatives did not provide detailed information pertaining to the activities at this unit. However, the wastes generated at the unit were transferred to the PCB Drummed Waste Storage Area (SWMU 27).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATION:

No Further Action	(X)
RFA Phase II Sampling	( )
RFI Necessary	( )

REFERENCES: 9, 18, 19, 48, 53

COMMENTS: It is suggested that the facility provide documentation pertaining to the activities and disposal of wastes.

AOC DATA SHEET

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AOC NUMBER: A

PHOTO NUMBER: A.1, A.2

NAME: Spray Paint Booth Area

PHYSICAL DESCRIPTION AND CONDITION:

A Paint Booth 12 feet long, 12 feet wide and 16 feet high, and a metal tray ten feet long, ten feet wide and six inches deep, were identified in the central section of the facility during the VSI. The tray is used for paint stripping and the booth is active. According to facility representatives, a water-based sulfuric or phosphoric acid is used for stripping and an epoxy paint is utilized at the spray booth. Paint wastes are transferred to the Container Storage Shed (SWMU 4). It is suggested that the facility and FDER determine if an air permit is required for the booth.

Number:	SWMU-33
Name:	Laboratory
Type of Unit:	Laboratory Satellite Accumulation
Period of Operation:	1991 to present
Physical Description and Condition:	This unit consists of an area within the laboratory where 3 five gallon pails are located for the accumulation of glass, hazardous solids (plastic/glass), and crimp-top vials. These wastes are accumulated as a result of laboratory operations. The unit is provided with a base composed of interior service tile and is approximately 5 feet by 2 feet in size.
Wastes and/or Hazardous Constituents Managed:	The unit receives glass, hazardous solids (plastic/glass), and crimp-top vials which are accumulated in 3, five gallon pails prior to management (as appropriate) in the non-hazardous, or RCRA areas on-site.
Release Pathways:	Air (L) Surface Water (L) Soil (L) Subsurface Gas (L) Groundwater (L)
Release History:	The unit has been operational for laboratory activities which are monitored by facility personnel. No reportable release of hazardous constituents has occurred from the unit.
Recommendation:	No further Action (X) RFA Phase II Sampling ( ) RFI Necessary ( )
Comments:	The unit is part of laboratory operations and is maintained in good condition.

Number:	SWMU-34
Name:	West Warehouse
Type of Unit:	90-Day generator storage area, satellite accumulation area and 10 day transfer area
Period of Operation:	1991 to present; 10 day transfer area operational since 1995
Physical Description and Condition:	This unit consists of three general areas utilized as identified above for the temporary storage or transfer of drummed waste.
Wastes and/or Hazardous Constituents Managed:	The unit receives site generated hazardous wastes including hazardous solids (plastic/debris); organic solvents/flammable materials, crimp-top vials, and metal/corrosive wastes.
Release Pathways:	Air (L) Surface Water (L) Soil (L) Subsurface Gas (L) Groundwater (L)
Release History:	The unit has been operational for site activities which are monitored by facility personnel. No reportable release of hazardous constituents has occurred from the unit.
Recommendation:	No further Action (X) RFA Phase II Sampling ( ) RFI Necessary ( )
Comments:	The unit provides temporary storage and transfer of segregated hazardous waste storage for site generated incompatible wastes. The transfer facility has operated since 1995 and is maintained in good condition.

Number:	SWMU-35
Name:	East Warehouse
Type of Unit:	Non hazardous tank and container storage area
Period of Operation:	1991 to present
Physical Description and Condition:	This unit consists of an area within the warehouse where containerized non-hazardous wastes are stored on a concrete base. The area also contains one 8,000 gallon storage tank, with secondary containment for oily water
Wastes and/or Hazardous Constituents Managed:	Non hazardous wastes including (but not limited to) waste oils, waste waters, oily waste and types and forms or non-hazardous waste.
Release Pathways::	Air (L) Surface Water (L) Soil (L) Subsurface Gas (L) Groundwater (L)
Release History:	The unit has been operational for facility activities which are monitored by facility personnel. No reportable release has occurred from the unit.
Recommendation:	No further Action (X) RFA Phase II Sampling ( ) RFI Necessary ( )
Comments:	The unit will be maintained be in good condition.

Number:	SWMU-36
Name:	East Loading Area
Type of Unit:	Loading Dock
Period of Operation:	1991 to present
Physical Description and Condition:	The unit is a concrete loading dock approximately 35 X 25 feet in size. The dock is approximately 3½ feet above the parking area elevation.
Wastes and/or Hazardous Constituents Managed:	The unit is utilized for the loading and off-loading of drums from transport vehicles. The unit receives non-hazardous or hazardous waste in accordance with the PFF RCRA permit.
Release Pathways:	Air (L) Surface Water (L) Soil (L) Subsurface Gas (L) Groundwater (L)
Release History:	To date, the unit has not been used for waste management activities. No reportable release of hazardous constituents has occurred from the unit.
Recommendation:	No further Action (X) RFA Phase II Sampling ( ) RFI Necessary ( )
Comments:	The unit will be maintained in good condition.

APPLICATION FOR A HAZARDOUS WASTE PERMIT

PART II

R. SUBPART AA - AIR EMISSIONS STANDARDS FOR PROCESS VENTS

R1 Applicability

These standards apply to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that manage hazardous waste with organic content of at least 10 ppm by weight.

PFF currently operates affected process vents in association with the Liquid Scintillation Vial (LSV) waste treatment unit, the Perma-Fix® II (PF-II) process that meets the definitions of "distillation" and "steam stripping operations" as defined in Subpart AA, and chemical extraction operations for debris treatment as described in Part I of this permit application. Hence, Subpart AA will apply to operation of each of these three units when hazardous waste of at least 10 ppm organic content by weight is processed.

In addition, PFF plans to operate a solvent distillation process at the Facility. Although this process will be exempt from permitting requirements, it will be subject to Subpart AA requirements because the unit will be located at a TSDF otherwise subject to permitting requirements of Part 270. The unit will be located in an area equipped with a vapor recovery system in accordance with the requirements of 40 CFR 264.1033.

Under the provisions of 40 CFR 264.1032(a), total facility organic emissions from affected process vents must be either reduced with a control device by 95 weight percent or limited to 3 pounds/hour and 3.1 tons/year.

PFF has installed a closed-vent system and air pollution control device on the PF-II unit to control volatile organic compounds (VOCs). The PF-II process is designed to vent minimal concentrations of VOCs that are not collected in the condenser and absorber units to a regenerative thermal oxidizer (RTO). The RTO is described in detail in Part II.I of this permit application. The PF-II process equipment is located within the Facility's Treatment and Operations Building. See Part I, Figure 1.D.1.

The LSV unit is connected to a closed-vent system meeting the definition of 40 CFR 264.1031. Chemical extraction operations for debris treatment are conducted in a vat near the LSV processing area. Each of the three process areas regulated under 40 CFR 264, Subpart AA are vented through the RTO. The RTO is designed and operated to capture and control VOC air emissions. The minimum VOC control efficiency of the RTO is 95%.

R2 Compliance Documentation for Process Vent Air Emission Standards

PFF has implemented volumetric flow monitoring for the LSV process area (including debris treatment) and the PF-II process as required by 40 CFR 264.1033(f)(1). Flow monitors are located upstream of the RTO gas inlet. Process vent volumetric air flow is recorded at least once per operating hour. In addition, a temperature-monitoring device equipped with a continuous recorder is installed as specified by 40 CFR 264.1033(f)(2)(i). To demonstrate compliance with the 95% efficiency requirements of 40 CFR-264.1033(c), PFF relies on the manufacturer's guarantee of a minimum of 95% destruction efficiency.

S. SUBPART BB - AIR EMISSIONS STANDARDS FOR EQUIPMENT LEAKS

S1 Applicability

Pursuant to the requirements of 40 CFR 264.1050, the air emissions standards for equipment leaks apply to the equipment at the Facility that contain or come in direct contact with hazardous waste with organic chemical concentrations of 10% by weight or higher.

PFF manages hazardous waste with organic chemicals that range in concentration from 0 to 100% by weight. Therefore, all of the equipment (as defined in 40 CFR 264.1031) at the Facility that contains or is in direct contact with hazardous waste is potentially subject to the leak detection and monitoring standards.

The equipment in the following areas of the Facility is potentially subject to 40 CFR 264, Subpart BB:

- LSV area;
- 3,000-gallon tank;
- debris treatment area;
- hazardous waste transfer area;
- mixed waste tanker loading area;
- mixed waste transfer to larger containers area; and,
- PF-II treatment area.

Except for the LSV area equipment, the hazardous waste transfer equipment, and the mixed waste transfer to larger containers equipment, all equipment contacting hazardous waste with organic chemical concentration of 10% by weight or higher is exempt from the Subpart BB requirements. These exemptions are described below.

40 CFR 264.1050(f) states, "Equipment that contains or contacts hazardous waste with an organic concentration of at least 10% by weight for less than 300 hours per calendar year is excluded from the requirements of Sections 264.1052 through 264.1060, if it is identified, as required by Section 264.1064(g)(6)." This exemption applies to the

equipment associated with the 3,000-gallon storage tank, debris treatment area, and mixed waste tanker loading. A log identifying either by list or location (area or group) of this exempted equipment will be kept in the Facility Operating Record as required by 40 CFR 264.1064 (g)(6).

40 CFR 264.1050(e) states, "Equipment that is in vacuum service is excluded from the requirements of 264.1052 to 264.1060 if it is identified as required by 264.1064(g)(5)." This exemption applies to equipment used by the PF-II treatment. A log containing a list of identification numbers for equipment in vacuum service will be kept in the Facility Operating Record as required by 40 CFR 264.1064(g)(5).

Per the requirements of 40 CFR §264.1050, PFF has identified and marked each piece of existing equipment to which the equipment leak standards apply. PFF has developed process and instrumentation diagrams (P&IDs) to identify the location of each piece of equipment subject to 40 CFR 264, Subpart BB requirements and the associated hazardous waste management units. The diagrams have been provided as Exhibits S-1 and S-4 through S-6. Exempt equipment for the 3,000-gallon tank, debris treatment, mixed waste tanker loading area, and PF-II treatment area is shown by Exhibits S-2, S-3, and S-7 through S-11. A comprehensive list of the equipment subject to the standards of 40 CFR 264 Subpart BB has been included in Attachment S-1 for the hazardous waste transfer area equipment, Attachment S-2 for the LSV area equipment, and Attachment S-3 for mixed waste transfer to larger containers area equipment.

S2 Pumps in Light Liquid Service

All of the pumps subject to Subpart BB standards are designated for light liquid service at this time. As provided in 40 CFR 264.1052(e), all the pumps in the hazardous waste transfer area, the LSV area, and the mixed waste transfer to larger containers area are designated "no detectable emissions" (i.e., instrument reading of less than 500 ppm above background) and will be monitored annually using Method 21 specified in 40 CFR Part 60. These pumps do not have an externally actuated shaft penetrating the pump housing.

S3 Compressors

The Facility does not have any compressors that are in direct contact with hazardous waste; therefore, 40 CFR 264.1053 is not applicable.

S4 Pressure Relief Devices in Gas/Vapor Service

Pressure relief devices (i.e., valves and conservation vents) are employed on the PF-II reactor vessel (valve), absorber (conservation vent), and accumulator (conservation vent). However, since each of these pressure relief devices is part of a closed vent system (see previous regenerative thermal oxidizer discussion) capable of capturing and transporting leakage from devices, the requirements of 40 CFR 264.1054 do not apply.

S5 Sampling Connection Systems

The Facility does not have any sampling connecting systems or in-situ sampling systems. The samples for analysis are collected through open-ended valves or lines. Hence, the requirements of 40 CFR 264.1055 are not applicable.

S6 Open-ended Valves or Lines

The open-ended valves and lines that are subject to the requirements of 40 CFR 264.1056 are identified in the equipment list for the hazardous waste transfer area, LSV area, and the mixed waste transfer to larger containers area. These pieces of equipment are either equipped with caps, blind flanges, plugs, or second valves that seal the open end at all times except during operations requiring hazardous waste flow through the open-ended valve or line. Each open-ended valve or line equipped with a second valve is operated so that the valve on the hazard waste side is closed before the second valve is closed.

S7 Valves in Gas/Vapor Service or in Light Liquid Service

All existing valves that come into direct contact with hazardous waste liquid are designated for light liquid service at this time and are identified in the equipment list. All valves in light liquid service and in gas/vapor service will meet the standards specified by 40 CFR 264.1057.

As provided in 40 CFR 264.1057(f), all valves in the hazardous waste transfer area, the LSV area, and the mixed waste transfer to larger containers area are designated for no detectable emissions (i.e., instrument reading of less than 500 ppm above background), and will be monitored annually using Method 21 specified in 40 CFR Part 60. These valves do not have an external actuating mechanism in contact with the hazardous waste.

S8 Pumps and Valves in Heavy Liquid Service, Pressure Relief Devices in Light Liquid or Heavy Liquid Service, and Flanges and other Connectors

At the present time, all pumps and valves in contact with hazardous waste liquid are designated for light liquid service. There are no pressure relief devices in liquid service at the facility. Flanges and other connectors subject to the requirements of 40 CFR 264.1058 are identified in the equipment list and will be monitored within 5 days if evidence of a potential leak is found by a visual, audible, or olfactory method during the daily inspection of piping.

If a leak is detected using Method 21 specified in 40 CFR Part 60(i.e., an instrument reading of 10,000 ppm or greater above the background), the flange or connector will be repaired as soon as practicable, but no later than 15 calendar days after detection. The first attempt at repair will be made within 5 days of detection. Repair of a leaking flange/other connector may extend beyond 15 days if at least one of the conditions specified in the subsection titled “Delay of Repair” is met.

S9 Recordkeeping Requirements

Pursuant to the requirements of 40 CFR 264.1064, PFF has identified each affected piece of equipment by number and location (See Attachments S-1, S-2, and S-3).

