

Velsicol Chemical Corporation (Marshall Plant)  
Redevelopment Work Plan

Aggregate Material Storage Yard  
& Post-Frame Building

Repowericol Development LLC, (Repowericol)  
Marshall, Illinois

  
Approved on 10/1/24

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## 1.0 Introduction

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In November 2011 Velsicol Chemical Corporation entered into an Environmental Covenant -Replacing and Superseding 1989 Deed Restrictions and 2009 Restatement and Clarification of Deed Restrictions for the property located in the City of Marshall, Clark County, Illinois. The property is the former location of a Velsicol Chemical LLC plant that has been remediated as described in Section 5(B) of the Environmental Covenant (Appendix 5). The Environmental Covenant established in 2011 set forth updated activity and use limitations as described in Section 7(a-c). Section 7(a-c) describes the Land Use Restrictions, Restriction on Groundwater Use, and No Interference with Remedial Action.

Repowericol Development LLC, (Repowericol), is proposing the installation of an aggregate material storage area as well as a post frame building to help with the operational needs of B&T Drainage, INC. The proposed aggregate material storage area is to be 8" thick compacted layer of CA-06 aggregate placed on the existing surface area. **No excavation below the existing surface will take place. The building will be post-frame so no excavation for footers will be necessary, only post holes drilled for the posts.** Once the aggregate pad and building is completed B&T Drainage, INC. will store material needed for various projects on it. This material will primarily be all new stock HDPE and PVC pipe, fire hydrants, water valves, and precast concrete structures. All material stored will not interfere with the remedy, nor lead to surface water, ground water or soil contamination.

The former Velsicol Chemical Corporation plant located in the City of Marshall, Clark County, Illinois is approximately one (1) mile north of the City of Marshall along State Highway Route 1. Interstate 70 is Approximately 0.6 miles north of the plant site. The former Velsicol plant property expands over approximately 420 acres, of which 86 acres were utilized for the production facility and onsite ponds. The production facility occupied 50 acres of the easterly portion of the plant area. Immediately west of the production facility, 14 acres were devoted to stormwater management ponds 2, 4 and north stormwater pond. The 5/6 pond occupied an approximate area of 22 acres immediately to the west of the plant area. The remainder of the 334 acres of property previously owned by Velsicol was leased for crop production.

The Velsicol Chemical Corporation former plant site in Marshall was an active chlordane manufacturing facility until August 1987 when the USEPA and Velsicol reached an agreement canceling the registration of products containing chlordane and heptachlor. The plant has been operating since the 1930's for the production of petroleum derivatives from petroleum by-products. Finished products included a variety of resins, solvents and rubber extenders. Production of chlordane began in the mid-

1940's. the manufacturing operations at the facility remained essentially unchanged until 1979 at which time Velsicol withdrew from the resin market. Manufacture of technical grade chlordane had been the sole product at this facility since 1980 until its closure.

## 2.0 Site Safety Considerations

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Site safety is of the utmost concern of Repowericol Development LLC, (Repowericol). Proposed construction activities will adhere closely to Article 5 & 7 of the Environmental Covenant and will in no way adversely affect the integrity or protectiveness of the remediation action outlined in the Record of Decision. Proposed activities will in no way endanger the endanger human health or the health of the environment. The contractor performing the proposed work, B&T Drainage, INC. has an extensive safety plan that is followed for all work activities. This safety plan can be found in Appendix 3.

During construction of the proposed material storage yard, a morning safety tailgate meeting will be held to discuss the potential safety concerns of the day and to ensure everyone has a good understanding of the task for the day. Heavy equipment will be used to install the aggregate pad therefore extreme attention to one's surroundings will be taken to ensure the safety of the workers present on site.

All personnel present onsite will be required to wear personal protective equipment. At a minimum all persons present on site will be required to wear safety glasses, hard hat, high visibility clothing, steel toed boots and hard hats. If other hazards arise that require additional PPE, the hazard will be assessed and proper PPE will be provided.

In the event an emergency occurs please referend the below contacts and phone numbers:

### **EMERGENCY CONTACT INFORMATION**

**EMERGENCY 911**

Non-emergency contacts:

Police: 217-826-8081

Clark County Health Department: 217-967-2243

Poison Control: 1-800-222-1222

US EPA Region 5 Chicago: 312-353-2000

### 3.0 Aggregate Storage Pad and Post Frame Building Construction

Repowericol Development LLC, (Repowericol) is proposing the construction of an aggregate material storage yard using aggregate previously stockpiled in March of 2024 in area 5, referenced from the 1989 deed restrictions drawing (Appendix 4) that states no restrictions and part of area 4 from the 1989 deed restrictions drawing that states it can be developed with restrictions described in section 7 of the Environmental Covenant found in Appendix 5. The proposed storage yard will be comprised of a layer of geotextile fabric with 8" of compacted CA-06 crushed limestone on top. Repowericol Development LLC, (Repowericol) is also proposing the construction of a post frame building to be constructed in the non-restricted area 5, referenced from the 1989 deed restrictions drawing (Appendix 4). The location of this proposed improvement will be in the northeastern most corner of the fenced in area of the Velsicol property. The location is described in greater detail in Appendix 1.

The construction crew that will complete the proposed work will comprise of the following:

- Site foreman – Tasked with managing the site to ensure proper installation of the aggregate pad. Also tasked with ensuring the safety and welfare of the crew performing the work.
- Equipment operators – Tasked with placing, grading and compacting the aggregate in the designated area for installation.
- Laborer – Tasked with ensuring the aggregate pad is installed to the correct grade to ensure proper drainage onsite as well as coordination of trucks delivering aggregate.

The construction will at no time violate Section 7 of the Environmental Covenant entered into in 2011. All persons onsite will be required to have an acute understanding of Section 7 of the Environmental Covenant. No soil is to be excavated in the area of the aggregate pad. The aggregate is to be placed onto the existing ground surface without disruption. None of the groundwater monitoring wells will be interfered with. No underground facilities will be installed.

The CA-06 crushed limestone to be used is virgin material produced at the Quality Lime rock quarry in Marshall, IL. See attached gradation and IDOT certification. This aggregate is virgin material and is not contaminated with any substance that is harmful to human health or the health of the environment. This material has already been

stockpiled at the main entrance at the Northeast corner of the property. The CA-06 will be placed in an 8" thick layer and compacted to 95% proctor density. The estimated amount of aggregate to be placed is ±29,000 Tons.

The post frame building will be constructed of treated pine posts set in the ground at 4' depth. No footer excavation will be needed, only post holes for each post. Soil will be placed back around the posts and immediately seeded to re-establish vegetation growth to ensure no sediment runoff. No soil to leave the site. A concrete pad will be poured inside the building. This will be poured on top of a 6" bed of crushed CA-06 stone on top of existing conditions. No excavation will be performed for this concrete pad. The estimated size of the building is 40' x 80'. The post frame building to be constructed in the non-restricted area 5, referenced from the 1989 deed restrictions drawing, no equipment decontamination will be required.

## 4.0 Work Plan Timeline

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The anticipated construction timeline is as follows contingent upon work plan approval:

Work Plan Approval – 12/30/2024

Begin aggregate laydown yard construction – 3/1/2025

Complete aggregate laydown yard construction – 6/1/2025

Construction of the post frame building not anticipated to begin until 2026/2027

# APPENDIX 1

## DESCRIPTION OF PROPERTY

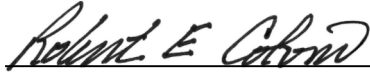
A PART OF THE FRACTIONAL WEST HALF (1/2) OF SECTION 12, TOWNSHIP 11 NORTH, RANGE 12 WEST, OF THE 2<sup>ND</sup> P.M., THAT LIES EAST OF THE INDIANA BOUNDARY LINE, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF TRACK #1 SHOWN ON PLAT OF SURVEY DONE BY CHASTAIN & ASSOCIATES, LLC DATED 07-08-2022 BEING NORTH 510.52 FEET AND 46.90 FEET WEST OF THE CENTER OF SAID SECTION 12; THENCE WESTERLY PARALLEL TO THE NORTH LINE OF THE FRACTIONAL SOUTHWEST QUARTER (1/4) OF SAID SECTION 12, 850.00 FEET; THENCE SOUTHERLY, MAKING AN INTERIOR ANGLE OF 90 DEG. 16 MIN. 39 SEC. WITH THE LAST DESCRIBED COURSE, 660.00 FEET; THENCE EASTERLY, MAKING AN INTERIOR ANGLE OF 89 DEG. 43 MIN. 21 SEC. WITH THE LAST DESCRIBED COURSE, AND BEING PARALLEL TO THE AFOREMENTIONED NORTH LINE OF THE SAID FRACTIONAL SOUTHWEST QUARTER (1/4), 850.00 FEET TO A POINT IN A LINE ESTABLISHED TO BE THE CENTERLINE OF THE OLD CHICAGO & VINCENNES WAGON ROAD; THENCE NORTHERLY ALONG SAID LINE, MAKING AN INTERIOR ANGLE OF 90 DEG. 16 MIN. 39 SEC. WITH THE LAST DESCRIBED COURSE, 660.00 FEET TO THE PLACE OF BEGINNING, BEING ALL SITUATED IN MARSHALL TOWNSHIP, CLARK COUNTY, ILLINOIS, AND CONTAINING 12.88 ACRES, MORE OR LESS.

THE ABOVE DESCRIBED PROPERTY IS SUBJECT TO THE RIGHT OF WAY FOR ILLINOIS ROUTE 1 AS SHOWN ON PLAT AND ALSO ANY OTHER EXISTING EASEMENTS, ROAD RIGHT-OF-WAYS, RESTRICTIVE COVENANTS AND ENCUMBRANCES OF RECORD.

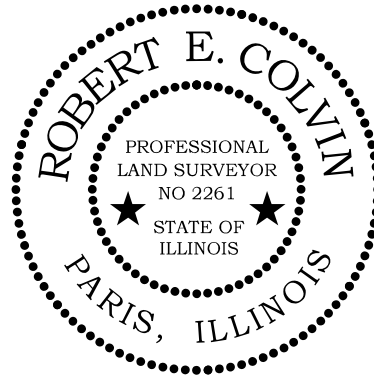
A PART OF PARCEL:  
08-08-12-00-100-007I AND  
08-08-12-00-300-002I

PREPARED BY:



4/15/2024

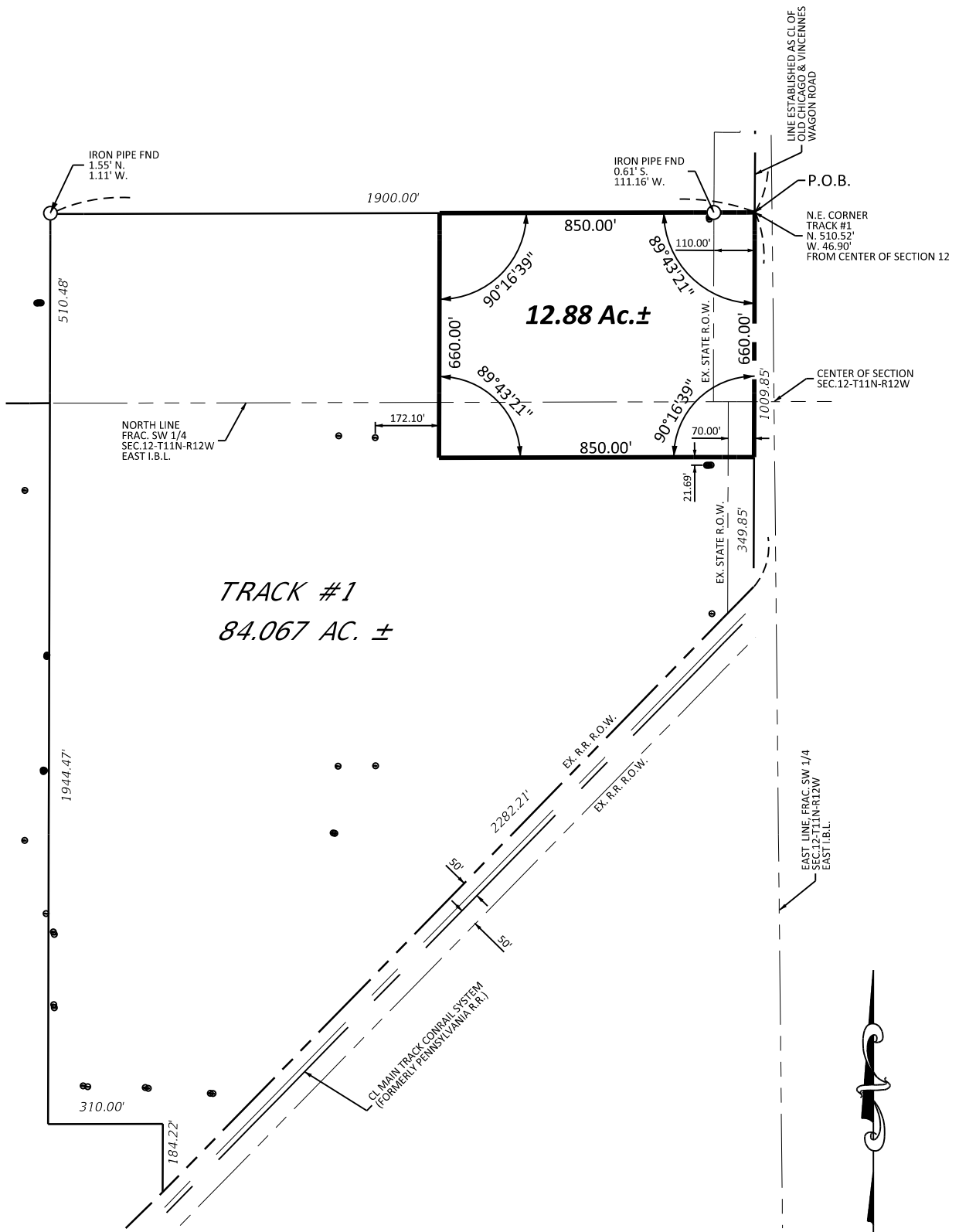
ROBERT E. COLVIN DATE  
330 NORTH CENTRAL AVENUE - PARIS, ILLINOIS, 61944  
PHONE: (217) 465-5306 - EMAIL: bcolvin@chastainengineers.com  
ILLINOIS PROFESSIONAL LAND SURVEYOR NO. 2261  
LICENSE EXPIRES: 11/30/2024



**PREPARED FOR: John Boyer**

**CHASTAIN  
& ASSOCIATES LLC**  
CONSULTING ENGINEERS  
SERVICE | SOLUTIONS | COMMITMENT™  
330 NORTH CENTRAL AVENUE,  
PARIS, ILLINOIS 61944  
OFFICE (217) 465-5306  
DESIGN FIRM # 184001397-0014 [www.chastainengineers.com](http://www.chastainengineers.com)




DRAWN BY : TLT  
CHECKED BY : REC  
DATE : 4/15/2024  
JOB NO. : 7936.00  
SCALE : N-T-S  
SHEET : 1 OF 2



*TRACK #1*  
84.067 AC. ±

**12.88 Ac.±**

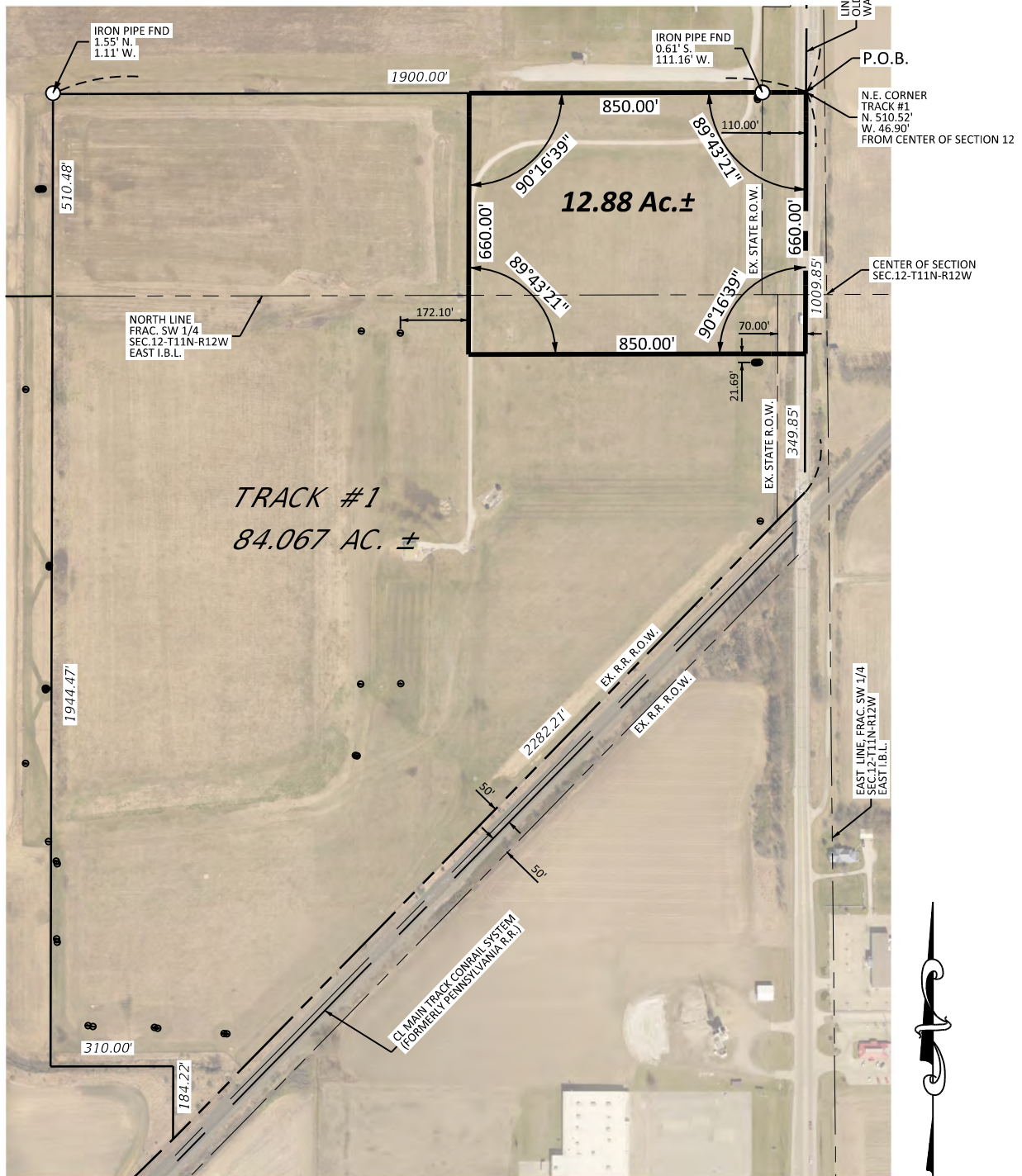
**LEGEND**

-  BOUNDARY OF PROPERTY
-  EX. IRON ROD OR PIPE FOUND
-  EX. MONITORING WELLS






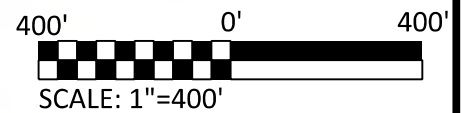
**CHASTAIN & ASSOCIATES LLC**  
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PARIS, ILLINOIS 61944  
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DESIGN FIRM # 184001397-0014 [www.chastainengineers.com](http://www.chastainengineers.com)

DRAWN BY : TLT  
CHECKED BY : REC  
DATE : 4/15/2024  
JOB NO. : 7936.00  
SCALE : 1"= 400'  
SHEET : 2 OF 2



**LEGEND**

-  BOUNDARY OF PROPERTY
-  EX. IRON ROD OR PIPE FOUND
-  EX. MONITORING WELLS



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DRAWN BY : TLT  
 CHECKED BY : REC  
 DATE : 4/15/2024  
 JOB NO. : 7936.00  
 SCALE : 1"= 400'  
 SHEET : 2 OF 2

# APPENDIX 2



# Gradation Test Report

Plant 01-Quality Lime  
 Product C-06-042CA06-Roadpack  
 Specification ILDOT CA-06



## Sample Information

**Sample No** 788916583 **Split Sample**  **Sequence** 832  
**Date Sampled** 02/15/2024 15:54 **Resample**   
**Sampled By** Adam Philippi  
**Type** Production  
**Method** Sample Pad  
**Process** 20 Primary (HSI,RR1/RR03,03,D6)  
**Ledge** (005) West Top  
**Weather** Sunny  
**Temp** 45

## Gradation Results

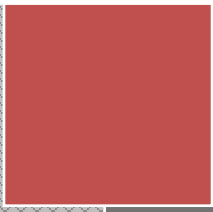
**Date Completed** 02/15/2024 17:02 **Tested By** Adam Philippi

Unit	Moist Mass	Dry Mass	Wash Mass	Moisture %	Wash Loss %	Procedure
g	5797.50	5647.00	5165.60	2.7	8.5	AASHTO T27 & T11: ITP 27 & ITP 11

Sieve	Mass Retained	Cum Mass Retained	Ind % Retained	% Retained	% Passing	Target	Specification	Comment
1 1/2" (37.5mm)	0.00	0.00	0.0	0.0	100.0		100-100	
1" (25mm)	0.00	0.00	0.0	0.0	100.0		90-100	
3/4" (19mm)	239.70	239.70	4.2	4.2	95.8			
5/8" (16mm)	274.30	514.00	4.9	9.1	90.9			
1/2" (12.5mm)	584.60	1098.60	10.4	19.5	80.5		60-90	
3/8" (9.5mm)	616.90	1715.50	10.9	30.4	69.6			
1/4" (6.3mm)	781.50	2497.00	13.8	44.2	55.8			
#4 (4.75mm)	474.20	2971.20	8.4	52.6	47.4		30-56	
#8 (2.36mm)	774.20	3745.40	13.7	66.3	33.7			
#16 (1.18mm)	502.00	4247.40	8.9	75.2	24.8		10-40	
#40 (.425mm)	437.90	4685.30	7.8	83.0	17.0			
#100 (.15mm)	289.00	4974.30	5.1	88.1	11.9			
#200 (75µm)	114.50	5088.80	2.03	90.12	9.88		4-12	
Pan	74.20	5163.00	9.88	100.00	0.00			

# APPENDIX 3



# B&T Drainage, Inc.

## Safety Program

Company Safety Policies, Rules, & Regulations

January 1, 2024



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## COMPANY SAFETY STATEMENT

Dear Fellow Employee:

B&T Drainage, Inc. recognizes and accepts its responsibility to provide a safe, healthy environment for its employees.

Accidents have a far-reaching effect on all those involved. The injured person incurs the physical pain of the injury, and lost time and wages adversely affect the family of the injured party. Increased insurance costs, job delays, and damaged equipment, all increase our cost of producing the job at hand. This creates adverse public and customer opinions of B&T Drainage, Inc.; hinders our ability to retain the jobs we have and secure future jobs in today's extremely competitive marketplace.

Safety and prevention of accidents has first priority at B&T Drainage, Inc. followed closely by quality and productivity. These functions are the responsibility of all members of the Team.

To accomplish our goals in this area, B&T Drainage, Inc. is revitalizing our safety program. A copy of our new safety program is enclosed. We are sending you this program to enable you to understand the company's commitment to safety. Safety regulations, programs, wearing of protective equipment and direction by managers and supervisors are B&T Drainage, Inc.'s contribution to your well-being. B&T Drainage, Inc. intends to not impose any discomfort on its employees, but instead to provide guidance, leadership and safer working conditions in order to eliminate personal injuries among members of B&T Drainage, Inc.'s Team.

Everyone doing his or her part will make this program successful and will make SAFETY FIRST at B&T Drainage, Inc.

Sincerely,

B&T Drainage, Inc.

START WITH SAFETY

Study your job from the safety angle. Think before starting work. If original work plans change, stop and re-plan your work from the standpoint of safety. Report to your Supervisor any condition or practice you think might cause injury to yourself, fellow employee, or damage equipment.

Your cooperation in complying with the following rules will do much to make B&T Drainage, Inc. a safe and pleasant place to work.

Mentally review the construction checklist for self-inspection on your jobsite. Report any concerns to your supervisor. Remember: If it's not safe, make it safe!

### GENERAL SAFETY RULES

1. Know all safety rules. The company welcomes all safety suggestions from any employee.
2. Report all injuries, no matter how minor, to your supervisor. Supervisor will fill out Accident Report.
3. Never attempt to perform any job with which you are not familiar. Request full instruction from your supervisor.
4. Running, wrestling, practical joking or any horseplay is prohibited on job sites and company property.
5. Obey all warning signs.
6. Employees must not deface or destroy any building, equipment, machinery, signs, bulletin boards or other company property.
7. All employees must be properly dressed.
8. The practice of wearing jewelry, such as rings, watch chains, necklaces, loose or torn clothing, while working around moving machinery is not permitted; as such articles can easily get caught in machinery.
9. All employees are responsible for containing their hair so it cannot become entangled or pulled in moving machinery. Employees electing to wear their hair at such lengths to create potential hazard, must provide a suitable means of containing the loose hair at all times around moving machinery. The means selected to accomplish this must meet the approval of your supervisor.
10. Personal protective equipment be worn at all time in those areas deemed necessary by law or management.
11. Gasoline is not permitted for cleaning tools, equipment or machinery.

12. Compressed air should not be used to blow off clothes or person. An air hose should not be directed toward anyone.
13. Be alert for moving vehicles at all times.
14. All employees are required to report to work in good, mental and physical condition. Failure to do so could result in the employee being sent home.
15. Reporting to work or attempting to work under the influence of drugs, alcohol or other controlled substances is not permitted. Only drugs prescribed by a doctor or over the counter medications are permitted in the plan.

### Roles and Responsibilities

#### MANAGEMENT RESPONSIBILITIES

It is well recognized that safety performance is a controllable entity, along with standards of production, costs control and quality of product produced. It is because of this fact that Management will support and maintain the Safety Program & Procedures Manual by the following methods:

1. Impressing to management levels the responsibility and accountability of each individual for maintaining a safe and healthy work place. This will be done by providing all line management with appropriate safety rules, regulations, and procedures.
2. Providing employees with the necessary safety training for all facets of their work operation.
3. Distributing relevant information, reports, accident data, and changes in regulations or codes that pertain to operations.
4. Ensuring active employee involvement in safety and health concerns through an effective recognition system.
5. Establishing disciplinary procedures for those who violate any of the safety rules, policies and procedures.
6. Ensuring that any employee reporting a violation of the Safety Rules, Regulations or Procedures is protected from harassment; since all inquiries will be held strictly confidential by Management.
7. Providing advanced planning for all projects to maximize the use of engineering and administrative controls, which contribute greatly to the operating of a safe work-site.
8. Periodic site visits to consistently reinforce, support and monitor all employees as to their effective implementation of the Safety & Health Program.

#### SUPERINTENDENTS RESPONSIBILITIES

It is important to realize that the attitude developed by workers towards safety is a direct reflection of their superintendent. Therefore, all superintendents must pay prompt attention and take appropriate actions to all employee safety suggestions, reports of unsafe conditions and practices.

The following responsibilities have been established to address these objectives. SUPERINTENDENTS MUST: 1. SET A GOOD EXAMPLE. 2. Observe all employees to make sure that all proper safety procedures are being implemented.

3. Conduct an inspection with the use of the Safety Inspection Checklist.
4. Report any unsafe acts or conditions to the main office and document the unsafe act or condition by using the Safety Violation Warning Form.
5. Designate a responsible person for each job. Example: foreman, crew leader, street crew leader.
6. Have the Safety Program & Procedures Manual and the Hazard Communication Program readily available, at all times, in his truck.

7. Use all necessary personal protective equipment, safety equipment and safe work practices required for safe work performance.
8. Spend more time with crews that do not have a Foreman present.
9. Maintain a fully charged fire extinguisher and a fully stocked first aid kit in their truck.
10. Conduct Bi-Weekly Tool Box Safety Talks.

**FOREMEN**

Foremen each play a vital role in the implementation of the Safety Program & Procedures Manual in achieving the maximum goal of zero injuries and illnesses.

**FOREMEN SHALL:**

1. Be the Responsible Person on-site when so designated by the Superintendent. As the Designated Responsible Person the Foreman must follow the outlined Superintendents Responsibilities as outlined in this section.
2. Have the Safety Program & Procedures Manual and the Hazard Communication Program readily available, at all times, in their truck.
3. Maintain a fully charged fire extinguisher and a fully stocked first aid kit in their truck.

**CREW LEADER, STREET CREW LEADER, EXPERIENCED LABORER & COMMON LABORER SHALL:**

1. Be the Responsible Person on-site when so designated by the Superintendent. As the Designated Responsible Person the Crew Leader, Street Crew Leader, Experienced Laborer or Common Laborer must follow the outlined Superintendents Responsibilities as outlined in this section.
2. Follow all responsibilities as outlined under Employee Responsibilities in this section.

**EMPLOYEE RESPONSIBILITIES**

The employee plays a vital role in B&T Drainage Inc Safety Program & Procedures Manual. Waters & Bugbee Inc. cannot achieve the maximum goal of zero injuries and illnesses without the full cooperation of each employee.

**EMPLOYEES SHALL:**

1. Consistently observe work conditions and equipment operations for the purpose of preventing accidents.
2. Comply with all commonly observed safe work practices and company safety rules.
3. Use all necessary personal protective equipment, safety equipment and safe practices required for safe work performance.
4. Correct, where possible, any unsafe work practices within the scope of their work operations and to report all other unsafe work actions or conditions to their superintendent.
5. Examine tools and equipment before use and to advise the Superintendent of any defects or problems. **DO NOT USE A DEFECTIVE TOOL OR PIECE OF EQUIPMENT. DO NOT USE TOOLS OR EQUIPMENT IMPROPERLY OR IN A MANNER FOR WHICH THE TOOL OR EQUIPMENT WAS NOT DESIGNED.**
6. Stop work if conditions are such that there is an imminent danger to life, limb or property. **REPORT SUCH CONDITIONS IMMEDIATELY TO SUPERINTENDENT.**
7. Make themselves available to all company and industry sponsored safety training, information and programs.
8. Encourage co-workers to work safely and to assist them in performing their work in a safe manner by informing them of potential problems, unsafe conditions or unsafe actions.

**JOB DESCRIPTIONS**

### Operators:

The Heavy Equipment Operator is responsible for operating heavy equipment in a safe and appropriate manner. Heavy equipment may include trucks, front-end loaders, dozers, graders, compactors, track hoe, backhoe, and other pieces of equipment. The Heavy Equipment Operator must also clean, maintain and secure all equipment.

Heavy Equipment Operators have a physically strenuous and demanding job. He/she will be lifting, pulling and managing heavy equipment and objects. Operators have to work in all weather conditions, including extreme heat and cold. The Heavy Equipment Operator must ensure that all activities are completed in a safe and efficient way.

### Laborers:

Laborers duties include laying pipe, metal culvert and box culvert for water, sewer water, water main, waste sewage, storm water runoff, catch basins, manholes, and pedestrian access. Typical tools used by laborers include shovels, bars, lasers, targets, level, measuring, and surveying equipment, stick rule, pipe fusion equipment, impact wrench, rigging equipment, small mechanical hoist, chain saw, cutoff saw, compaction equipment, paving breaker, air compressor, hammers, pliers, chisel, screwdriver, wheelbarrow, scraper, grinder, torch, and ladder. Laborers have to work in all types of weather conditions, including extreme heat and cold.

## HOUSEKEEPING

Job site work areas, and all premises occupied by B&T Drainage, Inc. personnel will be maintained in a clean, healthy, and sanitary condition.

Work areas, in and around buildings and structures, shall be kept clear of debris. Construction materials shall be stored in an orderly manner. Storage areas and walkways on all sites shall be maintained free of dangerous depressions, obstructions and debris. Construction equipment shall be stored or placed in an orderly manner.

Good housekeeping on all projects is mandatory and every employee must do his or her part daily to clean-up his work area.

## PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) is the last means of protecting workers from injury. PPE is only employed when administrative and engineering controls are ineffective or insufficient. Hazards should be minimized by ensuring that all jobs are well planned, workers are properly trained, and safe work practices and safe job procedures are followed. PPE provides an additional degree of protection from injury. Hazard assessments of the workplace shall be made to determine if hazards are present, or are likely to be present, which necessitate the use of PPE.

PPE in our safety program generally falls into two categories.

1. Basic – The PPE that should be worn at all times by all personnel in the work place. This includes hard hats, safety glasses, safety footwear, and appropriate clothing.

2. Specialized – Covers PPE which is used only for specific jobs or for protection from specific hazards. This includes gloves, welder's goggles, respiratory protective equipment, fall arresting equipment and special clothing.

Employee owned PPE is not allowed.

Employees expected to wear Personal Protective Equipment (PPE) will be trained as follows:

- Exposures and how to identify them;
- Types of PPE to wear as protection from each exposure;
- When to wear them and their limitations;
- How to wear PPE properly; and
- How to care for, clean and properly store PPE.

Employees shall inspect all PPE prior to use. Any defects are to be reported to your supervisor. Defected PPE shall be replaced prior to starting any job.

#### Head Protection

Safety headwear is designed to protect the head from impact from falling objects, bumps, splashes from chemicals or harmful substances, and contact with energized objects and equipment.

In construction, the recommended type of protective headwear is a hard hat which has the required "dielectric strength". There are many designs, but they all must meet CSA requirements for Class G (General Usage) and Class E (Electrical trades).

Most head protection is made up of two parts:

- The shell (light and rigid to deflect blows)
- The suspension (to absorb and distribute the energy of the blow)

Both parts of the headwear must be compatible and maintained according to manufacturer's instructions. If attachments are used with headwear, they must be designed specifically for use with the specific headwear used. Bump caps or laceration hats are not considered safety helmets.

Employees shall;

- Replace headgear that is pitted, holed, cracked or brittle;
- Replace headgear that has been subjected to a blow even though damage cannot be seen;
- Remove from service any headgear if its serviceability is in doubt;
- Replace headgear and components according to manufacturer's instruction;
- Consult regulations or your supplier for information on headgear.

Employees must never;

- Drill, remove peaks, alter the shell or suspension in any way;
- Use solvents or paints on the shell (makes the shell breakdown);
- Use any liner that contains metal or conductive material;
- Carry anything in the hard hat while wearing the hard hat.

## Eye and Face Protection

This PPE is designed to protect the worker from such hazards as:

- Flying objects and particles,
- Molten metals,
- Splashing liquids,
- Ultraviolet, infrared, and visible radiation (welding).

There are two types of eye and face protection:

1. Basic Eye Protection includes:
  - Eye cup goggles,
  - Monoframe goggles and spectacles with side shields.
2. Face Protection includes:
  - Metal mesh face shields for radiant heat or hot and humid conditions,
  - Chemical and impact resistant (plastic) face shields,
  - Welders' shields or helmets with specified cover,
  - Filter plates and lenses.

Hardened glass prescription lens and sport glasses are not an acceptable substitute for proper, required industrial safety eye protection.

Comfort and fit are very important in the selection of safety eye wear. Lens coatings, venting or fittings may be needed to prevent fogging.

Contact lenses should NOT be worn at the work site. Contact lenses may trap or absorb particles or gases causing eye irritation or blindness. Hard contact lenses may injure the eye when hit.

Basic eye protection should be worn with face shields. Face shields alone often are not enough to fully protect the eyes from work hazards. When eye and face protection is required, advice from special specialists, information on Material Safety Data Sheets (SDS) for various chemicals, or your supplier will help you select such protection.

Employees shall;

- Ensure your eye protection fits properly (close to the face);
- Clean safety glasses daily, or more often if needed;
- Store safety glasses in a safe, clean, dry place when not in use;
- Replace pitted, scratched, bent and poorly fitted PPE. (Damages to face/eye protection interferes with vision and will not provide the protection it is designed to deliver.)

Employees must never

- Modify eye/face protection;
- Use eye/face protection which does not have a proper certification. (Various markings or the safety stamp for safety glasses are usually on the frame inside the temple near the hinges of the glasses.) Must meet CSA Z94.3-92: Industrial Eye and Face Protectors.

### Hand Protection

There are many types of gloves and made of many different types of materials, each with a specific application. Gloves will be worn as precaution from the following exposures:

- Chemicals - check the Material Safety Data Sheets (SDS) for listed PPE required for safe handling
- Cuts
- Hot work

No glove can protect against all hazards so select the appropriate glove for the job.

Where there is risk of injury from glove entanglement in moving parts of machinery, employees shall not wear gloves and use other methods to protect their hands from injury exposure.

Jewelry, such as rings has caused the loss of many fingers. Be aware that wrist watches, and other jewelry can be caught in moving machinery, or caught on a protruding hook or nail. Never wear metallic jewelry or other objects when working around electrically energized equipment.

### Foot Protection

Safety footwear is designed to protect against foot hazards in the workplace. Safety footwear protects against compression, puncture injuries, and impact.

Safety footwear is divided into three grades, which are indicated by colored tags and symbols:

- The tag color tells the amount of resistance the toe will supply to different weights dropped from different heights.
- The symbol indicates the strength of the sole. For example, a triangle means a puncture resistant sole able to withstand 135 kg (300 ft. lbs) of pressure without being punctured by a 5cm (2 inch) nail.

Only the green triangle grade of footwear is to be used, which also gives ankle support.

Your choice of protective footwear should always overprotect, not under protect.

Employees shall;

- Choose footwear according to the job hazard and approved standards;
- Lace up boot and tie laces securely (boots do not protect if they are a tripping hazard or fall off);
- Choose a high-cut boot to provide ankle support (fewer injuries).

Employees must never;

- Wear defective safety footwear (i.e., exposed steel toe caps);
- Under protect your feet;
- Modify safety footwear.

### Hearing Protection

Hearing protection will be made available to all employees exposed to sources of noise 85 dB or greater, as measured by a sound level meter or identified by the contracting company. In general, anytime someone must elevate their voice to be heard, hearing protection will be worn.

A Hearing Conservation Program shall be developed for workers who are exposed to sources of noise over 85 dB on a consistent basis.

### LIFTING AND CARRYING TOOLS AND MATERIALS

1. Don't Lift Alone – Employees are not to lift awkward or heavy materials alone. If in doubt, he/she should contact the job site Foreman to assist or make available a mechanical lifting device to assist.
2. Lift Properly – Whenever possible, employees should keep their back straight and bend at the hips and knees to position their body directly over the load to be lifted. Employees are to use their stronger leg muscle to do the lifting; not weaker back muscles. This is the single best prevention method to use when the object allows one to bend in such a manner.
3. Inspect the Object to be Lifted – Employees should inspect the object to be moved for sharp corners, nails and other projections that may cause an injury. Persons preparing to lift need to check out the container or object, make an intelligent decision as to their capabilities and limitations for making a lift. If any doubt exists to such capabilities, assistance should be sought. Employees should examine the item to be lifted for a weight indicator or a capacity rating to determine how much they will be attempting to lift.
4. Team Lifting – When two or more workers are “team lifting,” a decision needs to be made in advance as to the route to be used and how the object will be handled. Workers should keep in step and have signals for changing directions, stopping, placing objects, etc.
5. Mechanized Lifting – For heavier objects that demand hoists, lifts, or cranes to assist, utilize only well-maintained and appropriate slings and chains for the load to be transported. Workers must inspect slings and hoist components for defects and visual signs of fatigue before attempting a lift. Any noted problems should be immediately directed to the site superintendent. Safe lifts are not to be compromised by the use of damaged hoists or, slings, even for a short-term transport.

### LOCKOUT/TAGOUT

#### **1.0 Policy**

Work activities associated with energized equipment or processes shall be controlled prior to initiating by verifying a zero energy state.

This policy covers minimum performance standards applicable to all B&T Drainage, Inc. associates, employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

#### **2.0 Purpose**

To establish safe practices associated with equipment or processes that involve hazardous energy sources.

#### **3.0 Scope**

Applies to all B&T Drainage, Inc. Associates work sites, i.e., B&T Drainage, Inc. offices, client job sites, etc., that perform activities such as, but not limited to, erecting, installing, constructing, repairing, adjusting, inspecting, cleaning, operating or maintaining equipment/machines/processes whereby hazardous energy sources are involved such as accessing tanks, air handlers, etc.

Note special exception to policy: equipment/machines that have an electrical plug as the sole hazardous energy source and can reach a zero energy state by simply being unplugged are exempt from this policy, as long as control of the plug can be maintained at all times.

#### 4.0 Definitions

**Affected Employee** means any B&T Drainage, Inc. Associates employee who is not an Authorized Employee but is required to work in the area of equipment/machine/processes where Lockout procedures are being implemented.

**Authorized Employee** means any B&T Drainage, Inc. Associates employee who utilizes Lockout procedures on equipment/machines/processes.

**Control Mechanism** means any lock or combination of locks, multi-lock hasps and/or other types of special mechanisms (chains, valve covers, breaker covers, etc.) applied to an energy-isolating device to ensure that it cannot be moved/operated.

**Energy Isolating Device** means a mechanical device that physically prevents the transmission or release of hazardous energy, including, but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; line valve; slide gate; similar device used to block or isolate energy.

**Hazardous Energy Source** means any type of energy that could injure anyone working on or near the equipment/machine/process if released as a result of work activities. Examples of hazardous energy sources include, but are not limited to the following: electrical; hydraulic (fluid/liquids); pneumatic (air); chemical; radiation; thermal; mechanical (from stored energy, like in flywheels and springs); and mechanical (from gravity).

**Lockout** means the placement of a control mechanism on an energy-isolating device that ensures that the equipment/machine/process being worked on cannot be operated/initiated until the control mechanism is removed.

**Other Personnel** means non B&T Drainage, Inc. Associates personnel or visitors to any work area where B & T Drainage, Inc. Associates authorized employees are utilizing processes outlined in this Policy.

**Operation Device** means any switch, button, lever, valve, etc. that is expressly intended for the starting or initiation of the equipment/machine/process.

**Zero Energy State** means the equipment/machine/process has been purged of and blocked from hazardous energy sources.

#### 5.0 Requirements

## **5.1 Identifying Applicable Equipment/Machines/Processes**

The following shall be documented:

- Owned and common/typical equipment/machine/processes where this Policy applies
- Owned and known/common/typical energy isolating devices for applicable procedures related to the identified equipment/machine/processes
- Applicable lockout mechanisms necessary for applicable energy control procedures related to the identified equipment/machine/processes
- Applicable energy control procedures related to the identified equipment/machine/processes.

This information shall be developed by the Branch Safety Officer, posted on/near machine and kept on file, utilized within the training required for Authorized employees, and updated as equipment/machines/processes and lockout mechanisms are introduced.

## **5.2 Training**

### **5.2.1 Initial Training**

Each affected employee shall receive training during orientation on the procedures of this Policy Section for the expressed purpose of ensuring awareness of the prohibition of removing control mechanisms and/or operation/initiation of applicable equipment/machines/processes.

Each authorized employee shall receive special training in the recognition of hazardous energy sources, the specific and/or common equipment/machines/ processes within respective work areas, types of necessary control mechanisms, and the procedures of this Policy Section.

### **5.2.2 Other Re-training**

Any affected or authorized employee shall be immediately re-trained if their actions during related work activities violated any portion of this Policy.

## **5.3 Lockout Procedures (in order of action)**

### **5.3.1 Preparation**

Authorized employees shall verbally notify affected B & T Drainage, Inc. employees

Associates-employed or anyone considered as Other Personnel) of the procedures to be used BEFORE commencing other work activities.

### **5.3.2 Lockout Application**

Perform the actions BEFORE commencing other work activities, in the following order:

- Identify known operation devices for the equipment/machine/process, and commit all of them to the 'off' or 'neutral' position
- Identify known energy controlling devices for the equipment/machine/process, commit all of them to the 'off' or 'neutral' position following established machine shutdown procedures, and utilize a lockout device to secure them in the 'off' or 'neutral' position

Note 1: tag the lockout mechanism if multiple authorized employees are present or if the work will not be completed within the normal work shift. In such cases, mark the tag with your name and contact information.

Note 2: If the proper lockout procedures or a hazardous energy source is unknown, authorized employees shall not conduct further work activities and shall immediately contact their supervisor for assistance/instructions on proceeding.

- Identify and neutralize all potential stored energy sources such as gravity, springs, electrical capacitors, hydraulic pressure and compressed gases.
- Visually inspect the equipment/machine/process and/or use electronic or mechanical means to verify that a zero energy state has been reached
- Ensure that affected and authorized employees are clear from the equipment/machine/process, then try to activate the equipment/machine/process by initiating identified operation devices to ensure that a zero energy state has been reached. Apply additional lockouts to any energy controlling devices having unprotected energy sources and repeat this procedure point until a zero energy state is obtained. Proceed with the required work activities for the equipment/machine/process when the zero energy state is obtained
- If a zero energy state cannot be reached, contact your supervisor for instructions

### **5.3.3 Release From Lockout**

Authorized employees shall visually inspect the equipment/machine/ process to ensure that personnel and tools have been cleared and/or removed.

Then, only the authorized employee who placed the lockout mechanism into use can remove it. See Section 5.5 of this Policy for Emergency Lock Removal Procedures.

#### **5.4 Testing/Diagnosis/Re-positioning Procedures During Lockout**

Perform the actions, in the following order:

- Clear the equipment/machine/process of tools, materials and personnel
- remove the applicable lockout mechanisms from the energy isolating device
- Energize the applicable portion of the equipment/machine/process
- Proceed with the test/diagnosis/re-positioning
- De-energize the equipment/machine/process
- Re-apply the applicable lockout mechanisms to the energy isolating device
- Re-test operation devices to ensure a zero energy state is in place
- Continue work and repeat this procedure as necessary

#### **5.5 Emergency Lock Removal Procedures**

Every effort shall be made to personally contact authorized employees prior to their lock being removed.

The direct supervisor of an authorized employee is the first person allowed to remove their lock. If the applicable supervisor is not physically capable, only another authorized employee can be provided with the authority, directly by the applicable supervisor only.

In either event, the direct supervisor of the authorized employee who originally placed the lockout mechanism(s) to be removed, shall inform that employee of the removal BEFORE that employee returns to that work area. This communication shall be documented. Messages (oral, written, or forwarded) are prohibited.

#### **5.6 Lockout Control Mechanisms**

##### **5.6.1 Locks**

Each authorized employee shall be issued a lock (for locks) individually keyed and manufactured of a standard size, shape and/or color. Each Branch shall identify this as an Addendum to this manual section.

Each Branch shall require a list of employees and corresponding lock numbers maintained at the work site. Such lists shall be maintained by the Branch Safety Officer or designee.

### **5.6.2 Multi-lock Hasps**

The following steps shall be followed to accommodate multiple authorized employees on a single project:

- A multi-lock hasp shall be utilized when more than one authorized employee is performing work on the equipment/machine/process.
- The senior B&T Drainage, Inc. authorized employee working on the specific project shall be responsible for assuring that other authorized employees working on the project attach their personal lockout device prior to work being performed.
- The senior B&T Drainage, Inc. authorized employee working on the specific project shall also be responsible for assuring the continuity of the lockout device during shift changes and/or personnel changes unless formally relieved of that responsibility by the Project Manager. At which time, the Project Manager will obtain the responsibility for the integrity of the lockout device.
- When a traditional multi-lock hasp will not provide enough attachment points for authorized employees, another method shall be established (e.g. adding another multi-lock hasp, lockout box, lockout cabinet, etc.) as per the direction of the senior B&T Drainage, Inc. authorized employee working on the specific project.

### **5.6.3 Other Specialized Equipment**

Tags (when necessary) shall be durable, standardized in type and have areas to indicate the employee's name and contact information. These tags shall be established in Addendum to this Policy.

## **5.7 Multi-Contractor Site/Subcontractor**

Authorized employees shall inform the supervision of other employers in a multi-employer work site of all aspects covered by this manual section.

Subcontractors for B & T Drainage, Inc. Associates are required to meet or exceed all aspects covered by this manual section.

## **5.8 Policy Review and Certification**

Annually, this manual section (and applicable addendums and related training programs) shall be reviewed and documented (certified) by the Branch Safety Officer for updating and verifying the use of these procedures. Inspections verifying that these procedures are being followed shall be a component of this review.

- Never stand directly in front of the wheel during start-up because there is always a possibility that the wheel may disintegrate (explode) when accelerating to full speed.

## TOOL SAFETY AND INSPECTION

### **PURPOSE:**

There are various types of tools and equipment used in the workplace for many different purposes. Examples include, but are not limited to, portable hand tools, power tools, pneumatic tools, and powder-actuated tools.

The purpose of this policy is to provide employees with appropriate knowledge relating to the care and use of tools and equipment and to protect employees from hazards associated with improper use of tools and equipment and defective and poorly maintained tools and equipment.

### **POLICY:**

Only trained and/or experienced employees may use/operate tools or equipment. Tools and equipment shall not be modified and they are to be used only for their designed purpose. It shall be the responsibility of the employee to inspect tools and equipment prior to use and to use all tools and equipment in a safe manner. Employees observed abusing, altering, modifying or misusing tools or equipment shall be subject to disciplinary action. Employees shall wear all appropriate personal protective equipment while using tools and equipment. Additionally if a tool or piece of equipment is found to be defective, the tool/equipment shall be red-tagged, taken out of service until it can be replaced or repaired by a qualified person.

It shall be the responsibility Project Manager or Site Superintendent to designate a competent person who will be assigned to be responsible for testing/inspecting and repairing all tools and equipment. All periodic inspections, maintenance and repairs of tools or equipment shall be documented.

To promote safety and efficiency, the following procedures shall be followed:

### **PROCEDURE:**

#### **1. General Tool Safety**

Many serious injuries have resulted from the improper use of tools and equipment. Many of these injuries could have been prevented if the following rules were followed:

##### **Inspection and Maintenance**

All tools shall be identified and inventoried either individually or by group.

All tools in the inventory shall have a documented inspection at least once every six months. In addition to these periodic documented inspections all tools shall be inspected prior to issue and upon return by the tool room attendants and prior to each use by the user.

All tools will be kept in good working condition with no modifications.

All periodic inspections and all maintenance & repairs shall be documented. Completed forms shall be kept in a binder in the tool room or tool trailer for one year. The binder shall contain a copy of the inspection checklist for the type for tools and/or equipment being inspected.

#### **• Selection**

Use the right tool for the task instead of trying to make the wrong one fit.

- **Use**

Keep control of yourself, the tool, and the job. When applying force with a tool, remember that it may slip, break, or just suddenly do its job. Watch your hands and your balance (body mechanics) to avoid injury.

Vibration Absorbing Gloves are to be made available to workers using pneumatic impact guns or other vibrating equipment. These gloves are required PPE for worker's operating heavy vibrating tools (i.e. jack hammers, 90 guns, impact guns etc.). The use of these gloves are designed to dampen vibration, dissipate impact and absorb shock, they can assist in the prevention of cumulative trauma injury often associated with operating this type of equipment. They only work if you use them.

Select the right protective equipment for the task and use it properly.

Do not use tools and equipment that you have not been trained to use.

- **Care**

Take proper care of your tools and equipment. Keep them stored where they will not get damaged and will not present a hazard.

Check your tools and equipment prior to use for defects, wear, or damage. Immediately remove from service and tag any defective tools. Damaged tools shall be turned into the tool room for repair or replacement.

- **Supervision**

Supervisors shall be responsible for ensuring that employees are trained before using a specific tool. Watch your employees at work. Ask them about their immediate assignment and take an interest in finding the safest way to do the job. Then follow up to insure that the tools and equipment in your area are being used safely.

## 2. **Hand Tool Safety**

Hand tools shall only be used for the purpose for which they are intended.

All appropriate PPE will be worn while using hand tools.

Wrenches, including adjustable, pipe and socket shall not be used when jaws are sprung to the point of slippage.

Pipe wrench parts (i.e., jaws) are not to be removed and used for anything other than the manufactured use.

The use of snipes and cheater bars or double wrenching to gain leverage **is prohibited**.

Always use tool holder while using hammer and knocker wrenches.

Hand tools shall be tagged and removed from service if any of the following defects are present:

- Impact tools, such as hammers, flange wedges chisels, drift pins, pin bars and knocker wrenches with visible signs of mushrooming, cracking or bending.
- Wooden handle tools, such as hammers, picks, shovels, and brooms with visible sign of cracking, loosening or splintering of the handle.
- Wrenches, such as adjustable, combo and pipe with visible signs of bending, cracking, defective handles or other defects that impair their strength.

### 3. **Electrical Power Tool Safety**

All appropriate PPE will be worn while using power tools.

Be sure that the proper permit has been obtained prior to use of electrical power tools.

GFCI's are to be used with all portable electric equipment. GFCI's are to be inspected and tested prior to each use.

**Do not** connect electrical power unless the operating switch is turned off.

Employee shall avoid loose fitting clothing when operating power tools.

The power source on tools shall be physically disconnected prior to attempting any repairs or attachment replacement.

Protective guards on power tools **shall not** be removed, altered or modified.

Trigger/switch locks on power tools are prohibited.

All electrical tools and power cords must be inspected per the Electrical Equipment Safety and Inspection Policy.

Electrical tools and power cords must display the current inspection color code for the current inspection period to it being placed in service.

Electrical tools **shall not** be hoisted or carried by their power cords.

Cords are tripping hazards. Route them so as to minimize interference in walkways. Overhead is preferred.

Electrical power tools shall be tagged and removed from service if any of the following defects are present:

- Electrical power tool cord does not have current inspection color code.
- Power cord is frayed, cut or damaged. The use of electrical tape to cover damage to cords is **prohibited**.
- Defective or faulty on/off switches.
- Loose or defective components

### 4. **Air Power Tool Safety**

All hoses exceeding 1/2" inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

Chicago fittings shall be pinned.

Attachments on air tools shall be secured by retainer pins and rings.

**Do not** connect air unless the operating switch is turned off.

**Do not** disconnect tool until air supply is shut off and air pressure is bled off.

Air power tools **shall not** be hoisted or carried by their hoses.

Hoses are tripping hazards. Route them so as to minimize interference in walkways. Overhead is preferred.

Air power tools shall be tagged and removed from service if any of the following defects are present:

- Air power tools, such as air power grinders, impact wrenches, German hacksaws with visible signs of deformities in the body of the tool, improperly functioning actuator, bent or deformed blades, or any signs of obvious damage to the air supply line fittings.
- Hoses must be visually inspected for cracking, signs of aging, worn or damaged connecting fittings, or any other obvious deformities, such as blistering or bulges.

## 5. Powder Actuated Tool Safety

Only employees who have received an approved training course and license for the particular tool to be used may operate powder-actuated tools.

Tool room personnel shall not issue powder-actuated tools unless the person requesting the tool can provide a current license for that tool.

Powder-actuated tools shall be tested prior to use to ensure all safeties are functioning.

The fastener **shall not** be loaded until ready for the shot. The tool **shall not** be left unattended unless it is unloaded.

**Never** point either an empty or loaded tool at any person.

Keep both hands and feet clear of the open-end of the barrel.

In the event of a misfire, the operator shall hold the tool firmly against the work surface for a period of 30 seconds and then follow manufacturer's instructions.

Personnel, other than the operator of the tool, must stay clear of the area where the tool is being used.

Operators of powder-actuated tools shall wear goggles for eye protection while operating these tools.

A sign at least 8 x 10 inches, using boldface type no less than 1 inch in height, shall be posted within 50 feet of the area where the tool is being used. The sign shall bear the following wording:

CAUTION

POWDER-ACTUATED TOOL IN USE

Powder-actuated tools shall be tagged and removed from service if any of the following defects are present:

- Tool has visible signs of worn or damaged parts.
- Missing or malfunctioning parts or accessories.
- Missing operator's instruction manual or missing power load and fastener chart.
- Tool misfires more than one time during use.

## 6. Abrasive Wheel Machinery

Abrasive wheels shall be used only on machines provided with safety guards as defined:

- The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard.
- Grinding machines shall be equipped with flanges
- Abrasive wheel machinery guards shall meet the design specifications of the American National Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, ANSI B7.1-1970, which is incorporated by reference as specified in Sec. 1910.6.

## FORKLIFT OPERATION

### **1.0 Policy**

Forklifts (powered industrial trucks) shall be operated, maintained, and controlled in a safe manner.

*This policy covers minimum performance standards applicable to B & T Drainage, Inc. Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.*

### **2.0 Purpose**

To define the procedures and standards that apply to the care, control, maintenance, inspection, and operation of forklifts (powered industrial trucks).

### **3.0 Scope**

B&T Drainage, Inc. Associates work sites, i.e., B&T Drainage, Inc. offices, client job sites, etc. requiring the use of forklifts (powered industrial trucks).

### **4.0 Definitions**

**Forklift** means a mobile, power-propelled truck used to carry, push, pull, lift, stack, or tier materials. Powered industrial trucks (forklifts) are also commonly known as pallet trucks, rider trucks, fork trucks, or lift trucks.

### **5.0 Requirements**

#### **5.1 Training**

Only trained and authorized persons are permitted to operate a forklift. No employees are allowed to operate a forklift without the proper training. The Branch Safety Officer or designee will administer the forklift operator certification program and maintain training records.

Training shall occur prior to employee operation of any B & T Drainage, Inc. forklift, and at least every three years thereafter unless observed performance by the operator dictates the need for

more frequent retraining. The following requirements shall be met to become a "Qualified Forklift Operator":

- Perform the demonstrated capability requirement satisfactorily. Each trainee, who satisfactorily completes the qualifications as outlined above, shall be issued a written document as evidence of being a Qualified Forklift Operator.

## **5.2 Inspection and Maintenance**

Prior to placing a forklift truck into service, the truck operator shall inspect their vehicle and document this inspection. This inspection is not necessary on days when the forklift will not be placed into service.

Forklifts that are defective, in need of repair or are unsafe shall be tagged "Danger - Do Not Operate-" and taken out of service until restored to safe operating condition.

A maintenance log shall be maintained for each forklift to determine when required maintenance is due. Only qualified personnel shall perform maintenance and repair. Maintenance records for each forklift shall be kept on file by the assigned department manager.

## **5.3 General Safe Operating Rules**

The following safe operating rules apply to B&T Drainage, Inc. Associates employees who operate a forklift. Violations of safe operating rules can and will result in retraining and/or disciplinary action.

- 1) Only B&T Drainage, Inc. employees trained as per the requirements of this manual section and authorized by the department manager shall be allowed to operate forklifts
- 2) B&T Drainage, Inc. forklifts shall not be loaned or rented to others for use.
- 3) Stunt driving and horseplay shall not be permitted.
- 4) Personnel are not permitted to ride on forklifts except in designated seats that are part of the equipment design.
- 5) Forklifts shall be equipped with a portable fire extinguisher.
- 6) Under travel conditions, the forklift shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
- 7) Traffic regulations shall be observed, including authorized work site speed limits. A safe distance shall be maintained approximately three forklift lengths from the forklift truck ahead.

- 8) The driver shall be required to slow down and sound the horn at cross aisles and other areas where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
- 9) The driver shall be required to look in the direction of, and keep a clear view of the path of travel.
- 10) Copies of the manufacturer's operating instructions for each type of forklift shall be readily available for review by operators and supervisory personnel.
- 11) Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When the manufacturer provides auxiliary removable counterweights, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.
- 12) No modifications or additions, which affect the capacity or safe operation of the equipment, shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.
- 13) Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering hand wheel to spin. The steering knob shall be mounted within the periphery of the wheel.
- 14) Forklifts shall have the manufacturer's nameplate showing its weight with attachments, lifting capacity, lift height maximum and other pertinent data. Nameplates or markings shall be maintained in a legible condition and remain in place.
- 15) Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.
- 16) Grades shall be ascended or descended slowly.
- 17) When ascending or descending grades in excess of 10 percent, loaded forklifts shall be driven with the load up grade.
- 18) Unloaded forklifts should be operated on all grades with the load engaging means down grade.
- 19) On grades, the load and load engaging means shall be tilted back if applicable and raised only as far as necessary to clear the road surface.
- 20) No person shall be allowed to stand or pass under the elevated portion of any forklift, whether loaded or empty.

- 21) There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
- 22) Arms or legs are prohibited from being placed between the uprights of the mast or outside the running lines of the forklift.
- 23) When a forklift is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set.
- 24) Wheels shall be blocked if parked on an incline.
- 25) A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform, or freight car. Forklifts shall not be used for opening or closing freight doors.
- 26) Dock board or bridge plates shall be properly secured before they are driven over. Dock board or bridge plates shall be driven over carefully and slowly and their rated capacity never exceeded. Portable dock boards shall be secured in position, by being anchored or equipped with devices that will prevent their slipping.
- 27) An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc. representative of the job application, but not to withstand the impact of a falling capacity load.
- 28) Additional counter weighting of forklifts shall not be allowed unless approved by the manufacturer.
- 29) Employees shall not jump off a forklift.
- 30) Forklift operators shall yield to pedestrians.
- 31) Loads carried shall be secured on the forks to prevent upset / overturn.

## HAZARDOUS CHEMICALS

### **PURPOSE**

The purpose of this plan is to establish a program and procedures for the safe use of hazardous chemical substances at B&T Drainage, Inc.

The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) 29 CFR 1910.1200 (General Industry) and 29 CFR 1926.59 (Construction Industry) call for the development of a hazard communication program when employees may be exposed to any chemical in the workplace under normal conditions of use or in a foreseeable emergency. In

2012, OSHA revised the HCS to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). As a result, this program has been revised to comply with the requirements of the OSHA HCS 2012. The written hazard communication program will include and address the following criteria in order to satisfy the minimum requirements of the OSHA HCS 2012:

- List of all hazardous chemicals known to be present in the workplace or individual work area
- Methods used to ensure that all containers, including pipes and holding tanks, are labeled, tagged or marked properly
- Methods used to obtain and maintain safety data sheets (SDSs)
- Methods used to provide employees with information and training on hazardous chemicals in their work areas
- Methods used to inform employees of the hazards of non-routine work practices
- Methods used to provide the employees of other employers (e.g., consultants, construction contractors and temporary employees) on-site access to SDSs for each hazardous chemical that the other employer's employees may be exposed to while working in the workplace
- Methods used to inform the employees of other employers of precautionary measures that need to be taken to protect themselves during the workplace's normal operating conditions and in foreseeable emergencies
- Methods used to inform the employees of other employers of the labeling system used in the workplace

The hazard communication program will identify the following:

- Key personnel responsible for the program
- Location of chemical inventory list and SDSs
- Workplace labeling system
- Good work practices and procedures to minimize exposures
- How training will be performed
- Procedures to maintain the program and update the required information
- How records will be maintained

### **RESPONSIBILITIES**

The Safety Coordinator is responsible for administering the hazard communication program.

This person is also responsible for:

- Reviewing the potential hazards and safe use of chemicals

- Maintaining a list of all hazardous chemicals and a master file of SDSs
- Ensuring that all containers are labeled, tagged or marked properly
- Providing new-hire and annual training for employees
- Maintaining training records
- Monitoring the air concentrations of hazardous chemicals in the work environment
- Properly selecting and caring for personal protective equipment
- Directing the cleanup and disposal operations of the spill control team
- Identifying hazardous chemicals used in non-routine tasks and assessing their risks
- Informing outside contractors who are performing work on company property about potential hazards
- Reviewing the effectiveness of the hazard communication program and making sure that the program satisfies the requirements of all applicable federal, state or local hazard communication requirements

The purchasing agent is responsible for:

- Contacting chemical manufacturers and/or distributors to obtain SDSs and secondary labels for hazardous chemicals used or stored in the workplace

The receiving department is responsible for:

- Reviewing incoming hazardous chemicals to verify correct labeling
- Holding hazardous chemicals in the receiving area until receipt of the SDS for the product

Employees are responsible for the following aspects of the hazard communication program:

- Identifying hazards before starting a job
- Reading container labels and SDSs
- Notifying the supervisor of torn, damaged or illegible labels or of unlabeled containers
- Using controls and/or personal protective equipment provided by the company to minimize exposure
- Following company instructions and warnings pertaining to chemical handling and usage
- Properly caring for personal protective equipment, including proper use, routine care and cleaning, storage, and replacement
- Knowing and understanding the consequences associated with not following company policy concerning the safe handling and use of chemicals
- Participating in training

#### LABELS AND OTHER FORMS OF WARNING

Each container of hazardous chemicals received from the chemical manufacturer, importer or distributor will be labeled with the following information:

- Product identifier
- Signal word
- Hazard statement(s)
- Pictogram(s)
- Precautionary statement(s)
- Name, address and telephone number of the chemical manufacturer, importer or other responsible party

B&T Drainage, Inc. will use the GHS labeling system for secondary containers. When a chemical is transferred from the original container to a portable or secondary container, the container will be labeled, tagged or marked with a GHS label containing the following information:

- Product identifier
- Signal word
- Hazard statement(s)
- Pictogram(s)
- Precautionary statement(s)

Portable containers into which hazardous chemicals are transferred from labeled containers and that are intended for the immediate use of the employee who performs the transfer do not require a label. If the portable container will be used by more than one employee or used over the course of more than one shift, the container must be labeled. Food and beverage containers should never be used for chemical storage.

Signs, placards, process sheets, batch tickets, operating procedures or other such written materials may be used in lieu of affixing labels to individual, stationary process containers as long as the alternative method identifies the containers to which it is applicable and conveys the information required for workplace labeling.

Where an area may have a hazardous chemical in the atmosphere (e.g., where extensive welding occurs), the entire area will be labeled with a warning placard.

Pipes that contain hazardous chemicals should be labeled in accordance with ANSI/ASME A13.1 and indicate the direction of flow. (Please note that this not a requirement of the OSHA HCS but a best practice or requirement of local jurisdiction.)

Workplace labels or other forms of warning will be legible, in English and prominently displayed on the container or readily available in the work area throughout each work shift. If employees speak languages other than English, the information in the other language(s) may be added to the material presented as long as the information is presented in English as well.

Note: After Dec. 1, 2015, distributors may not ship containers labeled by the chemical manufacturer or importer unless the label on the container meets GHS labeling requirements.

#### SAFETY DATA SHEETS

An SDS will be obtained and maintained for each hazardous chemical in the workplace. SDSs for each hazardous chemical will be readily accessible during each work shift to employees when they are in their work areas.

SDSs will be obtained from the chemical manufacturer, importer or distributor. The name on the SDS will be the same as that listed on the chemical inventory list. SDSs for chemicals or process streams produced by the company will be developed and provided by the Safety Coordinator.

The Safety Coordinator will maintain the master file of all original SDSs.

SDSs for new products or updated SDSs for existing products will be obtained by the purchasing agent and forwarded to the safety coordinator. The (Safety Coordinator OR APPROPRIATE TITLE) will then update the master file with new and/or updated SDSs.

If problems arise in obtaining an SDS from the chemical manufacturer, importer or distributor, a phone call will be made to request an SDS and to verify that the SDS has been sent. The phone call will be logged and a letter will be sent the same day. The company will maintain a written record of all efforts to obtain SDSs. If these efforts fail to produce an SDS, the local OSHA office will be contacted for assistance.

#### EMPLOYEE INFORMATION AND TRAINING

Employees included in the hazard communication program will receive the following information and training prior to exposure to hazardous chemicals and when new chemical hazards are introduced to their work area:

- Requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 (General Industry) or 29 CFR 1926.59 (Construction Industry)
- Operations in the work area where hazardous chemicals are present
  
- Location and availability of the hazard communication program, chemical inventory list and SDSs
- Methods and observations used to detect the presence or release of a hazardous chemical in the work area, such as monitoring devices, visual appearance or odor of hazardous chemicals when being released
- Physical, health, simple asphyxiation, combustible dust and pyrophoric gas hazards, as well as hazards not otherwise classified of the chemicals in the work area
- Measures employees can take to protect themselves from hazards, such as appropriate controls, work practices, emergency and spill cleanup procedures, and personal protective equipment to be used
- Explanation of the labels received on shipped containers
- Explanation of the workplace labeling system
- Explanation of the SDS, including order of information and how employees can obtain and use the appropriate hazard information

Note: To facilitate understanding of the new GHS system, the OSHA HCS requires that employees be trained regarding the new label elements and SDS format by Dec. 1, 2013. Employers are required to update the hazard communication program and to provide any additional training for newly identified physical or health hazards no later than June 1, 2016.

#### NONROUTINE TASKS

The Safety Coordinator and the immediate supervisor of an employee performing a non-routine task, such as cleaning machinery and other process equipment, is responsible for ensuring that adequate training has been provided to the employee on any hazards associated with the non-routine task. Employees share in this responsibility by ensuring that their immediate supervisor knows that the non-routine task will be performed.

Special work permits are required for the performance of certain non-routine tasks, such as entry to confined spaces, breaking and opening piping systems, and welding and burning. For some special tasks, employees are required to follow special lockout/tag out procedures to ensure that all machinery motion has stopped and energy sources are isolated prior to and during the performance of such tasks.

## CONTRACTORS

Prior to beginning work, the Safety Coordinator will inform contractors with employees working on company property of any hazardous chemicals that the contractors' employees may be exposed to while performing their work. The Safety Coordinator will also inform contractors of engineering or work practice control measures to be employed by the contractor, personal protective equipment to be worn by the contractors' employees, and any other precautionary measures that need to be taken to protect their employees during the workplace's normal operating conditions and in foreseeable emergencies.

Furthermore, the Safety Coordinator will advise contractors that they must comply with all OSHA standards while working on company property. Appropriate controls will be established with the contractor to ensure that company employees are not exposed to safety and health hazards from work being performed by the contractor and that company operations do not expose contractors' employees to hazards.

The Safety Coordinator will inform contractors of the workplace labeling system and the availability and location of SDSs for any chemical to which contractors' employees may be exposed while performing their work.