The following information will be maintained at the Facility to demonstrate compliance with the requirements of 40 CFR 264 Subpart BB:

1. Type of equipment - valve, pump, flange, etc.
2. Service - designated as light liquid at this time, based on knowledge of the hazardous waste received and managed at the Facility for all equipment contacting liquids.
3. Percent-by-weight of total organics is not necessary for the affected equipment because PFF has determined applicability and consequently designed the compliance program based on the fact that PFF manages hazardous waste up to 100% organics by weight.
4. Method of compliance with the standard.
5. Leak monitoring results and any repairs conducted at the Facility.
6. Notification record(s) to the Florida DEP if a detected leak is not repaired within the designated time period.
7. Records associated with the Test Methods and Procedures outlined in 40 CFR 264.1063. These records typically include VOC Analyzer Calibration, Response Time, and Calibration Precision Logs (typical forms included in Attachment S-4). A copy of Reference Method 21 (40 CFR Part 60) has been included in Attachment S-5. Copies of sample inspection forms and the VOC analyzer logs are included in Attachment S-6.

PFF may choose the exemption provided in 40 CFR 264.1050(f) for the affected equipment identified in Attachments S-1, S-2, and S-3 if this equipment contains or contacts hazardous waste for less than 300 hours per calendar year, and keep a record of hours of operation.

S10 Delay of Repair

All detected leaks will be repaired as soon as practicable, but not later than 15 days after detection unless the following conditions arise.

- The repair is not technically feasible without shutdown of a hazardous waste management unit. In such a case, the leak repair will be completed before the end of the next shutdown of the hazardous waste management unit.
- The leaking equipment is isolated and does not continue to contain or contact hazardous waste with an organic concentration of at least 10% by weight.
- The emissions resulting from immediate repair of a leaking valve would be greater than the emissions likely to result from delay of repair.

- The repair of a leaking pump requires the use of a dual mechanical seal system, which includes a barrier fluid system. In such a case, the repair will be completed as soon as practical, but no later than six months after leak detection.

S11 Reporting Requirements

For each semi-annual reporting period designated by the Florida DEP Director, a report will be submitted including the information required by 40 CFR 264.1065(a) if the following condition occurs during that reporting period.

- Leak repair is not performed within 15 calendar days of leak detection and/or the first attempt at repair is not performed within 5 calendar days of the leak detection for valves in gas/vapor service or in light liquid service.

This report will include:

- EPA identification number, name, and address of the facility;
- Dates of hazardous waste management unit shutdowns that occurred during the reporting period; and,
- Equipment identification number of each pump or valve for which leak repair was not performed within 15 calendar days after leak detection or the first attempt at repair was not performed within 5 calendar days.

SUBPART CC - AIR EMISSIONS STANDARDS FOR TANKS AND CONTAINERS

Applicability

The Facility storage tank is exempt from Subpart CC tank requirements because the 3,000-gallon tank is used to receive mixed waste. The PF-II process components, although considered tank-like for permitting, are also exempt from Subpart CC requirements because they are designated solely for the management of mixed wastes. Because Subpart CC container requirements do not apply to containers or tanks holding mixed waste, the LSV processing equipment will not be subject to Subpart CC since only mixed wastes are processed in the equipment. For containers up to 110 gallons holding hazardous wastes with a volatile organic content of ≥500 ppm and that are not radioactive, PFF will meet the Level 1 control requirement regulations specified in 40 CFR 264.1086 (c). For any container greater than 110 gallons (e.g., totes) holding hazardous waste that is not radioactive, PFF will meet the Level 2 control requirements specified at 40 CFR 264.1086(d). PFF receives hazardous waste and places treatment residuals which are hazardous waste in containers that meet U.S. Department of Transportation (DOT) regulations on packaging hazardous materials for transportation as specified in 40 CFR 1086(f). It should be noted that the PF-I stabilization and fixation process will be used to treat characteristic mixed wastes having an average VOC concentration of less than 500 ppmw. Therefore, Subpart CC does not apply to the PF-I process. Debris treatment operations conducted in the LSV Processing Area involving the use of the debris treatment vat (Dip Tank) will meet the Level 3 Subpart CC emission control requirements specified in 40 CFR 264.1086(e). The air pollution control system (regenerative thermal oxidizer) that will be used to meet the Level 3 controls is described in Part II.I of the permit application.

Attachment S-1

List of Equipment Subject to 40 CFR 264 Subpart BB
Processing and Storage Building
Hazardous Waste Transfer Area

Attachment S-1
Subpart BB Equipment List - Hazardous Waste Transfer Area (PSB)

Equipment ID# (Tag Number)	Equipment Type/Location	Exemption from Subpart Requirements	Applicable Regulation
BV-1	Valve, Ball, 2" @ KN-1 and CA-1 on Pump Suction, wand end.	**2**	40 CFR 264.1057
BV-2	Valve, Ball, 2" @ KN-2 and CA-2 on Pump Suction, pump end.	**2**	40 CFR 264.1057
BV-3	Valve, Ball, 2" @ suction side of Pump PU-5	**2**	40 CFR 264.1057
BV-4	Valve, Ball, 2" @ discharge side of pump PU-5	**2**	40 CFR 264.1057
BV-5	Valve, Ball, 2" @ CA-6 on 2" Sch 40 pipe on bulk tank wall. (Drop pipe)	**2**	40 CFR 264.1057
BV-6	Valve, Ball, 2" @ CA-10 on 2" Sch 40 pipe at discharge end (to tanker)	**2**	40 CFR 264.1057
BV-7	Valve, Ball, 2" @ CA-9 on 2" Chemhose, from 2" tanker discharge end of pipe.	**2**	40 CFR 264.1057
BV-8	Valve, Ball, 2" @ CA-8 on tanker end of discharge hose.	**2**	40 CFR 264.1057
BV-9	Valve, Ball, 2" @ Discharge side of pump PU-4	**2**	40 CFR 264.1057
BV-10	Valve, Ball, 2" @ Suction side of pump PU-4	**2**	40 CFR 264.1057
CA-1	Camlock, Male, 2" @ BV-1 on wand end of suction hose.	n/a	40 CFR 264.1058
CA-2	Camlock, Male, 2" @ BV-2 on pump end of suction hose.	n/a	40 CFR 264.1058
CA-3	Camlock, Female, 2" @ CP-1 and CA-2 on suction of pump PU-5	n/a	40 CFR 264.1058
CA-4	Camlock, Male, 2" @ CP-2 on discharge side of pump PU-5	n/a	40 CFR 264.1058
CA-5	Camlock, Female, 2" @ KN-3 on jumper hose connecting to ovhd.	n/a	40 CFR 264.1058
CA-6	Camlock, Female, 2" @ BV-5 on 2" Sch 40 pipe on bulk tank wall. (Drop pipe)	n/a	40 CFR 264.1058
CA-7	Camlock, Male, 2" @ KN-4 on 2" Chemhose jumper to overhead.	n/a	40 CFR 264.1058
CA-8	Camlock, Male, 2" @ BV-8 Tanker end of discharge hose.	n/a	40 CFR 264.1058
CA-9	Camlock, Female, 2" @ BV-7 on pipe end (Overhead) of tanker fill hose.	n/a	40 CFR 264.1058
CA-10	Camlock, Male, 2" @ BV-6 on discharge (tanker) end of overhead pipe.	n/a	40 CFR 264.1058
CA-11	Camlock, Female, 2" @ EL-6 on suction wand	n/a	40 CFR 264.1058
CA-12	Camlock, Male, 2" on Discharge side of pump PU-4	n/a	40 CFR 264.1058
CA-13	Camlock, Female, 2" on Suction side of pump PU-4	n/a	40 CFR 264.1058
CP-1	Coupling, 2" @ BV-3 on suction side of pump PU-5	n/a	40 CFR 264.1058

Equipment ID# (Tag Number)	Equipment Type/Location	Exemption from Subpart Requirements	Applicable Regulation
CP-2	Coupling, 2" @ BV-4 on discharge side of pump PU-5	n/a	40 CFR 264.1058
CP-3	Coupling, 2" @ BV-9 on discharge of pump PU-4	n/a	40 CFR 264.1058
CP-4	Coupling, 2" @ BV-10 on suction side of pump PU-4	n/a	40 CFR 264.1058
CV-1	Check Valve, 1/4" Backflow preventer on PU-5 Discharge (Blowback lines)	**2**	40 CFR 264.1057
CV-2	Check Valve, 1/4" Backflow preventer on PU-5 Suction (Blowback Lines)	**2**	40 CFR 264.1057
CV-3	Check Valve, 1/4" Backflow preventer on PU-4 Discharge (Blowback lines)	**2**	40 CFR 264.1057
CV-4	Check Valve, 1/4" Backflow preventer on PU-4 Suction (Blowback Lines)	**2**	40 CFR 264.1057
EL-1	Elbow, 45 deg., Galv., 2" @ BV-5 @ jumper hose connection to drop pipe on wall.	n/a	40 CFR 264.1058
EL-2	Elbow, 45 deg., Galv., 2" @ KN-6 on pulse dampener hose to overhead.	n/a	40 CFR 264.1058
EL-3	Elbow, 45 deg., Galv., 2" @ KN-6 on pulse dampener hose to overhead.	n/a	40 CFR 264.1058
EL-4	Elbow, 90 deg., Galv., 2" @ pump end of overhead pipe	n/a	40 CFR 264.1058
EL-5	Elbow, 90 deg., Galv., 2" @ tanker end of overhead pipe after U-2	n/a	40 CFR 264.1058
EL-6	Elbow, 90 deg., Galv., 2" on drum suction wand.	n/a	40 CFR 264.1058
KN-1	Nipple, King, 2" @ BV-1 on wand end of suction hose.	n/a	40 CFR 264.1058
KN-2	Nipple, King, 2" @ BV-1 on wand end of suction hose.	n/a	40 CFR 264.1058
KN-3	Nipple, King, 2" @ CA-5 on pump end of jumper hose connecting to ovhd.	n/a	40 CFR 264.1058
KN-4	Nipple, King, 2" @ CA-7 on overhead end of jumper hose, connected to CA-6	n/a	40 CFR 264.1058
KN-5	Nipple, King, 2" @ 45 deg Elbow EL-2 @ dampener hose connecting to overhead.	n/a	40 CFR 264.1058
KN-6	Nipple, King, 2" @ 45 deg Elbow EL-3 @ dampener hose connecting to overhead.	n/a	40 CFR 264.1058
KN-7	Nipple, King, 2" @ BV-7 on pipe end of tanker fill hose.	n/a	40 CFR 264.1058
KN-8	Nipple, King, 2" @ BV-8 on tanker end of tanker fill hose.	n/a	40 CFR 264.1058
PU-4	Pump, Sandpiper, 2", SB-2 series diaphragm pump	**1**	40 CFR 264.1052
PU-5	Pump, Sandpiper, 2", SB-2 series diaphragm pump	**1**	40 CFR 264.1052
U-1	Union, 2" Galv. On 2" galv. Overhead pipe @ EL-4 end of pipe. (Pump End)	n/a	40 CFR 264.1058
U-2	Union, 2" Galv. On 2" galv. Overhead pipe @ EL-5 end of pipe. (Tanker end)	n/a	40 CFR 264.1058

LEGEND:

CA – CAMLOCK	BV – VALVES	CP- Coupling	FA – FLANGE	CP - COUPLING
KN- KING NIPPLE	EL - ELBOW	M - MOTOR	CV- CHECK VALVE	U - UNION
VP - VACUUM PUMP	T - TEE	TK - TANK	X - CROSS	

Exemptions:

PUMPS (1): 40 CFR 264.1052(e) Pumps without externally actuated shafts, which penetrate the pump housing (e.g. sandpiper pumps), will be monitored. If the results of the monitoring indicate no detectable emissions (instrument reading of < 500 ppm), the pump is exempt from monthly monitoring and weekly inspection and is subject to annual monitoring. The exempted pump identification numbers will be kept in a list as required by 40CFR264.1064(g)(2).

VALVES (2): 40 CFR 264.1057(f) Valves with external actuating mechanisms not in contact with hazardous waste will be monitored. If the results of the monitoring indicate no detectable emissions (instrument reading of < 500 ppm), the valve is exempt from monthly monitoring and is subject to annual monitoring. The exempted valve identification numbers will be kept in a list as required by 40CFR264.1064(g)(2).

VACUUM SERVICE (3): 40CFR264.1050(e) Equipment that is in vacuum service is excluded from the requirements of Sec. 264.1052 to Sec. 264.1060 if it is identified as required in Sec. 264.1064(g)(5).

40CFR264.1064(g) The following information pertaining to all equipment subject to the requirements in Secs. 264.1052 through 264.1060 shall be recorded in a log that is kept in the facility operating record: (5) A list of identification numbers for equipment in vacuum service.

All repairs must be performed within 15 days of discovery.