## RECORDKEEPING

Records pertaining to the hazard communication program will be maintained by the Safety Coordinator. The Safety Coordinator will keep the following records:

- Chemical inventory list
- Hazardous material reviews
- Copies of phone call logs and letters requesting SDSs
- Employee training records
- Warnings issued to employees for not following the hazard communication program

## BENZENE AWARENESS

Benzene may be encountered at refineries and laboratories, during refueling and tank gauging, and when completing oil field and pipeline maintenance operations. Benzene is a clear, colorless liquid with a pleasant, sweet odor. The odor of benzene does not provide adequate warning of its hazard. Benzene can affect your health if you inhale it, or if it comes in contact with your skin or eyes. Benzene is also harmful if you happen to swallow it. If you have short-term (acute) exposure to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy; you may experience irritation in eyes, nose, and respiratory tract. You may develop a headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness. Long-term (chronic) exposure. Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an

irreversible, fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms. Benzene liquid is highly flammable. It should be stored in tightly closed containers in a cool, well ventilated area. Benzene vapor may form explosive mixtures in air. All sources of ignition must be controlled. Smoking is prohibited in areas where benzene is used or stored. The following PPE should be used to protect employees from benzene:

- A.** Respirators are required for those operations in which engineering controls or work practice controls are not feasible to reduce exposure to the permissible level.
- B.** Protective Clothing. You must wear appropriate protective clothing (such as boots, gloves, sleeves, aprons, etc.) over any parts of your body that could be exposed to liquid benzene.
- C.** You must wear splash-proof safety goggles if it is possible that benzene may get into your eyes. In addition, you must wear a face shield if your face could be splashed with benzene liquid.

### HYDROGEN SULFIDE

Hydrogen sulfide may be encountered during drilling operations. The gas may be associated with recycled drilling mud, water from sour crude wells, blowouts, tank gauging, and field maintenance. Hydrogen sulfide may also be present in refineries and is associated with decaying material in natural settings. Hydrogen sulfide is colorless and has the odor of rotten eggs. H<sub>2</sub>S is toxic, flammable, corrosive, soluble in water, and creates toxic by-products when burned. The health effects of hydrogen sulfide include irritation of the eyes, nose, throat and respiratory system. Hydrogen sulfide is both an irritant and a chemical asphyxiant with effects on both oxygen utilization and the central nervous system. Its health effects can vary depending on the level and duration of exposure. Personal or area monitors that alarm when PEL exceeds the preset level of 20 ppm for General Industry (1910) or 10 ppm for the Construction Industry (1926) must be used. Employees must immediately put on supplied air respiratory equipment (SCBA) and/or evacuate the area upon sounding of H<sub>2</sub>S alarms. Employees must be informed of the site's H<sub>2</sub>S emergency plan.

### COMPRESSED GAS CYLINDERS

Any gas under pressure is just waiting to escape. If that escape is sudden and uncontrolled, the results can be extremely dangerous. By knowing how to store, transport, move, treat and use compressed gas cylinders properly, you can use them as they are intended to be used, safely.

Empty or full, compressed gas cylinders shall be stored, transported, and used in a secured upright position, except for short periods of time for hoisting purposes, where they may be secured to a cradle, sling board or pallet. NEVER attempt to use a magnet or choker slings around the cylinder for hoisting or transportation purposes.

When not in use, valve protection caps must be securely attached to the cylinder. NEVER attempt to lift cylinders by their protection caps. Move cylinders by tilting and rolling on their bottom edge – do not drop strike, or allow cylinders to strike each other. Always close cylinder valves when empty or when cylinders are moved.

NEVER use cylinders for rollers or supports. Keep cylinders away from flame, sparks, and electrical circuits. NEVER allow the surface temperature of a cylinder to exceed 125 degrees Fahrenheit.

NEVER take a compressed gas cylinder into a confined space area. NEVER attempt to use a cylinder that has been damaged or is defective in any way.

## ELECTRICAL

### **PURPOSE**

To establish the procedures that shall be followed in the safe performance of work activities involving general electrical hazards.

### **SCOPE**

Applies to all B&T Drainage, hereafter referred to as "B&T Drainage", work sites, i.e., company offices, client job sites, etc.

### **DEFINITIONS**

**Approved** - acceptable to the authorities.

**Authorized Person** - a person approved or assigned by B&T Drainage to perform a specific duty or duties or to be at a specific location or locations at the jobsite.

**Cabinet** - an enclosure designed either for surface or flush mounting.

**Competent Person** - one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to workers, and who has the authorization to take prompt corrective measures to eliminate them.

**Conductor (bare)** - a conductor having no covering or electrical insulation whatsoever.

**Conductor (insulated)** - a conductor encased within material of composition and thickness that is recognized as electrical insulation.

**Defect** - any characteristic or condition that tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

**Disconnect** - a device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

**Enclosed** - surrounded by a case, housing, fence, or walls which shall prevent persons from accidentally contacting energized parts.

**Enclosure** - the case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

**Exposed** (as applied to live parts) - capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated.

**Guarded** - covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

**Isolated** - not readily accessible to persons unless special means for access are used.

**Labeled** - equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

**NEC** - stands for National Electric Code.

**Qualified** - people who are trained and permitted to work on or near energized exposed parts. They are familiar with electrical properties, the proper use of special precautionary techniques, personal protective

equipment, insulating and shielding materials, and insulated tools. Qualified persons have the skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.

**Receptacle** - a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

**Unqualified** - are workers who face a risk of electric shock or may be expected to face comparable risk of injury due to electric shock or other electrical hazards. They shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments.

## **PROCEDURES**

### **Training**

B&T Drainage will ensure that unqualified workers who face a higher-than-normal risk of electrical exposure or accident will be trained in safety-related work practices that pertain to their job scope. In addition, qualified workers will receive specific training relative to working with or near exposed de-energized and/or energized parts. Electrical safety training will provide clear understanding and expectations of safety-related work practices.

### **General**

Feasible engineering and administrative controls shall be applied to mitigate or minimize the risk of injury and illness from exposure to electrical hazards. Where such hazards still exist after application of these controls, 'hot work' procedures shall apply, and Personal Protective Equipment (PPE) shall be used and comply with NFPA 70E.

Where feasible, workers shall not perform live electrical work. Branches that engage in live work are required to provide applicable safe work procedures, PPE, and equipment.

In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

Worn or frayed electric cords or cables shall be removed from work areas for repair or disposal. Plugs equipped with a grounding prong must have the prong in place. Damaged plugs must be repaired. Repairing cords shall be limited to being completed by an authorized qualified person, as determined by the Safety Officer.

Working spaces, walkways, and similar locations must be kept clear of cords to eliminate hazards.

Extension cords shall not be fastened with staples, hung from nails, or suspended by wire. Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

Electrical switches shall be labelled to indicate the system, equipment, service, or tool they control. This includes switch boxes, cabinets, motor control cabinets, stationary equipment, control panels, and other such switches or disconnects.

Workers who perform electrical work shall wear hard hats that are proof tested to 20,000 volts and shall not wear clothing with or without PPE that could increase injury (100% cotton is better than blended materials).

In work areas where the exact location of underground electric power lines is unknown, workers using jackhammers, bars, or other hand tools that may contact a line shall be provided with insulated protective gloves. Gloves must be rated to (or exceed) the voltage for which they may be exposed. The gloves shall be inspected before use and replaced as per the manufacturer's specifications.

Wiring components and equipment in hazardous environments shall be maintained in a condition consistent with NEC requirements (i.e., no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition).

Hazardous locations are those locations where flammable vapors, liquids or gases, or combustible dusts or fibers may be present. There are six "classifications" for these types of locations, as follows:

- Class I Division 1 and Division 2
- Class II Division 1 and Division 2
- Class III Division 1 and Division 2

Equipment, wiring methods, and installations of electrical equipment in hazardous (classified) locations must be designated as "intrinsically safe" or be approved for the classification location.

### **Energized Electrical Parts and Systems**

This section does not apply to power distribution or transmission lines. Refer to CFR Subpart "R" 1910.269 (servicing) and/or CFR Subpart "V" 1926.950 (Construction) for overhead power transmission and distribution line requirements.

Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contact when work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

Live parts to which a worker may be exposed shall be de-energized before the worker works on or near them, unless it can be demonstrated that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

If the exposed live parts are not de-energized (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices shall be used to protect workers who may be exposed to the electrical hazards involved. Such work practices shall protect workers against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts.

### **Working on or near exposed de-energized parts**

This section applies to working on exposed de-energized parts near enough to expose worker(s) to an electrical hazard.

While a worker is exposed to contact with fixed electrical equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out in accordance with the Energy Control (lockout) section of this manual.

The circuits and equipment to be worked on shall be disconnected from electrical energy sources (and locked out). Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for de-energizing circuits or equipment.

Procedures for the release of stored electric energy shall be managed according to this policy.

When capacitors or associated equipment are handled, they shall be treated as energized.

Stored non-electrical energy in devices that could reenergize electrical parts shall be blocked or relieved to the extent that the parts could not be accidentally energized by the device.

### **Working on or near exposed energized parts**

Every effort shall be made to preclude work on energized electrical parts. When this is not possible, the requirements of this section shall apply. Potential contact with live energized parts includes work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for workers to be exposed to any hazard they present.

Only qualified people shall work on electrical equipment that has not been de-energized.

If work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started.

If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved in de-energizing and grounding them. If protective measures, such as guarding, isolating, or insulating are provided, these precautions shall prevent workers from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

### **Overhead electrical lines**

While conducting site activities near overhead lines, field personnel need to be aware of the location of the lines so as not to use conductive equipment (e.g., metal equipment to include drill rigs; hand auger extensions; geoprobe units; excavators, etc.) in close proximity to power lines.

OSHA 29 CFR 1926.550 requires that any vehicle or mechanical equipment (i.e., drill rigs) capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance distance of at least 10 feet is maintained.

When calculating clearance distances for a drill rig, consider both the length of the derrick and the length of the rods. Position the rig such that if rods are ever fully extended from the top of the derrick, the rods will still be at least 10 feet away from the power lines. Note that rods can lean or sway when elevated so it

may be necessary to maintain more than a 10- foot distance on the ground to ensure that there is a 10-foot horizontal distance between the rods and the power line.

Higher voltages require greater clearance distances. Contact the electrical utility company to verify line voltage. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10kV over that voltage.

<b>Voltage</b>	<b>Required Clearance</b>
0-50 kV	10 feet
50-200 kV	15 feet
200-350 kV	20 feet
350-500 kV	25 feet
500-750 kV	35 feet
750-1000 kV	45 feet

Under any of the following conditions, OSHA allows the required clearance to be reduced:

- If a vehicle is in transit with its structure lowered, the clearance shall be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10kV over that voltage
- If insulating barriers (boots) are installed to prevent contact with the lines, and if the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, OSHA allows the clearance to be reduced to a distance within the designed working dimensions of the insulating barrier. However, while this is permissible according to OSHA, some utility companies are recommending that safe distances, as described previously, be maintained in addition to the insulating barrier.
- If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given

When an unqualified person is working in an elevated position near overhead lines or working on the ground in the vicinity of overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the clearance distances indicated in Table 12-1.

For voltages normally encountered with overhead power lines, objects which do not have an insulating rating for the voltage involved shall be considered to be conductive.

When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person shall not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than the clearance distances indicated in Table 12-2, unless:

- The person is insulated from the energized part (gloves, with sleeves, if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or
- The energized part is insulated both from other conductive objects at a different potential and from the person, or
- The person is insulated from conductive objects at a potential different from that of the energized part.

<b>Table 12-2</b>	
<b>Approach Distances for Qualified Workers - Alternating Current</b>	
<b>Voltage range (phase to phase)</b>	<b>Minimum approach distance</b>
300V and less	Avoid contact
Over 300V, not over 750V	1 ft. 0 in.
Over 750V, not over 2kV	1 ft. 6 in.
Over 2kV, not over 15kV	2 ft. 0 in.
Over 15kV, not over 37kV	3 ft. 0 in.
Over 37kV, not over 87.5kV	3 ft. 6 in.
Over 87.5kV, not over 121kV	4 ft. 0 in.
Over 121kV, not over 140kV	4 ft. 6 in.

If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance indicated in Table 12-2. However, workers standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:

- The worker is using protective equipment rated for the voltage or the equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to workers on the ground) can come closer to the line than permitted in this section.
- If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, workers working on the ground near the point of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect workers from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

### **Illumination**

Workers shall not enter spaces containing exposed energized parts unless illumination is provided that enables the workers to perform the work safely. Where lack of illumination or an obstruction precludes

observation of the work to be performed, workers shall not perform tasks near exposed energized parts. Workers shall not reach blindly into areas which may contain energized parts.

#### **Confined Space or enclosed space work**

When a worker works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, protective shields, protective barriers, or insulating materials shall be used as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent swinging into a worker and causing the worker to contact exposed energized parts.

#### **Conductive materials and equipment**

Conductive materials and equipment that are in contact with any part of a worker's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts.

For instance, a worker should measure the length of a sledgehammer and the expected radius of his swing prior to using the hammer near an energized circuit. If such a circuit is present, a sign must be posted to warn the workers. The job supervisor must inform the workers of the location of the lines, the hazards involved, and the protective measures to be taken.

#### **Portable ladders**

Portable ladders shall have nonconductive siderails if they are used where the worker or the ladder could contact exposed energized parts.

#### **Conductive apparel**

Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) shall not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

#### **Housekeeping duties**

Where live parts present an electrical contact hazard, workers shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

#### **Interlocks**

Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

#### **Grounding, GFCIs and Assured Grounding Procedures**

Equipment, tools, and cord sets shall be provided and used to protect workers from electrical shock and to prevent fire.

#### **Equipment and tools**

Note: Portable equipment which is "double insulated" and endorsed by a nationally recognized testing facility need not have a grounding conductor but is subject to the inspection requirements of this section.

Tools and equipment subject to inspection and testing include:

- Portable Electrical Tools such as grinders, drills, and stapling guns
- Stationary tools such as table saws, drill presses, and jig saws
- Portable electrical extension cords
- Portable and Temporary lighting systems and cords

Receptacles shall be of the grounding type and their contacts shall be grounded by connection to the equipment grounding conductor of the circuit supplying that receptacle in accordance with the National Electrical Code (NEC).

### **Visual inspections**

Visual inspection of tools and equipment is required prior to each use and shall include:

- General condition
- Plugs and caps, and presence of ground prong
- Electrical cord sets
- External defects, and missing parts

Defective tools shall be tagged, taken out of service, and placed in a secured location until they are repaired or destroyed.

### **Testing**

The following tests shall be performed on all applicable equipment:

- Equipment grounding conductors shall be tested for continuity and shall be electrically continuous
- Receptacle and attachment cap or plug shall be tested for correct attachment of the equipment-grounding conductor. The equipment-grounding conductor shall be connected to its terminal

Required tests should be performed as indicated below:

- Before first use
- Before being returned to service following any repairs
- Before being used, after any incident that can be reasonably suspected to have caused damage (for example, when a cord set is run over)
- At intervals not to exceed 3 months

Test equipment must be evaluated for proper operation immediately before and after tests are conducted.

### **Removal from service**

Any equipment failing any test shall be taken out of service, shall be tagged with a "Danger, Do Not Use" tag, secured and repaired or destroyed.

### **Ground Fault Circuit Interrupters (GFCI's)**

Ground Fault Circuit Interrupters (GFCI's) shall be used on receptacles >15 amps up to and including 30 amps for tool and equipment used in construction applications and potentially wet environments (either indoors or outdoors). Receptacles of temporary wiring systems and portable generators shall be protected with a GFCI.

The minimum requirements relative to the use of Ground Fault Circuit Interrupters are:

- Prior to use, and periodically thereafter, verify that the GFCI is in good working order. (e.g., Plug the GFCI into an outlet, plug a power tool or light in to the GFCI, hit the "test" button and verify that it interrupts current flow). Periodically re-test the GFCI to ensure continued effectiveness.
- Remove from service any GFCI that has insufficient load capacity, is damaged or is ineffective for any reason. Affix a "Danger, Do Not Use" tag and store the GFCI in a secure location until it can be replaced or repaired. Destroy and discard any GFCI that cannot be repaired or re-used.
- Train workers in the provisions of this section as related to safe use of GFCIs. This training should include:
  - Double insulated tools
  - Defective cords and plugs
  - Heavy moisture, and wet conditions
  - Operation, selection, and use of GFCI's

### **Assured Grounding Program**

When it is not possible to use GFCI's, the Assured Grounding procedures in this section shall apply. If unavoidable, the elements of this program shall include as a minimum:

- Written description of program
- Program coordinator
- Inspections
- Documented Testing
- Availability of Equipment
- Integrity of testing equipment (repairs/testing of test equipment)
- Handling of defective tools and equipment
- Who will perform tests, and repairs
- Recordkeeping
- How receptacles will be provided with GFCI's

Only qualified persons shall perform inspection and "color code" labeling of tools and equipment.

The color code scheme for labeling tools and equipment, as indicated in the following table, shall be used. This color code scheme is consistent with guidance from construction and electrical contractors. Tools and equipment shall be color coded on a quarterly basis when inspected and marked according to the Quarterly Code.

Month	Quarterly Code
January	White
February	White
March	White
April	Green
May	Green
June	Green
July	Red
August	Red
September	Red
October	Orange
November	Orange
December	Orange

### **Temporary Wiring**

This section applies to temporary electrical power and lighting wiring methods that may be of a class less than would be required for a permanent installation.

Temporary wiring shall be removed immediately upon completion of work and when the purpose for which the wiring was installed no longer applies.

### **General requirements for temporary wiring**

Feeders shall originate in a distribution center. The conductors shall be run as multi-conductor cord or cable assemblies or within raceways.

Branch circuits shall originate in a power outlet or panel board. Conductors shall be run as multi-conductor cord or cable assemblies or open conductors or shall be run in raceways. Conductors shall be protected by over-current devices at their ampacity.

Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment-grounding conductor, and receptacles shall be connected to the grounding system. Receptacles shall not be connected to the same ungrounded conductor of multi-wire circuits that supply temporary lighting.

Disconnecting switches or plug connectors shall be installed to permit the disconnection of ungrounded conductors of each temporary circuit.

Lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

The electric cords shall not be used to suspend temporary lights unless cords and lights are designed for this means of suspension. Temporary lighting shall be properly supported.

Portable electric lighting used in wet and/or other conductive locations, such as drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

A mounted box (with a cover) shall be used wherever a change is made to a raceway system or a cable system that is metal clad or metal sheathed. Non-metallic wiring system joints below seven feet (7') shall have mounted boxes and be covered. Exposed temporary joints shall have the wire nuts or other mechanical devices taped with black (electrical) tape to prevent them from falling off. Temporary joints including the ground wire shall have a mechanical connection.

Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points if protection is provided to avoid damage. Cords and temporary wiring passing through walls shall be properly protected (e.g., sleeved).

Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage. See the NEC, ANSI/NFPA 70, in Article 400, Table 400-4 that lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Note: SEU, SER or other similar cables cannot be laid on the floor despite their rating.

For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

#### **Clearances in the Workplace**

Workers shall not be permitted to work in such proximity to any part of an electric power circuit that the worker could contact the electric power circuit in the course of work unless the worker is protected against electric shock by deenergizing the circuit and grounding it (if appropriate) or by guarding it effectively by insulation or other means.

Supervisors and/or Competent Person(s) shall ascertain by inquiry, direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The supervisor/Competent Person shall post and maintain proper warning signs where such a circuit exists. The supervisor/Competent Person shall advise workers of the location of such lines, the hazards involved, and the protective measures to be taken.

Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

#### **Fuses**

Installing or removing fuses shall be considered as work with live electrical energy and shall be followed according to this policy section for operations conducting such activities.

Persons who perform work on high voltage fuses (over 600 volts) shall wear appropriate head, face, body flash suits, protective footwear, and insulated gloves.

Insulating electrical gloves, sleeves, aprons, and other protective electrical clothing shall be tested for leaks and integrity prior to initial use and periodically.

Protector gloves shall be worn over insulating gloves, except as defined in the above referenced standard.

Only manufacturer-qualified personnel shall inspect and make repairs to electrical insulating protective clothing.

**Workspace Clearances - 600 Volts, nominal, or less**

**Working space about electric equipment**

Sufficient access and working space should be provided and maintained for electric equipment to permit ready and safe operation and maintenance of such equipment.

**Working clearances**

Except as required or permitted elsewhere in this section, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while live shall not be less than indicated in the table below.

In addition to the dimensions shown in the following table, the workspace shall not be less than 30 inches wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tiles are considered to be grounded.

Working space is not required behind assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where connections are accessible from locations other than the back.

<b>Minimum Depth of Clear Working Space in Front of Electric Equipment (feet)</b>			
<b>Nominal voltage to ground conditions*</b>	<b>(a)*</b>	<b>(b)*</b>	<b>(c)*</b>
0-150	3	3	3
151-600	3	3 1/2	4
*Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated bus bars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.			
Note: For International System of Units (SI): one foot=0.3048m.			

Working space required in this section shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space shall be guarded.

At least one entrance should be provided to give access to the working space for electrical equipment.

Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet.

The minimum headroom of working spaces for service equipment, switchboards, panel boards, or motor control centers shall be 6 feet 3 inches.

### **Guarding of live parts**

Except as required or permitted live parts of electrical equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

- By location in a room, vault, or similar enclosure that is accessible only to qualified persons
- By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that person are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them
- By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons

In locations where electric equipment could be exposed to physical damage, enclosures or guards should be so arranged and of such strength to prevent damage.

Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

### **Workspace Clearances - over 600 volts, nominal**

Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applicable provisions of this section and with the following provisions that supplement or modify those requirements. The provisions of paragraphs listed paragraphs of this section do not apply to equipment on the supply side of the service conductors.

- Installations accessible to qualified persons only
- Installations accessible to unqualified person(s)
- Workspace about equipment

### **Enclosure for electrical installations**

Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are accessible to qualified persons only.

A wall, screen, or fence less than 8 feet in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8-foot fence. The entrances to buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

### **Installations accessible to qualified persons only**

Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the requirements of this standard and applicable regulatory standards.

### **Installations accessible to unqualified worker(s)**

Electrical installations that are open to unqualified workers shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed

switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

**Workspace about equipment**

Sufficient space shall be provided and maintained for electrical equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches high (measured vertically from the floor or platform), or less than 3 feet wide (measured parallel to the equipment). The depth shall be as required in the table below. The workspace shall be adequate to permit at least a 90-degree opening of doors or hinged panels.

The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in the following table, unless otherwise specified. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed.

However, working space is not required behind equipment such as dead front switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where connections are accessible from locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of thirty (30) inches horizontally shall be provided.

<b>Minimum Depth of Clear Working Space in Front of Electric Equipment (feet)</b>			
<b>Nominal voltage to ground conditions*</b>	<b>(a)*</b>	<b>(b)*</b>	<b>(c)*</b>
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75 kV	6	8	10
Above 75kV	8	10	12
*Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated bus bars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or tiles are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.			
Note: For International System of Units (SI): one foot=0.3048m.			

**Lighting outlets and points of control**

The lighting outlets shall be so arranged that workers changing lamps or making repairs to the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that workers are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

**Elevation of unguarded live parts**

Unguarded live parts above working spaces shall be maintained at elevations not less than specified in the following table.

<b>Elevation of Unguarded Energized Parts Above Working Space</b>	
<b>Nominal voltage between phases</b>	<b>Minimum elevation</b>
601-7,500	8 feet 6 inches
7,501-35,000	9 feet
Over 35kV	9 feet + 0.37 inches per kV above 35kV
Note: For SI units: one inch=25.4 mm; one foot=0.3048 m.	

**Entrance and access to workspace**

At least one entrance not less than 24 inches wide and 6 feet 6 inches high shall be provided to give access to the working space for electrical equipment. On switchboard and control panels exceeding 48 inches in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be guarded.

Electrical- Qualified Arc Flash Safety

**PURPOSE**

The purpose of this program is to set forth procedures for the safe use of electrical equipment, tools, and to comply with NFPA 70E requirements. Qualified workers who perform electrical activities in or around arc flash must adhere to the requirements of this program.

**SCOPE**

This program applies to all B&T Drainage, Inc., hereafter referred to as “B&T Drainage”, workers. When work is performed on a non-owned or operated site, the operator’s program shall take precedence, however, this document covers B&T Drainage workers and contractors and shall be used on owned premises, or when an operator’s program doesn’t exist or is less stringent.

B&T Drainage shall advise the host employer of:

- Any unique hazards presented by the contract employer’s work,
- Any unanticipated hazards found during work by B&T Drainage that the host employer did not mention, and
- The measures B&T Drainage took to correct any hazards reported by the host employer to prevent such hazards from recurring in the future.

**RESPONSIBILITIES**

## **Managers/Supervisor**

The HSE Manager or delegate will develop electrical safety programs and procedures in accordance with OSHA requirements and/or as indicated by events and circumstances.

Operations Managers and Supervisors are responsible for ensuring that only qualified workers and or qualified contractors perform electrical repairs or installations. Unqualified persons shall not be permitted to enter spaces that are required to be accessible to qualified workers only unless the electric conductors and equipment involved are in a safe working condition.

Operations Managers and Supervisors shall ensure a documented job briefing is held before starting each job and will include all workers involved. The briefing will cover hazards associated with the job, work procedures involved, special precautions, energy source controls and Personal Protective Equipment (PPE) requirements.

Operations Managers are also responsible for ensuring all applicable electrical safety programs are implemented and maintained at their locations.

Workers are responsible to use electrical equipment, tools, and appliances according to this program, for attending required training sessions when directed to do so and to report unsafe conditions to their supervisor immediately.

Only qualified workers may work on electric circuit parts or equipment that has not been de-energized. Such workers shall be made familiar with the use of special precautionary techniques, PPE, insulating and shielding materials and insulated tools. Prior to any work being done within the Limited Approach Boundary a hazard risk analysis shall be performed. The analysis shall contain event severity, frequency, probability, and avoidance to determine the level of safe practices employed.

## **PROCEDURES**

### **Limited Approach Boundary**

The limited approach boundary is the distance from an exposed live part within which a shock hazard exists. It is a shock protection boundary intended to define the approach limit for unqualified employees and to eliminate the risk of contact with an exposed energized electrical conductor.

When workers are closer than this minimum distance, special considerations are necessary for protection. Any worker within the limited approach boundary of exposed energized circuit conductors or circuit parts can do so only if an energized work permit has been completed and authorized. If an unqualified employee is required to work within the limited approach boundary, the employee must be directly and continuously supervised by a qualified person.

Prior to any work being done within the Limited Approach Boundary a hazard risk analysis shall be performed. The analysis shall contain event severity, frequency, probability, and avoidance to determine the level of safe practices employed. See Appendix I

### **Restricted Approach Boundary**

An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased likelihood of electric shock, due to electrical arc-over combined with inadvertent movement, for personnel working near the energized electrical conductor or circuit part.

The restricted approach boundary is a shock protection boundary that is not related to arc flash or incident energy. It is the approach limit for qualified employees. Qualified employees should have the knowledge and ability to avoid unexpected contact with an exposed energized conductor. If it is necessary for a qualified employee to cross the restricted approach boundary, the employee must be protected from unexpected contact with the conductors that are energized and exposed.

No qualified person shall approach or take any conductive object closer to exposed energized electrical conductors or circuit parts than the restricted approach boundary set forth in Table 130.4(E)(a) and Table 130.4(E)(b), unless one of the following conditions applies:

- (1) The qualified person is insulated or guarded from energized electrical conductors or circuit parts operating at 50 volts or more. Insulating gloves and sleeves are considered insulation only with regard to the energized parts upon which work is performed.
- (2) The energized electrical conductors or circuit parts are insulated from the qualified person and from any other conductive object at a different potential.

### **Arc Flash Boundary**

The Flash Protection Boundary is the approach limit at a distance from exposed live parts within which a person could receive a second degree burn if an electrical arc flash were to occur.

- Use PPE appropriate for working near exposed live parts and rated for the voltage and energy level involved.
- For systems of 600 volts and less, the flash protection boundary is 4 feet, based on an available bolted fault current of 50 kA and a clearing time of 6 cycles for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles.
- When working on de-energized parts and inside the flash protection boundary for nearby live exposed parts - If the parts cannot be de-energized, use barriers such as insulated blankets to protect against accidental contact or wear proper PPE.

### **See Appendix II – Arc Flash PPE Categories in NFPA 70E**

### **Arc Flash Hazard Analysis**

An arc flash hazard analysis includes the following:

- Collect data on the facility's power distribution system.
  - Arrangement of components on a one-line drawing with nameplate specifications of every device.
  - Lengths and cross-section area of all cables.
- Contact the electric utility for information including the minimum and maximum fault currents that can be expected at the entrance to the facility.
- Conduct a short circuit analysis followed by a coordination study is performed.
- Feed the resultant data into the NFPA 70E equations.
  - These equations produce the necessary flash protection boundary distances and incident energy to determine the minimum PPE requirement.

- The flash protection boundary is the distance at which PPE is needed to prevent incurable burns (2nd degree or worse) if an arc flash occurs. (It is still possible to suffer 1st or 2nd degree burns.)
  - For systems of 600 volts and less, the flash protection boundary is 4 feet, based on an available bolted fault current of 50 kA (kiloamps) and a clearing time of 6 cycles (0.1 seconds) for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles (5000 ampere seconds).

When working on de-energized the parts, but still inside the flash protection boundary for nearby live exposed parts:

- If the parts cannot be de-energized, barriers such as insulated blankets must be used to protect against accidental contact or PPE must be worn.
- Workers shall not reach blindly into areas that might contain exposed live parts.
- Workers shall not enter spaces containing live parts unless illumination is provided that allows the work to be performed safely.
- Conductive articles of jewelry and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal frame glasses) shall not be worn where they present an electrical contact hazard with exposed live parts.
- Conductive materials, tools, and equipment that are in contact with any part of a worker's body shall be handled in a manner that prevents accidental contact with live parts. Such materials and equipment include but are not limited to long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, and chains.
- When a worker works in a confined space or enclosed spaces (such as a manhole or vault) that contains exposed live parts, the worker shall use protective shields, barriers or insulating materials as necessary to avoid contact with these parts. Doors, hinged panels, and the like shall be secured to prevent them from swinging into workers. Refer to the confined space entry program.

### **Inspections**

- Electrical equipment, tools, and appliances must be inspected prior to each use.
- The use of a hard fixed GFCI or a portable GFCI adapter shall be used with all portable electric hand tools and electric extension cords.
- Faulty equipment, tools, or appliances shall be removed from service immediately and tagged "Out of Service", dated, and signed by the worker applying the tag. When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument shall be verified before and after an absence of voltage test is performed.

### **Equipment**

Test instruments, equipment, and their accessories shall meet the requirements of ANSI/ISA-61010-1- Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Part 1

General Requirements, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 Volts and below.

When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument shall be verified before and after an absence of voltage test is performed.

### **Personal Protective Equipment**

All insulating PPE must be inspected before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air test, along with the inspection. Maximum test intervals for rubber insulating personal protective equipment shall include:

- Blankets-before first issue/every 12 months thereafter
- Gloves-before first issue and every 6 months
- Sleeves before first issue and every 12 months
- Covers and line hose shall be testing if insulating value is suspect.

### **Energized Electrical Work Permit**

Work on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition shall be considered energized electrical work and shall be performed by written permit only.

### **Lighting**

Workers shall not enter spaces containing electrical hazards unless illumination is provided that enables the workers to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed workers shall not perform any task within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

### **Extension Cords (Flexible Cords)**

- Use only three-wire, grounded, extension cords and cables that conform to a hard service rating of 14 amperes or higher, and grounding of the tools or equipment being supplied.
- Only commercial or industrial rated-grounded extension cords may be used in shops and outdoors.
- Cords for use other than indoor appliances must have a rating of at least 14 amps.
- Cords must have suitable strain relief provisions at the plug the receptacle ends.
- Work lamps (drop light) used to power electrical tools must have a 3 wire, grounded outlet, unless powering insulated tools.
- Adapters that allow three wire, grounded prongs, connected to two wire non-grounded outlets are strictly prohibited.
- Cords must have a service rating for hard or extra-hard service and have S, AJ, ST, SO, SJO, SJT, STO, or SJTO printed on the cord.
- Cords may not be run through doorways, under mats or carpets, across walkways or aisles, concealed behind walls, ceilings, floors, or run through holes in walls, or anywhere where they can become a tripping hazard.
- High current equipment or appliances should be plugged directly into a wall outlet whenever possible.
- All extension cords shall be plugged into one of the following:
  - A GFCI outlet.

- A GFCI built into the cord.
- A GFCI adapter used between the wall outlet and cord plug.
- All extension cords and or electrical cords shall be inspected daily or before each use, for breaks, plug condition and ground lugs, possible internal breaks, and any other damage. If damage is found, the extension cord or electrical cord shall be removed from service and repaired or replaced.
- Extension cords shall not be used on compressor skid to operate heat tapes or any other type of equipment on a temporary basis. Heat tapes or other equipment shall be hard wired per applicable electrical codes.

#### **Outlets**

- Outlets connected to circuits with different voltages must use a design such that the attachment plugs on the circuits are not interchangeable.

#### **Multiple Outlet Boxes**

- Multiple outlet boxes must be plugged into a wall receptacle.
- Multiple outlet boxes must not be used to provide power to microwave ovens, toasters, space heaters, hot plates, coffeepots, or other high-current loads.

#### **Double Insulated Tools**

- Double insulated tools must have the factory label intact indicating the tool has been approved to be used without a three-wire grounded supply cord connection.
- Double insulated tools must not be altered in any way, which would negate the factory rating.

#### **Switches, circuit breakers, and disconnects**

- All electrical equipment and tools must have an on and off switch and may not be turned on or off by plugging or unplugging the supply cord at the power outlet.
- Circuit breaker panel boxes and disconnects must be labeled with the voltage rating.
- Each breaker within a breaker panel must be labeled for the service it provides.
- Disconnect switches providing power for individual equipment must be labelled accordingly.

#### **Ladders**

Inspect ladders prior to each use. Ladders used by B&T employees must meet OSHA/ANSI specifications. If a defective ladder is found on the job site, tag it out of service and send back to the shop for repair or disposal. No tape or other coverings will be put on ladders that might prohibit an adequate future inspection.

- Do not exceed the manufacturers load rating on the ladder.
- Survey surroundings when setting up a ladder – grade, other crafts, traffic, overhead lines, mud.
- The base of each ladder should be firmly set and level on the floor or ground.
- Set the ladder up with a 1:4 ratio – back the base of the ladder out 1 foot for every 4 feet of rise.
- Secure ladder – tie the ladder off or have a tool partner hold the ladder to secure it.
- Maintain 3 points of contact when traveling up and down a ladder.
- Do not carry items while climbing a ladder. Tools, materials, and/or equipment must be raised by hand line or other means.

- Stay off the top two steps of step ladder – Use the proper size ladder to reach you task.
- Step ladders should only be used their fully opened position.
- Straight ladders must extend 3-feet above landing area to give users a good hand hold.
- Do not use ladders as a scaffold brace or in aerial lifts.
- To maintain you balance – keep you belt buckle between the rails.
- Face ladder and do not limb back side of ladder.
- Do not move the ladder while in use.
- Keep ladder rungs should be kept clear of mud, ice and other slippery substances.
- Protect ladders used in locations such as doorways so they will not be knocked over.

### **Energized and Overhead High Voltage Power Lines & Equipment**

- A minimum clearance of 10 feet from high voltage lines must be maintained when operating vehicular and mechanical equipment such as forklifts, cranes, winch trucks, and other similar equipment.
- When possible, power lines shall be de-energized and grounded or other protective measures shall be provided before work is started.
- The minimum approach distance to energized high power voltage lines for unqualified workers is 10 feet.

Minimum approach distance for qualified workers shall be followed per 29 CFR 1910.333(c)(3)(i) Qualified – Table S5 Selection and Use of Work Practices - Approach Distances for Qualified Workers – Alternating Current).

### **Confined or Enclosed Workspaces**

- When a worker works in a confined or enclosed space that contains exposed energized parts, the worker shall isolate the energy source and turn off the source and lock and tag out the energy source (Only qualified electricians can work on an exposed energy source).
- Protective shields, protective barriers or insulating materials as necessary should be provided.

### **Enclosures, Breaker Panels, and Distribution Rooms**

- A clear working space must be maintained in the front, back and on each side of all electrical enclosures and around electrical equipment for safe operation and to permit access for maintenance and alteration.
- A minimum of two-foot working floor space in front of panels and enclosures shall be painted yellow.
- Workers may not enter spaces containing exposed energized parts unless illumination is provided that enables the workers to work safely.
- Housekeeping in distribution rooms must receive high priority to provide a safe working and walking area in front of panels and to keep combustible materials to the minimum required to perform maintenance operations.
- All enclosures and distribution rooms must have “Danger: High Voltage – Authorized Personnel Only” posted on the front panel and on entrance doors.
- Flammable materials are strictly prohibited inside distribution rooms (Boxes, rags, cleaning fluids, etc.)

### **Lock Out/Tag Out**

- No work shall be performed on (or near enough to them for workers to be exposed due to the dangers of tools or other equipment coming into contact with the live parts) live parts and the hazards they present.
- If any worker is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both.
- Conductors and parts of electrical equipment that have been de-energized but have not been locked or tagged out shall be treated as live parts.
- Per company policy all electrical will be outsourced and performed only by qualified and licensed electrical contractors who are familiar with the use of special precautionary techniques, PPE, insulating and shielding materials and insulated tools. Any equipment being made ready for maintenance will be locked out using B&T Drainage's Control of Hazardous Energy – Lock Out/Tag Out Program. Lock outs are performed by the HSE Manager, Shop Foreman, or Branch Manager. Designated workers in some branches may be trained by local management to lock out equipment. If live sources are to be worked, it will only be performed with the knowledge of local management. Only certified electricians may work on electric circuit parts or equipment.
- Only authorized personnel may perform lock out/tag out work on electrical equipment and will follow Company's Control of Hazardous Energy – Lock out/Tag Out Program.
- Authorized personnel will be trained in lock out/tag out procedures.
- Affected personnel will be notified when lock out/tag out activities are being performed in their work area.

### **Contractors**

- Only approved, certified, electrical contractors may perform construction and service work on Company or client property.
- It is the Manager/Supervisors responsibility to verify the contractor's certification.

### **Fire Extinguishers**

- Approved fire extinguishers must be provided near electrical breaker panels and distribution centers.
- Water type extinguishers shall not be located closer than 50 feet from electrical equipment.

### **Electric Shock-CPR:**

- If someone is discovered that has received an electric shock and is unconscious, first check to see if their body is in contact with an electrical circuit. Do not touch a person until you are sure there is no contact with an electrical circuit.
- When it is safe to make contact with the victim, begin CPR if the person's heart has stopped or they are not breathing.
- Call for help immediately.

### **Electric Welders**

- A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.
- A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means may not be less than the supply conductor ampacity.

### **Equipment Grounding**

- All gas compressors, air compressors, separators, vessels, etc. shall be grounded by means of using a lug and ground strap, nominal in size to a ½” bolt or larger, attached to a ground rod six feet or longer.
- Equipment bonding jumpers shall be of copper or other corrosion-resistance material.
- The transfer of hazardous or flammable material from a metal or plastic container with a flash point of 100 degrees F or less shall have a ground strap from the container and attached to the skid or a ground rod placed in the ground.

### **Training**

Workers are trained to understand the specific hazards associated with electrical energy. Workers shall be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with their respective jobs. Workers shall be trained to identify and understand the relationship between electrical hazards and possible injury.

Workers shall be trained in the skills and techniques to distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment, to determine the nominal voltage of exposed energized electrical conductors and circuit parts, the approach distances specified in Table 130.2 (below), and the decision making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely.

**APPENDIX I**  
**Limited Approach Boundary**

<b>Nominal system voltage range, phase to phase</b>	<b>Exposed movable conductor</b>	<b>Exposed fixed-circuit part</b>	<b>Restricted approach boundary (allowing for accidental movement)</b>	<b>Prohibited approach boundary</b>
0 to 50 volts	Not specified	Not specified	Not specified	Not specified
51 to 300 volts	10 ft. 0 in.	3 ft. 6 in.	Avoid contact	Avoid contact
301 to 750 volts	10 ft. 0 in.	3 ft. 6 in.	1 ft. 0 in.	0 ft. 1 in.
751 volts to 15 KV	10 ft. 0 in.	5 ft. 0 in.	2 ft. 2 in.	0 ft. 7 in.
15.1 kV to 36 KV	10 ft. 0 in.	6 ft. 0 in.	2 ft. 7 in.	0 ft. 10 in.
36.1 KV to 46 kV	10 ft. 0 in.	8 ft. 0 in.	2 ft 9 in.	1 ft. 5 in.
46.1 KV to 72.5 KV	10 ft. 0 in.	8 ft. 0 in.	3 ft 2 in.	2 ft. 1 in.
72.6 KV to 121 KV	10 ft. 8 in.	8 ft. 0 in.	3 ft. 3 in.	2 ft. 8 in.
138 KV to 145 KV	11 ft 0 in	10 ft. 0 in.	3 ft. 7 in	3 ft. 1 in.
161 KV to 169 KV	11 ft 8 in.	11 ft. 8 in.	4 ft. 0 in.	3 ft. 6 in.
230 KV to 242 KV	13 ft. 0 in.	13 ft. 0 in.	5 ft. 3 in.	4 ft. 9 in.
345 KV to 262 KV	15 ft. 4 in	15 ft. 4 in.	8ft. 6 in.	8 ft. 0 in.

**APPENDIX II**

**Arc Flash PPE Categories in NFPA 70E**

**PPE Category 1: Minimum Arc Rating 4 cal/cm<sup>2</sup>**

- **Required clothing:** Long sleeve shirt (or jacket) and pants or AR coverall with minimum arc rating of 4 cal/cm<sup>2</sup>
- **Required face and head protection:** Face shield (with “wrap around” guarding...i.e., balaclava) or arc flash suit hood
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following products are required or to be used as needed:

- **Required hand protection:** Heavy-duty leather gloves
- **Additional PPE:** Hard hat, eye protection (glasses, goggles), hearing protection
- **Footwear:** Leather footwear (as needed)

**PPE Category 2: Minimum Arc Rating 8 cal/cm<sup>2</sup> - workers need the following clothing:**

**Required clothing:** Arc rated long sleeve shirt and pants or arc rated coverall with minimum arc rating of 8 cal/cm<sup>2</sup>

- **Required AR face and head protection:** Arc rated arc flash suit hood or AR face shield, sock hood/balaclava with minimum arc rating of 8 cal/cm<sup>2</sup>
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following products are required or to be used as needed:

- **Required hand protection:** Heavy-duty leather gloves
- **Additional PPE:** Hard hat, eye protection (glasses, goggles), hearing protection
- **Footwear:** Leather footwear (as needed)

#### **PPE Category 3: Minimum Arc Rating 25 cal/cm<sup>2</sup>**

**PPE Category 3 and 4 require additional layers of PPE. Arc flash suit hoods are required and rubber insulating gloves & leather protectors or arc rated gloves are required. For PPE Category 3; workers need the following clothing:**

- **Required clothing:** Arc rated flash suit jacket and AR pant or AR coverall with minimum arc rating of 25 cal/cm<sup>2</sup>
- **Required AR face and head protection:** Arc rated flash suit hood with minimum arc rating of 25 cal/cm<sup>2</sup>
- **Required AR hand protection:** Rubber insulating gloves & leather protectors or arc rated gloves
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following PPE is required:

- **Additional PPE:** Hard hat, eye protection (glasses, goggles), hearing protection (inserts), leather footwear

#### **PPE Category 4: Minimum Arc Rating 40 cal/cm<sup>2</sup>**

**The final PPE category requires AR clothing with a minimum rating of 40 cal/cm<sup>2</sup>.**

- **Required clothing:** Arc rated flash suit jacket and AR pant or AR coverall with minimum arc rating of 40 cal/cm<sup>2</sup>
- **Required AR face and head protection:** Arc rated flash suit hood with minimum arc rating of 40 cal/cm<sup>2</sup>
- **Required AR hand protection:** Rubber insulating gloves & leather protectors or arc rated gloves
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following PPE is required:

- **Additional NFPA 70E PPE requirements:** Hard hat, eye protection (glasses, goggles), hearing protection (inserts), leather footwear.

### Hoisting and Rigging Safety

A thorough annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor. B&T Drainage, Inc. shall maintain a record of the dates and results of inspections and rated load tests for each hoisting machine and piece of equipment.

Any defective rigging equipment shall be removed from service. Before a crane is placed in service for use, rope components shall be inspected by a qualified person for defects, damage and deformities and at least monthly thereafter. Certification of this inspection shall be in writing and document the date of inspection; inspector's name and signature; and identification number of the rope component inspected.

Rigging equipment must have permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load. Rigging must not be loaded in

excess of its recommended safe working load as prescribed on the identification markings by the manufacturer; and must not be used without affixed, legible identification markings.

### ***Inspection of wire rope***

Wire rope shall be taken out of service when any of the following conditions exist:

- In running ropes, 6 randomly distributed broken wires in 1 lay or 3 broken wires in one strand in one lay;
- Wear of 1/3 the original diameter of outside individual wires.
- Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;
- Evidence of any heat damage from any cause;
- Reductions from nominal diameter of more than 1/64 inch for diameters up to and including 5/16 inch, 1/32 inch for diameters 3/8 inch to and including 1/2 inch, 3/64 inch for diameters 9/16 inch to and including 3/4 inch, 1/16 inch for diameters 7/8 inch to 1 1/8 inches inclusive, 3/32 inch for diameters 1 1/4 to 1 1/2 inches inclusive;
- In standing ropes, more than 2 broken wires in 1 lay in sections beyond end connections or more than 1 broken wire at an end connection.
- Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.

Heavy wear and/or broken wires may occur in sections that have contact with equalizer sheaves or other sheaves (where rope travel is limited) or with saddles. Particular care shall be taken to inspect ropes at these locations.

If rope has not been used for a month or longer (i.e. due to shut down or storage of a crane on which it is installed) this rope shall be given a thorough inspection before it is used.

This inspection shall be made by a designated person who is authorized by the Company.

This inspector shall examine rope for any kind of damage, deterioration or defect that might compromise the safety and specifications of the rope. Specific attention and care shall be given to the inspection of non-rotating rope.

Only this designated and authorized inspector shall give approval for use of this rope following satisfactory safety inspection as described above.

A written record of the inspector's certification shall be maintained by the Safety Coordinator in a file and be readily available for review and confirmation. This certification shall include the inspection date, name and signature of the inspector, and the identification number of the rope component that was inspected.

### ***Inspection of hoist chains***

Hoist chains and end connections shall be inspected daily for damage, deterioration, excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.

Chains shall be inspected visually by the operator each day or before first use.

Chains also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the chain that was inspected. Written certification records shall be maintained by the Safety Coordinator in a file.

***Inspection of hooks and hook components***

Crane hooks and safety latches shall be visually inspected each day or at the beginning of a shift prior to use for damage, cracks or deformation.

Hooks and safety latches also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the hook that was inspected. Written certification records shall be maintained by the Safety Coordinator in a file.

Hooks that have cracks or a throat opening that is greater than 15 percent in excess of normal or more than 10 degree twist from the plane of the unbent hook shall be discarded.

***Preventive maintenance***

The Company has implemented a preventive maintenance program to help ensure the safety of cranes, hoists, rigging and related equipment. Preventive maintenance shall be performed in accordance with manufacturer’s recommendations. Each crane shall have a written record of preventive maintenance that is maintained by the Safety Coordinator.

<i>Type of Inspection</i>	<i>Who?</i>
<i>Modified or repaired/adjusted</i>	<i>Qualified person</i>
<i>Post-assembly</i>	<i>Qualified person</i>
<i>Shift</i>	<i>Competent person</i>
<i>Monthly</i>	<i>Competent person</i>
<i>Annual</i>	<i>Qualified person</i>

**Qualified Riggers**

All riggers of (B&T Drainage, Inc.) will be qualified person for the performance of specified hoisting activities such as during assembly/disassembly work and those that require employees to be in the fall zone to handle a load. The rigger would be considered qualified through possession of a recognized degree, certificate, or professional standing; or by extensive knowledge, training, and experience, successfully demonstrating the ability to solve/resolve problems related to rigging work and related activities.

**Signal Persons:**

- *Qualification Requirements:*
  - *Know & understand signals*
  - *Competent in using signals*
  - *Basic understanding of crane operation*
  - *Verbal or written test plus practical test*

*Qualified How*

*Documentation*

*Portable*

<i>Third party qualified evaluator</i>	<i>Yes</i>	<i>Yes</i>
<i>Employer qualified evaluator</i>	<i>Yes</i>	<i>No</i>

### LADDER SAFETY

Inspect ladders prior to each use. Ladders used by B&T employees must meet OSHA/ANSI specifications. If a defective ladder is found on the job site, tag it out of service and send back to the shop for repair or disposal. No tape or other coverings will be put on ladders that might prohibit an adequate future inspection.

1. Do not exceed the manufacturers load rating on the ladder.
2. Survey surroundings when setting up a ladder – grade, other crafts, traffic, overhead lines, mud.
3. The base of each ladder should be firmly set and level on the floor or ground.
4. Set the ladder up with a 1:4 ratio – back the base of the ladder out 1 foot for every 4 feet of rise.
5. Secure ladder – tie the ladder off or have a tool partner hold the ladder to secure it.
6. Maintain 3 points of contact when traveling up and down a ladder.
7. Do not carry items while climbing a ladder. Tools, materials, and/or equipment must be raised by hand line or other means.
8. Stay off the top two steps of step ladder – Use the proper size ladder to reach you task.
9. Step ladders should only be used their fully opened position.
10. Straight ladders must extend 3-feet above landing area to give users a good hand hold.
11. Do not use ladders as a scaffold brace or in aerial lifts.
12. To maintain you balance – keep you belt buckle between the rails.
13. Face ladder and do not limb back side of ladder.
14. Do not move the ladder while in use.
15. Keep ladder rungs should be kept clear of mud, ice and other slippery substances.
16. Protect ladders used in locations such as doorways so they will not be knocked over.

### SCAFFOLD SAFETY

Scaffolding must be designed by a qualified person. Supported scaffolds must be able to support their own weight and at least four times the maximum intended load.

All employees are provided scaffold training by a qualified person. Training includes the following:

- The nature of any electrical hazards, fall hazards, and falling object hazards in the work area.
- The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used.
- The proper use of the scaffold along with proper handling of materials on the scaffold.
- The maximum intended load and the load-carrying capacities of the scaffolds used.
- Any other pertinent requirements.

Retraining of employees will occur in the following cases:

- when there is a change in jobsite that presents a hazard
- when there is a change in type of scaffold, fall protection, falling object protection, or other equipment that an employee is unfamiliar with
- whenever deemed necessary based on employee's work or skill.

Scaffolding must be inspected by a competent person before each work shift and after anything happens that could affect the structure.

Scaffolding needs to be 10 feet or more from power lines, or three feet if there are less than 300 volts, unless you are sure the power lines are de-energized.

You cannot work on a scaffold in high winds or storms, or with snow or ice accumulated.

Guidelines for Checking a Scaffold:

If a scaffold is more than two feet above or below a level, there must be a way to get on or off, such as a ladder or ramp. The access must not be more than 14" from the scaffold.

Put a standing scaffold on a firm foundation with base plates attached to feet.

Uprights must be vertical and braced to prevent swaying; platforms must be level.

A scaffold that is more than four times higher than its base is wide must be tied to supports.

Most scaffold platforms and walkways must be 18" wide or more. If a work area is less than 18" wide, guardrails and/or personal fall-arrest must be used.

Ten-foot planks must extend at least 6" past the end supports, but not more than 12"; no more than 1" between planks or between planks and uprights.

Wood planks must be unpainted, so any cracks will show.

Suspended Scaffolds:

Supporting outrigger beams must be able to support at least four times the intended load. To keep a scaffold from falling to the ground, it must be attached to the roof, tied to a secure anchorage, or secured with counterweights. The suspension ropes and rigging must support at least six times the intended load.

Counterweights must be attached to secure and strong places on a building so they won't move. Do not use bags of sand or gravel, masonry blocks or roofing materials that can flow or move.

Do not use gas-powered equipment or hoists. Hoists must have automatic brakes for emergencies.

A 1-point or 2-point suspended scaffold must be tied or secured to prevent swaying.

Fall Protection:

If a scaffold is more than 10 feet above a level, worker must have fall protection.

On most scaffolds, guard rails must be on all open sides and ends. On supported scaffolds and some other scaffolds, guardrails or personal fall protection is enough. On most suspension scaffolds, both are needed. Use a harness, not a body belt for personal fall protection.

You do not need a guard rail on the working side when the platform is less than 14" from the work (18" for plastering and lathing). The open side of an outrigger must never be more than 3" from the face of the building.

On supported scaffolds most of the time, the top rail must be 38" to 45" above the platform. A top rail must be strong enough to hold 200 pounds (or 100 pounds on single-point and two-point suspension scaffolds). A mid-rail must be about halfway between the platform and the top rail; most mid-rails must be able to hold 150 pounds. If mesh, screens, or panels are used, a top rail is needed (unless mesh was designed and installed to meet guardrail requirements).

Scaffold walkways must have not more than a 9.5" gap between planks and a guardrail

Protection for People Below a Scaffold:

There must be a 3 1/2" high toe board to prevent items from falling off a scaffold. If items are taller than 3 1/2" above the toe board, other systems such as debris nets can be used to catch falling tools or materials.

## FALL PROTECTION

### **1.0 Policy**

Work activities where employees may be subject to falls and/or falling objects shall be conducted safely with associated hazards eliminated and/or controlled.

***This policy covers minimum performance standards applicable to B&T Drainage, Inc. Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.***

### **2.0 Purpose**

To ensure that employees are protected from the hazards associated falls and falling objects.

### **3.0 Scope**

Applies to all B&T Drainage, Inc. Associates work sites, i.e., B&T Drainage, Inc. offices, client job sites, etc., where field construction related activities involve exposure to heights greater than or equal to six (6) feet and/or falling objects exist. In general industry (e.g. offices, shops, warehouses, etc.) exposure to heights greater than or equal to four (4) feet shall be in place of all references to the construction six (6) foot reference.

### **4.0 Definitions**

**Anchorage** means a secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of supporting 5,000 lbs. per employee or two times the intended impact load, whichever is greater, or for a positioning system, 3,000 lbs. without failure.

**Approved** means, for the purpose of this section, authorized by the Branch Safety Officer, tested and certified by the manufacturer or any recognized national testing laboratory to possess the strength requirements specified in this section.

**Catenary Line** – see **Horizontal Lifeline**.

**Competent Person** means an individual knowledgeable (through experience and/or training) of fall protection equipment, including the manufacturer’s recommendations and instructions for the proper use, inspection, and maintenance; who is capable of identifying existing and potential fall hazards; who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

**Controlled Access Zone** means an area in which certain work may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

**Deceleration Device** means a device manufactured (fall) shock-absorbing device whereby the forces of the fall are rapidly reduced to meet acceptable levels.

**Drop Line** means a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

**Employee** means every laborer regardless of title or contractual relationship.

**Fall Arrest System (Personal)** means the use of multiple, approved safety equipment components such as body harnesses, shock absorbing lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to ones body as to arrest a free fall.

**Fall Protection Work Plan** means a written planning document in which the employer identifies areas in the work area where a fall hazard of 6 feet or greater exists, whereby conventional Fall Restraint and Fall Arrest Systems cannot be utilized.

**Fall Restraint System** means an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level.

**Fall Distance** means the actual distance from the employee’s work platform (area) to the level where a fall would stop (ground level or otherwise).

**Full Body Harness** means a configuration of connection straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, positioning rings, or deceleration devices.

**Full Body Harness System** means a Class III full body harness and shock absorbing lanyard attached to an anchorage or attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in the applicable sections.

**Hardware** means snap hooks, D-rings, buckles, carabiners, and adjusters used to attach the components of a fall protection system together.

**Holes (floor, roof or walking surface)** means any opening in the floor greater than two inches whereby falling objects or an employee fall equal to, or greater than six foot is possible.

**Holes (wall)** – see **Wall Opening**.

**Horizontal Lifeline** means an approved rail, rope, or synthetic cable installed in a horizontal plane between two anchorages and used for attachment of an employee's lanyard or lifeline device while moving horizontally.

**Lanyard** means a flexible line of webbing, rope or cable (usually in two, four or six foot lengths) used to secure a harness to a lifeline or an anchorage point.

**Leading Edge** means the advancing edge of a floor or roof, where a fall of more than six feet is possible to the ground or to another level.

**Lifeline (vertical or horizontal)** means an approved vertical line from a fixed overhead anchorage or horizontal line between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured.

**Restraint Line** means a line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to restrict the employee from reaching a point where falling to a lower level is possible.

**Safety Line** – see **Lifeline**.

**Shock Absorbing Lanyard** means a flexible line of webbing or rope used to secure a harness to a lifeline or anchorage point that has an integral shock absorber of either a rip-stitch or retractable configuration.

**Snaphook** – means a 'locking' hook at the end of a lanyard or restraining/positioning line that has a double-action locking mechanism intended to eliminate unintentional unhooking from the D-ring of a body harness. Non-locking snaphooks are prohibited.

**Standard Guardrail** means a toprail at 42 inches high (plus or minus three inches), a midrail installed midway the top edge of the guardrail system and the surface.

**Static Line** – see **Lifeline**.

**Toeboard** means a barrier at the base of the guardrail system to prevent material and objects from falling off the surface. They are at least four (4) inches of nominal height with no less than one (1) inch clearance from the surface.

**Unprotected Sides and Edges** means any side or edge (except at entrances to points of access) of a floor, roof, ramp, or runway where there is no wall or guardrail system.

**Walking/Working Surface** means for the purpose of this section, any area whose dimensions are 45 inches or greater in all directions through which employees pass or conduct work, and can include scaffolding and aerial lifts regardless of surface dimensions.

**Wall Opening** means a gap in a wall where the outside bottom edge is 6 feet or more above lower levels, and the inside bottom edge (e.g. parapit wall) is less than 39 inches above the walking/working surface.

**Work Area** means that portion of a walking/working surface where work activities are being performed.

## 5.0 Requirements

## 5.1 Training

Fall Protection training requirements shall include:

- New employees with work responsibilities requiring the use of fall protection will be oriented to the B&T Drainage, Inc. Associates Fall Protection Program (and any local addendums) as part of the 'new employee orientation program'.
- At new worksites, i.e. B&T Drainage, Inc. offices, client job sites, etc., during the pre-job meeting to describe specific fall protection requirements of the job.
- Thereafter, every foreseeably exposed employee will be trained at least annually, and include the following:
  - The nature of fall hazards in the typical work area
  - The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems
  - The use and operation of conventional and non-conventional fall protection systems
  - The role of each employee in the safety monitoring system when such a system is in use
  - The limitations on the use of mechanical equipment during the performance of roof work on low-slope roofs
  - The correct procedures for equipment and materials handling and storage, and the erection of overhead protection
  - The correct fit, maintenance and use of (personal) fall arrest system components, as determined by the manufacturer(s)
  - Rescue procedures in the event an individual falls
  - All other details in this section (and local addendums)

Toolbox talks for related issues of this manual section shall be covered periodically.

Retraining shall also occur whenever deficiencies in the training program are identified, standard requirements change or are modified or new fall protection systems are introduced.

Any employee who has not received orientation or annual training (as previously outlined) shall not be allowed to work at heights identified by this section.

Training provided shall be documented and maintained in a training file at the Branch Office. Training will include dates of training, instructor's name, topics / material covered and attendee names.

**5.2 Conventional Fall Arrest and Fall Restraints Systems shall be utilized where the exposure to falls greater than 6 foot and from falling objects as is reasonably foreseen. The following systems shall be utilized:**

**5.2.1 Guardrail System (fall restraint and potentially from falling objects)**

Toprails and midrails of guardrail systems constructed of wood shall be at least ¼ inch diameter or thickness to prevent cuts and lacerations.

If wire rope is used for top rails, it shall be flagged at not more than 6 feet intervals with high-visibility material. Steel and plastic banding are prohibited for use as top rails or midrails.

The top edge height of top rails, or (equivalent) guardrails shall be 42 inches, plus or minus 3 inches, above the walking/working level.

When employees are using ladders in distance proximity equivalent to the maximum use-length of the ladder, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the maximum use-length height of the ladder, or see **Special Control Procedures** (5.4.5) portion (for ladders) of this manual section for other options.

Screens, midrails, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there are no walls or parapet walls at least 21 inches high. When midrails are used, they shall be installed at a height midway between the top edge of the guardrail system and the walking/working level. When screens and mesh are used, they shall extend from the top rail to the walking/working level. Intermediate members, such as balusters, when used between posts, will not be more than 19 inches apart.

The guardrail system shall be capable of withstanding a force of at least 200 pounds of force applied within 2 inches of the top edge in any outward or downward direction. When the 200 pounds is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working level.

Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members will be capable of withstanding a force of at least 150 pounds of force applied in any downward or outward direction at any point along the midrail or other member.

Guardrail systems shall be free of sharp edges and burrs to protect against punctures or lacerations and to prevent clothing from snagging.

The ends of top rails and midrails shall not overhang terminal posts, except where such an overhang does not constitute a projection hazard.

When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.

At uncovered holes, guardrail systems shall be set up on unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it shall be covered or provided with guardrails along unprotected sides/edges.

If guardrail systems are used around uncovered holes that are used as access points (such as ladderways), gates shall be used or the guardrail shall be offset at a 45 degree angle to prevent accidental walking into the hole. Toeboards shall be utilized around the edges not utilized as the actual access point.

If guardrails are used at unprotected sides or edges of ramps and runways, they shall be erected on each unprotected side/edge.

When guardrail systems, in combination with netting, is used to prevent materials from falling from one level to another, openings shall be small enough to prevent passage of potential falling objects.

### **5.2.2 Covers for Holes (fall restraint and from falling objects)**

Covers (or a guardrail system with toe boards...see Guardrail Systems within this section) shall be installed over holes equal to or greater than 2" in floors, roofs and walkways that are more than 6 feet above lower levels.

Hole covering material shall support at least two times the potential weight that will cross over it. If plywood is chosen as the cover material, it shall be of at least ¾ inch in thickness.

Hole covers shall be secured in place in such a manner as to not easily be displaced. Examples of securing methods include, but are not limited to: nailing, attached cleats, wire, etc.

Such covers shall have the word 'HOLE' or 'COVER' predominately marked on the top surface. Where covers are too small for such marking, they shall be painted or significantly marked in the color orange.

### **5.2.3 Restraining/Positioning System (fall restraint)**

Only full body harness systems with positioning rings are to be utilized with any restraining/positioning system.

Restraint line (rope) length shall not exceed the distance to fall exposure, and shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.

Requirements for body harness systems, snaphooks, D-rings, and other connectors used with positioning device systems shall meet the same criteria as those for fall arrest systems (5.2.4) of this section.

No makeshift fall protection equipment may be utilized.

**Body belts are prohibited.**

#### **5.2.4 (Personal) Fall Arrest System (fall arrest)**

(Personal) Fall Arrest Systems shall do all of the following:

- Limit maximum arresting force on an employee to 1,800 pounds. Note: total body weight including tools cannot exceed 310 lbs. to stay under arresting force limit
- Be rigged so that an employee can neither free fall more than 6 feet nor contact any lower level
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet
- Have sufficient strength to withstand 5000 lbs. (excluding horizontal lifelines which require a safety factor of at least two times the potential impact energy)
- All components of the (personal) fall arrest system (lanyards, body harness and attached hardware, and shock-absorbing devices) shall meet the design specifications of OSHA 1926.502 Subpart M

The following items/actions are prohibited for use with (personal) fall arrest systems:

- body belts
- non-locking snaphooks
- lanyards without shock absorbers
- tying back to the lanyard (once around another object) for a means of an anchorage point, unless the lanyard was designed for this purpose by the manufacturer, the object tied around can support the anticipated fall force and the object does not have sharp edges or burrs

#### **5.2.5 (Personal) fall arrest systems shall be utilized in the following manner:**

##### **5.2.5.1 Pre-Use Inspection**

All components shall be inspected prior to each use for wear damage, and other deterioration in accordance with manufacturer's requirements (see equipment inspection and maintenance procedures of this section).

### **5.2.5.2 General Proper Body Harness Fit Guidelines (two employees are usually required to completely fit each other)**

The body harness type and size shall meet the physical needs of its user (male/female or small, medium, large, etc.).

Follow the manufacturer's guidelines on proper fit.

Shoulder, thigh, button and chest straps shall be fit snugly whereas it is slightly difficult to slide the hand underneath.

Loose straps ends shall be folded back under.

D-ring placement should be between the shoulder-blades.

Chest straps should be positioned across the mid-chest area.

### **5.2.5.3 Sufficient Anchorage Points Utilized**

Anchorage shall be used under the supervision of a competent person, as part of a complete (personal) fall arrest system that maintains a safety factor of at least two (i.e., capable of supporting at least twice the weight expected to be imposed upon it).

Anchorage used to attach (personal) fall arrest systems will be independent of any anchorage being used to support or suspend platforms and shall be capable of supporting at least 5,000 pounds of force per person attached.

Anchorage points can include:

- Lifelines (horizontal and vertical)
- Designed anchorage points on aerial lifts
- Eye-bolts listed for use by the manufacturer
- Specially designed anchorage tools specifically designed to meet fall force requirements, including:
- Wrap-around lanyards as approved by the manufacturer
- I-beam clamps designed specifically as an anchorage point

**Prohibited anchorage points** include, but are not limited to:

- Standard guardrails and railing
- Ladders/rungs
- Scaffolding, unless approved by the manufacturer for/with anchorage points

- Light fixtures, ductwork, conduit, pipe vents, wiring/duct/piping harnesses, other roof stacks, vents or fans
- C-clamps
- Piping (unless capable of meeting the criteria of an anchorage point)
- To a lanyard (around a solid object), unless the lanyard and hardware is manufactured for that purpose

#### **5.2.5.4 Lifeline/Lanyard Applications**

Lanyards shall only be attached to anchorage points sufficient to meet the fall force requirements.

Shock-absorbing lanyards are required to limit the fall force to less than 1800 pounds.

**Self-retracting lanyards (retractables)** capable of withstanding the tensile load of 3,000 lbs. that limit the free fall distance to two (2) feet or less are always recommended and **are required when the fall distance is less than nineteen and one-half (19.5) feet.**

Lanyards that do not limit free fall distance to 2 feet or less, such as ripstitch lanyards and tearing/deforming lanyards will be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Horizontal lifelines will be designed, installed, and used under the supervision of a Competent Person, as part of a complete (personal) fall arrest system. Lifelines shall be protected against being cut or abraded. Horizontal lifelines cannot exceed sixty feet in length.

Vertical lifelines shall be utilized with leading edge work, shall reach the ground, and the method of anchorage attachment shall be of proper design (i.e. no knots).

#### **5.2.6 Safety Net System (fall arrest and potentially from falling objects)**

When utilized, safety nets shall be installed as close as practicable under the walking/working surface on which employees are working and never more than 30 feet below such levels.

Safety nets will be inspected at least once a week for wear, damage, and other deterioration. The maximum size of each safety net mesh opening will not exceed 36 square inches nor be longer than 6 inches on any side, and the openings, measured center-to-center, of mesh ropes or webbing, will not exceed 6 inches.

Defective/unfit nets are not to be used and are to be taken from service and immediately destroyed by cutting into unusable sizes and properly disposed.

Mesh crossings will be secured to prevent enlargement of the mesh opening. Each safety net or section will have a border rope for webbing with a minimum breaking strength of 5,000 pounds. Connections between safety net panels will be as strong as integral net components and be spaced no more than 6 inches apart.

Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net surface.	Minimum required horizontal distance of outer edge of net from edge of working surface.
Up to 5 feet	8 feet
More than 5 feet up to 10 feet	10 feet
More than 10 feet	13 feet

Safety nets shall be tested at the beginning of each workday and shall be capable of absorbing an impact force of a drop test consisting of a 400-pound bag of sand 30 inches in diameter dropped from the highest walking/working surface at which workers are exposed, but not from less than 42 inches above that level. Employees shall not be allowed in work areas controlled with safety nets until this test is complete.

If safety nets are utilized for the dual purpose of employee fall protection and the protection of other workers from fall objects, the net webbing opening shall be small enough to prevent passage of potential falling objects.

Items that have fallen into safety nets, such as materials, scrap, equipment, and tools, shall be removed as soon as possible and at least before the next work shift.

**5.3 Where conventional fall restraint and fall arrest methods cannot be utilized (or utilized safely), the following non-conventional methods can be utilized**

A written work plan shall be developed when a project or task possesses a fall exposure whereby these systems are utilized. A sample written plan format can be found in 29 CFR 1926 Subpart M Appendix E.

A Competent Person will develop and implement a written Fall Protection Work Plan including each area of the work place where the employees are assigned and where fall hazards of 6 feet or more will exist. The Risk Assessment for this project/task should be reviewed for this document.

The written Fall Protection Work Plan shall include:

- Identification of fall hazards in the work area
- Describe the non-conventional method (or in combination with conventional method) of fall protection to be provided

- Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of any fall protection system to be used
- Describe the correct procedures for the handling, storage, and securing of tools and materials
- Describe the method of providing overhead protection for workers who may be in or pass through the area below the work site
- Describe the method for prompt, safe removal of injured workers
- Describe the method for destruction of personal fall arrest system equipment subjected to the forces of any fall
- Be available at all times on the jobsite

### **5.3.1 Controlled Access Zone System**

Controlled access zone systems shall be set up as follows:

- Zone shall be established no closer than six (6) feet or further than twenty-five (25) feet from any leading edge
- Control line shall extend parallel along the entire length of the unprotected or leading edge
- Only trained employees are allowed in the Zone
- The Zone shall have signage marking it as a 'Controlled Access Zone'

### **5.3.2 Warning Line System (pitches of $\leq 4:12$ and flat surfaces only)**

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than 6-foot intervals with high-visibility material
- Rigged and supported so that the lowest point including sag is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface
- Stanchions, after being rigged with warning lines, will be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge
- The rope, wire, or chain will have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall support without breaking the load applied to the stanchions as prescribed above

- Line will be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over
- Warning lines will be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line will be erected not less than 6 feet from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation

When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet from the roof edge.