Attachment S-2

List of Equipment Subject to
40 CFR 264 Subpart BB
LSV Area

Attachment S-2
Subpart BB Equipment List - LSV Area

Equipment ID# (Tag Number)	Equipment Type/Location	Exemption from Subpart Requirements	Applicable Regulation
Tees			
WT-1	1" Waste Line Tee for Air Purge	n/a	40 CFR 264.1058
Connections			
WC-1	1" Waste Line Union	n/a	40 CFR 264.1058
WC-2	1" Waste Line Union	n/a	40 CFR 264.1058
WC-3	1" Waste Line Union	n/a	40 CFR 264.1058
WC-4	1" Waste Line Union	n/a	40 CFR 264.1058
WC-5	1" Waste Line Union	n/a	40 CFR 264.1058
WC-6	1" Waste Line Union	n/a	40 CFR 264.1058
WC-7	1" Waste Line Union	n/a	40 CFR 264.1058
WC-8	1" Waste Line Union	n/a	40 CFR 264.1058
WC-9	1" PVC Threaded Coupling	n/a	40 CFR 264.1058
Elbows			
WE 1	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 2	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 3	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 4	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 5	1" Waste Line 45° Elbow	n/a	40 CFR 264.1058
WE 6	1" Waste Line 45° Elbow	n/a	40 CFR 264.1058
WE 7	1" Waste Line 45° Elbow	n/a	40 CFR 264.1058
WE 8	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 9	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 10	1" Waste Line 90° Last Elbow in Air Handling Room	n/a	40 CFR 264.1058
WE 11	1" Waste Line 45° First Elbow Outside	n/a	40 CFR 264.1058
WE 12	1" Waste Line 45° Elbow	n/a	40 CFR 264.1058
WE 13	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 14	1" Waste Line 90° Elbow	n/a	40 CFR 264.1058
WE 15	1" Waste Line 90° Elbow °	n/a	40 CFR 264.1058
Valves			
WV 1	1" Waste Line Valve on Discharge Side of Pump	**2**	40 CFR 264.1057
WV 2	1" Waste Line Valve at Tee	**2**	40 CFR 264.1057
WV 3	1" Test Tank Valve Connection to Test Tank	**2**	40 CFR 264.1057
WV 4	1" Waste Line Valve on Air Purge Line	**2**	40 CFR 264.1057

Equipment ID# (Tag Number)	Equipment Type/Location	Exemption from Subpart Requirements	Applicable Regulation
Pumps			
P5	1" Dual Diaphragm Ball Pump	**1**	40 CFR 264.1052

Attachment S-2 (cont.)

LSV Processing Area – Equipment List

Process Outfeed

(See Exhibit S-6)

Tag Number	Equipment Type/Location	Exemption from Subpart Requirements	Applicable Regulation
1	2" 90 deg EL at Hog Spray Box	n/a	40 CFR 264.1058
2	2" 45 deg EL at Hog Spray Box	n/a	40 CFR 264.1058
3	2" King Nipple @ TEE @ HOG Spray Box	n/a	40 CFR 264.1058
4	2" TEE at Hog Spray Box	n/a	40 CFR 264.1058
5	2" 90 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
6	2" King Nipple @ TEE @ HOG Spray Box	n/a	40 CFR 264.1058
7	2" 45 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
8	2" 90 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
9	2" CamLock @ Cross Over	n/a	40 CFR 264.1058
10	2" CamLock @ Cross Over	n/a	40 CFR 264.1058
11	2" 90 deg EL @ Welded Manifold	n/a	40 CFR 264.1058
12	2" 90 deg EL @ Welded Manifold	n/a	40 CFR 264.1058
13	2" 90 deg EL @ Spray Bar Inlet	n/a	40 CFR 264.1058
14	2" 90 deg EL @ Ethanol Tank	n/a	40 CFR 264.1058
15	2" 45 deg EL @ Ethanol Tank	n/a	40 CFR 264.1058
16	1-1/2"" CamLock @ 1-1/2" Sandpiper Pump -Suction Side	n/a	40 CFR 264.1058
17	1-1/2"" CamLock @ 1-1/2" Sandpiper Pump - Disch. Side	n/a	40 CFR 264.1058
18	2" 90 deg EL @ Welded Manifold	n/a	40 CFR 264.1058
19	2" 90 deg EL @ Welded Manifold	n/a	40 CFR 264.1058
20	1-1/2" CamLock @ Welded Manifold	n/a	40 CFR 264.1058
21	2" CamLock @ Cross Over	n/a	40 CFR 264.1058
22	2" CamLock @ Cross Over	n/a	40 CFR 264.1058
23	2" 90 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
24	2" 45 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
25	2" 90 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
26	2" TEE at Hog Spray Box	n/a	40 CFR 264.1058
27	2" 45 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
28	2" 90 deg EL @ Hog Spray Box	n/a	40 CFR 264.1058
29	2" Ball Valve @ Pump Crossover	**2**	40 CFR 264.1057
30	2" TEE @ Pump Cross Over	n/a	40 CFR 264.1058
31	2" Ball Valve @ Pump Crossover	**2**	40 CFR 264.1057
32	1" Camlock on Final Fluid Transfer Hose	n/a	40 CFR 264.1058
33	1" Ball Valve	**2**	40 CFR 264.1057
34	2" 90 deg EL @ Base of Filter Housing	n/a	40 CFR 264.1058
35	2" Ball Valve @ 90 deg EL at Base of Filter Housing	**2**	40 CFR 264.1057
36	1" CamLock @ 2" Ball Valve @ Base of Filter Housing	n/a	40 CFR 264.1058
37	1" Ball Valve @ Final Fluid Transfer Hose	**2**	40 CFR 264.1057
38	1" Camlock on Final Fluid Transfer Hose	n/a	40 CFR 264.1058

Tag Number	Equipment Type/Location	Exemption from Subpart Requirements	Applicable Regulation
39	1" Ball Valve @ Filter Drain	**2**	40 CFR 264.1057
40	1-1/2" Camlock @ Ball Valve @ Filter Housing Outlet	n/a	40 CFR 264.1058
41	2" Ball Valve @ 90 DEG EL @ Filter Housing Outlet	**2**	40 CFR 264.1057
42	2" 90 deg EL @ Filter Housing Outlet	n/a	40 CFR 264.1058
43	2" 90 deg EL @ Filter Housing Inlet	**2**	40 CFR 264.1057
44	2" Ball Valve @ Filter Housing Outlet	n/a	40 CFR 264.1058
45	1-1/2" Camlock @ Ball Valve @ Filter Housing inlet	**2**	40 CFR 264.1057
46	2" 90 EL @ Knife Hog Catch Tank	n/a	40 CFR 264.1058
PU-7	1-1/2" Dual Diaphragm Ball Pump	**1**	40 CFR 264.1052

Exemptions:

PUMPS (1): 40 CFR 264.1052(e) Pumps without externally actuated shafts, which penetrate the pump housing (e.g. sandpiper pumps), will be monitored. If the results of the monitoring indicate no detectable emissions (instrument reading of < 500 ppm), the pump is exempt from monthly monitoring and weekly inspection and is subject to annual monitoring. The exempted pump identification numbers will be kept in a list as required by 40CFR264.1064(g)(2).

VALVES (2): 40 CFR 264.1057(f) Valves with external actuating mechanisms not in contact with hazardous waste will be monitored. If the results of the monitoring indicate no detectable emissions (instrument reading of < 500 ppm), the valve is exempt from monthly monitoring and is subject to annual monitoring. The exempted valve identification numbers will be kept in a list as required by 40CFR264.1064(g)(2).

VACUUM SERVICE (3): 40CFR264.1050(e) Equipment that is in vacuum service is excluded from the requirements of Sec. 264.1052 to Sec. 264.1060 if it is identified as required in Sec. 264.1064(g)(5).

40CFR264.1064(g) The following information pertaining to all equipment subject to the requirements in Secs. 264.1052 through 264.1060 shall be recorded in a log that is kept in the facility operating record: (5) A list of identification numbers for equipment in vacuum service.

All repairs must be performed within 15 days of discovery.

Attachment S-3

List of Equipment Subject to
40 CFR 264 Subpart BB
Mixed Waste Transfer to Larger Containers Area

Attachment S-3
Subpart BB Equipment List - Mixed Waste Transfer to Larger Containers Area

Tag No.	Equipment Type/Location	Exemption from Subpart Requirements	Applicable Regulation
BV-1	Valve, Ball, 1-1/2" on Pump Discharge	**2**	40 CFR 264.1057
BV-2	Valve, Ball, 1-1/2" on Pump Suction	**2**	40 CFR 264.1057
BV-3	Valve, Ball, 1-1/2" @ CA-3 and KN-1 on Pump Discharge	**2**	40 CFR 264.1057
BV-4	Valve, Ball, 1-1/2" on Pump Discharge Hose @ CA-2 and KN-4	**2**	40 CFR 264.1057
BV-5	Valve, Ball, 1-1/2" on Pump Suction Hose @ CA-5 and KN-3	**2**	40 CFR 264.1057
BV-6	Valve, Ball, 1-1/2" on Pump Suction Hose@ KN-4 and CA-6	**2**	40 CFR 264.1057
CA-1	CAMLOCK, Male, 1-1/2" @ BV-1 on Pump Discharge	n/a	40 CFR 264.1058
CA-2	CAMLOCK, Female, 1-1/2" @ BV-5 and KN-3 on Pump Suction	n/a	40 CFR 264.1058
CA-3	CAMLOCK, Male, 1-1/2" @ BV-3 on Pump Discharge Hose	n/a	40 CFR 264.1058
CA-4	CAMLOCK, Male, 1-1/2" @ KN-2 and BV-4 on Tank End of Discharge Hose	n/a	40 CFR 264.1058
CA-5	CAMLOCK, Male, 1-1/2" @ BV-5 and KN-3 on Pump End of Suction Hose	n/a	40 CFR 264.1058
CA-6	CAMLOCK, Female, 1-1/2" @ BV-6, on hose @ Wand End of Suction Hose	n/a	40 CFR 264.1058
CA-7	CAMLOCK, Male, 1'1/2" on Wand	n/a	40 CFR 264.1058
KN-1	Nipple, King, 1-1/2" @ BV-3, Pump Discharge Hose	n/a	40 CFR 264.1058
KN-2	Nipple, King, 1-1/2" @ CA-4 and BV-4 on Tank End of Pump Discharge Hose	n/a	40 CFR 264.1058
KN-3	Nipple, King, 1-1/2" @ BV-5 on Pump end of Pump Suction Hose	n/a	40 CFR 264.1058
KN-4	Nipple, King, 1-1/2" @ BV-6, Pump Suction, Wand End of Hose	n/a	40 CFR 264.1058
PU-3	Pump, Sandpiper, 1-1/2", Diaphragm Type	1	40 CFR 264.1052

LEGEND:

CA – Camlock	BV - Valves	CP- Coupling	FA – Flange
KN- King Nipple	EL – Elbow	M - Motor	CV- Check Valve
U – Union	VP - Vacuum Pump	T – Tee TK - Tank	X - Cross

EXEMPTIONS

Pumps (1): 40 CFR 264.1052(e) Pumps without externally actuated shafts, which penetrate the pump housing (e.g. sandpiper pumps), will be monitored. If the results of the monitoring indicate no detectable emissions (instrument reading of < 500 ppm), the pump is exempt from monthly monitoring and weekly inspection and is subject to annual monitoring. The exempted pump identification numbers will be kept in a list as required by 40CFR264.1064(g)(2). Pumps with externally actuated shafts will be monitored monthly and visually inspected weekly. Examples of this pump are the Gorman-Rupp pumps in LSV. An instrument reading of >10,000 ppm indicates a leak which requires repair.

Valves (2): 40 CFR 264.1057(f) Valves with external actuating mechanisms not in contact with hazardous waste will be monitored. If the results of the monitoring indicate no detectable emissions (instrument reading of < 500 ppm), the valve is exempt from monthly monitoring and is subject to annual monitoring. The exempted valve identification numbers will be kept in a list as required by 40CFR264.1064(g)(2).

Vacuum Service (3): 40CFR264.1050(e) Equipment that is in vacuum service is excluded from the requirements of Sec. 264.1052 to Sec. 264.1060 if it is identified as required in Sec. 264.1064(g)(5).

40CFR264.1064(g) The following information pertaining to all equipment subject to the requirements in Secs. 264.1052 through 264.1060 shall be recorded in a log that is kept in the facility operating record: (5) A list of identification numbers for equipment in vacuum service.

ALL repairs must be performed within 15 days of discovery.

Attachment S-4

Sample Forms
VOC Analyzer Response Time Log
VOC Analyzer Quarterly Calibration Precision Log
VOC Analyzer Calibration Log

METHOD 21 LEAK DETECTION MONITORING

VOC ANALYZER RESPONSE TIME LOG

THIS TEST MUST BE CONDUCTED BEFORE FIRST USE OF VOC ANALYZER AND AT SUBSEQUENT 3 MONTH (QUARTERLY) INTERVALS

Initial Testing **Subsequent Quarterly Testing** **After modification to VOC Analyzer Set Up**

(1) **Introduce "zero gas" into VOC Analyzer sample probe until the instrument readings have stabilized.**

(2) **Switch to the "test gas" (concentration = 10,000 ppmv). Take stable instrument reading.**

(3) **Repeat steps (1) and (2) for 3 cycles.**

Time to Reach a Reading of 10,000 ppmv (seconds)			Average Response Time (seconds)
(1)	(2)	(3)	$\frac{(1) + (2) + (3)}{3}$ =

Is Average Response Time > 30 seconds?

YES - <u>Do not</u> use VOC Analyzer for further testing.
NO - Proceed with monitoring.

_______________ Name (Print) _______________ Signature

_______________ Test Date _______________ Time

METHOD 21 LEAK DETECTION MONITORING

VOC ANALYZER QUARTERLY CALIBRATION PRECISION LOG

THIS TEST MUST BE CONDUCTED BEFORE FIRST USE OF VOC ANALYZER AND AT SUBSEQUENT THREE MONTH INTERVALS.

Initial Testing **Subsequent Quarterly Testing**

(1) Introduce "zero gas" into VOC Analyzer sample probe until the instrument readings have stabilized.

(2) Switch to the "test gas" (concentration = 10,000 ppmv). Take stable instrument reading.

(3) Repeat steps (1) and (2) for 3 cycles.

Analyzer Reading (ppmv)	Difference from Actual (ppmv)
(1)	**[10,000 - Reading (1)]** =
(2)	**[10,000 - Reading (2)]** =
(3)	**[10,000 - Reading (3)]** =
Total	
Average Difference (= Total/3)	
Calibration Precision (%) (= Average Difference / 10,000 X 100)	

Is Calibration Precision 90% or Better?

YES - Proceed with monitoring.
NO - Do not use VOC Analyzer for further testing.

Name (Print) _______________ Signature _______________

Test Date _______________ Time _______________

METHOD 21 LEAK DETECTION MONITORING

VOC ANALYZER CALIBRATION LOG

CALIBRATION TEST MUST BE PERFORMED PRIOR TO EACH USE OF THE VOC ANALYZER.