The warning line system shall be used in conjunction with one of the following:

- safety monitoring system (most common); or
- (personal) fall arrest system; or
- safety net system; or
- guardrails

### **5.3.3 Safety Monitoring System**

A competent person will appoint the 'safety monitor' and will ensure that the safety monitor:

- Is competent in the recognition of fall hazards
- Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices
- Is operating on the same walking/working surfaces of the employees and can see them
- Is close enough to work operations to communicate orally with the employees and has no other duties but the monitoring function
- Has the authority to stop work

Only employees engaged in roof/surface work and the safety monitor shall be allowed in an area where an employee is being protected by a safety monitoring system.

## **5.4 Specific Fall Hazard Procedures**

### **5.4.1 Aerial Personnel Lifts**

Employees utilizing aerial personnel lifts (e.g. scissor lifts, genie lifts, cherry-pickers, boom-lifts, etc.) shall use a restraint/positioning system or (personal) fall arrest system, even though a guardrail system is in place. Refer to Aerial Personnel Lifts section (8) for specific information on operating this equipment.

Attachment points for these systems shall be capable of withstanding 5,000 pounds and shall be maintained in the floor of the lift or where designed by the manufacturer.

Rails of such lifts shall not to be used as attachment points unless designed for that purpose by the manufacturer.

#### **5.4.2 Excavations**

Employees who work at the edge of an excavation 6 feet or more deep will be protected from falling into the excavation by guardrail systems or covers. Refer to Excavation & Trenching section (16) for specific information.

Where walk-ways are provided to permit employees to cross over excavations, guardrails are required on the walkway if the fall would be 6 feet or more to the lower level.

#### **5.4.3 Hoist Areas**

Each employee in a hoist area will be protected from falling 6 feet or more by guardrail, restraint/positioning or (personal) fall arrest systems. Refer to Equipment section (15) for specific information on utilizing this equipment.

If guardrail systems (or chain gate or guardrail), or portions thereof, must be removed to facilitate hoisting operations, as during the landing of materials, and a worker shall lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee shall be protected by a (personal) fall arrest system.

#### **5.4.4 Falling Objects (additional protection from)**

Except for scaffolding and aerial lifts, no materials or equipment shall be stored within 6 feet of working edges.

When **canopies** are used as protection from falling objects, canopies shall be strong enough to prevent collapse and to prevent penetration by any objects that may fall onto them.

When **toeboards** are used as protection from falling objects, they shall be erected along the edges of the overhead walking or working surface for a distance sufficient to protect persons working below. Toeboards will be capable of withstanding a force of at least 50 pounds of force applied in any downward or outward direction at any point along the toeboard. Toeboards will be a minimum of four (4) inches tall from their top edge to the level of the walking/working surface, have no more than one (1) inch clearance between its bottom and the surface.

**5.4.5 Ladders (where work height (due to leaning out) exposure is equal to, or exceeds six foot and/or the maximum ladder height is within the distance to a leading edge)**

If work is performed outside the rails of a ladder equal to, or exceeding 6' ; or if three-point contact on the ladder cannot be maintained, a (Personal) Fall Arrest Systems shall be utilized if anchorage points are available.

If anchorage points are not available or other traditional fall control systems are not feasible, a non-conventional system can be utilized (see 5.3 of this manual section).

**5.4.6 Leading Edge Work**

Employees working near a leading edge 6 feet or more above lower levels shall be protected by guardrail, safety net, restraint/positioning, or (personal) fall arrest systems. If these systems are not feasible the systems under 5.3 of this manual section can be utilized.

**5.4.7 Roadway/Vehicular Passage Covers**

Covers located in roadways and vehicular aisles shall be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected, and secured/marked as indicated in 5.2.2 of this manual section.

**5.4.8 Roofs (work from or on)**

**5.4.8.1.1 Low-sloped (<4:12 pitch)**

Employees engaged in roof activities on low-slope roofs with unprotected sides and edges 6 feet or more above lower levels will be protected from falling by guardrail systems, safety net systems, (personal) fall arrest systems or a combination of a warning line system and guard-rail system, warning line system and safety net system, warning line system and (personal) fall arrest system, or warning line system and safety monitoring system.

**5.4.8.2 Steep Roofs (>4:12 pitch)**

Employees on a steep roof with unprotected sides and edges 6 feet or more above lower levels will be protected by either guardrail systems with toeboards, a safety net system, or a (personal) fall arrest systems.

**5.4.9 Wall Openings**

Employee working on, at, above, or near wall openings (including those with chutes attached) shall be protected from falling by the use of either a guardrail system, a safety net system, or a (personal) fall arrest system.

**5.5 Equipment Inspection and Maintenance Procedures**

**5.5.1 Inspection, Replacement and Destruction**

All equipment hereafter noted shall be visually inspected before each use, replaced immediately if any of the defective conditions are found, tagged 'out of service' and sent back to the Branch for destruction.

### **5.5.2 Body Harness Inspection**

Beginning at one end, holding the body side of the harness toward you, grasp one area of the harness with your hands six to eight inches apart. Bend the strap in an inverted "U". Follow this procedure the entire length of the belt or harness. Watch for frayed edges, broken fibers, pulled stitches, cuts, burn marks or chemical damage. Special attention should be given to the attachment of buckles and D-rings to strap webbing. Inspect for frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface.

Rivets should be tight and unmovable with fingers. Body-side rivet base and outside rivet burr should be flat against the material. Bent rivets will fail under stress. Especially note condition of D-ring rivets and D-ring metal wear pads (if applicable). Discolored, pitted, or cracked rivets indicate chemical corrosion.

The tongue or billet of bolts receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted, or broken grommets. Harnesses using punched holes without grommets should be checked for torn or elongated holes causing slippage of the tongue buckle.

### **5.5.3 Hardware (Buckles, D-Rings, Snaps and Thimbles)**

Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on frame. Check for distortion or sharp edges.

Inspect the friction buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.

Inspect the sliding bar buckle frame and sliding bar for cracks, distortion, or sharp edges. The sliding bar should move freely. Knurled edge will slip if worn smooth. Pay special attention to corners and ends of sliding bar.

Inspect the forged steel D-ring for cracks or other defects. Inspect the assembly of the D-ring to the body pad or D-saddle. If the D-ring can be moved vertically independent of the body pad or D-saddle, the harness should be replaced. Check D-Rings and D-Ring metal wear pad (if any) for distortion, cracks, breaks, and rough or sharp edges. The D-Ring bar should be at a 90 degree angle with the long axis of the belt and should pivot freely.

Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seal into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper.

The thimble must be unmovable in the eyes of the splice, and the splice should have no loose or cut strands. The edges must be free of sharp edges, distortion, or cracks.

#### **5.5.4 Lanyard (shock-absorbing)**

Begin at one end and work to the opposite end. Slowly rotate the lanyard so the entire circumference is checked. Factory spliced ends require particular attention.

#### **5.5.5 Lanyard (Webbing) Retractable**

Bend the webbing over a non-lacerating edge, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks, and charring are obvious signs of chemical or heat damage. Closely observe for any breaks in the stitching.

#### **5.5.6 Rope**

Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken, or cut fibers. Areas weakened by extreme loads will appear as noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period. Strands should be separated and inspected since the rope may wear on the inside if grit or moisture becomes embedded.

#### **5.5.7 Storage/Cleaning**

Storage areas shall be maintained as clean, dry and free of exposure to fumes or corrosive elements.

Cleaning methods established by the manufacturer shall be followed for all components. Generally, the following applies for body harnesses:

- Wipe off surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion
- Wipe the belt dry with a clean cloth. Hang freely to dry but away from excessive heat
- Bolts and other equipment should dry thoroughly without close exposure to heat, steam, or long periods of sunlight
- Mildly dirty cotton may be cleaned normally. For heavy dirt or grease, soak belts in a solution of one tablespoon of grease cutter to one gallon of water. DO NOT USE A STRONGER SOLUTION. After soaking, rinse again, then hang to dry
- Fall protection, which is not in the original package, shall be stored in a clean, dry area

### **5.6 Post-Fall or Near-Miss Incidents**

Fall incidents and near-misses shall be thoroughly investigated to determine root causes and facilitate corrective measures to prevent reoccurrences.

Employees involved in a fall equal to, or greater than 6' shall be required to receive an immediate medical evaluation.

All components of a (personal) fall arrest system involved in any fall with a fall distance of over six feet shall be immediately and completely replaced. Such equipment shall be tagged 'out of service' and sent back to the Branch for destruction.

## MOTOR VEHICLES AND MECHANIZED EQUIPMENT SAFETY

### **PURPOSE**

This written Motor Vehicle Safety Program establishes guidelines to ensure that we hire capable operators, only allow eligible operators to drive a "covered motor vehicle," train and supervise operators, and maintain vehicles properly pertaining to the service provided by B&T Drainage, Inc.; hereafter referred to as "B&T Drainage". A "covered motor vehicle" is a motor vehicle that is owned, leased, or rented by the company or is a driver-owned vehicle operated during work time. B&T Drainage drivers may be assigned to use a company vehicle to visit clients, make deliveries, attend meetings, pick up supplies, or to do a variety of other tasks. When driving is part of the job, like every other task, it must be done safely. Adherence to this written program can improve traffic safety performance, minimize the risk of motor vehicle incidents, and help to keep our drivers safe and our costs as low as possible. Management leads, supports, and enforces this program; but driver input is essential for its success. B&T Drainage will comply with all Federal and State agency requirements.

### **RESPONSIBILITIES**

#### **Administration**

B&T Drainage Safety Manager is our Motor Vehicle Safety Program Administrator. The Program Administrator coordinates the Motor Vehicle Operation Program elements for our company. This person is responsible for setting up and managing the program so that managers, supervisors, and drivers know what our company expects. The Safety Manager will examine our existing policies and practices to ensure that they encourage and do not discourage reporting and participation in our program. In this way, early reporting of motor vehicle incidents and hazards and meaningful driver participation in the program are more likely to occur. All company incentive programs are designed to reward safe motor vehicle operation (such as active participation in the program, the identification of motor vehicle hazards in the workplace, and the reporting of motor vehicle incidents early), rather than to reward drivers for having fewer or lower rates of motor vehicle incidents. The responsibility and authority to allow a driver to operate a company vehicle lies squarely on the shoulders of B&T Drainage Management Representative in charge of the keys to the vehicle that will be driven. For this program to be administratively effective, good judgment, and correct choices must be made by the person in charge of their section or group of drivers and vehicles. Prior to the assignment of any vehicle to any driver or prior to allowing a driver to drive their own vehicle on company business or the continuation of driving any vehicle, B&T Drainage or driver owned vehicle, the following will be reviewed for the criteria below.

A current valid state driver's license with no "Status Actions"; driver must be at least 18 years old or 21 years old to drive interstate vehicles, or 18 years of age or older to drive a Fleet Vehicle. A review of the driving record (3 years back initially, then annual thereafter) will be done. If the MVR indicates no violations, or the following minor violations, the driver may be considered for qualification by B&T Drainage management. They are:

- conviction of one or more minor moving violations, if no more than 6 points have been assessed

- minor accident (no injuries) Note: If the driver/operator can remove the citation by going to traffic school, B&T Drainage will take this action into consideration for final qualification of the driver.

If the driver's MVR indicates the following major violations, then the driver is NOT qualified to drive for B&T Drainage:

- Operating a vehicle under the influence of a drug or alcohol
- Implied Consent Refusal (refusal to take blood alcohol test and or urine analysis)
- Committing homicide, manslaughter, or aggravated assault with a vehicle
- Failing to stop if you are involved in a traffic accident
- Reckless driving
- Felony speeding
- License Suspension or Revocation

Notification by B&T Drainage insurance carrier that the driver is ineligible for auto insurance coverage will cause the driver to be ineligible to drive. The above-listed violations should not be considered all inclusive, and these are not the only major violations that would disqualify the worker as a driver for B&T Drainage. Management reserves the right to make the final decision as to whether the driver will be qualified to drive for B&T Drainage.

#### **DEFINITIONS**

**Fleet Vehicle** - Any motor vehicle a company owns or leases that is used in the normal operations of a company. Vehicles which are used in the operation of a company, but are owned by company drivers, are not fleet vehicles. Fleet vehicles include gasoline/diesel powered vehicles and alternative-fuel vehicles. Commercial driver's license (CDL) A license issued to an individual by a State or other jurisdiction of domicile, in accordance with the standards contained in this part, which authorizes the individual to operate a class of a commercial motor vehicle.

**Commercial motor vehicle (CMV)** - A motor vehicle or combination of motor vehicles used in commerce to transport passengers or property if the motor vehicle:

- Has a gross combination weight rating or gross combination weight of 11,794 kilograms or more (26,001 pounds or more), whichever is greater (including) towed unit(s) with a gross vehicle weight rating or gross vehicle weight of more than 4,536 kilograms (10,001 pounds), whichever is greater; or
- Has a gross vehicle rating, gross combination weight rating, gross vehicle weight or gross combination weight of 4,536 kg (10,001 lbs.) or more; or
- Is designed or used to transport more than 8 passengers for compensation or more than 15 passengers without compensation: or
- Is of any size and is used in the transportation of hazardous materials.

**Gross combination weight rating (GCWR)** - The value specified by the manufacturer as the loaded weight of a combination (articulated) vehicle. In the absence of a value specified by the manufacturer, GCWR will be determined by adding the GVWR of the power unit and the total weight of the towed unit and any load thereon.

**Gross vehicle weight rating (GVWR)** - The value specified by the manufacturer as the loaded weight of a single vehicle.

**Out-of-service order (OOS)** - A declaration by an authorized enforcement officer of a Federal, State, Canadian, Mexican, or local jurisdiction that a driver, a commercial motor vehicle, or a motor carrier

operation, is out-of-service pursuant to FMCSR 386.72, 392.5, 395.13, 396.9, or compatible laws, or the North American Uniform Out-of-Service Criteria.

**Motor vehicle** - A vehicle, machine, tractor, trailer, or semitrailer propelled or drawn by mechanical power that is used on highways.

## **PROCEDURES**

### **Commercial Driver Qualifications (CMV and CDL)**

A person shall not drive a commercial motor vehicle unless they are qualified to drive a commercial motor vehicle. B&T Drainage shall not require or permit a driver to drive a commercial motor vehicle unless that driver is qualified to drive a commercial motor vehicle.

- A driver is qualified to drive a CMV:
  - If they are at least 18 years old or 21 years old to drive interstate vehicles.
  - Can read and speak the English language sufficiently to converse with the public, to understand highway traffic signs and signals in the English language, to respond to official inquiries, and to make entries on reports and records.
  - Can, by reason of experience, training, or both, safely operate the type of commercial motor vehicle they drive.
  - Is physically qualified to drive a commercial motor vehicle in accordance with FMCSR's Physical Qualifications and Examinations. Holds a current medical card and has provided a copy to their employer.
  - Has a currently valid commercial motor vehicle operator's license issued only by one State or jurisdiction (for GVWs or GCVWs of 26,001+ lbs).
  - Has prepared and furnished B&T Drainage with the list of violations or the Certificate of Violations.
  - Is not disqualified to drive a commercial motor vehicle under FMCSR §391.15.
  - Has successfully completed a driver's road test and has been issued a certificate of driver's road test or has presented an operator's license or a certificate of road test which we may accept as equivalent to a road test under FMCSR §391.33.

Final determination will be the responsibility of B&T Drainage Management with the advice of the Safety Manager.

All commercial drivers for B&T Drainage must always be prepared for their driving of a company CMV. There are many items, mainly documentation and proofs. Most CMV/CDL drivers will need:

- Certificate of Registration
- Hours of service records (logbook)
- Registration papers (cab cards, permits, etc.)
- Proof of insurance
- Driver's license documents and any related certificates
- Special permits for oversize and overweight loads, if required
- Hazardous materials shipping papers, and placards if required
- Fuel tax permits (IFTA)

- Bills/Invoices, etc. showing content and origin of agricultural products, if required
- Evidence of financial responsibility

Only pre-qualified and authorized drivers may operate company owned, rented, leased or their personal vehicle, used for company business.

### **Cell Phone Use and Texting**

There shall be no cell phone usage by any company CMV/CDL drivers while operating a company vehicle unless that vehicle or the driver's phone is equipped with a "Hands-free" operating system. The commercial driver should pull over at a safe location and then return the phone call if necessary. There shall be NO TEXTING while driving by anyone operating a vehicle (Fleet or CMV); the driver shall read or create texts only when stopped and parked in a safe location for him/her and the vehicle.

### **Driving Safety**

While it's important to understand B&T Drainage vehicle safety program, as a driver, you must put safe driving techniques into practice each time you get behind the wheel. The following safe driving strategies are under the driver's control:

- Make sure the vehicle is safe to operate.
- Bring supplies you may need in case of an emergency.
- Wear your seat belt.
- Drive defensively, not aggressively.
- Pay attention to your driving and avoid distractions.
- Only drive when you're alert and fully awake.
- Never drive under the influence of alcohol, medications, or illegal drugs.

**Note: Seat belts are the single most effective means of reducing deaths and serious injuries in traffic crashes.**

### **Vehicle Inspections**

Safe driving starts before you turn the ignition key. Always inspect the vehicle before you start your trip. Make sure:

- The vehicle does not have any visible damage that affects its safe operation.
- The tires are properly inflated (use the vehicle manufacturer's recommendations that are typically noted on a sticker inside the door, glove box, or trunk - the pressures stamped on the tire are not specific to the vehicle). Check the pressure when the tires are cold.
- Tires have sufficient tread depth (tread depth should be at least 1/16 inch).
- The vehicle's fluid levels are correct (oil, brake, transmission, battery, and wiper fluids).
- Belts and hoses are free of blisters, cracks, and cuts.
- The vehicle has plenty of fuel.
- The windshield wipers are in good condition and are functional.
- You are familiar with the location and operation of all the vehicle's controls; and the seat, steering wheel, and mirrors are properly adjusted.
- Headlights, brake lights, turn signals, emergency flashers, and interior lights are working.
- The seat belt is properly adjusted, and it's in good condition.
- The vehicle is equipped with an emergency kit.
- Loose objects are secured so they won't shift during a sudden stop or turn.

### **Plan for Emergencies**

In case of a breakdown or accident, your first actions should be to move the car to a safe area, remain in the car (if there is no risk of fire or other danger), and call for help. Some basic provisions to include in an emergency supply kit can include:

- A phone and a list of emergency phone numbers.
- First aid supplies.
- Roadside warning triangles or flares (follow instructions for their safe use).
- A fire extinguisher.
- Water and food.
- Clothing (raincoat; warm clothing, hat, mittens/gloves; comfortable boots/shoes).
- Basic car maintenance tools (a flashlight with fresh batteries; battery jumper cables; a jack, lug nut wrench, and spare tire; water for the radiator; oil; windshield wiper fluid; rags; gloves; etc.)

### **Be Defensive**

It's best to always practice defensive driving techniques. Continually check your mirrors, leave enough following distance, and keep a cushion of space around the vehicle in case you need to quickly change lanes or go onto the shoulder. Aggressive driving acts include:

- Speeding.
- Tailgating.
- Failing to signal lane changes.
- Running red lights or stop signs.
- Passing on the right.

Aside from being aggressive, taking these actions can result in getting a ticket. The best advice is to share the road - allow other drivers to merge as needed. Safely move out of an aggressive driver's way; don't become part of a conflict.

### **Stay focused and alert**

Driving is no time to multi-task. Stay focused on the road. Drivers can be distracted by a variety of things:

- Conversations with passengers.
- Eating, drinking, or grooming.
- Tuning the radio or selecting a CD to play.
- Reading maps or directions.
- Using electronic navigation systems.
- Using a cell phone.
- Get a full night of rest before driving.
- Stop and get out of the car to stretch and walk about every two hours.
- Set a realistic goal of how many miles you can safely drive each day.
- Avoid taking medications that cause drowsiness.

### **What to do in Case of an Accident**

**Stop at Once!** Check for personal injuries and send for an ambulance, if needed. Do not leave the scene but ask for the assistance of bystanders.

- If Fire or Smoke Is Present evacuate vehicle occupants to a safe location. If stalled on a railroad track, evacuate occupants to a safe location away and at a right angle from the tracks.
- If Fire, Smoke, or Spilled Fuel is Present send for the fire department. Do not leave the scene; ask a bystander to call the fire department. If possible, use a spill kit to absorb the spill.

**Protect the Scene.** Set emergency warning devices to prevent further injury or damage. Secure your vehicle and its contents from theft.

**Secure Assistance** of the police whenever possible. Record names and badge numbers. Do not leave without law enforcement presence on scene.

**Record Names, Addresses, and Phone Numbers** of all witnesses injured and driver(s) and their passengers, record vehicle license numbers. Take complete pictures with cell phone or camera.

**Do Not Argue!** Make no statement except to the proper authorities and to Management. Sign only official police reports. Do not make statements regarding the operating condition of your vehicle and do not admit fault.

**Report the Incident to Your Supervisor/Safety Manager IMMEDIATELY** after first aid has been given, authorities have been notified, the scene has been protected and you are able to do so.

**Complete the Incident Report** at the scene (or with your Supervisor ASAP) and as thoroughly as possible. Make sure the Safety Manager gets copies of all incident paperwork and related information within 24 hours.

**If You Strike an Unattended Vehicle** and cannot locate the owner, leave a note with your name and B&T Drainage's address and phone number, get the vehicle description, VIN number and license plate number.

A motor vehicle incident is a negative occurrence that involves a "covered" motor vehicle and that caused or could have caused injury, illness, or property damage.

All motor vehicle incidents will be investigated to determine their causes and whether the incidents were preventable. Understanding the root causes of incidents and why they are happening, regardless of fault, forms the basis for eliminating them in the future.

If any of the following traffic violations occur, whether in the driver's personal vehicle (on or off company business) or while operating an owned, rented, or leased vehicle, suspension of driving or operating any vehicle will be immediate:

- Operating a vehicle under the influence of a drug or alcohol
- Implied Consent Refusal (refusal to take blood alcohol test and or urine analysis) •  
Committing homicide, manslaughter, or aggravated assault with a vehicle
- Failing to stop if you are involved in a traffic accident

- Reckless driving
- Felony speeding
- License Suspension or Revocation
- Cancellation of the driver's auto insurance by the driver's insurance carrier.

The above-listed violations should not be considered all inclusive, and these are not the only major violations that would suspend the driver as a driver. Management reserves the right to make the final decision. B&T Drainage follows 49 CFR Subpart C 383.33 for CMV drivers. If the driver is found to not have reported to B&T Drainage any traffic violation, suspension, or revocation of their license, by reviewing their MVR on an annual basis or as often as deemed necessary, the driver will be subjected to disciplinary action up to and including termination. It is the overall responsibility of all drivers to maintain proper and acceptable driving records and all licenses required for their position.

### **Drugs and Alcohol**

In accordance with our Drugs and Alcohol Policy driving a company owned, rented, leased or personal vehicle on company business, while under the influence of drugs or alcohol shall result in immediate termination.

### **Training**

Under no circumstances may a driver operate a covered motor vehicle until they have successfully completed this company's initial training on motor vehicle safety. B&T Drainage supervisor of that driver is responsible for conducting training if they assign that driver to driving duties. B&T Drainage requires a preceding state issued, driving record (Motor Vehicle Report "MVR"), for each driver-applicant operating a vehicle which is company owned, rented, or leased as well as any personal vehicle used on Company business. If the driver has an out-of-state license, they will be required to submit their MVR from that state for our review. The MVR will be reviewed by a responsible management official for determination of qualification of each driver. B&T Drainage shall also obtain an MVR on each driver thereafter on an annual basis.

Through training we ensure that motor vehicle operators are knowledgeable in practices such as B&T Drainage expectation; impaired, fatigued, aggressive, distracted, and defensive driving; seat belt use; vehicle inspection; security and motor vehicle incident procedures; cargo securement; handling hazardous materials and spills; and safety features and emergency equipment.

### **Driver training must include the following:**

- Pre-trip safety inspection.
- Use of vehicle controls and equipment, including operation of emergency equipment.
- Operation of vehicle, including turning, backing, braking, parking, handling, and vehicle characteristics including those that affect vehicle stability, such as effects of braking and curves, effects of speed on vehicle control, dangers associated with maneuvering through curves, dangers associated with weather or road conditions that a driver may experience (e.g., blizzards, mountainous terrain, high winds), and high center of gravity;
- Procedures for maneuvering tunnels, bridges, and railroad crossings.
- Requirements pertaining to attendance of vehicles, parking, smoking, routing, and incident reporting; and
- Loading and unloading of materials, including:
  - Compatibility and segregation of cargo in a mixed load.

- Package handling methods; and
- Load securement.

After a driver has completed the training program, management will determine whether the driver can safely operate a motor vehicle. If the driver passes, management places a training record in the driver's personnel file or driver qualification (DQ) file.

### **Evaluation**

Individual assigned management evaluates each trained operator to verify that the driver has retained and uses the knowledge and skills needed to operate safely. If the evaluation shows that the driver is lacking the appropriate skills and knowledge, the driver is retrained.

The Safety Manager will review motor vehicle records periodically to ensure that operators maintain a good driving record. The results of each check are made known to Human Resources.

A driver may lose their privilege to operate a company vehicle for work or operate a company-owned-leased-rented vehicle for personal use, if after an incident(s), accident(s), or after a violation(s) it was discovered to be the driver's fault and preventable; the Safety manager may recommend the driver receive additional training if warranted. Besides all the safety issues surrounding the driving of a commercial motor vehicle, there are other safety issues that can affect a driver. Examples of these are back strain and lifting concerns; slip- trip-falls; and personal safety in parking lots and other places.

Training and policy documents have been developed to address some of these driver safety topics. It is inherent that deficiencies may occasionally arise in this Motor Vehicle Safety Program. By having our program thoroughly evaluated, periodically and as necessary, and promptly taking action to correct any deficiencies in our program, we can eliminate problems effectively. Note: The occurrence of a motor vehicle incident does not in itself mean that the program is ineffective.

All drivers have a general obligation to work and drive safely.

## FIRE PROTECTION AND PREVENTION

### **PURPOSE:**

Fire Prevention/Protection Policy is intended to provide compliance with all related regulation and standard safe work practice. The purpose of the policy is to prevent fires and to provide guidelines for action in the event that a fire does occur.

Fire prevention program combines the following policies:

- PPE Policy
- Electrical Safety Policy
- Emergency Action Plan

These policies encompass methods used for incidence avoidance, incident response and specialized training required in the event of a fire.

Issues addressed in the above policies include, but are not limited to:

- Evacuation Procedure

- Extinguisher Training
- Basic Process Safety Training (if applicable)
- Hot Work Safety Training (if applicable)
- Confined Space Entry Safety Training (if applicable)
- Emergency Life Support Training
- Respiratory Protective Devices Training (if applicable)
- Assured Grounding Programs

**POLICY:**

Employees shall be informed of the proper actions to take in the event of a fire. This includes, but is not limited to; notification and evacuation procedures. It is STRESSED that at no time does the task of fighting fire supersede an employee's primary duties of:

- Ensuring their own personal safety and the safety of others.
- Reporting the incident to the proper authority and ensuring personnel accountability for yourself and all subordinates at the jobsite, in accordance with company and client policy.

**PROCEDURE:**

- All employees are responsible for good housekeeping practices to enhance fire prevention methods. Supervisors will be held accountable for the housekeeping of their job sites.
- If applicable, welding machine mufflers will be equipped with an approved spark arresting muffler.
- Only approved containers will be used during fueling operations. These shall be of the self-closing type.
- Flammable material shall be kept under the control. It shall be stored in compliance with applicable OSHA and client regulations. The quantity of flammable/combustible material shall be kept to a minimum on the job site.
- Welding, cutting and grinding sparks shall be contained.
- Hot work areas shall be kept wetted down, and a fire extinguisher and hose maintained on each jobsite.
- Oily rags shall be immediately disposed of in designated hazardous waste containers.
- No hot work is to be performed without a Hot Work Permit.
- All vehicle entry into process areas requires a permit or permission from the operator.
- Use bonding straps to discharge and prevent static charges during transfer of flammable liquids from one container to another.
- Report all spills or suspicious odors immediately.
- Fire extinguishers are to be kept in areas easily accessible to employees. Only approved fire extinguishers are to be used. They must have an inspection tag attached. Extinguishers are to be maintained in a fully charged, ready to operate state. Extinguishers are to be inspected before each use and documented annually. Training is provided to all employees who use or may use fire extinguishers.

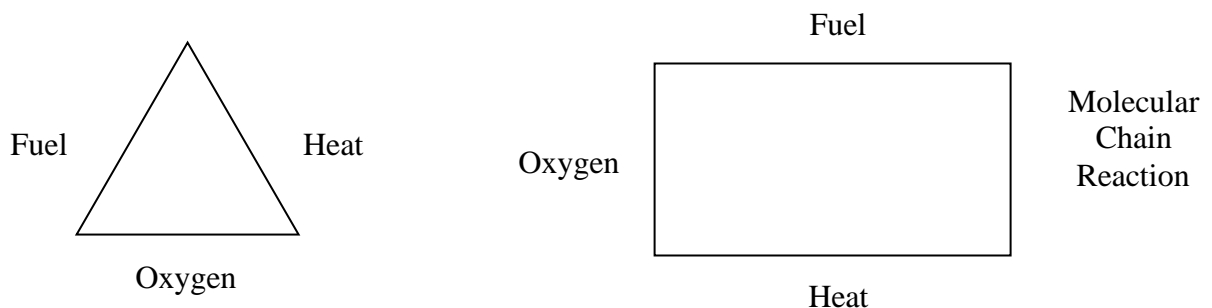
- **NEVER** put yourself or others a risk while attempting to extinguish an incipient fire.
- **DO NOT USE** any fire hoses larger than 1-3/4", unless fully trained as an industrial firefighter.
- **NEVER** attempt to extinguish a pressurized-fuel fed fire.
- **DO NOT** direct a fire nozzle with a straight stream at any type of LPG fire. This action could extinguish the fire, producing an LPG vapor cloud capable of detonation.
- **DO NOT USE** fire monitors as the force can damage small equipment and certain high chrome alloy equipment cannot have water applied as cracking could occur.
- **DO NOT APPLY** water to any acid or caustic release as it can cause a violent reaction. Additionally, low concentration acids or caustics become extremely corrosive, causing an increasing leak condition.

#### IN THE EVENT OF A FIRE:

- Remain calm
- Only extinguish a fire when it is clearly within your abilities and the equipment available
- Know the location of the nearest alarm and how to activate the emergency system
- Know the evacuation routes and collection points
- If the fire cannot be extinguished, leave the area immediately and report to your evacuation area
- Await further instructions from the Incident Commander, or designated responsible personnel

#### BASIC FIRE SCIENCE:

- The combination of fuel, heat, oxygen equals the well-know fire triangle. To understand fire better, a fourth factor is added, a molecular chain reaction. This is due to the fact that fire results from a series of reactions in which complicated molecules "crack" into easily oxidized fragments. Disruption of this chain, along with the removal of fuel, heat or oxygen, is recognized as a method of fire extinguishment through the use of dry chemical extinguishers.



- **Heat Energy** - Can be produced by building up molecules (composition) or breaking apart (decomposition) by heat or a solution when materials are dissolved in a liquid, or by combustion.

- **Heat Transfer** - A law of physics states that heat tends to flow up from a hot substance or place to a cold substance or place. This is through conduction (transfer of heat through a medium such as metals) or through convection (transfer of heat with a medium-usually circulatory).
- **Fuels** - Those substances that will burn when heat is applied. The most common fuels are not pure elements such as carbon, but compounds and mixtures such as paper and wood.
- **Oxygen** - Makes up a major portion of the oceans and earth's crust and one-fifth of our atmosphere. Atmospheric oxygen is the major source of oxygen that supports combustion. Oxygen itself does not burn, however, without it, combustion is impossible. Normal burning is the combination of fuels with oxygen under the influence of heat.
- **Combustion** - A rapid oxidation or chemical combination accompanied by heat.
- **Oxidation** - The ability of materials to produce oxygen during a chemical reaction.
- **Spontaneous Combustion** - When oxidation is allowed to occur, enough oxygen is available, heat is produced, molecules become more energetic and combine with oxygen at an increasing rate, temperatures rise and visible heat (flames) are produced.

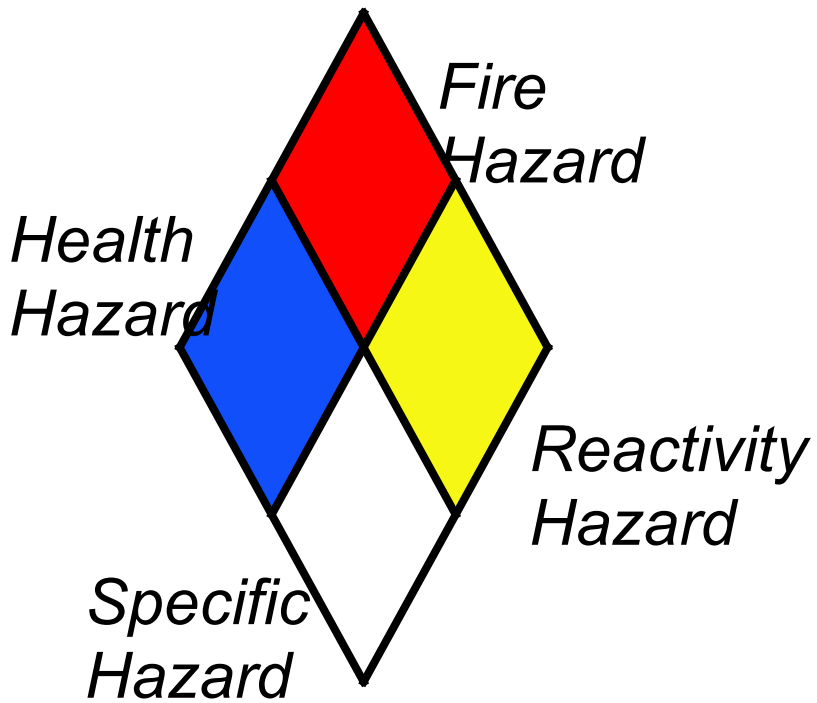
#### **CLASSES OF FIRES:**

- Class A - **Ordinary combustibles (wood/paper/textiles)**
- Class B - **Flammable liquids (gasoline/oils/grease)**
- Class C - **Live electric (wiring/generators/motors)**
- Class D - **Combustible metals (finely divided form/chips, turnings)**


#### **TYPES OF FIRE EXTINGUISHERS:**

- **Water** - extinguisher for ordinary combustible fires
- **Dry Chemical or CO2** - extinguisher for electrical equipment fires and for flammable liquid fires
- **Multipurpose Dry Chemical** - extinguisher for ordinary combustible fires, liquid fires, and electrical equipment fires
- **Foam** - extinguishing agent for hydrocarbon fires

#### **NFPA Diamond:**



Scale ranges from 0 (lowest hazard) to 4 (highest hazard)

Fire Hazard (Red)	Health Hazard (Blue)	Reactivity (Yellow)	Specific Hazards (White)
Flash Points	4 Deadly	4 may detonate	Oxidizer = OX
4 below 73 <sup>o</sup> F	3 Extreme Danger	3 shock and heat, may detonate	Acid = ACID
3 below 100 <sup>o</sup> F	2 Hazardous	2 violent chemical change	Corrosive = COR
2 from 100 - 200 <sup>o</sup> F	1 Slight Hazard	1 unstable if heated	Use no water ≡ W
1 above 200 <sup>o</sup> F	0 Normal Material	0 stable	Radioactive = 
0 will not burn			

CONCRETE AND MASONRY CONSTRUCTION

Compliance with company safety requirements listed below should greatly reduce or eliminate the injuries and accidents that occur to frequently during concrete and masonry construction.

1. All protruding reinforcing steel, onto which employees could fall, must be guarded to eliminate the hazard of impalement.
2. Employees are not permitted behind the jack during tensioning operations.
3. Signs and barricades must be erected during tensioning operations to limit employee access.
4. Employees are prohibited from riding in concrete buckets.
5. Employees are prohibited from working under concrete buckets while the buckets are being elevated or lowered into position.
6. Employees are required to wear protective head and face equipment when applying cement, sand, and water mixtures through a pneumatic hose.

### HOT WORK

\*\*\*B&T Drainage, at this time, does not have a need for the hot work program. In an effort to protect employees from potentially hazardous working conditions, a hot work program has been developed and will be implemented as needed for the protection of our employees.

#### **PURPOSE:**

The purpose of this policy is to establish cutting and welding safety procedures and to ensure that all cutting and welding operations are performed in the safest manner possible, and in compliance with applicable regulations.

#### **POLICY:**

All cutting and welding operations shall be performed in compliance with OSHA standards and all other applicable state, local and client regulations, policies, procedures and standard safe work practices. Welding is restricted to areas or situations where adequate fire prevention, welder protection and passerby protection can be assured.

#### **PROCEDURES:**

This safety standard is intended as a guide to safe practices in welding, burning, brazing and related operations. The precautions and protective measures outlined are recommended minimum requirements. Welders should exercise judgment in applying these precautionary measures in such matters as length of work periods, poor ventilation, unusual work locations, and specialized operations. Additional protective measures may be required in certain instances.

#### **TRAINING:**

- Fire Watch Training – At a minimum the fire watch will be trained to the following standards: A “Fire Watch” is a person specifically trained and assigned to warn others of hazards associated with flammable materials, and when capable to prevent incipient stage fires.
  - Ensure proper “Hot Work” permit is on site
  - Ensure permit is signed by all appropriate personnel
  - Ensure adequate means of access and egress are provided to the work site
  - Read and understand all permit provisions, and maintain the conditions of the permit at all times
  - Wear an identification vest (made of flame retardant material)

- Maintain appropriate sewer drain coverage (if applicable)
- Maintain a charged fire hose to the end nozzle, and/or a charged dry chemical fire extinguisher with current inspection tags
- Maintain spark containment by using approved fire blankets
- Prevent the taking of samples, venting, or opening of piping or equipment in the immediate area of the hot work
- Must be able to communicate in English so that you can inform others in the event of emergency conditions
- Determine the exact location of firefighting equipment in the immediate area
- Ensure proper barricading and warning signs are used
- Continuously monitor the work area during and for 30 minutes after hot work has finished to ensure no smoldering embers or slag exist
- During actual hot work, keep area wet when possible
- Continuously monitor the work area and surrounding area for any unsafe conditions, or potentially hazardous conditions
- In the event of a hazardous condition, emergency, or changing environment, the fire watch will stop all work until it is safe to resume
- Never leave the work site unless the work has stopped, or until you are relieved by another employee with equal or greater training and knowledge
- Ensure surrounding conditions are inspected and precautions are taken with consideration given to wind direction
- Ensure equipment such as welding machines, hoses, tools, etc., are located so as not to impede access or egress, or access to firefighting equipment
- In the event of a fire - Remain calm
- Only extinguish a fire when it is clearly within your abilities and the equipment available
- Know the location of the nearest alarm and how to activate the emergency system
- Know the evacuation routes and collection points
- If the fire cannot be extinguished, leave the area immediately and report to your evacuation area
- Await further instructions from the Incident Commander, or designated responsible personnel
- Only trained and qualified personnel may operate or maintain welding, cutting or brazing equipment Welders/Cutters will be trained per this policy and will possess the appropriate certifications for their work scope.
- Craft who perform any of the functions covered by this policy will be required to complete training including:
  - A test or other method to determine competency

- All training records shall be documented and kept on file with Human Resources

**General Rules**

**Initial Assessment – Fire is a primary focus and the assessment for fire protection guide should be used:**

A dedicated fire watch is required for all hot work. If the object to be cut, burned or brazed cannot be moved and if all fire hazards cannot be removed, then guards shall be used to confine the heat sparks and slag and to protect the immovable fire hazards. If these steps cannot be taken to prevent fire, then the hot work will be stopped until a safer alternative is available to perform the work safely.

Supervisor/qualified personnel will inspect the area prior to work beginning, and authorize the work. The competent person will be trained to perform his/her job functions and to identify substandard conditions/acts. The competent person shall ensure all oxygen-fuel gas supply equipment is suitable, safe to use, and in good working condition for the hot work.

Inspections and certification records will be kept for recordkeeping.

If	And	Then
The object to be welded, cut or heated can be moved	A fire-resistant, safe workspace is available	Welding, cutting or heating shall be done in that space.
The object to be welded, cut or heated cannot be moved	All fire hazards can be moved to a safe distance	Welding, cutting or heating can be done once fire hazards are taken to a safe place.
The object to be welded, cut or heated cannot be moved	All the fire hazards cannot be removed	Guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

1. Before doing any welding or burning, outside of an area approved for routine hot work, be certain the necessary Hot Work Permit has been issued. All hot work will be approved by the client and the site supervisor. The crew responsible for the equipment will ensure all is suitable and in good working order. All equipment is inspected prior to beginning work and all crew members using the equipment will be familiar with “American Welding Society Standard A6-1-1966”. Any equipment that is not ready for service or needs repair shall be red-tagged and repaired by qualified personnel.
2. Whenever it is necessary for hoses, lines or cords to cross walkways or work areas, they must be strung overhead or protected by planks laid on both sides of the hose. All hoses, cord and leads and other welding equipment must be maintained in a safe and serviceable condition, with no fraying or exposed copper permitted. They should be deployed in a manner that does not create tripping hazards.
3. Contain all sparks with fire blanketing.
4. Before each use, hose must be inspected for leaks, burns, worn places, loose connections, or other defects which may render the hose unfit for service. Hose burned by a flash back must be discarded.
5. Welding machine ground connections must be made on or as close as possible to the object being worked upon to assure a good ground and prevent damage to valves, pump bearings, etc.

6. Welding machine grounds shall not be made to handrails, stairs, or to projections from steel power or lighting towers, or on any active oil, gas, steam, air, or chemical line.
7. Temporary power lines to portable arc welding machines should be carried overhead whenever practical, or laid on the floor or ground suitably protected so that they cannot be damaged or interfere with safe passage.
8. Necessary precautions must be taken to protect against electrical shocks when working in wet or damp places.
9. In electric welding, all parts of the body should be covered to prevent skin burns from ultra-violet rays or molten metal. The feet and ankles are particularly vulnerable to burns, and care should be taken to see that they are properly protected.
10. Do not use ear cotton when welding. Sparks or slag may ignite the cotton.
11. Welding rod shall not be stored in its original container once the container has been opened. When an original container is opened, the rod shall be immediately transferred to either a rod oven or an approved container, such as the plastic "rod guard" container. The original container shall then be crushed and properly disposed of.
12. Full spark containment is required and any exposed equipment or small bore piping must be protected from damage. A trained fire watch must be present at all times hot work is in progress.
13. Two sets of Flash Back arrestors must be installed on oxyacetylene system; one set installed at regulators and one set at torch handle (unless torch is equipped with arrestors).
14. Welders must wear Z-87 Safety Glasses with side shields under their welder's hoods.
15. Grinders are required to have OSHA approved guards in place at all times. Exceptions must be approved by the Safety Department.
16. Only pipe stands that are designed to prevent pinch points at the center tube locking washer, and a stop at the base of the center tube to prevent crushing type injuries shall be used.
17. All welding rigs must be in safe operating condition and be properly identified.
18. Welding rigs must have emergency brake set and transmission in park or low gear when parked. If there is any slope the wheels must be chocked. When exiting a welding rig, welders must wear all required PPE.
19. The work area must be kept clean and materials including used weld rod removed when job is complete.
20. All welding rigs shall have a fire extinguisher.
21. Approved spark arrestors are required on all welding machines.
22. Always inspect grinders before each use. Grinders must have ground fault circuit interrupters (GFCI's)
23. Welding hoods must be equipped with the proper shaded lens for protection against radiant energy. (According to chart)
24. Make sure all sewers, drains, pits, pipe trenches, confined spaces; enclosed spaces have been tested for flammable vapors and/or hydrocarbons. Cover all openings per client policy.

### Filter Lens Shade Numbers for Protection against Radiant Energy

Shade Number	Welding Operation
10	Shielded metal arc welding 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
11	Gas-shielded arc welding (nonferrous) 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
12	Gas-shielded arc welding (ferrous) 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
12	Shielded metal-arc welding 3/16, 7/32, 1/4-in. diameter electrodes
14	Shielded metal-arc welding 5/16, 3/8-in. diameter electrodes.
10 to 14	Atomic hydrogen welding
14	Carbon arc Welding
2	Soldering
3 or 4	Torch Brazing
3 or 4	Light cutting, up to 1 in.
4 or 5	Medium cutting, 1 in. to 6 in.
5 or 6	Heavy cutting, over 6 in.
4 or 5	Gas welding (light), up to 1/8-in.
5 or 6	Gas welding (medium), 1/8-in. to 1/2-in.
6 or 8	Gas welding (heavy), over 1/2-in.

### Gas Cylinders

1. Compressed gas cylinders are to be shut-off at the bottle when not in use or unattended for short periods of time. At the end of the shift the bottles are to be shut off and gauges and hoses detached and properly stored and protective caps installed.
2. Compressed gas cylinders shall have gauges removed and be capped prior to transportation. Cylinders shall only be transported or stored in the up position.
3. Use approved storage racks or dollies to store compressed gas cylinders. Chain or #9 wire may also be used. Never use rope for this purpose.
4. On welding rigs compressed gas cylinders shall be securely stored in vertical racks.
5. Oxygen and acetylene cylinders must be stored at a distance of 20 feet apart or be separated by a fire wall that is 5 feet or higher and has a fire rating of 60 minutes or more. These cylinders must be kept at least 20 feet away from combustibles or separated by a fire wall.
6. Do not use a choker or chokers to haul cylinders.
7. Keep cylinders away from work so sparks, slag, or flame cannot reach them. If cylinders cannot be isolated, fire resistant shields must be provided for them.
8. Cylinders shall always have the gauges removed and cylinder caps installed prior to being moved.
9. Acetylene shall never be exposed to unalloyed copper except in a torch.
10. Compressed gas cylinders shall be equipped with connections that conform to ANSI B57.1-1965.
11. Cylinders shall be marked to identify contents.
12. No more than 15 psi of acetylene shall be used at any time.
13. Bottles shall be slightly opened then closed just prior to attachment of the regulator.
14. Torches shall be lighted by friction lighters, not matches or other hot work.

15. Welders must insure that lines have been adequately purged prior to working on them.
16. Equipment shall be inspected for leaks daily. Unserviceable/non-approved equipment may not be used.
17. All welders shall possess current certifications.
18. Hot work area shall be kept damp at all times.
19. Unattended/unused welding machines shall be turned off.
20. Fire Watches shall remain on site for at least 1/2 hour after job.
21. MOST IMPORTANTLY: NO HOT WORK PERMIT = NO WELDING.

### **Ventilation**

The following are ventilation requirements for welding.

1. Ensure that adequate ventilation is provided for employees working with welding and cutting equipment. Confined space work will have a plan to address securing of cylinders, lifelines, and warning systems that will be utilized by the safety attendant (Fire Watch/Confined Space Attendant).
2. Ensure that contaminated air exhausted from a working space is discharged into the open air or otherwise clear of the source or intake air.
3. Do not use oxygen for ventilation, comfort cooling, blowing dust from clothing, or for cleaning a work area.
4. Ensure that all necessary precautions are taken to prevent the accumulation of gases when cutting torches are used.
5. Do not take compressed gas cylinders into confined areas.
6. Ventilation equipment consists of air siphons (air movers), and/or exhaust blower (copus air mover).
7. When using blowers or siphons to exhaust fumes, exhaust inlet must be kept as close as possible to the work. Air siphons use large amounts of compressed air. The following safety procedures shall be followed:
  - Keep connecting air hoses as short as possible.
  - Do not attempt to operate more than one siphon off a single air hose or outlet.
  - If used to exhaust a vessel, be sure to seal the bell of the inlet side around the manhole or vessel opening.
  - A daily inspection of the safety screens' condition should be accomplished on the blowers. Repair or replace if broken. The use of a blower hinge is also recommended.

### **Planning Hot Work Welding**

In planning or carrying out hot work, certain factors should be considered besides the obviously important hot work permit, gas test and hazard analysis. Those factors include, but are not limited to:

1. The base metal and its health effects. The SDS on the metal is available and will address this issue.

2. The welding or burning process to be used and its special health problems, if any.
3. The location of the work: Is the work to be done in the open or in a confined space?
4. Ventilation required: Is special ventilation equipment needed?
5. Position of the work: Is the work overhead or below? Can it be positioned to allow fumes to be carried away without entering the welder's breathing zone?
6. Presence of other employees near the job: Is eye protection needed against ultraviolet radiation? Are other workers in the path of the welding fumes?
7. Cleanliness of the metal surface: Are harmful or flammable materials present beneath patches or in seams?
8. Respiratory protection: Are fume respirators adequate, or are air-supplied respirators needed? Protection must be appropriate to the circumstances and must meet the minimum requirement of the permit, but also may be upgraded.
9. Ensure adequate first aid supplies are available before beginning work. All injuries will be reported immediately.

**Welding and Burning Safe Practices**

The following information is the recommended minimum precautionary measure to be followed in performing the types of hot work listed in Table 13-1. If, in the opinion of the supervisor, additional protection is required for a particular welding or burning job, such added protective measures should be used.

Open Area includes most outside work, the mechanical shop (except vessels or partitioned areas inside the building) and well-ventilated large rooms, buildings or tanks. Confined Spaces include work areas such as inside small tanks, drums, towers, or other vessels, whether indoors or out, as well as small rooms, deep excavations, and manholes.

**Table 13-1 - Welding and Burning Stick Electrode Welding**

Electrode	Basic Elements	Byproducts	Precautions
AWS E-6010	Iron		A
AWS E-6011	Iron		A
AWS E-6012	Iron		A
AWS E-6013	Iron		A
AWS E-6020	Iron		A
E-316 Stainless 18-12	Chromium, Nickel, Iron	Chromium, Nickel	B
E-310 Stainless 25-20	Chromium, Nickel, Iron	Chromium, Nickel	B
e-308 Stainless 18-8	Chromium, Nickel, Iron	Chromium, Nickel	B
E-610 12% Cr	Chromium, Iron	Chromium	B
E-502 5% Cr	Chromium, Iron		A
E-605 9% Cr	Chromium, Iron	Chromium	B
E-7018 Low Hydrogen	Iron	Fluorides	C
E-8018 B-2 (1-1/4% Cr)	Chromium, Iron		A
E-9018 B-3 (2-1/4% Cr)	Chromium, Iron		A
E-8108 C-2 (3-1/2% Ni)	Nickel, Iron		
Stoody 6		Chromium	B

Eutectic 680	65% Cobalt, 45% Tungsten, 28% Chromium Cobalt	Chromium, Nickel	B
Inco-A	High Chromium, Nickel	Nickel	B
Inconel 182	68% Nickel	Nickel	B
Monel 190	65% Nickel	Nickel, Copper	B
Ni-Rod 55	60% Nickel, 23% Copper	Nickel	B
Carpenter 20	60% Nickel 36% Nickel, 20% Chromium		B

**Precautions:**

A. No special precautions are needed in open or well-ventilated areas. Work in poorly ventilated areas will require respiratory protection. Work in confined spaces may require fume filter-type respirators or supplied air. Adhere to or upgrade permit requirements. Consult the Welding Supervisor.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces will require high efficiency particulate respirators.

C. Fumes and gases generated:

1. Use exhaust blowers or air siphons to remove gases and fumes from breathing zone in open areas.
2. Work in confined spaces will require air-supplied respirator.

D. Intense arc. Large amounts of metal fumes and gases generated:

1. Provide adequate ventilation of work. Use fume exhausters to remove fumes and gases from breathing zone in open areas. Do not direct exhaust air toward other employees. Use fume filter-type respirators in open areas.
2. In confined areas, adequate ventilation must be provided and air-supplied respirator must be worn.

E. Use only in metalizing hood. If necessary to metalize in other locations, use air-supplied respirator and protect other workers in the vicinity. Do not use any lead alloys in open shop area.

**Table 13-1  
Tungsten Arc Welding, Gas Shielded (Heli arc)\* (TIG)**

Rod	Basic Elements	Harmful Byproducts	Precautions
Evedur 1010	05.6% Copper Silicon	Copper, Ozone	C
Oxweld 372 Copper	98% Copper	Copper, Ozone	C
AWS ER 4043	Aluminum, Silicon	Ozone	C
AWS ER 5356	Magnesium, Aluminum	Ozone	C
Oxweld 28	18% Chromium, 8% Nickel, Iron	Chromium, Nickel Ozone	C
Steel	Steel	Ozone	C
1-1/4% Chromium	Chromium, Iron	Ozone	C
2-1/4% Chromium	Chromium, Iron	Ozone	C

\*High levels of ultraviolet light produced. Avoid eye flash with side shield goggles. Avoid skin burns with proper clothing.

C. Fumes and gases generated:

1. Use exhaust blowers or air siphons to remove gases and fumes from breathing zone in open areas.

2. Work in poorly ventilated areas will require respiratory protection.
3. Work in confined spaces will require air-supplied respirator.

### Short Arc Consumable Electrode Gas Shield\* (MIG)

Wire	Basic Elements	Harmful Byproducts	Precautions*
18-8 Stainless	18% Chromium, 8 % Nickel, Steel	Chromium, Nickel, Ozone	B
25-20 Stainless	25% Chromium, 20% Nickel, Steel	Chromium, Nickel, Ozone	B
Oxweld 63	98% Copper	Copper, Ozone	B
Airco 110	98% Copper	Copper, Ozone	B
Oxweld 62	91.5% Copper, Aluminum	Copper, Ozone	B
Type 316 Stainless	18% Chromium, 13% Nickel, Steel	Copper, Nickel, Ozone	B
Aluminum	Aluminum	Ozone	B
Hastelloy B	Nickel, Molybdenum	Nickel, Ozone	B
Inconel 62	Chromium, Nickel	Nickel, Ozone	B
Oxweld 65	Iron		B

\*High levels of ultraviolet light produced. Avoid eye flash with side shield goggles. Avoid skin burns with proper clothing.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces or poorly ventilated areas will require high efficiency particulate respirators.

### Acetylene Welding and Brazing

Wire	Basic Elements	Harmful Byproducts	Precautions
Hastelloy D	Silicon, 90% Nickel	Nickel	A
Oxweld 5M	Copper, Zinc, Tin	Copper, Zinc	B
1 Oxweld	Steel		A
Aluminum	Aluminum		A
Everdur 1010	Copper, Silicon	Copper	A
Arcosil J	56% Silver, 22% Copper 17% zinc, 5% Tin	Copper, Zinc	B
Oxweld 28	18% Chromium, 8% Nickel, Steel	Chromium, Nickel	B
18-8 Stainless	18% Chromium, 8% Nickel, Steel	Chromium, Nickel	B
Easy-Flo	45% Silver, 15% Copper 25% Cadmium, 16% Zinc	Copper, Cadmium Zinc	B
Sil-Fos	15% silver, 80% Copper 5% Phosphorus	Copper	B
Oxweld 372	98% Copper	Copper	B
Colmonoy 6	65% Cobalt, 28% Chromium	Cobalt, Chromium	B
Chromium	Tungsten		
Stoodite	Iron, 30% Chromium	Chromium	B
Borod	Tungsten Carbide, Iron		

- A. No special precautions are needed in open or well-ventilated areas. Work in confined spaces or poorly ventilated areas may require fume filter-type respirators. Consult the mechanical welding and metals supervisor.
- B. Moderate amounts of fumes generated:
1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
  2. Work in confined spaces will require high efficiency particulate respirators.

### Silver Soldering and Soldering

Rod, Wire	Basic Elements	Harmful Byproducts	Precautions*
1801 Super	Silver, Copper, Cadmium, Zinc	Copper, Cadmium, Zinc	B
1602	Silver, Copper, Tin	Copper	B
18 FC	Copper, Tin Zinc	Copper, Zinc	B
16 FC	Silver Copper, Nickel	Copper, Nickel	B
15 Phoson	Silver Copper Phosphorous	Copper	B
11 Allstate	Copper, Zinc, Nickel	Copper, Zinc, Nickel	B

- B. Moderate amounts of fumes generated:
1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
  2. Work in confined spaces will require high efficiency particulate respirators.

### Air Arc Cutting and Gouging (Carbon Rod)\*

Material Worker	Basic Elements	Harmful Byproducts	Precautions*
Steel	Iron	Iron Oxides	D
Cast Iron	Iron	Iron Oxides	D
Monel	Copper, Nickel	Copper, Nickel	D
Stainless Steels	Chromium Nickel, Iron	Chromium, Nickel	D
Chrome Steels	Chromium, Iron	Chromium	D
Brass	Copper, Zinc	Copper, Zinc	D
Copper	Copper	Copper	D
Aluminum	Aluminum	Nickel Oxides	D
High Nickel	Nickel	Nickel Oxides	D

\*Air gouging produces much higher metal fume levels than ordinary cutting or welding. Hearing protection needed for high noise levels.

- D. Intense arc. Large amounts of metal fumes and gases generated:
1. Provide adequate ventilation of work. Use **fume** exhausters to remove fumes and gases from breathing zone in open areas. Do not direct exhaust air toward other employees. Use fume filter-type respirators in open areas.
  2. In confined areas, adequate ventilation must be provided.
  3. Use IH monitoring or representative sampling results to determine level of respiratory protection. If no monitoring or sampling results are available, supplied air must be used until analytical information is available to safely downgrade the level of protection.

### Plasma Arc Cutting

Metals Cut	Basic Elements	Harmful Byproducts	Precautions*
Steel	Iron	Iron Oxides	D
Cast Iron	Iron	Iron Oxides	D

Monel	Copper, Nickel	Copper Nickel	D
Stainless Steel	Chromium, Nickel Steel	Chromium, Nickel	D
Chrome Steel	Copper , Steel	Chromium	D
Brass	Copper, Zinc	Copper, Zinc	D
Aluminum	Aluminum	Aluminum Oxides	D
Everdur	Silicon, Copper	Copper	D
Copper	Copper	Copper	D

\*High levels of ultraviolet light produced. Avoid eye flash with proper eye protection. Avoid skin burns with proper clothing. High noise levels produced. Hearing protection required.

D. Intense arc. Large amounts of metal fumes and gases generated:

1. Provide adequate ventilation of work. Use fume exhausters to remove fumes and gases from breathing zone in open areas. Do not direct exhaust air toward other employees. Use fume filter-type respirators in open areas.
- 2 Adequate ventilation must be provided in confined areas.
3. Use IH monitoring or representative sampling results to determine level of respiratory protection. If no monitoring or sampling results are available, supplied air must be used until analytical information is available to safely downgrade the level of protection.

#### CRANE SAFETY

\*\*\*B&T Drainage, at this time, does not have a need for the crane safety program. In an effort to protect employees from potentially hazardous working conditions , a crane safety program has been developed and will be implemented as needed for the protection of our employees.

Cranes will only be setup in areas where the ground is capable of supporting the crane and its intended load. The ground must be firm, drained and graded to a sufficient extent so that when used with supporting materials, the manufacturer’s specifications are met.

The crane will be assembled and disassembled under the direction of a competent and qualified person. The manufacturer’s instructions and prohibitions must be followed at all times. The manufacturer must approve all modifications/additions to the equipment in writing or a registered professional engineer that must be qualified with respect to the equipment involved, and must insure the original safety factor of the equipment is not reduced.

The competent person will conduct a preoperational hazard assessment to identify hazards in the area of operation. One main hazard is overhead power lines. The work zone will be identified by available means (caution tape, cones, flags). If it is determined that any part of the equipment or the load being lifted, may be within 20 feet of the power line then at least one of the following must be taken:

1. Ensure the power lines have been de-energized and visibly grounded.
2. Ensure no part of the equipment, load line or load get closer than 20’.
3. Determine the line’s voltage and minimum approach distance.

Proper fall protection must be provided when any member of the setup crew is working at a level over 6’.

Only certified/competent employees are allowed to operate equipment and machinery, including cranes.

#### Inspections:

The crane will be visually inspected prior to operation each shift by the competent person. The inspection will consist of observations of apparent deficiencies. Inspection items will include at least: control mechanisms, pressurized lines, hooks and latches, wire ropes, electrical apparatus, tires (if appropriate) and ground conditions.

Monthly inspections will be conducted by a competent person and these inspections will be documented and maintained in the cab of the crane. The documentation will include at least the following: items checked, results of the inspection, name and signature of the inspector. The documentation will be maintained in the cab of the crane for at least three months, the documentation will then be forwarded to the main office for record maintenance.

#### Working Around Cranes:

The Safety devices are required to be on all equipment and must be in proper working condition before the operation of the equipment begins.

The operator has the authority to stop and refuse to handle loads whenever there is a safety concern until a qualified person has determined that safety has been assured.

The perimeter of the swing radius of the counterweights of the crane will be protected by a red danger zone line. No employees are allowed in the red zone other than the crane operator and the oiler.

The swing of the radius of the boom of the crane will be protected by a yellow caution line. No employees are allowed in the caution zone other than those directly involved in the rigging of the lift. No lift will travel overhead of any employees.

Watch out for a swing or roll. Anticipate the direction of the swing or roll and work away from it. Never place yourself between material, equipment or other stationary objects and the load. Stay away from stacked material that may be knocked over by a swinging load.

Never get under a suspended load, and keep out from under the crane's boom.

Protect your hands. If it isn't possible to release the chain, sling, or choker, be sure your hand is clear of pinch points. Keep your hand far enough away so that a frayed wire or splinter on the chain can't catch your glove and jerk your hand into a pinch point.

When guiding a load, use a tag line or hook. If you have to walk with a load, keep it as close to the ground as possible. Tag lines shall be used unless their use creates an unsafe condition.

The headache ball should have a safety latch to prevent loads from coming off the hook during a lift.

A fire extinguisher will be maintained in working order in the cab or the crane. The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator.

No part of the crane or the load should ever come within 20' of a power line.

A signal person must be provided in each of the following situations: (1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator; (2) When the equipment is traveling, the view in the direction of travel is obstructed; (3) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.

## AERIAL LIFT SAFETY

### **Policy**

Aerial personnel lifts shall be operated, maintained, and controlled in a safe manner.

### **Purpose**

To define the procedures and standards that apply to the care, control, maintenance, inspection, and operation of aerial personnel lifts.

### **Scope**

Applies to all B & T Drainage, Inc. work sites, i.e., B&T Drainage, Inc. offices, client job sites, etc., requiring the use of aerial personnel lifts.

### **Definitions**

**Aerial personnel lift** means any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel. These include extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers, and a combination of any of the above.

**Articulating boom platform** means an aerial personnel lift with two or more hinged boom sections.

**Extension boom platform** means an aerial personnel lift (except ladders) with a telescopic or extension boom. Telescopic derricks with personnel platform attachments shall be considered to be extension boom platforms when used with a personnel platform.

**Insulated aerial device** means aerial personnel lift designed for work on energized lines and apparatus.

**Platform** means any personnel-carrying device (basket or bucket) that is a component of an aerial personnel lift.

**Vertical tower** means aerial personnel lift designed to elevate a platform in a substantially vertical axis.

### **Requirements**

#### **General**

**Equipment that is not designed for use as a personnel lift shall not be used as a personnel lift (e.g., front end loader buckets, backhoe buckets and cranes).**

Only trained personnel who have been deemed competent and designated by their supervisor are authorized to operate aerial personnel lifts.

Lift controls shall be tested prior to use to determine that such controls are in safe working condition.

Review and follow fall protection requirements for aerial personnel lifts identified in Personnel should not be permitted to stand on the rails of aerial devices. A body harness shall be worn and a lanyard appropriately attached.

Personnel should not be permitted to stand on the rails of aerial devices. A body harness shall be worn and a lanyard appropriately attached.

Personnel shall not be permitted to use an aerial personnel lift as a means of access. In the event that there are no other means of access, specific procedures including rationale (feasibly), duration, evacuation, fall protection, etc. shall be developed and reviewed with affected employees prior to implementation.

Large or excessive amounts of material, excluding tools, shall not be transported in an aerial personnel lift. Other material lifts would be necessary for such activities.

Load limits specified by the manufacturer shall not be exceeded.

Aerial personnel lifts that can operate horizontally shall set brakes and outriggers, when used, be positioned on pads or a solid surface, and chock wheels before using on an incline.

### **Boom and Ladder Lift Units**

Before ladder trucks and tower trucks are moved from site to site, the aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means (e.g., cradles which prevent rotation of the ladder in combination with positive acting linear actuators).

An aerial lift truck may not be moved when the boom is elevated in a working position with personnel in the basket, except for equipment that is specifically designed for this type of operation.

Articulating boom and extendible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

The insulated aerial devices shall not be altered in any manner that might reduce its insulating value. The insulated boom of a lift shall be regularly maintained and certified to ensure the continued insulating properties.

Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position.

### **Modifications**

Aerial lifts may be "field modified" for uses other than those intended by the manufacturer, provided the modification has been certified in writing.

### **References**

OSHA CFR 29 1926.453, .952(b), and .955(e)(12)

OSHA CFR 29 1910.67(b)(2)

### LEAD SAFETY

\*\*\*B&T Drainage, Inc. is not a lead abatement company, but does engage in minor demolition work during normal construction operations. In an effort to protect employees from potentially hazardous working conditions, this lead safety program has been developed and will be implemented as needed for the protection of our employees, general public and our facility owners.

Employees will be notified of the potential exposure and the steps being taken to prevent any potential employee exposure. If the presence of lead is detected in the materials involved in demolition or renovation work, potential employee exposure must be determined. Employees will be notified of the date and time demolition or renovation work will commence.

The employer shall post the following warning signs in each work area where the PEL is exceeded:

DANGER

LEAD

MAY DAMAGE FERTILITY OR THE UNBORN CHILD

CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM

DO NOT EAT, DRINK OR SMOKE IN THIS AREA

A medical surveillance program shall be implemented for all employees who are or may be exposed at or above the action level for more than 30 days per year. The company shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician. The company shall provide the required medical surveillance without cost to employees and at a reasonable time and place.

Personal protective measures will be taken that assume that there is employee exposure until proven otherwise. In the case of lead, employees will be trained on the hazards or working with lead in the

environment. Employees will participate in the Respirator Safety Program and wear approved respirators, Tyvek suits, hard hats, safety glasses and gloves while working. A clean change area will be provided. Hepa vac sweepers will be used to clean up any dust and clean people before exiting the work area. Dry sweeping is not allowed. Work procedures will be reviewed to ensure procedures are in place that would minimize any potential employee exposure. Wash facilities will be provided with running water to remove any potential contaminants and a clean lunch/break area will be provided. Smoking is not allowed in the work area and employees must store their cigarettes outside of the work area to prevent the cigarettes from becoming contaminated.

Personal air samples will be taken the first day of work and sent to an accredited lab to determine the level of employee exposure. If the results are below the level of 30 micrograms per cubic meter of air in an eight hour work day, special precautions may be lifted and work would again progress as per work schedule. If the employee exposure is over the action level, then the special precautions will remain in effect.

Any employee who tests at or above 50 micrograms of lead per deciliter of blood shall be removed from any work that would exceed the action level or when a medical condition is detected that places him at medical risk of health from further exposure to lead.

Debris will be bagged and secured before removing from the work area and placed in appropriate identified hazardous waste containers. The containers will be appropriately maintained and covered when necessary to prevent any potential environmental exposure.

Upon project completion, the work area will be cleaned and the cleaning verified by the Superintendent prior to containment removal.

Records of exposure monitoring and other data will be kept in the office and made available to employees.

### ASBESTOS

\*\*\*B&T Drainage, Inc., at this time, does not have a need for the asbestos program. In an effort to protect employees from potentially hazardous working conditions, asbestos program has been developed and will be implemented as needed for the protection of our employees.

Asbestos is the name of a class of magnesium-silicate minerals that occur in fibrous form. Minerals that are included in this group are chrysotile, crocidolite, amosite, anthophyllite, asbestos, tremolite asbestos and actinolite asbestos. Asbestos is used in the manufacturing of heat-resistant clothing, automobile brakes and clutch linings and a variety of building materials including floor tiles, roofing felts, ceiling tiles, asbestos-cement pipe and sheet, and fire-resistant drywall. Asbestos is also present in pipe and boiler insulation materials, and in sprayed-on materials located on beams, in crawlspaces and between walls.

The potential for an asbestos-containing product to release breathable fibers depends on its degree of friability. Friable means that the material can be crumbled with hand pressure and is therefore likely to emit fibers. The fibrous or fluffy sprayed-on materials used for fireproofing, insulation, or sound proofing are considered to be friable, and they readily release airborne fibers if disturbed. Materials such as vinyl-asbestos floor tile or roofing felts are considered non-friable and generally do not emit airborne fibers

unless subjected to sanding or sawing operations. Asbestos-cement pipe or sheet can emit airborne fibers if the materials are cut or sawed, or if they are broken.

Since 1970, very few asbestos-containing products have been or are being installed. Consequently, most worker exposures occur during the removal of asbestos and the renovation and maintenance of buildings and structures containing asbestos. Asbestos fibers enter the body by inhalation or ingestion of air-borne particles and become embedded in the tissues of the respiratory or digestive systems. Exposure to asbestos can cause disabling or fatal diseases such as asbestosis, lung cancer, and mesothelioma in the cells of membranes covering the lungs and body and gastrointestinal cancer. The symptoms of these diseases generally do not appear for 20 years or more after exposure.

The job site supervisor is on constant alert for asbestos materials. These are most commonly found in the demo phase of a job such as removing plaster walls or ceilings, floor tile, opening into a wall and pipe insulation. Before each task is started, or if materials are uncovered, materials suspected of being asbestos will be tested.

If during the demo phase suspect materials are uncovered, work must stop at once. Notify your Supervisor.