(1) **Switch on the VOC Analyzer. Allow instrument to "warm up". Introduce "zero gas" into VOC Analyzer sample probe until the instrument readings have stabilized.**

(2) **Introduce "test gas" (concentration = 10,000 ppmv) and adjust meter until it corresponds to 10,000 ppmv.**

VOC Analyzer adjusted to 10,000 ppmv?

YES - Proceed with monitoring

NO - Do not use VOC Analyzer for further testing until repaired.

______________________ Name (Print)

______________________ Signature

______________________ Calibration Date

______________________ Time

Attachment S-5

Reference Method 21

Method 21—Determination of Volatile Organic Compound Leaks

1.0 Scope and Application

1.1 Analytes.

Analyte	CAS No.
Volatile Organic Compounds (VOC)	No CAS number assigned.

1.2 Scope. This method is applicable for the determination of VOC leaks from process equipment. These sources include, but are not limited to, valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals.

1.3 Data Quality Objectives. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.

2.0 Summary of Method

2.1 A portable instrument is used to detect VOC leaks from individual sources. The instrument detector type is not specified, but it must meet the specifications and performance criteria contained in Section 6.0. A leak definition concentration based on a reference compound is specified in each applicable regulation. This method is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rate from individual sources.

3.0 Definitions

3.1 *Calibration gas* means the VOC compound used to adjust the instrument meter reading to a known value. The calibration gas is usually the reference compound at a known concentration approximately equal to the leak definition concentration.

3.2 *Calibration precision* means the degree of agreement between measurements of the same known value, expressed as the relative percentage of the average difference between the meter readings and the known concentration to the known concentration.

3.3 *Leak definition concentration* means the local VOC concentration at the surface of a leak source that indicates that a VOC emission (leak) is present. The leak definition is an instrument meter reading based on a reference compound.

3.4 *No detectable emission* means a local VOC concentration at the surface of a leak source, adjusted for local VOC ambient concentration, that is less than 2.5 percent of the specified leak definition concentration. that indicates that a VOC emission (leak) is not present.

3.5 *Reference compound* means the VOC species selected as the instrument calibration basis for specification of the leak definition concentration. (For example, if a leak definition concentration is 10,000 ppm as methane, then any source emission that results in a local concentration that yields a meter reading of 10,000 on an instrument meter calibrated with methane would be classified as a leak. In this example, the leak definition concentration is 10,000 ppm and the reference compound is methane.)

3.6 *Response factor* means the ratio of the known concentration of a VOC compound to the observed meter reading when measured using an instrument calibrated with the reference compound specified in the applicable regulation.

3.7 *Response time* means the time interval from a step change in VOC concentration at the input of the sampling system to the time at which 90 percent of the corresponding final value is reached as displayed on the instrument readout meter.

4.0 Interferences[Reserved]

5.0 Safety

5.1 Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all of the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to performing this test method.

5.2 Hazardous Pollutants. Several of the compounds, leaks of which may be determined by this method, may be irritating or corrosive to tissues (*e.g.,* heptane) or may be toxic (*e.g.,* benzene, methyl alcohol). Nearly all are fire hazards. Compounds in emissions should be determined through familiarity with the source. Appropriate precautions can be found in reference documents, such as reference No. 4 in Section 16.0.

6.0 Equipment and Supplies

A VOC monitoring instrument meeting the following specifications is required:

6.1 The VOC instrument detector shall respond to the compounds being processed. Detector types that may meet this requirement include, but are not limited to, catalytic oxidation, flame ionization, infrared absorption, and photoionization.

6.2 The instrument shall be capable of measuring the leak definition concentration specified in the regulation.

6.3 The scale of the instrument meter shall be readable to ±2.5 percent of the specified leak definition concentration.

6.4 The instrument shall be equipped with an electrically driven pump to ensure that a sample is provided to the detector at a constant flow rate. The nominal sample flow rate, as measured at the sample probe tip, shall be 0.10 to 3.0 l/min (0.004 to 0.1 ft^3 /min) when the probe is fitted with a glass wool plug or filter that may be used to prevent plugging of the instrument.

6.5 The instrument shall be equipped with a probe or probe extension or sampling not to exceed 6.4 mm (1/4in) in outside diameter, with a single end opening for admission of sample.

6.6 The instrument shall be intrinsically safe for operation in explosive atmospheres as defined by the National Electrical Code by the National Fire Prevention Association or other applicable regulatory code for operation in any explosive atmospheres that may be encountered in its use. The instrument shall, at a minimum, be intrinsically safe for Class 1, Division 1 conditions, and/or Class 2, Division 1 conditions, as appropriate, as defined by the example code. The instrument shall not be operated with any safety device, such as an exhaust flame arrestor, removed.

7.0 Reagents and Standards

7.1 Two gas mixtures are required for instrument calibration and performance evaluation:

7.1.1 Zero Gas. Air, less than 10 parts per million by volume (ppmv) VOC.

7.1.2 Calibration Gas. For each organic species that is to be measured during individual source surveys, obtain or prepare a known standard in air at a concentration approximately equal to the applicable leak definition specified in the regulation.

7.2 Cylinder Gases. If cylinder calibration gas mixtures are used, they must be analyzed and certified by the manufacturer to be within 2 percent accuracy, and a shelf life must be specified. Cylinder standards must be either reanalyzed or replaced at the end of the specified shelf life.

7.3 Prepared Gases. Calibration gases may be prepared by the user according to any accepted gaseous preparation procedure that will yield a mixture accurate to within 2 percent. Prepared standards must be replaced each day of use unless it is demonstrated that degradation does not occur during storage.

7.4 Mixtures with non-Reference Compound Gases. Calibrations may be performed using a compound other than the reference compound. In this case, a conversion factor must be determined for the alternative compound such that the resulting meter readings during source surveys can be converted to reference compound results.

8.0 Sample Collection, Preservation, Storage, and Transport

8.1 Instrument Performance Evaluation. Assemble and start up the instrument according to the manufacturer's instructions for recommended warmup period and preliminary adjustments.

8.1.1 Response Factor. A response factor must be determined for each compound that is to be measured, either by testing or from reference sources. The response factor tests are required before placing the analyzer into service, but do not have to be repeated at subsequent intervals.

8.1.1.1 Calibrate the instrument with the reference compound as specified in the applicable regulation. Introduce the calibration gas mixture to the analyzer and record the observed meter reading. Introduce zero gas until a stable reading is obtained. Make a total of three measurements by alternating between the calibration gas and zero gas. Calculate the response factor for each repetition and the average response factor.

8.1.1.2 The instrument response factors for each of the individual VOC to be measured shall be less than 10 unless otherwise specified in the applicable regulation. When no instrument is available that meets this specification when calibrated with the reference VOC specified in the applicable regulation, the available instrument may be calibrated with one of the VOC to be measured, or any other VOC, so long as the instrument then has a response factor of less than 10 for each of the individual VOC to be measured.

8.1.1.3 Alternatively, if response factors have been published for the compounds of interest for the instrument or detector type, the response factor determination is not required, and existing results may be referenced. Examples of published response factors for flame ionization and catalytic oxidation detectors are included in References 1–3 of Section 17.0.

8.1.2 Calibration Precision. The calibration precision test must be completed prior to placing the analyzer into service and at subsequent 3-month intervals or at the next use, whichever is later.

8.1.2.1 Make a total of three measurements by alternately using zero gas and the specified calibration gas. Record the meter readings. Calculate the average algebraic difference between the meter readings and the known value. Divide this average difference by the known calibration value and multiply by 100 to express the resulting calibration precision as a percentage.

8.1.2.2 The calibration precision shall be equal to or less than 10 percent of the calibration gas value.

8.1.3 Response Time. The response time test is required before placing the instrument into service. If a modification to the sample pumping system or flow configuration is made that would change the response time, a new test is required before further use.

8.1.3.1 Introduce zero gas into the instrument sample probe. When the meter reading has stabilized, switch quickly to the specified calibration gas. After switching, measure the time required to attain 90 percent of the final stable reading. Perform this test sequence three times and record the results. Calculate the average response time.

8.1.3.2 The instrument response time shall be equal to or less than 30 seconds. The instrument pump, dilution probe (if any), sample probe, and probe filter that will be used during testing shall all be in place during the response time determination.

8.2 Instrument Calibration. Calibrate the VOC monitoring instrument according to Section 10.0.

8.3 Individual Source Surveys.

8.3.1 Type I—Leak Definition Based on Concentration. Place the probe inlet at the surface of the component interface where leakage could occur. Move the probe along the interface periphery while observing the instrument readout. If an increased meter reading is observed, slowly sample the interface where leakage is indicated until the maximum meter reading is obtained. Leave the probe inlet at this maximum reading location for approximately two times the instrument response time. If the maximum observed meter reading is greater than the leak definition in the applicable regulation, record and report the results as specified in the regulation reporting requirements. Examples of the application of this general technique to specific equipment types are:

8.3.1.1 Valves. The most common source of leaks from valves is the seal between the stem and housing. Place the probe at the interface where the stem exits the packing gland and sample the stem circumference. Also, place the probe at the interface of the packing gland take-up flange seat and sample the periphery. In addition, survey valve housings of multipart assembly at the surface of all interfaces where a leak could occur.

8.3.1.2 Flanges and Other Connections. For welded flanges, place the probe at the outer edge of the flange-gasket interface and sample the circumference of the flange. Sample other types of nonpermanent joints (such as threaded connections) with a similar traverse.

8.3.1.3 Pumps and Compressors. Conduct a circumferential traverse at the outer surface of the pump or compressor shaft and seal interface. If the source is a rotating shaft, position the probe inlet within 1 cm of the shaft-seal interface for the survey. If the housing configuration prevents a complete traverse of the shaft periphery, sample all accessible portions. Sample all other joints on the pump or compressor housing where leakage could occur.

8.3.1.4 Pressure Relief Devices. The configuration of most pressure relief devices prevents sampling at the sealing seat interface. For those devices equipped with an enclosed extension, or horn, place the probe inlet at approximately the center of the exhaust area to the atmosphere.

8.3.1.5 Process Drains. For open drains, place the probe inlet at approximately the center of the area open to the atmosphere. For covered drains, place the probe at the surface of the cover interface and conduct a peripheral traverse.

8.3.1.6 Open-ended Lines or Valves. Place the probe inlet at approximately the center of the opening to the atmosphere.

8.3.1.7 Seal System Degassing Vents and Accumulator Vents. Place the probe inlet at approximately the center of the opening to the atmosphere.

8.3.1.8 Access door seals. Place the probe inlet at the surface of the door seal interface and conduct a peripheral traverse.

8.3.2 Type II—"No Detectable Emission". Determine the local ambient VOC concentration around the source by moving the probe randomly upwind and downwind at a distance of one to two meters from the source. If an interference exists with this determination due to a nearby emission or leak, the local ambient concentration may be determined at distances closer to the source, but in no case shall the distance be less than 25 centimeters. Then move the probe inlet to the surface of the source and determine the concentration as outlined in Section 8.3.1. The difference between these concentrations determines whether there are no detectable emissions. Record and report the results as specified by the regulation. For those cases where the regulation requires a specific device installation, or that specified vents be ducted or piped to a control device, the existence of these conditions shall be visually confirmed. When the regulation also requires that no detectable emissions exist, visual observations and sampling surveys are required. Examples of this technique are:

8.3.2.1 Pump or Compressor Seals. If applicable, determine the type of shaft seal. Perform a survey of the local area ambient VOC concentration and determine if detectable emissions exist as described in Section 8.3.2.

8.3.2.2 Seal System Degassing Vents, Accumulator Vessel Vents, Pressure Relief Devices. If applicable, observe whether or not the applicable ducting or piping exists. Also, determine if any sources exist in the ducting or piping where emissions could occur upstream of the control device. If the required ducting or piping exists and there are no sources where the emissions could be vented to the atmosphere upstream of the control device, then it is presumed that no detectable emissions are present. If there are sources in the ducting or piping where emissions could be vented or sources where leaks could occur, the sampling surveys described in Section 8.3.2 shall be used to determine if detectable emissions exist.

8.3.3 Alternative Screening Procedure.

8.3.3.1 A screening procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts, that do not have surface temperatures greater than the boiling point or less than the freezing point of the soap solution, that do not have open areas to the atmosphere that the soap solution cannot bridge, or that do not exhibit evidence of liquid leakage. Sources that have these conditions present must be surveyed using the instrument technique of Section 8.3.1 or 8.3.2.

8.3.3.2 Spray a soap solution over all potential leak sources. The soap solution may be a commercially available leak detection solution or may be prepared using concentrated detergent and water. A pressure sprayer or squeeze bottle may be used to dispense the solution. Observe the potential leak sites to determine if any bubbles are formed. If no bubbles are observed, the source is presumed to have no detectable emissions or leaks as applicable. If any bubbles are observed, the instrument techniques of Section 8.3.1 or 8.3.2 shall be used to determine if a leak exists, or if the source has detectable emissions, as applicable.

9.0 Quality Control

Section	Quality control measure	Effect
8.1.2	Instrument calibration precision check	Ensure precision and accuracy, respectively, of instrument response to standard.
10.0	Instrument calibration	

10.0 Calibration and Standardization

10.1 Calibrate the VOC monitoring instrument as follows. After the appropriate warmup period and zero internal calibration procedure, introduce the calibration gas into the instrument sample probe. Adjust the instrument meter readout to correspond to the calibration gas value.

Note: If the meter readout cannot be adjusted to the proper value, a malfunction of the analyzer is indicated and corrective actions are necessary before use.

11.0 Analytical Procedures[Reserved]

12.0 Data Analyses and Calculations[Reserved]

13.0 Method Performance[Reserved]

14.0 Pollution Prevention[Reserved]

15.0 Waste Management[Reserved]

16.0 References

1. Dubose, D.A., and G.E. Harris. Response Factors of VOC Analyzers at a Meter Reading of 10,000 ppmv for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2–81051. September 1981.