1. Seal the area if the material has been damaged or appears to be friable. Do not disturb suspect material.
2. Post area with signage: "DO NOT ENTER".
3. Notify other trades on the job.
4. Notify owner for proper testing of suspect material.

Do not remove signage until negative tests are presented.

### RESPIRATORY PROTECTION PROGRAM

#### General:

In the Respiratory Protection program, hazard assessment and selection of proper respiratory protective equipment (RPE) is conducted in the same manner as for other types of personal protective equipment (PPE). In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used. References: OSHA Standards *Respiratory Protection* (29 CFR 1910.134)

#### Responsibilities:

All Employees shall follow the requirements of the Respiratory Protection Program.

#### Management

- implement the requirements of this program
- provide a selection of respirators as required
- enforce all provisions of this program
- appoint a specific designated individual to conduct the respiratory protection program

#### Program Administrator

- review sanitation/storage procedures.
- ensure respirators are properly, stored, inspected and maintained
- monitor compliance for this program
- provide training for affected Employees
- review compliance and ensure monthly inspection of all respirators
- provide respirator fit testing

#### Designated Occupational Health care Provider

- conduct medical aspects of program

#### Program Administrator:

Each Facility will designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

#### Voluntary Use of Respirators is prohibited:

OSHA requires that voluntary use of respirators, when not required by the company, must be controlled as strictly as under required circumstances. To prevent violations of the Respiratory Protection Standard Employees are not allowed voluntary use of their own or company supplied respirators of any type. Exception: Employees whose only use of respirators involves the voluntary use of filtering (non-sealing) face pieces (dust masks).

#### Program Evaluation:

Evaluations of the workplace are necessary to ensure that the written respiratory protection program is being properly implemented; this includes consulting with employees to ensure that they are using the respirators properly. Evaluations shall be conducted as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective Program evaluation will include discussions with employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
- Appropriate respirator selection for the hazards to which the employee is exposed;
- Proper respirator use under the workplace conditions the employee encounters; and
- Proper respirator maintenance.

#### Record Keeping:

The Company will retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the Company in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

Training and Information:

Effective training for employees who are required to use respirators is essential. The training must be comprehensive, understandable, and recur annually and more often if necessary. Training will be provided prior to requiring the employee to use a respirator in the workplace. The training shall ensure that each employee can demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- Limitations and capabilities of the respirator
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
- How to inspect, put on and remove, use, and check the seals of the respirator
- What the procedures are for maintenance and storage of the respirator
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
- The general requirements of this program

Retraining shall be conducted annually and when:

- changes in the workplace or the type of respirator render previous training obsolete
- inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill
- other situation arises in which retraining appears necessary to ensure safe respirator use

Training will be conducted by instructors certified by \_\_\_\_\_. Training is divided into the following sections:

Classroom Instruction

1. Overview of the Company Respiratory Protection Program & OSHA Standard
2. Respiratory Protection Safety Procedures
3. Respirator Selection
4. Respirator Operation and Use
5. Why the respirator is necessary
6. How improper fit, usage, or maintenance can compromise the protective effect.
7. Limitations and capabilities of the respirator.
8. How to use the respirator effectively in emergency situations, including respirator malfunctions
9. How to inspect, put on and remove, use, and check the seals of the respirator.

10. What the procedures are for maintenance and storage of the respirator.
11. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
12. Change out schedule and procedure for air purifying respirators.

#### Fit Testing

##### Hands-on respirator Training

1. Respirator Inspection
2. Respirator cleaning and sanitizing
3. Record Keeping
4. Respirator Storage
5. Respirator Fit Check
6. Emergencies

#### Basic Respiratory Protection Safety Procedures:

1. Only authorized and trained Employees may use Respirators. Those Employees may use only the Respirator that they have been trained on and properly fitted to use.
2. Only Physically Qualified Employees may be trained and authorized to use Respirators. A pre-authorization and annual certification by a qualified physician will be required and maintained. Any changes in an Employees health or physical characteristics will be reported to the Occupational Health Department and will be evaluated by a qualified physician.
3. Only the proper prescribed respirator or self-contained breathing apparatus (SCBA) may be used for the job or work environment. Air cleansing respirators may be worn in work environments when oxygen levels are between 19.5 percent to 23.5 percent and when the appropriate air cleansing canister, as determined by the Manufacturer and approved by the National Institute for Occupational Health (NIOSH) or the Mine Safety & Health Administration (MSHA), for the known hazardous substance is used. SCBAs will be worn in oxygen deficient and oxygen rich environments (below 19.5 percent or above 23.5 percent oxygen).
4. Employees working in environments where a sudden release of a hazardous substance is likely will wear an appropriate respirator for that hazardous substance (example: Employees working in an ammonia compressor room will have an ammonia APR respirator on their person.).
5. Only SCBAs will be used in oxygen deficient environments, environments with an unknown hazardous substance or unknown quantity of a known hazardous substance or any environment that is determined "Immediately Dangerous to Life or Health" (IDLH).
6. Employees with respirators loaned on "permanent check out" will be responsible for the sanitation, proper storage and security. Respirators damaged by normal wear will be repaired or replaced by the Company when returned.
7. The last Employee using a respirator and/or SCBA that are available for general use will be responsible for proper storage and sanitation. Monthly and after each use, all respirators will be inspected with documentation to assure its availability for use.
8. All respirators will be located in a clean, convenient and sanitary location.

9. In the event that Employees must enter a confined space, work in environments with hazardous substances that would be dangerous to life or health should an RPE fail (a SCBA is required in this environment), and/or conduct a hazardous material (HAZMAT) entry, a "buddy system" detail will be used with a Safety Watchman with constant voice, visual or signal line communication. Employees will follow the established Emergency Response Program and/or Confined Space Entry Program when applicable.
10. Management will establish and maintain surveillance of jobs and work place conditions and degree of Employee exposure or stress to maintain the proper procedures and to provide the necessary RPE.
11. Management will establish and maintain safe operation procedures for the safe use of RPE with strict enforcement and disciplinary action for failure to follow all general and specific safety rules. Standard Operation Procedures for General RPE use will be maintained as an attachment to the Respiratory Protection Program and Standard Operation Procedures for RPE use under emergency response situations will be maintained as an attachment to the Emergency Response Program.

#### Respiratory Use Policies:

Adherence to the following guidelines will help ensure the proper and safe use of respiratory equipment:

- Wear only the respirator you have been instructed to use. For example, do not wear a self-containing breathing apparatus if you have been assigned and fitted for a half-mask respirator.
- Wear the correct respirator for the particular hazard. For example, some situations, such as chemical spills or other emergencies, may require a higher level of protection than your respirator can handle. Also, the proper cartridge must be matched to the hazard ( a cartridge designed for dusts and mists will not provide protection for chemical vapors)
- Check the respirator for a good fit before each use. Positive and negative fit checks should be conducted.
- Check the respirator for deterioration before and after use. Do not use a defective respirator.
- Recognize indications that cartridges and canisters are at their end of service. If in doubt, change the cartridges or canisters before using the respirator.
- Practice moving and working while wearing the respirator so that you can get used to it.
- Clean the respirator after each use, thoroughly dry it and place the cleaned respirator in a sealable plastic bag.
- Store respirators carefully in a protected location away from excessive heat, light, and chemicals.

#### Selection of Respirators:

The Company has evaluated the respiratory hazard(s) in each workplace, identified relevant workplace and user factors and has based respirator selection on these factors. Also included are estimates of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. This selection has included appropriate

protective respirators for use in IDLH atmospheres, and has limited the selection and use of air-purifying respirators. All selected respirators are NIOSH-certified.

Filter Classifications - These classifications are marked on the filter or filter package

N-Series: Not Oil Resistant

- Approved for non-oil particulate contaminants
- Examples: dust, fumes, mists not containing oil

R-Series: Oil Resistant

- Approved for all particulate contaminants, including those containing oil
- Examples: dusts, mists, fumes
- Time restriction of 8 hours when oils are present

P-Series: Oil Proof

- Approved for all particulate contaminants including those containing oil
- Examples: dust, fumes, mists
- See Manufacturer's time use restrictions on packaging

Respirators for IDLH atmospheres.

- The following respirators will be used in IDLH atmospheres:
- A full face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
- A combination full face piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
- Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

Respirators for atmospheres that are not IDLH.

The respirators selected shall be adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

Identification of Filters & Cartridges:

All filters and cartridges shall be labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible. A change out schedule for filters and canisters has been developed to ensure these elements of the respirators remain effective.

Respirator Filter & Canister Replacement:

An important part of the Respiratory Protection Program includes identifying the useful life of canisters and filters used on air-purifying respirators. Each filter and canister shall be equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or

If there is no ESLI appropriate for conditions a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life.

### Filter & Cartridge Change Schedule

Stock of spare filters and cartridges shall be maintained to allow immediate change when required or desired by the employee

Cartridges shall be changed based on the most limiting factor below:

- Prior to expiration date
- Manufacturer's recommendations for use and environment
- After each use
- When requested by employee
- When contaminate odor is detected
- When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally
- Cartridges shall remain in their original sealed packages until needed for immediate use

Filters shall be changed based on the most limiting factor below

- Prior to expiration date
- Manufacturer's recommendations for the specific use and environment
- When requested by employee
- When contaminate odor is detected
- When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally
- When discoloring of the filter media is evident
- Filters shall remain in their original sealed package until needed for immediate use.

Respiratory Protection Schedule by Job and Working Condition:

The Company maintains a Respiratory Protection Schedule by Job and Working Condition. This schedule is provided to each authorized and trained Employee. The Schedule provides the following information:

1. Job/Working Conditions
2. Work Location
3. Hazards Present
4. Type of Respirator or SCBA Required
5. Type of Filter/Canister Required
6. Location of Respirator or SCBA
7. Filter/Cartridge change out schedule

The schedule will be reviewed and updated at least annually and whenever any changes are made in the work environments, machinery, equipment, or processes or if respirator different respirator models are introduced or existing models are removed.

Permanent respirator schedule assignments are:

Each person who engages in welding will have their own company provided dust-mist-fume filter APR. This respirator will be worn during all welding operations.

#### Physical and Medical Qualifications:

Records of medical evaluations must be retained and made available in accordance with 29 CFR 1910.1020.

#### Medical evaluation required

Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. The company provides a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.

#### Medical evaluation procedures

The employee will be provided a medical questionnaire by the designated Occupational Health Care Provider

#### Follow-up medical examination

The company shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions in Part B of the questionnaire or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the Physician deems necessary to make a final determination.

#### Administration of the medical questionnaire and examinations

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content. The company shall provide the employee with an opportunity to discuss the questionnaire and examination results with the Physician.

#### Supplemental information for the Physician

The following information must be provided to the Physician before the Physician makes a recommendation concerning an employee's ability to use a respirator

- The type and weight of the respirator to be used by the employee
- The duration and frequency of respirator use (including use for rescue and escape)
- The expected physical work effort
- Additional protective clothing and equipment to be worn
- Temperature and humidity extremes that may be encountered
- Any supplemental information provided previously to the Physician regarding an employee need not be provided for a subsequent medical evaluation if the information and the Physician remain the same

The Company has provided the Physician with a copy of the written respiratory protection program and a copy of the OSHA Standard 1910.134

## Medical determination

In determining the employee's ability to use a respirator, the Company shall

- Obtain a written recommendation regarding the employee's ability to use the respirator from the Physician. The recommendation shall provide only the following information
- Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator
- The need, if any, for follow-up medical evaluations
- A statement that the Physician has provided the employee with a copy of the Physician's written recommendation
- If the respirator is a negative pressure respirator and the Physician finds a medical condition that may place the employee's health at increased risk if the respirator is used, the Company shall provide a APR if the Physician's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the Company is no longer required to provide a APR

## Additional Medical Evaluations

At a minimum, the Company shall provide additional medical evaluations that comply with the requirements of this section if:

- An employee reports medical signs or symptoms that are related to ability to use a respirator
- A Physician, supervisor, or the respirator program administrator informs the Company that an employee needs to be reevaluated
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation
- A change occurs in workplace conditions (e.g., physical work effort, protective clothing, and temperature) that may result in a substantial increase in the physiological burden placed on an employee.

## Respirator Fit Testing:

Before an employee is required to use any respirator with a negative or positive pressure tight-fitting face piece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. The Company shall ensure that an employee using a tight-fitting face piece respirator is fit tested prior to initial use of the respirator, whenever a different respirator face piece (size, style, model or make) is used, and at least annually thereafter

The Company has established a record of the qualitative and quantitative fit tests administered to employees including:

- The name or identification of the employee tested
- Type of fit test performed
- Specific make, model, style, and size of respirator tested
- Date of test

- The pass/fail results for Qualitative Fit Test (QLFT) or the fit factor and strip chart recording or other recording of the test results for Quantitative Fit Test (QNFT)

Additional fit tests will be conducted whenever the employee reports, or the Company, Physician, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

If after passing a QLFT or QNFT, the employee notifies the Company, program administrator, supervisor, or Physician that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator face piece and to be retested.

#### Types of Fit Tests

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of OSHA Standard 1910.134.

- QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half face pieces, or equal to or greater than 500 for tight-fitting full face pieces, the QNFT has been passed with that respirator.
- Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
- Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual face piece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator face piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator face piece.
- Quantitative fit testing of these respirators shall be accomplished by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the face piece.
- Any modifications to the respirator face piece for fit testing shall be completely removed, and the face piece restored to NIOSH approved configuration, before that face piece can be used in the workplace.

Fit test records shall be retained for respirator users until the next fit test is administered. Written materials required to be retained shall be made available upon request to affected employees.

#### Respirator Operation and Use:

Respirators will only be used following the respiratory protection safety procedures established in this program. The Operations and Use Manuals for each type of respirator will be maintained by the Program Administrator and be available to all qualified users.

Surveillance by the direct supervisor shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the Company shall reevaluate the continued effectiveness of the respirator.

For continued protection of respirator users, the following general use rules apply:

- Users shall not remove respirators while in a hazardous environment
- Respirators are to be stored in sealed containers out of harmful atmospheres
- Store respirators away from heat and moisture
- Store respirators such that the sealing area does not become distorted or warped
- Store respirator such that the face piece is protected

Face piece seal protection

The Company does not permit respirators with tight-fitting face pieces to be worn by employees who have:

- Facial hair that comes between the sealing surface of the face piece and the face or that interferes with valve function; or
- Any condition that interferes with the face-to-face piece seal or valve function.

If an employee wears corrective glasses or goggles or other personal protective equipment, the Company shall ensure that such equipment is worn in a manner that does not interfere with the seal of the face piece to the face of the user.

Continuing Effectiveness of Respirators

The Company shall ensure the following that employees leave the respirator use area:

- To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use
- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece
- To replace the respirator or the filter, cartridge, or canister elements.

If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, the Company will replace or repair the respirator before allowing the employee to return to the work area.

Procedures for IDLH atmospheres:

For all IDLH atmospheres, the Company shall ensure that:

- One employee or, when needed, more than one employee is located outside the IDLH atmosphere
- Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere
- The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue
- The Company or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue

- The Company or designee authorized to do so by the Company, once notified, provides necessary assistance appropriate to the situation

Employee(s) located outside the IDLH atmospheres will be equipped with:

- Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
- Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or

Equivalent means

- for rescue where retrieval equipment is not required.

The Company shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The Company shall ensure that respirators are cleaned and disinfected using the Standard Operating Procedure SOP: Cleaning and Disinfecting.

Cleaning and Disinfecting:

The respirators shall be cleaned and disinfected when:

- Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition
- Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals
- Respirators maintained for emergency use shall be cleaned and disinfected after each use
- Respirators used in fit testing and training shall be cleaned and disinfected after each use.

Cleaning and Storage of respirators assigned to specific employees is the responsibility of that Employee.

Respirator Inspection:

All respirators/SCBAs, both available for "General Use" and those on "Permanent Check-out", will be inspected after each use and at least monthly. Should any defects be noted, the respirator/SCBA will be taken to the program Administrator. Damaged Respirators will be either repaired or replaced. The inspection of respirators loaned on "Permanent Check-out" is the responsibility of that trained Employee.

Respirators shall be inspected as follows:

- All respirators used in routine situations shall be inspected before each use and during cleaning
- All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use
- Emergency escape-only respirators shall be inspected before being carried into the workplace for use

Respirator inspections include the following:

- A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the face piece, head straps, valves, connecting tube, and cartridges, canisters or filters
- Check of elastomeric parts for pliability and signs of deterioration.
- Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The Company shall determine that the regulator and warning devices function properly

For Emergency Use Respirators the additional requirements apply:

- Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.
- Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

Respirator Storage:

Respirators are to be stored as follows:

- All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the face piece and exhalation valve.
- Emergency Respirators shall be:
  - Kept accessible to the work area;
  - Stored in compartments or in covers that are clearly marked as containing emergency respirators; and
  - Stored in accordance with any applicable manufacturer instructions.

Repair of Respirators:

Respirators that fail an inspection or are otherwise found to be defective will be removed from service to be discarded, repaired or adjusted in accordance with the following procedures:

- Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;
- Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and
- Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

Breathing Air Quality and Use:

The Company shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

- Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and
- Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
  1. Oxygen content (v/v) of 19.5-23.5%;
  2. Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
  3. Carbon monoxide (CO) content of 10 ppm or less;
  4. Carbon dioxide content of 1,000 ppm or less; and
  5. Lack of noticeable odor.
    - compressed oxygen will not be used in atmosphere-supplying respirators that have previously used compressed air
    - oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution
    - cylinders used to supply breathing air to respirators meet the following requirements
    - cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178)
    - cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air
    - moisture content in breathing air cylinders does not exceed a dew point of -50 degrees F (-45.6 degrees C) at 1 atmosphere pressure
    - breathing air couplings are incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.
    - breathing gas containers shall be marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

## BLOODBORNE PATHOGENS

### **PURPOSE**

The purpose of this plan is to establish a program and procedures for employee protection from bloodborne pathogens at B&T Drainage, Inc.

This plan supports compliance with Occupational Safety And Health Administration 29 CFR 1910.1030 on bloodborne pathogens.

This plan applies to all company employees.

### **SCOPE**

*Bloodborne Pathogens:* Microorganisms that are present in human blood and body fluids and can cause diseases in humans. These pathogens include Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV).

*Exposure Incident:* A situation in which an employee has contact with blood or other potentially infectious materials as a result of his or her duties. This contact includes specific eye, mouth, other mucous membrane, nonintact skin or parenteral contact.

*Nonintact Skin:* Skin that has cuts, abrasions or other openings through which bloodborne pathogens can enter the bloodstream.

*Occupational Exposure:* Reasonably anticipated employee contact with blood or other potentially infectious materials that may result from performing an employee's duties. This contact includes specific eye, mouth, other mucous membrane, nonintact skin or parenteral contact.

*Source Individual:* Any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to an employee.

*Universal Precautions:* An approach to infection control, in which all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, HCV and other bloodborne pathogens.

## **RESPONSIBILITIES**

*The Program Administrator:* \_\_\_\_Carson Coots/Payroll Clerk\_\_\_\_\_

This person is responsible for these tasks:

- Issuing and administering this plan and making sure that it satisfies the requirements of all applicable federal, state and local bloodborne pathogens regulations
- Identifying which employees are likely to be exposed to bloodborne pathogens
- Developing procedures for postexposure incidents
- Maintaining medical records of exposure incidents, training records and hepatitis vaccinations
- Completing exposure incident reports and notifying affected individuals
- Evaluating and updating the program annually
- Training employees annually
- Inspects and maintains sharp disposal containers to prevent overfilling.

### *Universal Precautions*

Universal precautions will be used at B&T Drainage, Inc to prevent contact with blood or other potentially infectious material. All blood or other potentially infectious material will be considered infectious regardless of the perceived status of the source individual.

### *Exposure Control Plan*

Employees covered by this bloodborne pathogens program will receive an explanation of this exposure control plan (ECP) during their initial training. This program will also be reviewed in annual refresher training. All employees have an opportunity to review this plan at any time during their work shifts by contacting Carson Coots.

### *Personal Protective Equipment (PPE)*

- Employees will be provided with PPE at no cost.
- PPE will be removed before leaving the work area or after a garment becomes contaminated.
- Wash hands immediately or as soon as feasible after removing gloves or other PPE.
- Used PPE will be placed in designated containers.

- Gloves will be worn when the employee may have contact with blood or other potentially infectious materials.
- Gloves will be replaced if torn, punctured or contaminated.
- Utility gloves will be decontaminated for reuse if they are not torn or cracked.
- Decontaminated disposable gloves will never be reused.
- Appropriate face and eye protection will be worn when splashes, sprays, spatters or droplets of blood or other potentially infectious materials pose a hazard to the eyes, nose or mouth.
- Appropriate protective body covering will be worn when occupational exposure is anticipated.

#### *Housekeeping*

- All equipment and work surfaces that have been contaminated with blood or other potentially infectious materials will be cleaned and decontaminated with an appropriate disinfectant.
- Tongs, forceps or a brush and dust pan shall be used to pick up contaminated broken glass.
- All infectious waste will be placed in red-colored plastic bags for disposal.
- Contaminated sharps will be discarded in containers that are closeable and puncture resistant. The containers will then be discarded into red-colored plastic bags.
- All regulated waste will be discarded according to federal, state and local regulations.

#### *Labeling*

- All infectious waste containers will be labeled with a biohazard symbol and the word *biohazard*.
- Employees should notify Carson Coots if they discover regulated waste containers or contaminated equipment without proper labels.

#### *HBV Pre-Exposure Program*

- The Hepatitis B vaccine and vaccination series will be offered within 10 working days of initial assignment to employees who have occupational exposure.
- The vaccine and vaccinations, as well as all medical evaluations and follow-up, will be made available to employees during work hours at no cost.
- Vaccinations will be administered according to current recommendations of the U.S. Public Health Service.
- Each employee who declines the vaccination will sign a declination form. (The vaccination will still be available to the employee at a later date and at no cost if he or she continues to have the potential for exposure in the workplace.)

#### *HBV Postexposure Program*

- Company postexposure procedures will be followed for any employee who is not initially identified as occupationally exposed but who voluntarily or inadvertently becomes exposed in the workplace.
- The HBV vaccine will be administered within 24 hours of any reported exposure incident.

#### *Exposure Incident Procedure*

- The routes of exposure and how exposure occurred will be documented.
- The source individual will be identified and documented.
- If consent is given, the source individual's blood will be tested and documented as soon as possible to determine HIV, HBV and HCV infectivity.

- The exposed employee will be provided with the source individual’s test results and information about applicable laws and regulations concerning source identity.
- After consent is given, the exposed employee’s blood will be tested for HIV, HBV and HCV serological status.
- If the employee does not give consent for HIV serological testing, the baseline blood sample will be preserved for at least 90 days.
- Recommendations by the U.S. Public Health Service will be followed.
- The health care provider who is responsible for administering the vaccine and postexposure evaluation will be given a copy of the OSHA standard.
- After an exposure incident occurs, the health care provider will receive a description of the exposed employee’s job duties relevant to the exposure incident, documentation of the route of exposure and circumstances of exposure, results of the source individual’s blood tests and all relevant employee medical records, including vaccination status.
- The employee will be provided with a copy of the health care provider’s written opinion within 15 days after the evaluation.
- The following health care provider will complete the postexposure evaluations:

Name *Kacey McGurie* \_\_\_\_\_

Location *Cork Medical Center* \_\_\_\_\_

Address *408 N 2<sup>nd</sup> St Marshall, IL 62441* \_\_\_\_\_ Phone *217-826-2361* \_

#### *Training*

- Employees who have the potential for occupational exposure to bloodborne pathogens will be trained annually on the requirements of the OSHA standard, symptoms of bloodborne diseases, ways in which bloodborne pathogens are transmitted, how to recognize tasks that might result in occupational exposure and what measures are provided by the company’s Written Exposure Control Plan (which will include receiving a copy of the plan).

#### *Recordkeeping*

##### **Training Records**

Training records are completed for each employee upon completion of training. These documents will be kept for at least 3 years. The training records should include:

- the dates of training sessions;
- the contents or a summary of the training sessions;
- the names and qualifications of persons conducting the training; and
- the names and job title of all persons attending the training sessions.

##### **Medical Records**

Medical records are maintained for each employee with occupational exposure in accordance with 29 CFR 1910.1020, “Access to Employee Exposure and Medical Records.” These confidential records are kept in B&T Drainage office for at least the duration of employment plus 30 years.

##### **OSHA Recordkeeping**

An exposure incident is evaluated to determine if the case meets OSHA's Recordkeeping Requirements (29 CFR 1904). This determination and the recording activities are done by Carson Coots

### **Sharps Injury Log**

In addition to the 1904 Recordkeeping Requirements, all percutaneous injuries from contaminated sharps are also recorded in the Sharps Injury Log. All incidences must include at least:

- date of the injury
- type and brand of the device involved
- department or work area where the incident occurred
- explanation of how the incident occurred.

The log is reviewed at least annually and is maintained for at least 5 years following the end of the calendar year covered.

### *Associated Documents*

- Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR 1910.1030 "Occupational Exposure to Bloodborne Pathogens."
- Occupational Safety and Health Administration. Model Plans and Programs for the OSHA Bloodborne Pathogens and Hazard Communications Standards (2003). OSHA Publication 3186-06R 2003. Retrieved from: <https://www.osha.gov/Publications/osh3186.pdf>

### **Attachments**

*The following forms are typically prepared for incident and employee documentation:*

- A – Exposure Determination Form I
- B – Exposure Determination Form II
- C – Exposure Incident Checklist
- D – Exposure Incident Report
- E – Exposed Employee Medical Release Form
- F – Source Individual Medical Release/Refusal Form
- G – Sample Form Letter To Health Care Provider
- H – Bloodborne Pathogens Program Evaluation Record
- I – Bloodborne Pathogens Equipment List
- J – Hepatitis B Vaccination Declination Statement
- K – Bloodborne Pathogens Training Record

## CONFINED SPACE PROGRAM

### **Purpose:**

The Confined Space Entry Program is provided to protect authorized employees that will enter confined spaces and may be exposed to hazardous atmospheres, engulfment in materials, conditions which may trap or asphyxiate due to converging or sloping walls, or

contains any other safety or health hazards. Reference: *OSHA-Permit-Required Confined Spaces* (29 CFR 1910.146).

#### Responsibilities

##### Management

- Ensure proper training for entry & rescue teams
- Provide proper equipment for entry & rescue teams
- Ensure confined space assessments have been conducted
- Ensure all permit required confined spaces are posted
- Annually review this program and all Entry Permits
- Evaluate Rescue Teams/Service to ensure they are adequately trained and prepared
- Ensure rescue team at access during entry into spaces with IDLH atmospheres

##### Employees

- Follow program requirements
- Report any previously un-identified hazards associated with confined spaces

##### Entry Supervisor:

Entry supervisors are responsible for the overall permit space entry and must coordinate all entry procedures, tests, permits, equipment and other relevant activities. The following entry supervisor duties are required:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
- Verifies, by checking that the appropriate entries have been made on the permit, all test specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin
- Terminate the entry and cancel the permit when the entry is complete and there is a need for terminating the permit
- Verify that rescue services are available and that the means for summoning them are operable
- Remove unauthorized persons who enter or attempt to enter the space during entry operations
- Determine whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with the permit terms and that acceptable entry conditions are maintained.

##### Entry Attendants

At least one attendant is required outside the permit space into which entry is authorized for the duration of the entry operation. Responsibilities include:

- To know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
- To be aware of possible behavioral effects of hazard exposure on entrants
- To continuously maintain an accurate count of entrants in the permit space and ensures a means to accurately identify authorized entrants
- To remain outside the permit space during entry operations until relieved by another attendant (once properly relieved, they may participate in other permit space activities, including rescue if they are properly trained and equipped).
- To communicate with entrants as necessary to monitor entrant status and alert entrants of the need to evacuate.
- To monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the entrants to immediately evacuate if: the attendant detects a prohibited condition, detects entrant behavioral effects of hazard exposure, detects a situation outside the space that could endanger the entrants; or if the attendant cannot effectively and safely perform all the attendant duties.
- To summon rescue and other emergency services as soon as the attendant determines the entrants need assistance to escape the permit space hazards.
- To perform non-entry rescues as specified by that rescue procedure and entry supervisor
- Not to perform duties that might interfere with the attendants' primary duty to monitor and protect the entrants.
- To take the following action when unauthorized persons approach or enter a permit space while entry is under way:
  1. Warn the unauthorized persons that they must stay away from the permit space,
  2. Advise unauthorized persons that they must exit immediately if they have entered the space, and
  3. Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.

#### Entrants

All entrants must be authorized by the entry supervisor to enter permit spaces, have received the required training, used the proper equipment, and observes the entry procedures and permit. Prior to entering the space, the internal atmosphere shall be tested with a calibrated direct-reading instrument. The following will be tested in this specific order: oxygen content, flammable gases and vapors, and potential toxic air contaminants. The atmosphere within the space must be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of hazardous atmosphere. The following entrant duties are required:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

- Properly use the equipment required for safe entry;
- Communicate with the attendant as necessary to enable the attendant to monitor the status of the entrants and to enable the attendant to alert the entrants of the need to evacuate the space if necessary;
- Alert the attendant whenever; the entrant recognizes any warning signs or symptoms of exposure to a dangerous situation, or any prohibited condition is detected; and
- Exit the permit space as quickly as possible whenever; the attendant or entry supervisor gives an order to evacuate the permit space, the entrant recognized any warning signs or symptoms of exposure to a dangerous situation, the entrant detects a prohibited condition, or an evacuation alarm activated.

Hazards:

- Explosive / Flammable Atmospheres
- Toxic Atmospheres
- Engulfment
- Asphyxiation
- Entrapment
- Slips & falls
- Chemical Exposure
- Electric Shock
- Thermal / Chemical Burns
- Noise & Vibration

Hazard Control:

Engineering Controls

- Locked entry points
- Temporary ventilation
- Temporary Lighting

Administrative Controls

- Signs
- Employee training
- Entry procedures
- Atmospheric Monitoring
- Rescue procedures
- Use of prescribed PPE

Definitions:

Confined space:

- Is large enough or so configured that an employee can bodily enter and perform work.
- Has limited or restricted means for entry or exit (i.e. tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

Permit required confined space (permit space), is a confined space that has one or more of the following characteristics:

13. Contains or has a potential to contain a hazardous atmosphere.
14. Contains a material that has the potential for engulfing an entrant.
15. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly covering walls or by a floor which slopes downward and tapers to a smaller cross-section.
16. Contains any other recognized serious safety or health hazard.

Each Permit-Required Confined Space will be marked "Confined Space - Entry Permit Required".

#### Entry Standard Operating Procedures

A Standard Operating Procedure (SOP) has been developed for each space to standardize the entry procedure. The SOP outlines:

- Hazards
- Hazard Control & Abatement
- Acceptable Entry Conditions
- Means of Entry
- Entry Equipment Required
- Emergency Procedures

#### Permit Required Confined Space Entry General Rules

During all Confined Space Entries, the following Safety Rules must be strictly enforced:

1. Only Authorized and Trained Employees may enter a Confined Space or act as Safety Watchmen.
2. No Smoking is permitted in a Confined Space or near entrance/exit area.
3. During Confined Space Entries, a Watchmen must be present at all times.
4. Constant visual or voice communication will be maintained between the Safety Watchmen and Employees entering a Confined Space.
5. No bottom or side entry will be made or work conducted below the level any hanging material or material which could cause engulfment.
6. Air and Oxygen Monitoring is required before entering any Permit-Required Confined Space. Oxygen levels in a Confined Space must be between 19.5 and 23.5 percent. Levels above or below will require the use of an SCBA or other approved air supplied respirator. Additional ventilation and Oxygen Level Monitoring is required

when welding is performed. The monitoring will check Oxygen Levels, Explosive Gas Levels and Carbon Monoxide Levels. Entry will not be permitted if explosive gas is detected above one-half the Lower Explosive Limit (LEL).

7. To prevent injuries to others, all openings to Confined Spaces will be protected by a barricade when covers are removed.

#### Confined Space Entry Procedures

Each employee who enters or is involved in the entry must:

1. Understand the procedures for confined Space Entry
2. Know the Hazards of the specific space
3. Review the specific procedures for each entry
4. Understand how to use entry and rescue equipment

#### Confined Space Entry Permits

Confined Space Entry Permits must be completed before any Employee enters a Permit-Required Confined Space. The Permit must be completed and signed by an Authorized Member of Management before entry.

- Permits will expire before the completion of the shift or if any pre-entry conditions change. Permits will be maintained on file for 12 months.

#### Contractor Entry:

All work by non-company employees that involves the entry into confined spaces will follow the procedures of this program. The information of this program and specific hazards of the confined spaces to be entered will be provided to Contractor Management prior to commencing entry or work.

#### Training:

Training for Confined Space Entry includes:

1. Duties of Entry Supervisor, Entrant and Attendants
2. Confined Space Entry permits
3. Hazards of Confined Spaces
4. Use of Air Monitoring Equipment
5. First Aid and CPR Training
6. Emergency Action & Rescue Procedures
7. Confined Space Entry & Rescue Equipment
8. Rescue training, including entry and removal from representative spaces

#### Combined Space Hazards:

##### Flammable Atmospheres

A flammable atmosphere generally arises from enriched oxygen atmospheres, vaporization of flammable liquids, byproducts of work, chemical reactions, concentrations of combustible dusts, and desorption of chemical from inner surfaces of the confined space.

An atmosphere becomes flammable when the ratio of oxygen to combustible material in the air is neither too rich nor too lean for combustion to occur. Combustible gases or vapors will accumulate when there is inadequate ventilation in areas such as a confined space. Flammable gases such as acetylene, butane, propane, hydrogen, methane, natural or manufactured gases or vapors from liquid hydrocarbons can be trapped in confined spaces, and since many gases are heavier than air, they will seek lower levels as in pits, sewers, and various types of storage tanks and vessels. In a closed top tank, it should also be noted that lighter than air gases may rise and develop a flammable concentration if trapped above the opening.

The byproducts of work procedures can generate flammable or explosive conditions within a confined space. Specific kinds of work such as spray painting can result in the release of explosive gases or vapors. Welding in a confined space is a major cause of explosions in areas that contain combustible gas.

Chemical reactions forming flammable atmospheres occur when surfaces are initially exposed to the atmosphere, or when chemicals combine to form flammable gases. This condition arises when dilute sulfuric acid reacts with iron to form hydrogen or when calcium carbide makes contact with water to form acetylene. Other examples of spontaneous chemical reactions that may produce explosions from small amounts of unstable compounds are acetylene-metal compounds, peroxides, and nitrates. In a dry state, these compounds have the potential to explode upon percussion or exposure to increased temperature. Another class of chemical reactions that form flammable atmospheres arises from deposits of pyrophoric substances (carbon, ferrous oxide, ferrous sulfate, iron, etc.) that can be found in tanks used by the chemical and petroleum industry. These tanks containing flammable deposits will spontaneously ignite upon exposure to air.