2. Brown, G.E., *et al.* Response Factors of VOC Analyzers Calibrated with Methane for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2–81–022. May 1981.

3. DuBose, D.A. *et al.* Response of Portable VOC Analyzers to Chemical Mixtures. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2–81–110. September 1981.

4. Handbook of Hazardous Materials: Fire, Safety, Health. Alliance of American Insurers. Schaumberg, IL. 1983.

17.0 Tables, Diagrams, Flowcharts, and Validation Data[Reserved]

Attachment S-6

Sample Inspection Forms and VOC Analyzer Logs

MONTHLY MONITORING LOG
FOR SUBPART BB EQUIPMENT

Equipment ID	VOC Monitoring Reading, ppm (Actual – Background)

If any reading is > 10,000 ppm, leaking equipment must be repaired within 15 days with first attempt to repair within 5 days. If leak is detected, complete the Repair Log.

Inspected by ______________________________ (signature) Date ______________________

SUBPART BB EQUIPMENT REPAIR LOG

Equipment ID	Date Leak is Detected	Expected Date of Repair	Actual Repair Date	Repair Successful? (i.e., VOC monitoring shows < 10,000 ppm)	Method of Repair	Reason for Delay

ANNUAL INSPECTION LOG
FOR POLLUTION CONTROL DUCTWORK AND FLANGES[1]

Date	Time	Observed Evidence of Breaches or leaks? (Y/N)	Confirmed with DRI?[2] (Y/N)	Location of Breach	Action Taken	Initials

[1] The entire length of the VOC emission control system ductwork must be inspected from the catwalk.
[2] DRI = Direct Reading Instrument (e.g., organic VOC analyzer or photoionization detector)

EXHIBITS

Process and Instrumentation Diagrams

Exhibit S-1

Hazardous Waste Transfer Area – PSB

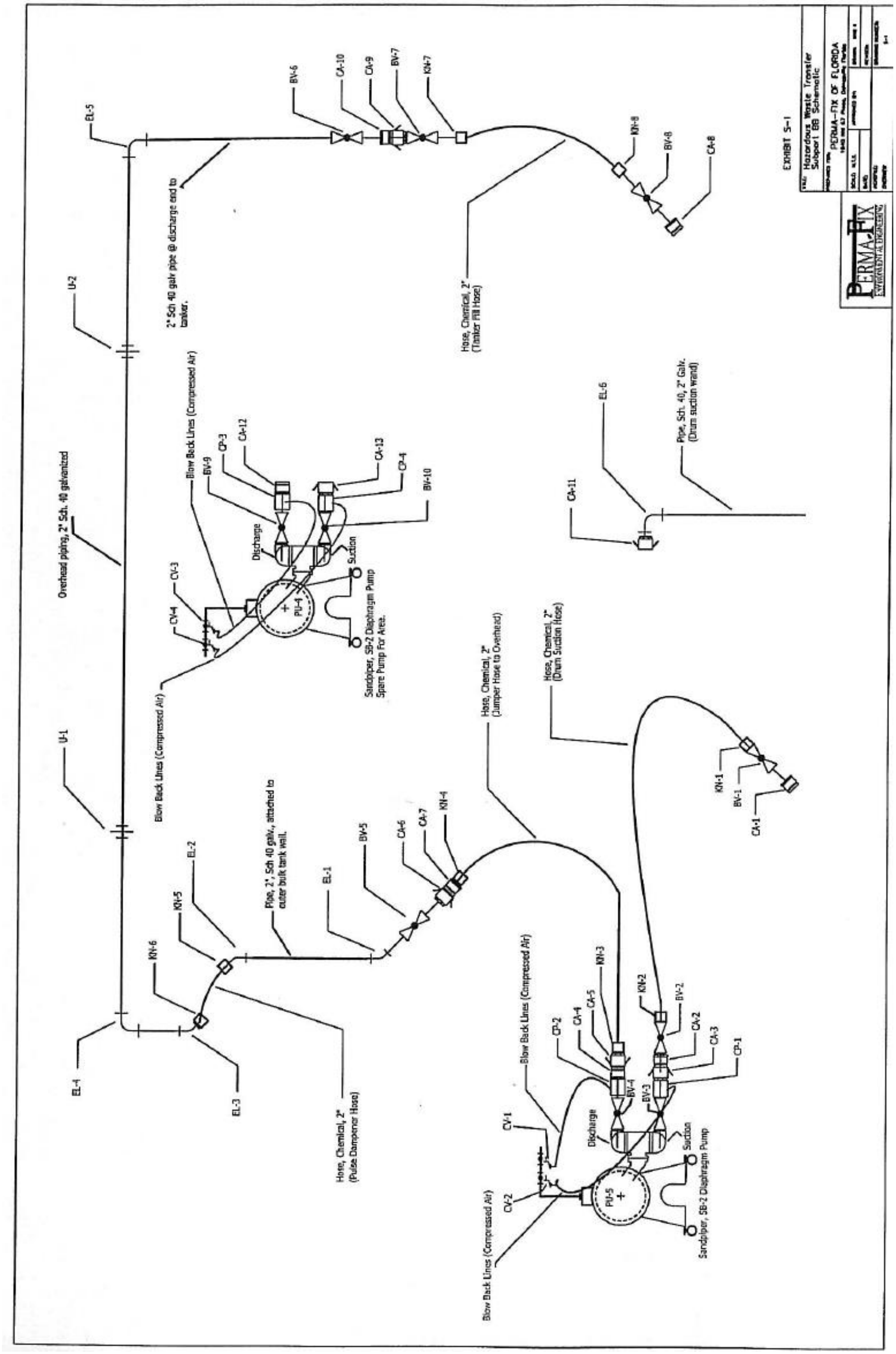


EXHIBIT S-1
Hazardous Waste Transfer Subpart BB Schematic
PERMA-FIX OF FLORIDA
EL-5
BV-6
CA-10
CA-9
BV-7
KN-7
KN-8
BV-8
CA-8
2" Sch 40 galv pipe @ discharge end to tanker.
Hose, Chemical, 2" (Tanker Fill Hose)
U-2
Overhead piping, 2" Sch. 40 galvanized
Blow Back Lines (Compressed Air)
CP-3
CA-12
BV-9
CA-13
CP-4
BV-10
Discharge
Suction
CV-3
CV-4
PU-4
Sandpiper, SB-2 Diaphragm Pump Spare Pump For Area.
EL-6
Pipe, Sch. 40, 2" Galv. (Drum suction wand)
CA-11
Hose, Chemical, 2" (Jumper Hose to Overhead)
Hose, Chemical, 2" (Drum Suction Hose)
U-1
Blow Back Lines (Compressed Air)
Pipe, 2", Sch 40 galv., attached to outer bulk tank wall.
EL-2
KN-5
KN-6
EL-1
BV-5
CA-6
CA-7
KN-4
KN-1
BV-1
CA-1
EL-4
EL-3
Hose, Chemical, 2" (Pulse Dampener Hose)
Blow Back Lines (Compressed Air)
KN-3
KN-2
BV-2
CP-2
CA-4
CA-5
CA-2
CA-3
CP-1
BV-4
BV-3
CV-1
CV-2
PU-5
Sandpiper, SB-2 Diaphragm Pump
Blow Back Lines (Compressed Air)

Exhibit S-2

Debris Treatment Area – LSV

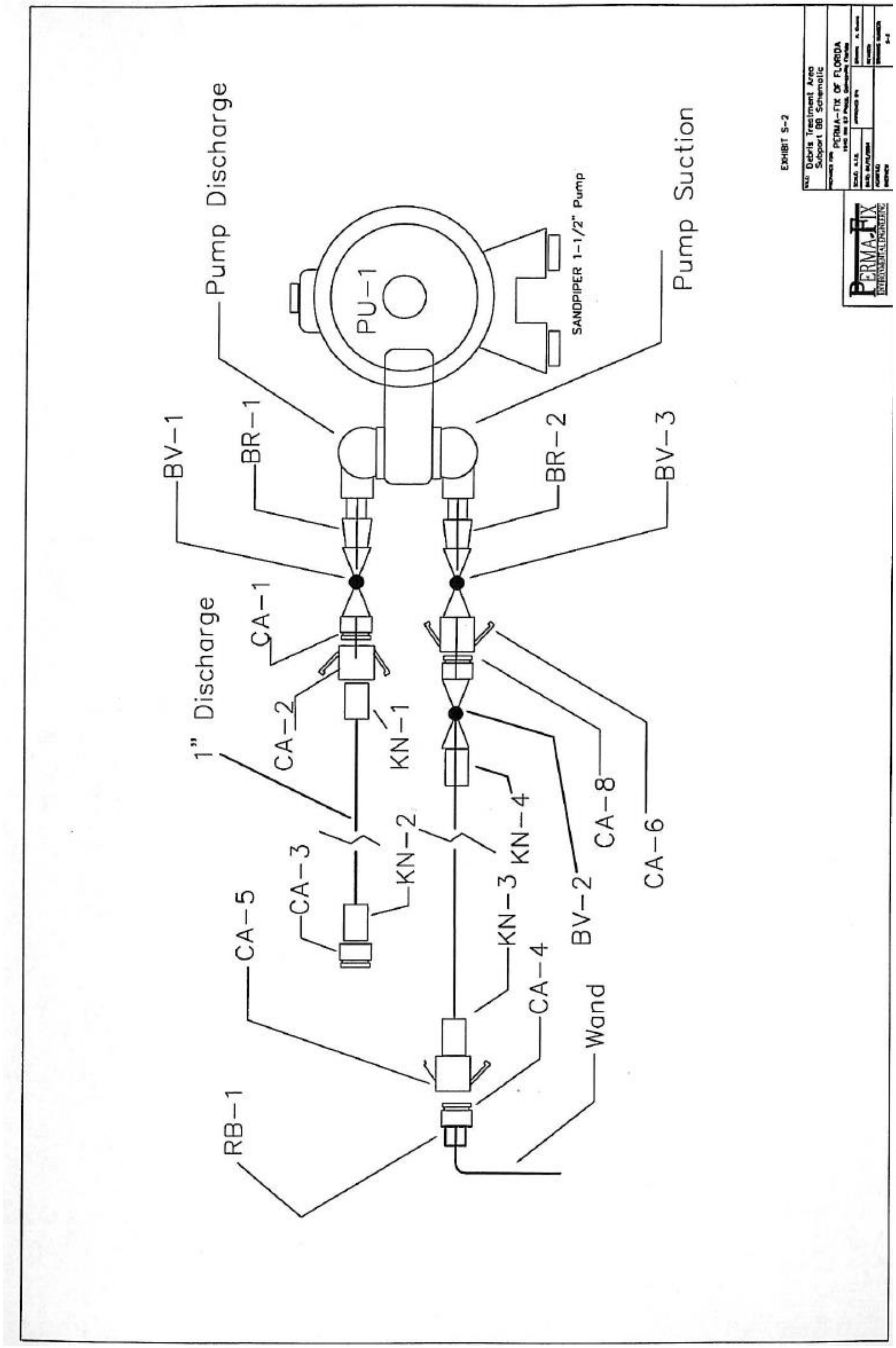

Pump Discharge
PU-1
SANDPIPER 1-1/2" Pump
Pump Suction
BV-1
BR-1
BR-2
BV-3
CA-1
1" Discharge
CA-2
KN-1
CA-8
CA-6
KN-4
KN-2
CA-3
CA-5
KN-3
BV-2
CA-4
Wand
RB-1
EXHIBIT S-2
Debris Treatment Area
Subpart BB Schematic
PERMA-FIX OF FLORIDA
PERMA-FIX

Exhibit S-3

Mixed Waste Tanker Loading Area – TOB

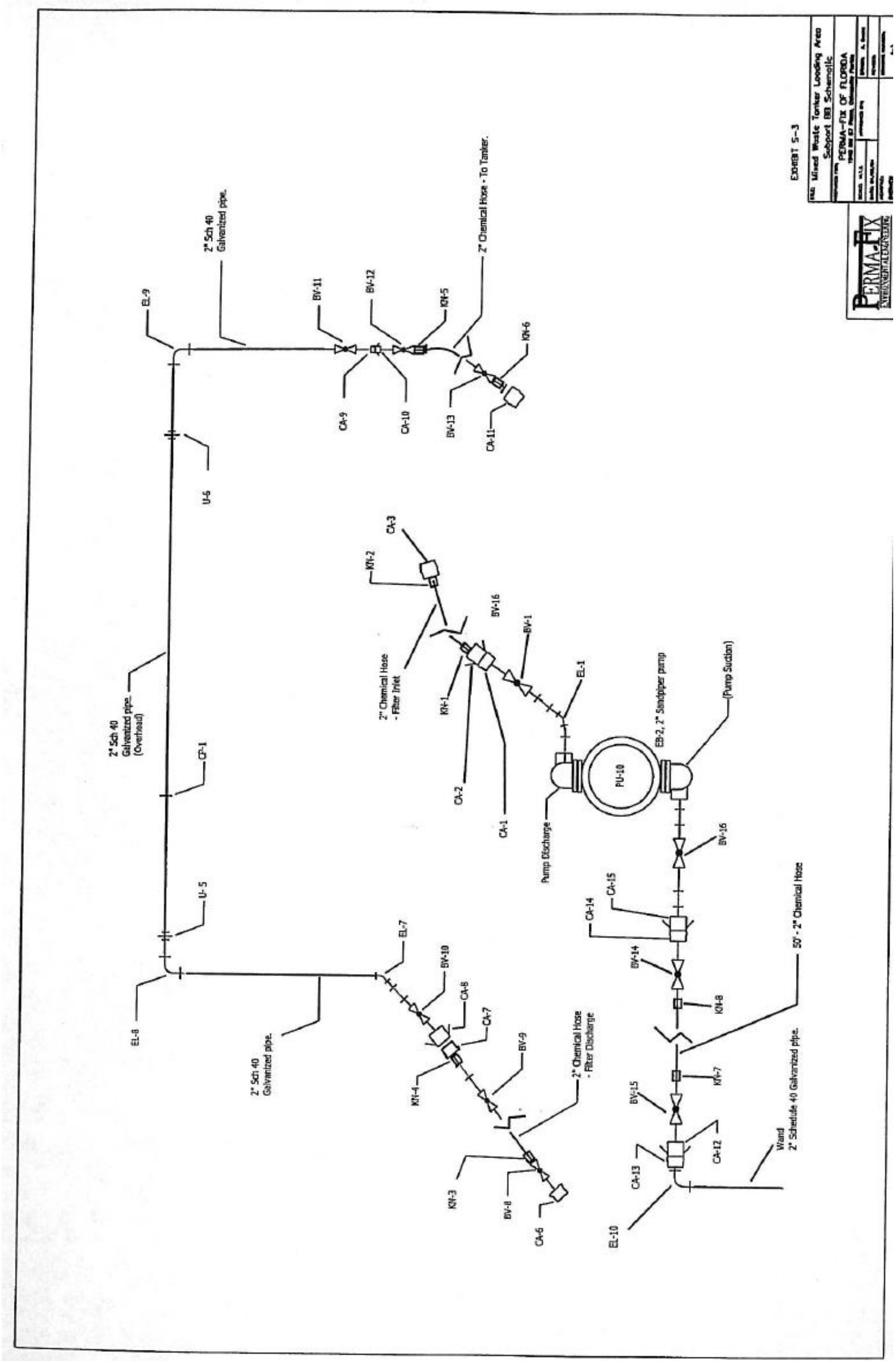


EXHIBIT S-3
Mixed Waste Tanker Loading Area
Subpart BB Schematic
PERMA-FIX OF FLORIDA
PERMA-FIX
2" Sch 40
Galvanized pipe.
2" Chemical Hose - To Tanker.
EL-9
BV-11
BV-12
KN-5
KN-6
CA-9
CA-10
BV-13
CA-11
U-6
CA-3
KN-2
BV-16
BV-1
2" Chemical Hose
- Filter Inlet
KN-1
EL-1
EB-2, 2" Sandpiper pump
(Pump Suction)
2" Sch 40
Galvanized pipe
(Overhead)
CP-1
CA-2
CA-1
PU-10
Pump Discharge
BV-16
CA-15
CA-14
U-5
EL-7
BV-10
CA-8
CA-7
BV-14
KN-8
50' - 2" Chemical Hose
EL-8
2" Sch 40
Galvanized pipe.
BV-9
2" Chemical Hose
- Filter Discharge
KN-4
KN-7
BV-15
2" Schedule 40 Galvanized pipe.
Wand
CA-13
CA-12
KN-3
BV-8
CA-6
EL-10

Exhibit S-4

Mixed Waste Transfer to Larger Containers Area

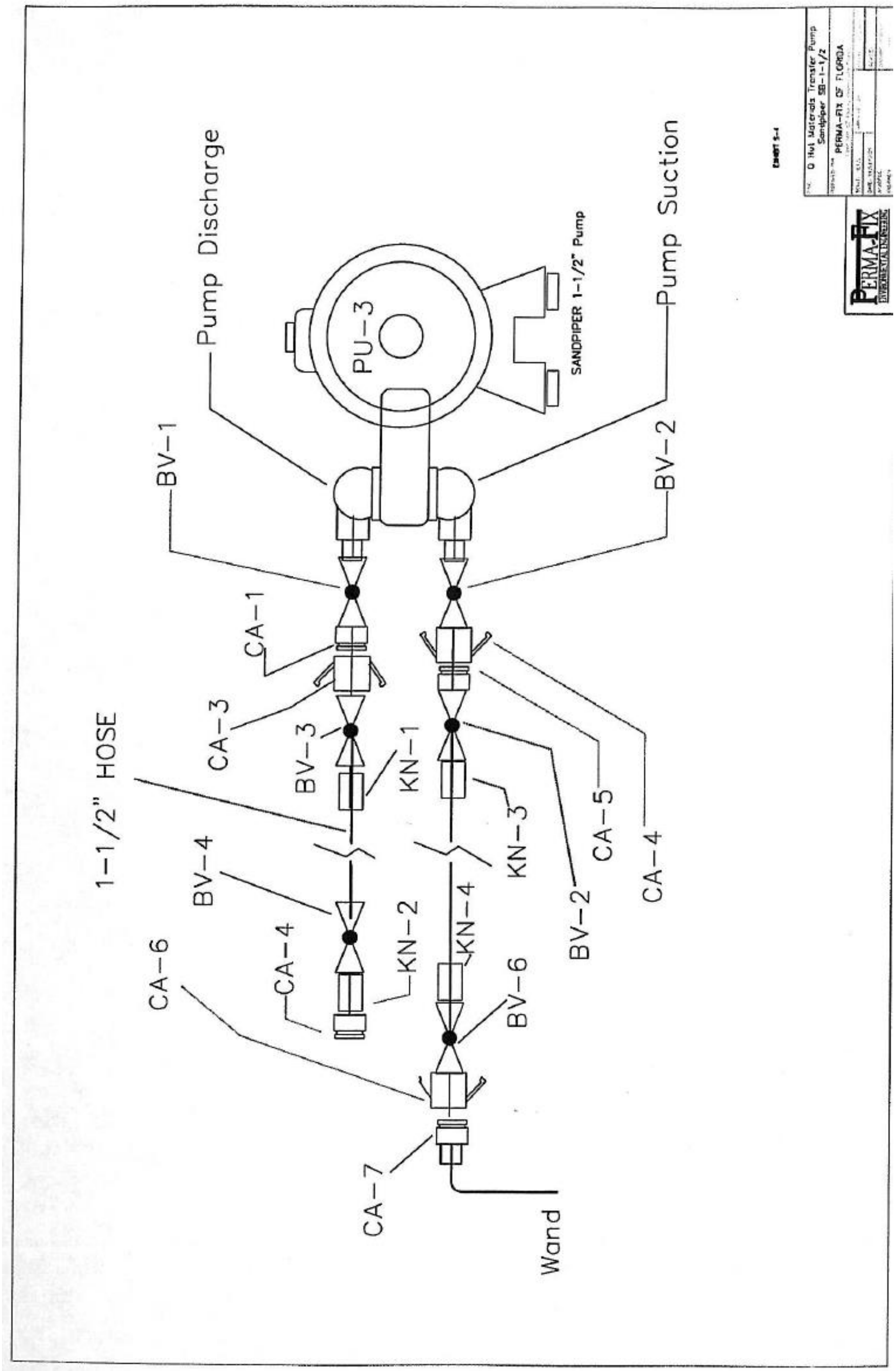

Pump Discharge
Pump Suction
PU-3
SANDPIPER 1-1/2" Pump
BV-1
BV-2
CA-1
CA-3
BV-3
KN-1
1-1/2" HOSE
BV-4
KN-2
CA-4
CA-6
KN-3
CA-5
CA-4
BV-2
KN-4
BV-6
CA-7
Wand
PERMA-FIX
PERMA-FIX OF FLORIDA

Exhibit S-5

LSV Waste Systems

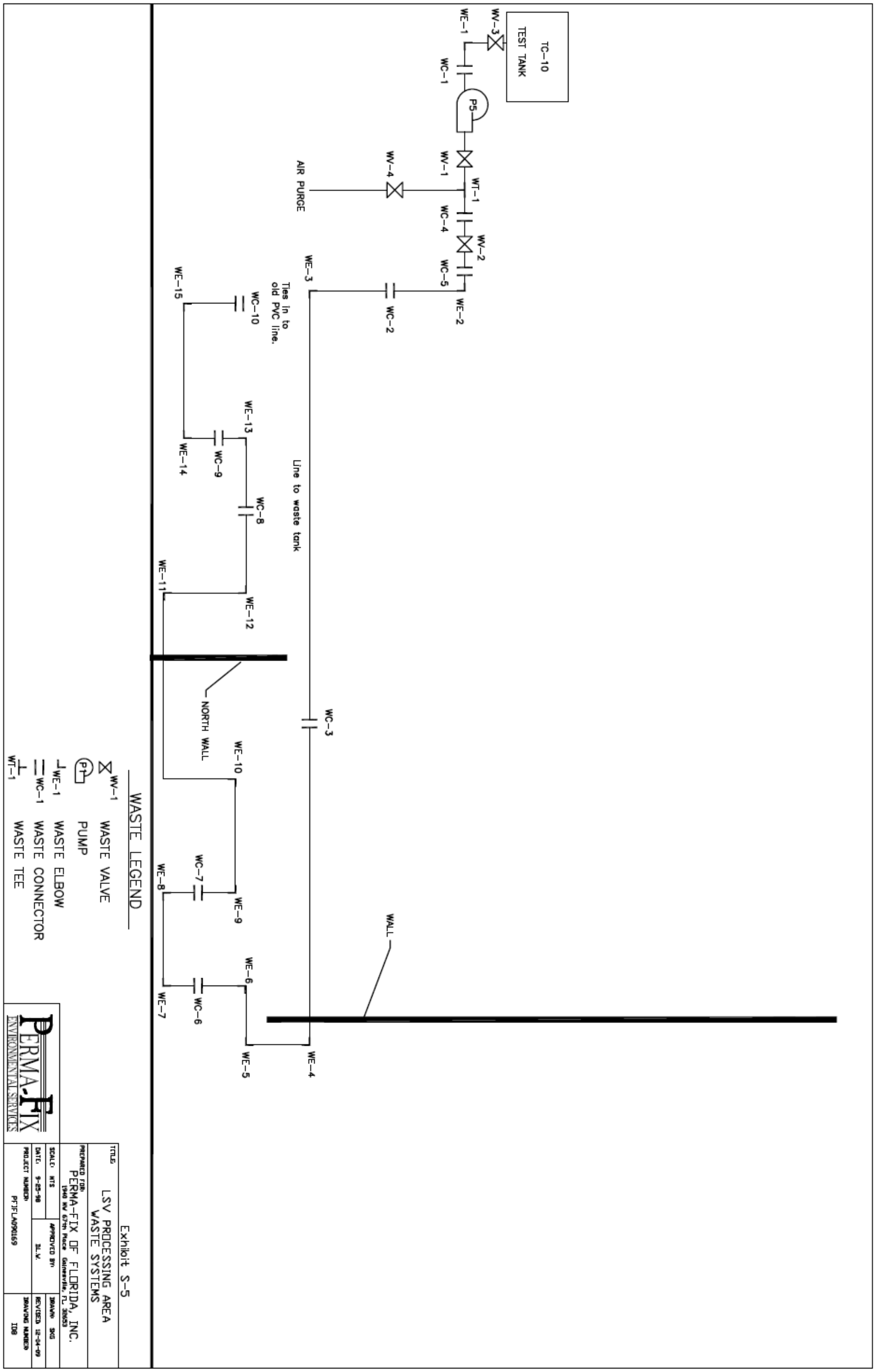

TC-10
TEST TANK
WV-3
WE-1
WC-1
P5
WV-1
WT-1
WV-4
AIR PURGE
WC-4
WV-2
WC-5
WE-2
WC-2
WE-3
Ties in to old PVC line.
WC-10
WE-15
WE-13
WC-9
WE-14
Line to waste tank
WC-8
WE-11
WE-12
NORTH WALL
WC-3
WE-10
WC-7
WE-8
WE-9
WALL
WE-6
WC-6
WE-7
WE-5
WE-4
WASTE LEGEND
WV-1 WASTE VALVE
P1 PUMP
WE-1 WASTE ELBOW
WC-1 WASTE CONNECTOR
WT-1 WASTE TEE
PERMA-FIX
ENVIRONMENTAL SERVICES
TITLE:
Exhibit S-5
LSV PROCESSING AREA
WASTE SYSTEMS
PREPARED FOR:
PERMA-FIX OF FLORIDA, INC.
SCALE: NTS
DATE: 9-25-98
PROJECT NUMBER
DRAWN SHG
REVISED 12-04-09
APPROVED BY: D.L.K.
DRAWING NUMBER
108

Exhibit S-6

LSV Outfeed System

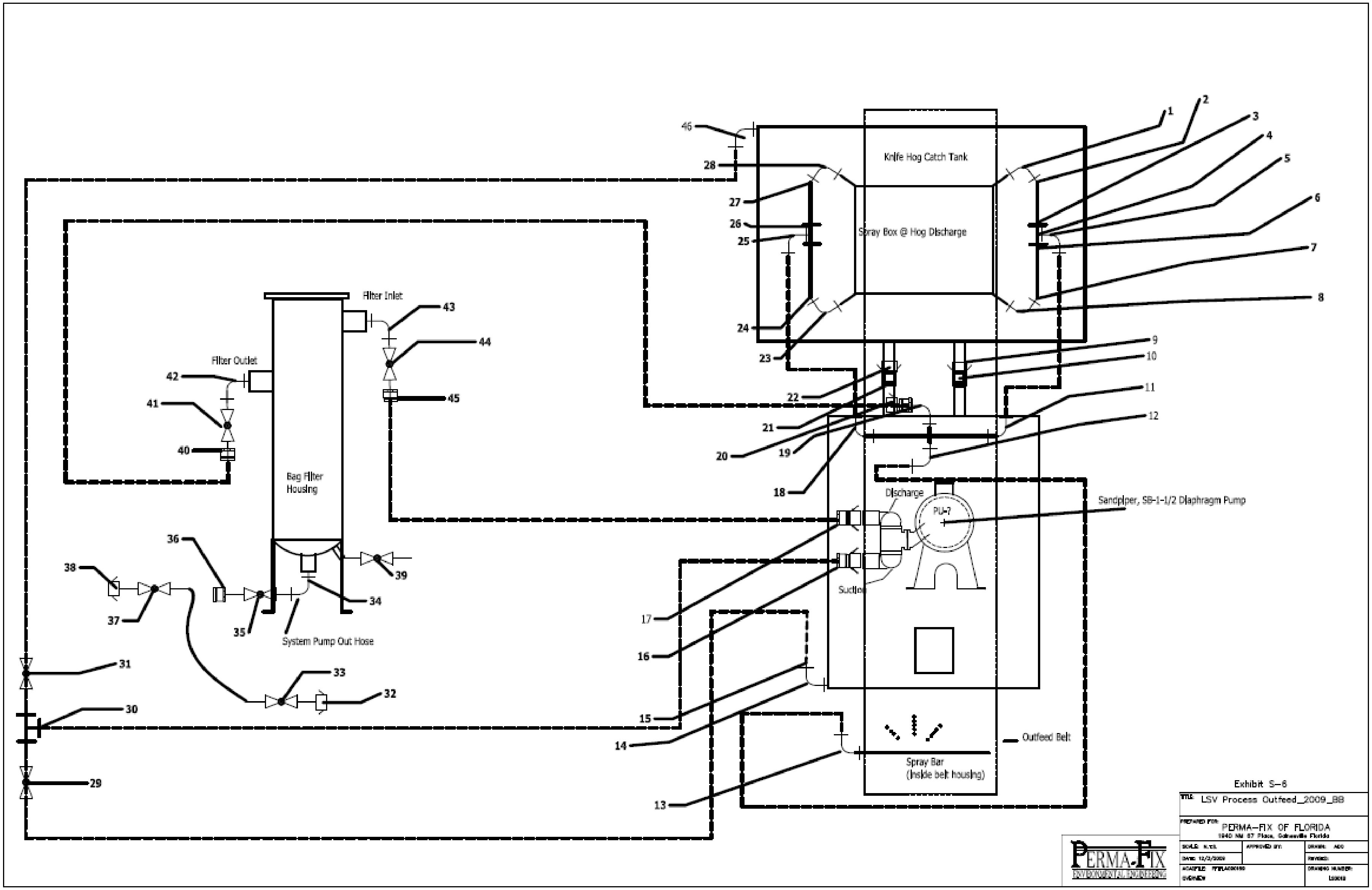

Knife Hog Catch Tank
Spray Box @ Hog Discharge
Filter Inlet
Filter Outlet
Bag Filter Housing
System Pump Out Hose
Discharge
Suction
PU-7
Sandpiper, SB-1-1/2 Diaphragm Pump
Outfeed Belt
Spray Bar (inside belt housing)
Exhibit S-6
LSV Process Outfeed_2009_BB
PERMA-FIX OF FLORIDA
PERMA-FIX ENVIRONMENTAL ENGINEERING

Exhibit S-7

3,000-Gallon Storage Tank

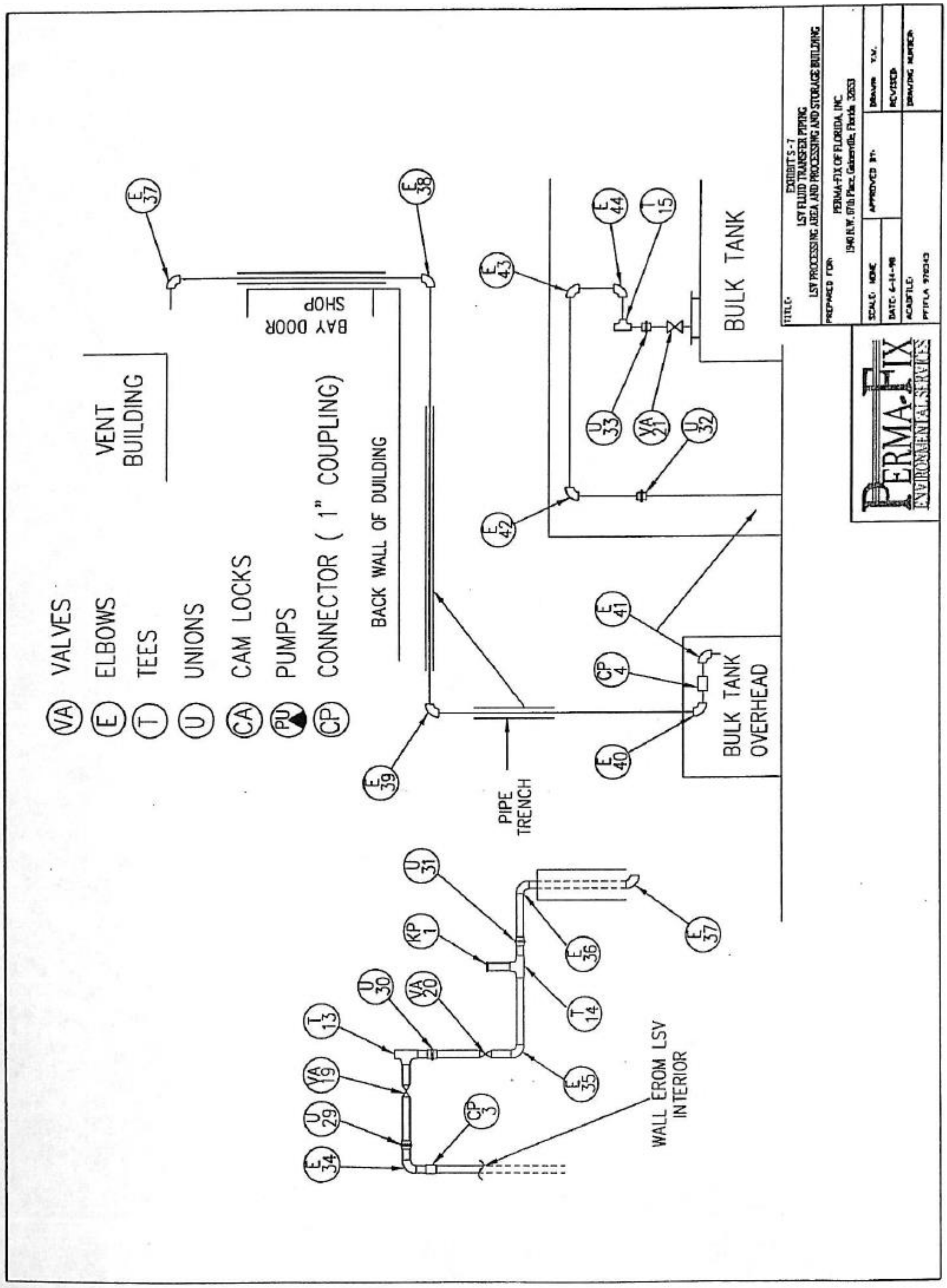

VA VALVES
E ELBOWS
T TEES
U UNIONS
CA CAM LOCKS
PU PUMPS
CP CONNECTOR (1" COUPLING)
VENT BUILDING
BAY DOOR SHOP
BACK WALL OF BUILDING
BULK TANK
BULK TANK OVERHEAD
PIPE TRENCH
WALL FROM LSV INTERIOR
EXHIBIT S-7
LSV FLUID TRANSFER PIPING
LSV PROCESSING AREA AND PROCESSING AND STORAGE BUILDING
PREPARED FOR:
PERMA-FIX OF FLORIDA, INC.
1940 N.W. 67th Place, Gainesville, Florida 32653
PERMA-FIX ENVIRONMENTAL SERVICES

Exhibit S-8

PF-II Vacuum System – Flanges & Valving

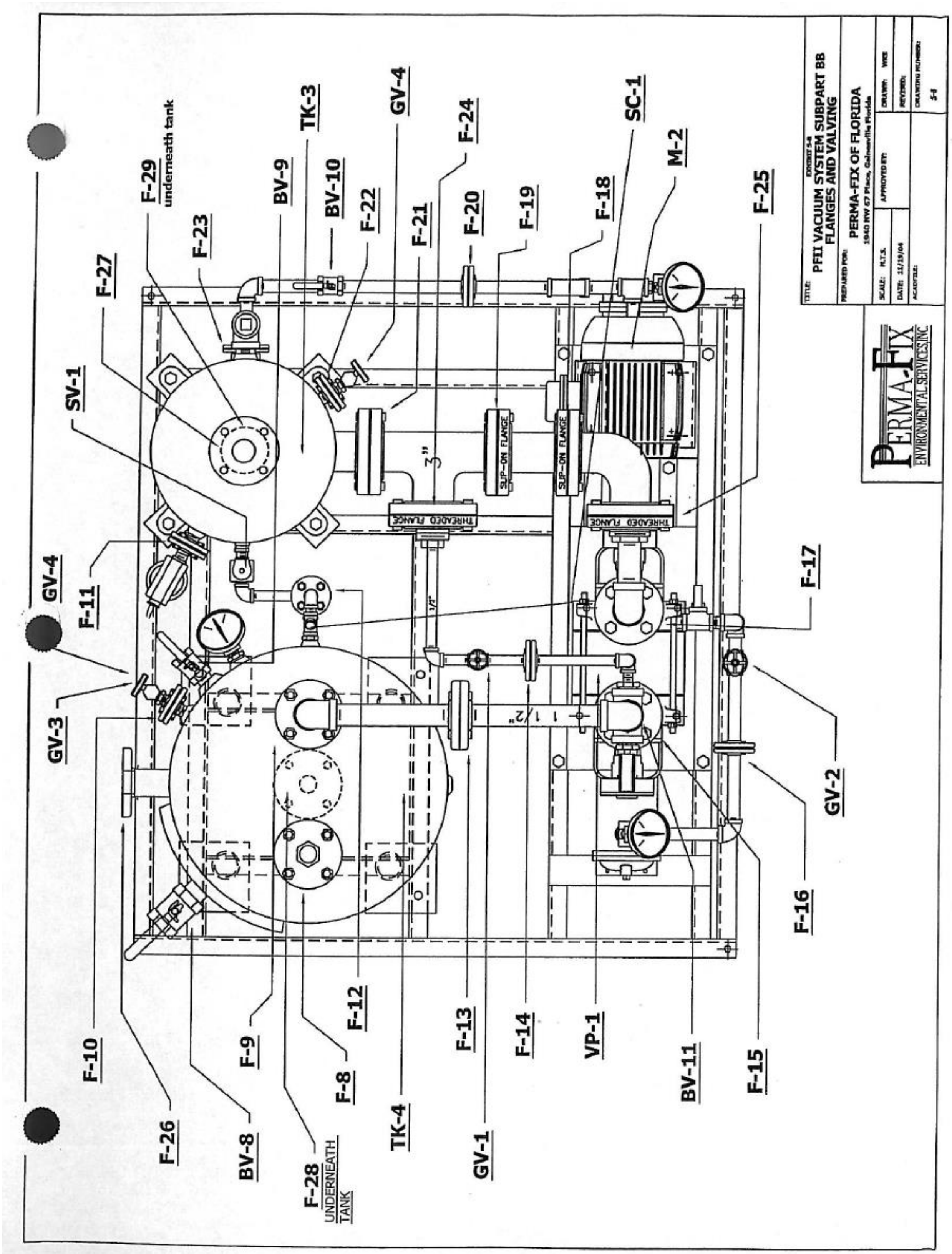

PFII VACUUM SYSTEM SUBPART BB
FLANGES AND VALVING
PREPARED FOR:
PERMA-FIX OF FLORIDA
SCALE: N.T.S.
DATE: 11/19/04
APPROVED BY:
DRAWN: WKE
REVISED:
DRAWING NUMBER:
PERMA-FIX
ENVIRONMENTAL SERVICES,INC
F-29
underneath tank
TK-3
GV-4
F-24
SC-1
M-2
F-25
BV-9
BV-10
F-22
F-21
F-20
F-19
F-18
F-23
F-27
SV-1
GV-4
F-11
GV-3
F-10
F-26
BV-8
F-28
UNDERNEATH TANK
F-9
F-8
TK-4
F-12
F-13
GV-1
F-14
VP-1
BV-11
F-15
F-16
GV-2
F-17
3"
1/2"
1 1/2"
SLIP-ON FLANGE
SLIP-ON FLANGE
THREADED FLANGE
THREADED FLANGE

Exhibit S-9

PF-II Vacuum System – Tees, Elbows, and Gauges

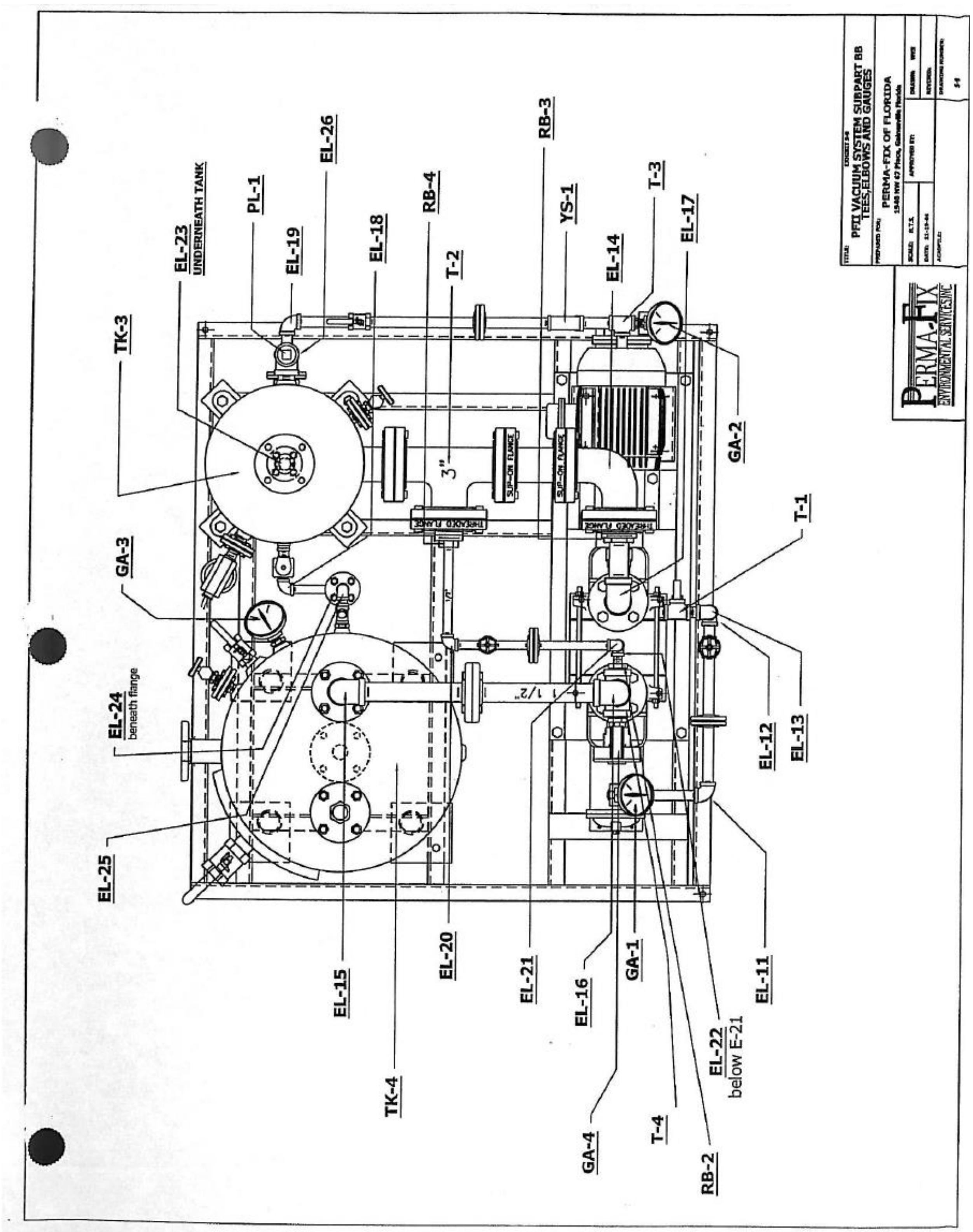

PFI VACUUM SYSTEM SUBPART BB
TEES,ELBOWS AND GAUGES
PERMA-FIX OF FLORIDA
PERMA-FIX
ENVIRONMENTAL SERVICES,INC
TK-3
EL-23
UNDERNEATH TANK
PL-1
EL-19
EL-26
EL-18
RB-4
T-2
RB-3
YS-1
EL-14
T-3
EL-17
GA-2
T-1
EL-12
EL-13
GA-3
EL-24
beneath flange
EL-25
EL-15
TK-4
EL-20
EL-21
EL-16
GA-1
GA-4
T-4
EL-22
below E-21
RB-2
EL-11
3"
1 1/2"
THREADED FLANGE
SLIP-ON FLANGE

Exhibit S-10

PF-II Reactor Vessel

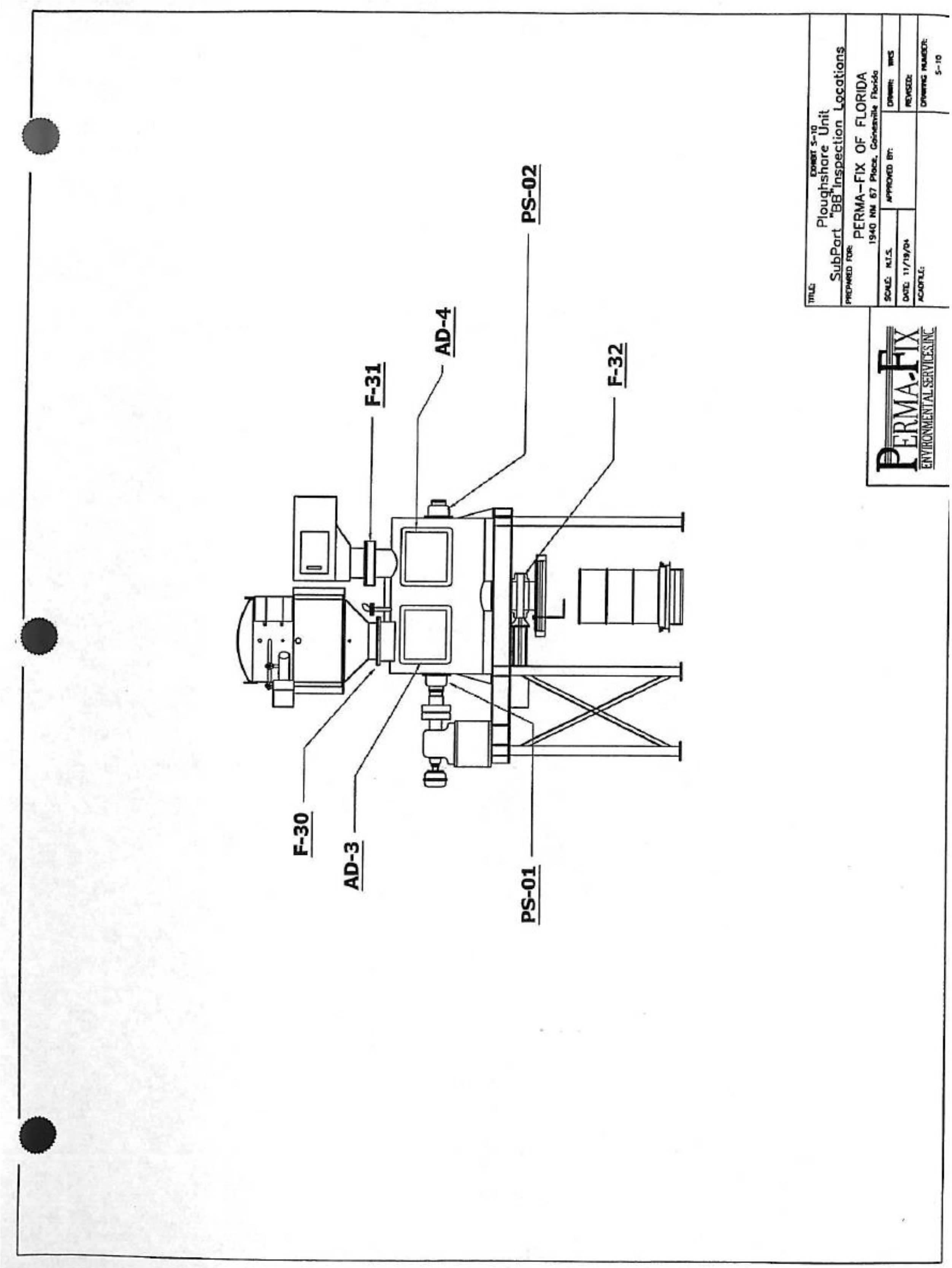
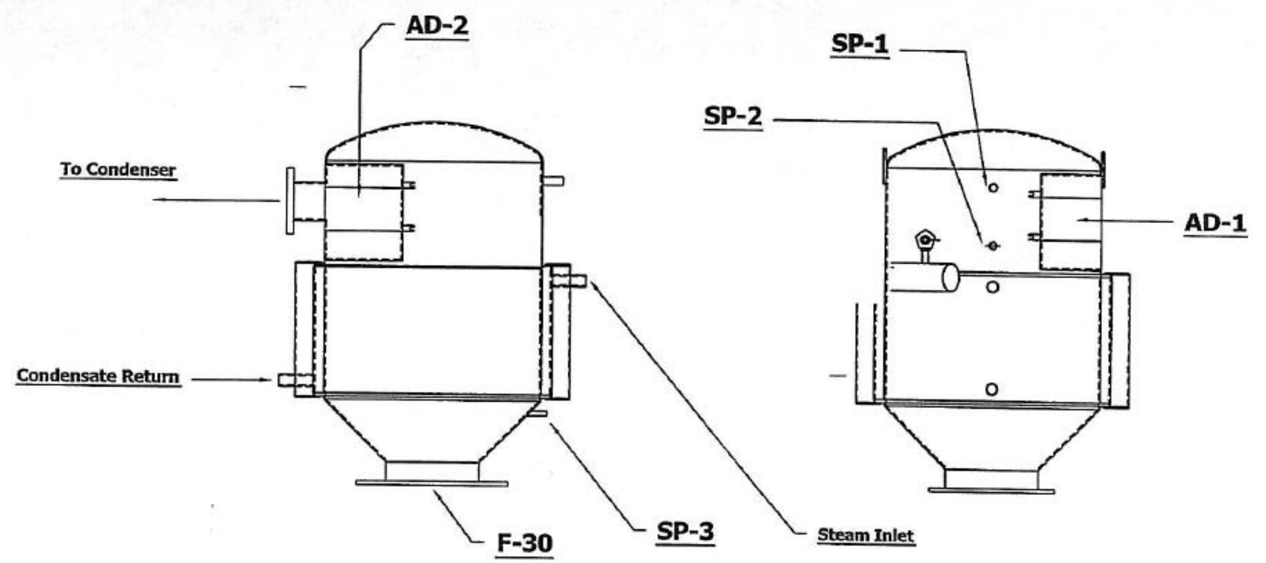

F-30
AD-3
PS-01
F-31
AD-4
PS-02
F-32
TITLE:
EXHIBIT S-10
Ploughshare Unit
SubPart "BB" Inspection Locations
PREPARED FOR:
PERMA-FIX OF FLORIDA
1940 NW 67 Place, Gainesville Florida
SCALE: N.T.S.
DATE: 11/19/04
ACADFILE:
APPROVED BY:
DRAWN: WKS
REVISED:
DRAWING NUMBER:
S-10
PERMA-FIX
ENVIRONMENTAL SERVICES, INC.

Exhibit S-11

PF-II Pulseback Filter Connections



40CFR264.1050(e) Equipment that is in vacuum service is excluded from the requirements of Sec. 264.1052 to Sec. 264.1060 if it is identified as required in Sec. 264.1064(g)(5).

40CFR264.1064(g) The following information pertaining to all equipment subject to the requirements in Secs. 264.1052 through 264.1060 shall be recorded in a log that is kept in the facility operating record:
(1)
(2)
(3)
(4)
(5) A list of identification numbers for equipment in vacuum service.

PERMA-FIX ENVIRONMENTAL SERVICES, INC

TITLE: EXHIBIT S-11 PULSEBACK FILTER CONNECTIONS		
PREPARED FOR: PERMA-FIX OF FLORIDA 1940 NW 67 Place, Gainesville Florida		
SCALE: N.T.S.	APPROVED BY:	DRAWN: WKS
DATE: 11/19/04		REVISED:
ACADFILE:		DRAWING NUMBER: S-11

APPLICATION FOR A HAZARDOUS WASTE FACILITY PERMIT
CERTIFICATION
TO BE COMPLETED BY ALL APPLICANTS

Signature and Certification

Facility Name Perma-Fix of Florida, Inc.

EPA/DEP I.D. No. FLD 980711071

The following certifications must be included with the submittal of an application for a hazardous waste authorization. The certifications must be signed by the owner of a sole proprietorship; or by a general partner of a partnership; or by a principal executive officer of at least the level of vice president of a corporation or business association, or by a duly authorized representative of that person. If the same person is a facility operator, facility owner, and real property owner, that person can cross out and initial the signature blocks under "1. Facility Operator" and "2. Facility Owner," and add the words "Facility Owner and Operator" at the line "Signature of the Land Owner or Authorized Representative."

1. Facility Operator

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, I agree to comply with the provisions of Chapter 403, Florida Statutes, and all rules of the Department of Environmental Protection. It is understood that the permit is only transferable in accordance with Chapter 62-730, Florida Administrative Code (F.A.C.), and, if granted a permit, the Department of Environmental Protection will be notified prior to the sale or legal transfer of the permitted facility.

R Whittle

Signature of the Operator or Authorized Representative*

Raymond Whittle, Vice President

Name and Title (Please type or print)

Date 12/08/14 E-mail address rwhittle@perma-fix.com

Telephone (352) 373-6066

- **Attach a letter of authorization**

2. Facility Owner

This is to certify that I understand this application is submitted for the purpose of obtaining a permit to construct, operate, or conduct remedial activities at a hazardous waste management facility on the property as described. As owner of the facility, I understand fully that the facility operator and I are jointly responsible for compliance with the provisions of Chapter 403, Florida Statutes, and all rules of the Department of Environmental Protection.

R. Whittle
Signature of the Facility Owner or Authorized Representative*

Raymond Whittle, Vice President
Name and Title (Please type or print)

Date 12/08/14 E-mail address rwhittle@perma-fix.com

Telephone (352) 373-6066

*** Attach a letter of authorization**

3. Land Owner

This is to certify that I, as land owner, understand that this application is submitted for the purpose of obtaining a permit for the construction, operation or postclosure of a hazardous waste management facility on the property as described. For hazardous waste facilities that close with waste in place, I further understand that I am responsible for providing the notice in the deed to the property required by 40 CFR 264.119 and 265.119, as adopted by reference in Chapter 62-730, F.A.C.

R. Whittle
Signature of the Land Owner or Authorized Representative*

Raymond Whittle, Vice President
Name and Title (Please type or print)

Date 12/08/14 E-mail address rwhittle@perma-fix.com

Telephone (352) 373-6066

*** Attach a letter of authorization**

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4. Professional Engineer Registered in Florida

Complete this certification when required to do so by Chapter 471, F.S., or when not exempted by Rule 62-730.220(9), F.A.C.

This is to certify that the engineering features of this hazardous waste management facility have been designed or examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgement, this facility, when properly constructed, maintained and operated, or closed, will comply with all applicable statutes of the State of Florida and rules of the Department of Environmental Protection.

Signature

Robert J. Schreiber, Jr.

Name (please type)

Florida Registration Number 46126

Mailing Address 16252 Westwoods Business Park Drive
street or P.O. Box

Ellisville MO 63021
city state zip

Date 12/5/2014 E-mail address rschrei45@aol.com

Telephone (573) 657-0639

(PLEASE AFFIX SEAL)