Combustible dust concentrations are usually found during the process of loading, unloading, and conveying grain products, nitrated fertilizers, finely ground chemical products, and any other combustible material. High charges of static electricity, which rapidly accumulate during periods of relatively low humidity (below 50%), can cause certain substances to accumulate electrostatic charges of sufficient energy to produce sparks and ignite a flammable atmosphere. These sparks may also cause explosions when the right air or oxygen to dust or gas mixture is present.

#### Toxic Atmospheres

The substances to be regarded as toxic in a confined space can cover the entire spectrum of gases, vapors, and finely-divided airborne dust in industry. The sources of toxic atmospheres encountered may arise from the following:

7. The manufacturing process (for example, in producing polyvinyl chloride, hydrogen chloride is used as well as vinyl chloride monomer, which is carcinogenic).
8. The product stored [removing decomposed organic material from a tank can liberate toxic substances, such as hydrogen sulfide ( $H_2S$ )].
9. The operation performed in the confined space (for example, welding or brazing with metals capable of producing toxic fumes).

During loading, unloading, formulation, and production, mechanical and/or human error may also produce toxic gases which are not part of the planned operation.

Carbon monoxide (CO) is a hazardous gas that may build up in a confined space. This odorless, colorless gas that has approximately the same density as air is formed from incomplete combustion of organic materials such as wood, coal, gas, oil, and gasoline; it can be formed from microbial decomposition of organic matter in sewers, silos, and fermentation tanks. Carbon monoxide is an insidious toxic gas because of its poor warning properties. Early stages of CO intoxication are nausea and headache. Carbon monoxide may be fatal at 1000 ppm in air, and is considered dangerous at 200 ppm, because it forms carboxyhemoglobin in the blood which prevents the distribution of oxygen in the body.

Carbon monoxide is a relatively abundant colorless, odorless gas, therefore, any untested atmosphere must be suspect. It must also be noted that a safe reading on a combustible gas indicator does not ensure that CO is not present. Carbon monoxide must be tested for specifically. The formation of CO may result from chemical reactions or work activities, therefore fatalities due to CO poisoning are not confined to any particular industry. There have been fatal accidents in sewage treatment plants due to decomposition products and lack of ventilation in confined spaces. Another area where CO results as a product of decomposition is in the formation of silo gas in grain storage elevators. In another area, the paint industry, varnish is manufactured by introducing the various ingredients into a kettle, and heating them in an inert atmosphere, usually town gas, which is a mixture of carbon dioxide and nitrogen.

In welding operations, oxides of nitrogen and ozone are gases of major toxicologic importance, and incomplete oxidation may occur and carbon monoxide can form as a byproduct.

Another poor work practice, which has led to fatalities, is the recirculation of diesel exhaust emissions. Increased CO levels can be prevented by strict control of the ventilation and the use of catalytic convertors.

#### Irritant (Corrosive) Atmospheres

Irritant or corrosive atmospheres can be divided into primary and secondary groups. The primary irritants exert no systemic toxic effects (effects on the entire body). Examples of primary irritants are chlorine, ozone, hydrochloric acid, hydrofluoric acid, sulfuric acid, nitrogen dioxide, ammonia, and sulfur dioxide. A secondary irritant is one that may produce systemic toxic effects in addition to surface irritation. Examples of secondary irritants include benzene, carbon tetrachloride, ethyl chloride, trichloroethane, trichloroethylene, and chloropropene.

Irritant gases vary widely among all areas of industrial activity. They can be found in plastics plants, chemical plants, the petroleum industry, tanneries, refrigeration industries, paint manufacturing, and mining operations.

Prolonged exposure at irritant or corrosive concentrations in a confined space may produce little or no evidence of irritation. This may result in a general weakening of the defense reflexes from changes in sensitivity. The danger in this situation is that the worker is usually not aware of any increase in his/her exposure to toxic substances.

#### Asphyxiating Atmospheres

The normal atmosphere is composed approximately of 20.9% oxygen and 78.1% nitrogen, and 1% argon with small amounts of various other gases. Reduction of oxygen in a confined space may be the result of either consumption or displacement.

The consumption of oxygen takes place during combustion of flammable substances, as in welding, heating, cutting, and brazing. A more subtle consumption of oxygen occurs during bacterial action, as in the fermentation process. Oxygen may also be consumed during chemical reactions as in the formation of rust on the exposed surface of the confined space (iron oxide). The number of people working in a confined space and the amount of their physical activity will also influence the oxygen consumption rate.

A second factor in oxygen deficiency is displacement by another gas. Examples of gases that are used to displace air, and therefore reduce the oxygen level are helium, argon, and nitrogen. Carbon dioxide may also be used to displace air and can occur naturally in sewers, storage bins, wells, tunnels, wine vats, and grain elevators. Aside from the natural development of these gases, or their use in the chemical process, certain gases are also used as inerting agents to displace flammable substances and retard pyrophoric reactions. Gases such as nitrogen, argon, helium, and carbon dioxide, are frequently referred to as non-toxic inert gases but have claimed many lives. The use of nitrogen to inert a confined space has claimed more lives than carbon dioxide. The total displacement of oxygen by nitrogen will cause immediate collapse and death. Carbon dioxide and argon, with specific gravities greater than air, may lie in a tank or manhole for hours or days after opening. Since these gases are colorless and odorless, they pose an immediate hazard to health unless appropriate oxygen measurements and ventilation are adequately carried out.

Oxygen deprivation is one form of asphyxiation. While it is desirable to maintain the atmospheric oxygen level at 21% by volume, the body can tolerate deviation from this ideal. When the oxygen level falls to 17%, the first sign of hypoxia is a deterioration to night vision which is not noticeable until a normal oxygen concentration is restored. Physiologic effects are increased breathing volume and accelerated heartbeat. Between 14-16% physiologic effects are increased breathing volume, accelerated heartbeat, very poor muscular coordination, rapid fatigue, and intermittent respiration. Between 6-10% the effects are nausea, vomiting, inability to perform, and unconsciousness. Less than 6%, spasmodic breathing, convulsive movements, and death in minutes.

#### Mechanical Hazards

If activation of electrical or mechanical equipment would cause injury, each piece of equipment should be manually isolated to prevent inadvertent activation before workers enter or while they work in a confined space. The interplay of hazards associated with a confined space, such as the potential of flammable vapors or gases being present, and the build-up of static charge due to mechanical cleaning, such as abrasive blasting, all influence the precautions which must be taken.

To prevent vapor leaks, flashbacks, and other hazards, workers should completely isolate the space. To completely isolate a confined space, the closing of valves is not sufficient. All pipes must be physically disconnected or isolation blanks bolted in place. Other special precautions must be taken in cases where flammable liquids or vapors may re-contaminate the confined space. The pipes blanked or disconnected should be inspected and tested for leakage to check the effectiveness of the procedure. Other areas of concern are steam valves, pressure lines, and chemical transfer pipes. A less apparent

hazard is the space referred to as a void, such as double walled vessels, which must be given special consideration in blanking off and inerting.

#### Thermal Effects

Four factors influence the interchange of heat between people and their environment. They are: (1) air temperature, (2) air velocity, (3) moisture contained in the air, and (4) radiant heat. Because of the nature and design of most confined spaces, moisture content and radiant heat are difficult to control. As the body temperature rises progressively, workers will continue to function until the body temperature reaches approximately 102°F. When this body temperature is exceeded, the workers are less efficient, and are prone to heat exhaustion, heat cramps, or heat stroke. In a cold environment, certain physiologic mechanisms come into play, which tend to limit heat loss and increase heat production. The most severe strain in cold conditions is chilling of the extremities so that activity is restricted. Special precautions must be taken in cold environments to prevent frostbite, trench foot, and general hypothermia.

Protective insulated clothing for both hot and cold environments will add additional bulk to the worker and must be considered in allowing for movement in the confined space and exit time. Therefore, air temperature of the environment becomes an important consideration when evaluating working conditions in confined spaces.

#### Noise

Noise problems are usually intensified in confined spaces because the interior tends to cause sound to reverberate and thus expose the worker to higher sound levels than those found in an open environment. This intensified noise increases the risk of hearing damage to workers which could result in temporary or permanent loss of hearing. Noise in a confined space which may not be intense enough to cause hearing damage may still disrupt verbal communication with the emergency standby person on the exterior of the confined space. If the workers inside are not able to hear commands or danger signals due to excessive noise, the probability of severe accidents can increase.

#### Vibration

Whole body vibration may affect multiple body parts and organs depending upon the vibration characteristics. Segmental vibration, unlike whole body vibration, appears to be more localized in creating injury to the fingers and hands of workers using tools, such as pneumatic hammers, rotary grinders or other hand tools which cause vibration.

#### Other Hazards

Some physical hazards cannot be eliminated because of the nature of the confined space or the work to be performed. These hazards include such items as scaffolding, surface residues, and structural hazards. The use of scaffolding in confined spaces has contributed to many accidents caused by workers or materials falling, improper use of guard rails, and lack of maintenance to insure worker safety. The choice of material used for scaffolding depends upon the type of work to be performed, the calculated weight to be supported, the surface on which the scaffolding is placed, and the substance previously stored in the confined space.

Surface residues in confined spaces can increase the already hazardous conditions of electrical shock, reaction of incompatible materials, liberation of toxic substances, and

bodily injury due to slips and falls. Without protective clothing, additional hazards to health may arise due to surface residues.

Structural hazards within a confined space such as baffles in horizontal tanks, trays in vertical towers, bends in tunnels, overhead structural members, or scaffolding installed for maintenance constitute physical hazards, which are exacerbated by the physical surroundings. In dealing with structural hazards, workers must review and enforce safety precautions to assure safety.

### CONSTRUCTION CHECKLIST FOR SELF-INSPECTION

#### Tools

##### Hand and Power Tools

Accidents with hand tools comprise five to ten percent of compensable injuries. Many of these injuries could be avoided with the proper care, maintenance and use of hand tools.

1. Are hand tools and other equipment regularly inspected for safe condition?
2. Are tool handles free of splints and cracks?
3. Are handles wedged tightly in the heads of all tools?
4. Are impact tools free of mushroomed heads?
5. Are the heads of chisels or punches ground periodically to prevent mushrooming?
6. Are cutting edges kept sharp so the tools will move smoothly without binding or skipping?
7. Is sharpening, redressing, or repairing tools done properly, using tools suited to each purpose?
8. When compressed air is used for cleaning purposes is nozzle pressure safely reduced to less than 30 psi?
9. Are power saws and similar equipment provided with safety guards?
10. Are tools used with the correct shield, guard or attachments recommended by the manufacturer?
11. Are abrasive wheel grinders provided with safety guards that cover the spindle ends, nut, and flange projections?
12. Are portable circular saws equipped with guards above and below the base or shoe?
13. Are saw guards checked to ensure they are not wedged up thereby leaving an unguarded lower portion of the blade? Are springs checked for wear?
14. Are guards kept in place and in working order?
15. Are rotating or moving parts of equipment guarded to prevent contact by employees?
16. Do operators wear eye and face protection when grinding?
17. Is the pneumatic hose line secured to the pneumatic tool? Are the tool bits secured by use of safety clips or retainers to prevent accidental disconnecting?
18. Are appropriate ground-fault circuit interrupters provided at the job site? Or
19. Is an assured equipment grounding conductor program established and implemented at the job site?
20. Are electric powered tools double-insulated or properly grounded?
21. Is eye and face protection used when driving hardened or tempered studs or nails?
22. Are tools stored in a dry, secure location where they won't be tampered with?

##### Powder Actuated Tools

23. Do all users of powder actuated tools possess an “Operator’s Card” to demonstrate that they have been trained?
24. Are tools left unloaded until they are ready for immediate use?
25. Are tools inspected each day for defects or obstructions prior to use?
26. Are the following types of personal protective equipment used by operators and others in area of tool use?
  - Hard hats?
  - Safety goggles?
  - Safety shoes?
  - Ear protection when making fastenings in confined areas such as small rooms, tanks, vaults or ship compartments?

#### Trenches & Excavations

1. Has the utility company been notified of intended digging?
2. Are daily inspections made of the excavation to determine the possibility of a cave-in and are necessary steps taken to protect employees?
3. Are shoring or sloping systems used to support the walls and faces of the excavations sufficient to insure against cave-ins?
4. Is there a ladder in the excavation?

#### Concrete

1. Is formwork and shoring adequate to support all intended loads during concrete placement?
2. Are protruding re-bars covered or bent over where work must be performed overhead?
3. Do employees wear gloves and eye protection during form stripping operations?
4. Are nails removed or bent over from stripped forms?
5. Are clear pathways maintained through stripping areas?

## EXCAVATION & TRENCHING

### SCOPE

This policy sets forth the official practices required for trenching and excavations pertaining to the service provided by B&T Drainage, Inc.; hereafter referred to as “B&T Drainage”.

### DEFINITIONS

**Aluminum hydraulic shoring**- an engineered shoring system comprised of aluminum hydraulic cylinders (cross braces), used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such a system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

**Benching** - a method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

**Cave-in** - the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

**Competent person** -one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to workers, and who has authorization to take prompt corrective measures to eliminate them. All competent persons must complete the 4-hour Physical Plant trenching and shoring class, successfully pass the exam, and be certified for successful completion of the class. A competent person should have and be able to demonstrate the following:

- Training, experience, and knowledge of:

- soil analysis
- use of protective systems
- requirements of 29 CFR 1926 Subpart P
- Ability to detect:
  - conditions that could result in cave-ins
  - failures in protective systems
  - hazardous atmospheres
  - other hazards including those associated with confined spaces
- Authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

**Excavation** -any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

**Registered professional engineer**- a person who is registered as a professional engineer.

**Shield (shield system)** -a structure that can withstand the forces imposed on it by a cave-in and thereby protect workers with the structure. Shields can be permanent structure or can be designed to be portable and moved along as work progresses. Also known as trench box or trench shield.

**Shoring (shoring system)** -a structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

**Sloping (sloping system)** - a method of protecting workers from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

**Trench (trench excavation)** -a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

## PROCEDURES

All excavations shall be made in accordance with the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652; the Occupational Safety and Health Administration's standard on excavations, except where otherwise noted below.

### Training

B&T Drainage will ensure all workers and associates are trained in trenching and excavation safety and specific work-related practices. B&T Drainage requires all subcontractors whose work does not include trenching/excavations, but are in close proximity, to provide a basic awareness program that addresses all job scope activities. The awareness program shall include information regarding safe access and egress and protective measures associated with trenching.

A competent person shall be placed in charge of all excavations. Underground utilities must be located and marked before excavation begins. Before digging, driving equipment into the ground, or engaging in earth moving activities are conducted, the appropriate one-call center will be contacted. Workers are not allowed in the excavation while heavy equipment is digging.

### Inspections

The competent person shall conduct inspections:

- Daily and before the start of each shift by using the DAILY EXCAVATION CHECKLIST found at the end of this chapter.
- As dictated by the work being done in the trench.
- After every rainstorm.
- After other events that could increase hazards, such as snowstorm, windstorm, earthquake, dramatic change in weather, etc.
- When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur.
- When there is a change in the size, location, or placement of the spoil pile.
- When there is any indication of change or movement in adjacent structures.

(For excavations 4 feet or greater in depth, a trench inspection form shall be filled out for each inspection.) If problems are found, provisions should be made for immediate personnel removal.

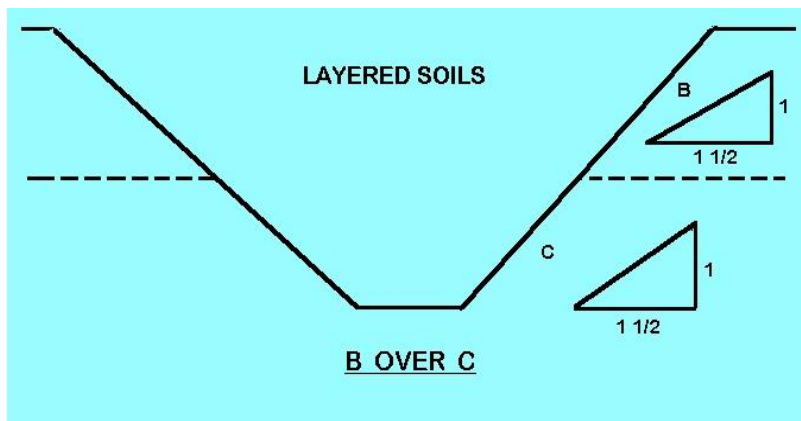
**Soil Types:**

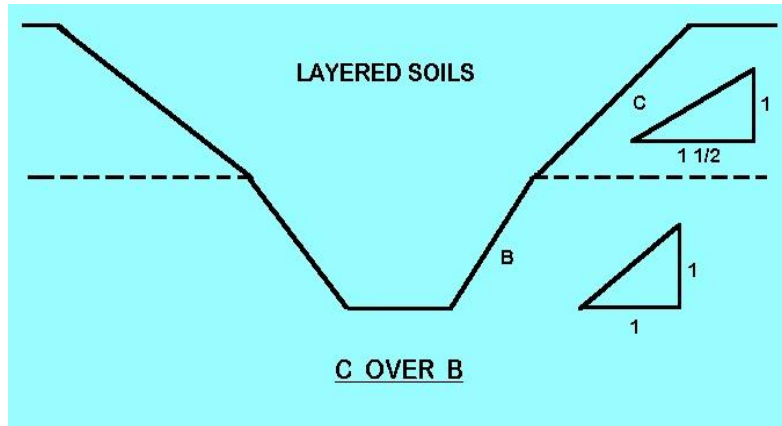
**Type A** - Most stable: clay, silty clay, and hardpan (resists penetration). No soil is Type A if it is fissured, is subject to vibration of any type, has previously been disturbed, or has seeping water.

**Type B** - Medium stability: silt, sandy loam, medium clay, and unstable dry rock; previously disturbed soils unless otherwise classified as Type C; soils that meet the requirements of Type A soil but are fissured or subject to vibration.

**Type C** - Least stable: gravel, loamy sand, soft clay, submerged soil or dense, heavy unstable rock, and soil from which water is freely seeping.

**Layered geological strata** (where soils are configured in layers) - The soil must be classified based on the soil classification of the weakest soil layer. Each layer may be classified individually if a more stable layer lies below a less stable layer, i.e., where a Type C soil rests on top of stable rock.





### Testing Methods

The competent person in charge of the excavation shall be responsible for determining whether the soil is Type B or C. The competent person shall use a visual test coupled with one or more manual tests.

#### Visual test

In addition to checking the items on the trench inspection form, the competent person should perform a visual test to evaluate the conditions around the site. In a visual test, the entire excavation site is observed, including the soil adjacent to the site and the soil being excavated. The competent person also checks for any signs of vibration.

During the visual test, the competent person should check for crack-line openings along the failure zone that would indicate tension cracks, look for existing utilities that indicate that the soil has been previously disturbed, and observe the open side of the excavation for indications of layered geologic structuring.

The competent person should also look for signs of bulging, boiling, or sloughing, as well as for signs of surface water seeping from the sides of the excavation or from the water table.

In addition, the area adjacent to the excavation should be checked for signs of foundations or other intrusions into the failure zone, and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

#### Manual tests

Thumb penetration test- Attempt to press the thumb firmly into the soil in question. If the thumb penetrates no further than the length of the nail, it is probably Type B soil. If the thumb penetrates the full length of the thumb, it is Type C. It should be noted that the thumb penetration test is the least accurate testing method.

Dry strength test- Take a sample of dry soil. If it crumbles freely, or with moderate pressure into individual grains, it is considered granular (Type C). Dry soil that falls into clumps that subsequently break into smaller clumps (and the smaller clumps can only be broken with difficulty) it is probably clay in combination with gravel, sand, or silt (Type B).

Plasticity or Wet Thread Test- Take a moist sample of the soil. Mold it into a ball and then attempt to roll it into a thin thread approximately 1/8 inch in diameter by two inches in length. If the soil sample does not break when held by one end, it may be considered Type B.

A pocket penetrometer, shear vane, or torvane may also be used to determine the unconfined compression strength of soils.

### **Spoil**

Temporary spoil shall be placed no closer than 2 feet from the surface edge of the excavation, measured from the nearest base of the spoil to the cut. This distance should not be measured from the crown of the spoil deposit. This distance requirement ensures that loose rock or soil from the temporary spoil will not fall on workers in the trench.

Spoil should be placed so that it channels rainwater and other run-off water away from the excavation. Spoil should be placed so that it cannot accidentally run, slide, or fall back into the excavation.

Permanent spoil should be placed some distance from the excavation.

### **Surface Crossing of Trenches**

Surface crossing of trenches should not be made unless absolutely necessary. However, if necessary, they are only permitted under the following conditions:

Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.

Walkways or bridges must have a minimum clear width of 20-inches and be fitted with standard rails and extend a minimum of 24 inches past the surface edge of the trench.

### **Access and Egress**

Trenches 4 feet or more in depth shall be provided with a fixed means of egress.

Spacing between ladders or other means of egress must be such that a worker will not have to travel more than 25 feet laterally to the nearest means of egress.

Ladders must be secured and extend a minimum of 36 inches above the landing.

Metal ladders should be used with caution, particularly when electric utilities are present.

Any structural ramps used solely for worker access or egress must be designed by a competent person.

### **Exposure to Vehicles**

Workers exposed to vehicular traffic shall be provided with and required to wear reflective vests or other suitable garments marked with or made of reflectorized or high-visibility materials.

Trained flag persons, signs, signals, and barricades shall be used when necessary.

### **Exposure to Falling Loads**

All workers on an excavation site must wear hard hats.

Workers are not allowed to work under raised loads.

Workers are not allowed to work under loads being lifted or moved by heavy equipment used for digging or lifting.

Workers are required to stand away from equipment that is being loaded or unloaded to avoid being struck by falling materials or spillage.

Equipment operators or truck drivers may remain in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.

### **Warning Systems for Mobile Equipment**

The following steps should be taken to prevent vehicles from accidentally falling into the trench:

- Barricades must be installed where necessary when:
  - Hand or mechanical signals must be used as required
  - Stop logs must be installed if there is danger of vehicles falling into the trench
  - Soil should be graded away from the excavation; this will assist in vehicle control and channeling of run-off water
  - Trenches left open overnight shall be fenced and barricaded

### **Hazardous Atmospheres and Confined Spaces**

Workers shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

- less than 19.5% oxygen
- a combustible gas concentration greater than 20% of the lower flammable limit
- concentrations of hazardous substance that exceed those specified in the Threshold Limit Values for airborne contaminants established by the ACGIH

All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls for personal protective equipment and for lifesaving equipment. Engineering controls (such as ventilation) and respiratory equipment may be required.

### **Testing for Atmospheric Contaminants**

If there is any possibility that the trench or excavation could contain a hazardous atmosphere, atmospheric testing must be conducted prior to entry. Conditions that might warrant atmospheric testing would be if the excavation was made in a landfill area or if the excavation was crossed by, was adjacent to, or contained pipelines containing a hazardous material (for example, natural gas lines).

Testing should be conducted before workers enter the trench and should be done regularly to ensure that the trench remains safe. The frequency of testing should be increased if equipment is operating in the trench.

Testing frequency should also be increased if welding, cutting, or burning is done in the trench.

Workers required to wear respiratory protection must be trained, fit-tested, and enrolled in a respiratory protection program.

Some trenches qualify as confined spaces. When this occurs, compliance with B&T Drainage’s Confined Space Program is also required.

**Standing Water and Water Accumulation**

Methods for controlling standing water and water accumulation must be provided and should consist of the following if workers must work in the excavation:

- Use of special support or shield systems approved by a registered professional engineer
- Water removal equipment, such as well pointing, used, and monitored by a competent person
- Safety harnesses and lifelines used in conformance with 29 CFR 1926.104
- Workers removed from the trench during rainstorms
- Trenches carefully inspected by a competent person after each rain and before workers are permitted to re-enter the trench

**Benching, Sloping, Shoring, and Shielding Requirements**

All excavations or trenches 4 feet or greater in depth shall be appropriately benched, shored, or sloped according to the procedures and requirements set forth in OSHA's Excavation standard, 29 CFR 1926.650, .651, and .652.

Excavations or trenches 20 feet deep or greater must have a protective system designed by a registered professional engineer.

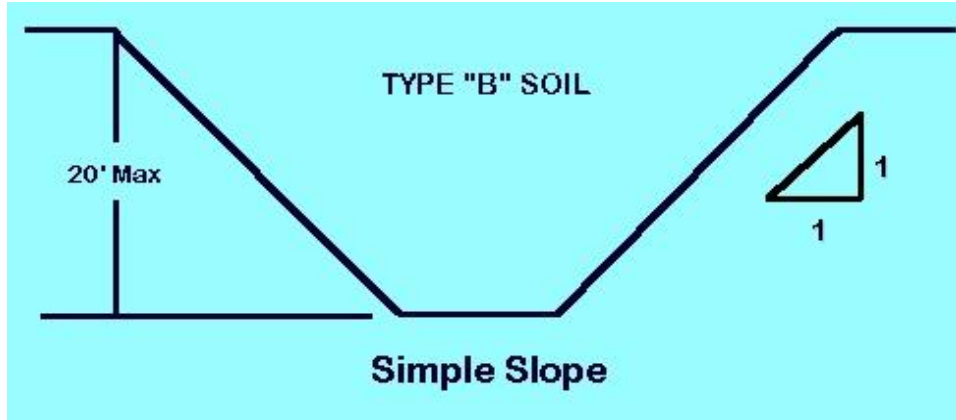
Excavations under the base of footing of a foundation or wall require a support system designed by a registered professional engineer.

Sidewalks and pavement shall not be undermined unless a support system or another method of protection is provided to protect workers from their possible collapse.

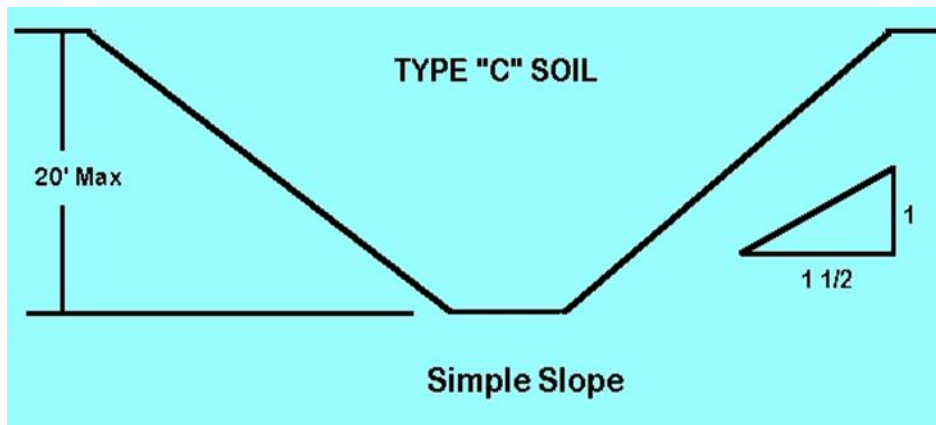
**Sloping**

Maximum allowable slopes for excavations less than 20' based on soil type and angle to the horizontal are as follows:

<b>Soil Type</b>	<b>Height/depth ratio</b>	<b>Slope angle</b>
Type B	1:1	45 degrees
Type C	1 1/2:1	34 degrees



A 10-foot-deep trench in Type B soil would have to be sloped to a 45-degree angle or sloped 10 feet back in both directions. Total distance across a 10-foot-deep trench would be 20 feet, plus the width of the bottom of the trench itself. In Type C soil, the trench would be sloped at a 34-degree angle, or 15 feet back in both directions for at least 30 feet across, plus the width of the bottom of the trench itself. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.

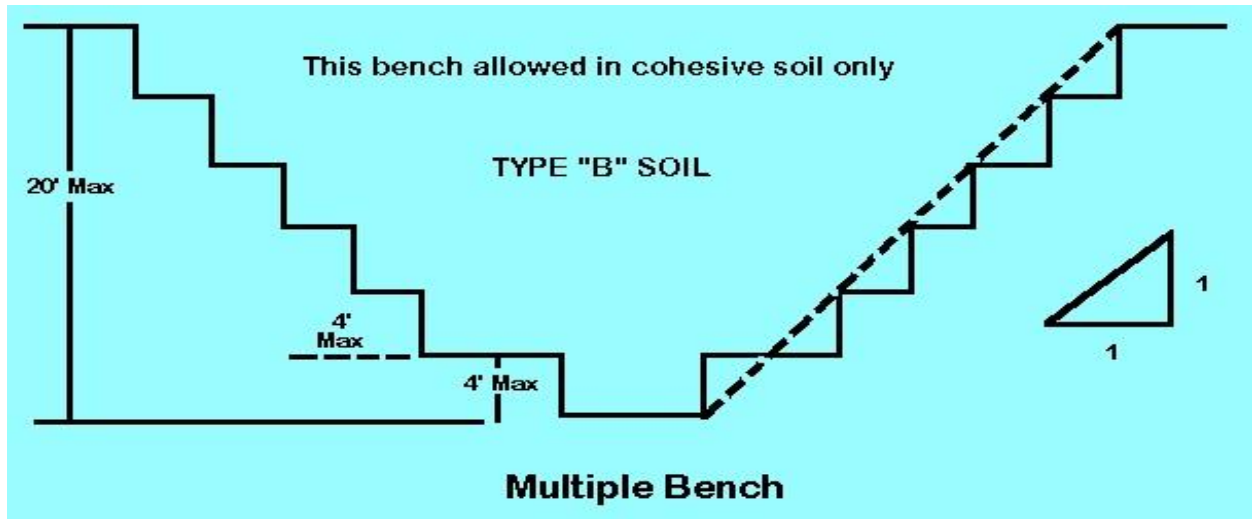


### **Benching**

There are two basic types of benching, single and multiple, which can be used in conjunction with sloping.

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

In Type B soil, the vertical height of the benches must not exceed 4 feet. Benches must be below the maximum allowable slope for that soil type. In other words, a 10-foot-deep trench in Type B soil must be benched back 10 feet in each direction, with a maximum of a 45-degree angle.



Benching is not allowed in Type C soil.

### Shoring

Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. There are two basic types of shoring, timber, and aluminum hydraulic.

Hydraulic shoring provides a critical safety advantage over timber shoring because workers do not have to enter the trench to install them. They are also light enough to be installed by one worker; they are gauge-regulated to ensure even distribution of pressure along the trench line; and they can be adapted easily to various trench depths and widths. However, if timber shoring is used, it must meet the requirements of 29 CFR 1926.650, .651, and .652.

All shoring shall be installed from the top down and removed from the bottom up. Hydraulic shoring shall be checked at least once per shift for leaking hoses and/or cylinders, broken connections, cracked nipples, bent bases, and any other damaged or defective parts.

The top cylinder of hydraulic shoring shall be no more than 18 inches below the top of the excavation.

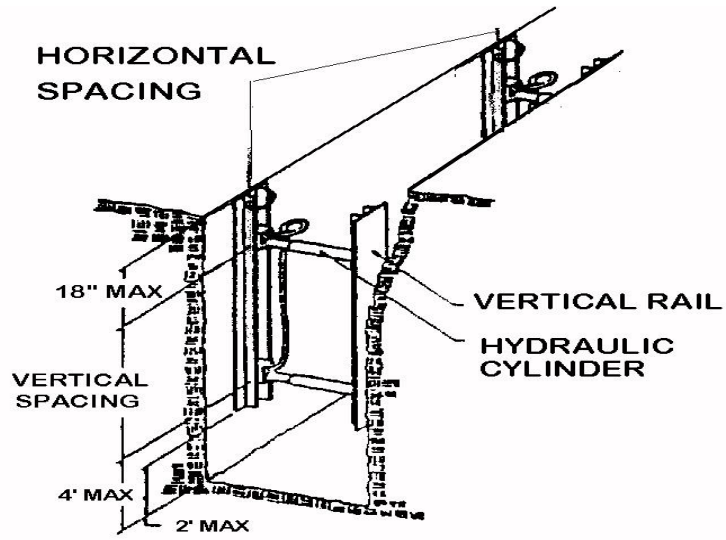
The bottom of the cylinder shall be no higher than four feet from the bottom of the excavation. (Two feet of trench wall may be exposed beneath the bottom of the rail or plywood sheeting, if used.)

Three vertical shores, evenly spaced, must be used to form a system.

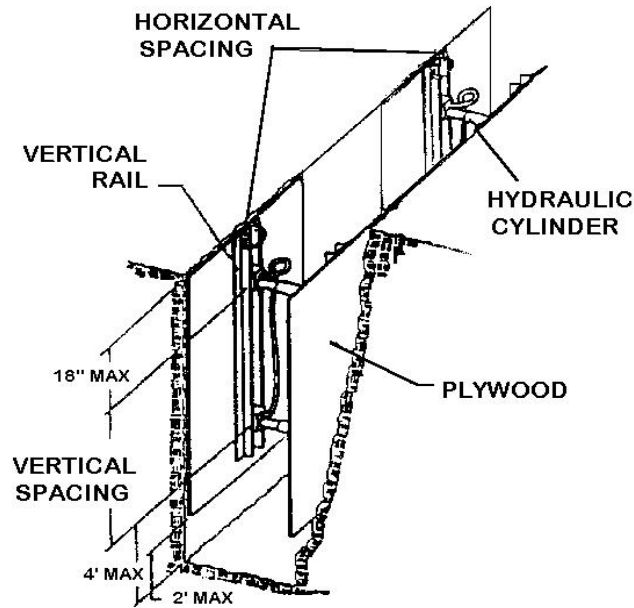
Wales are installed no more than two feet from the top, no more than four feet from the bottom, and no more than four feet apart, vertically.

Typical installations of aluminum hydraulic shoring:

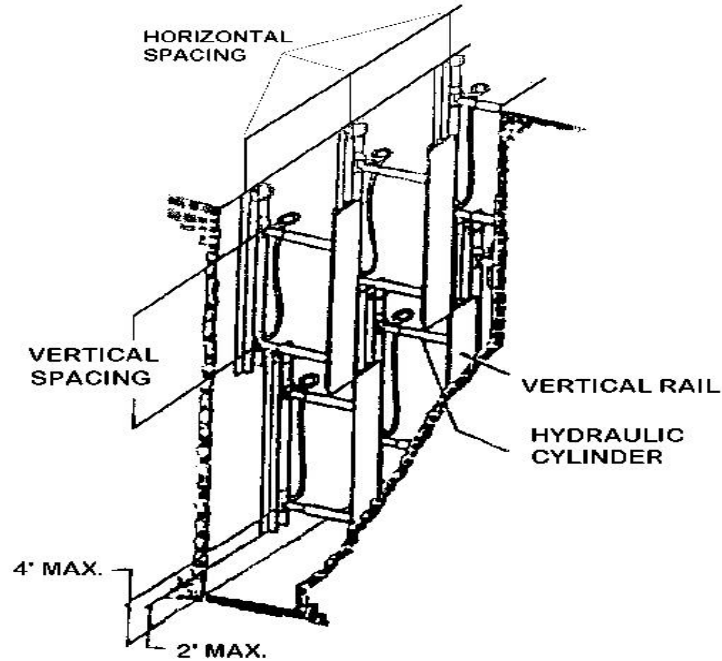
- **Vertical aluminum hydraulic shoring (spot bracing)**



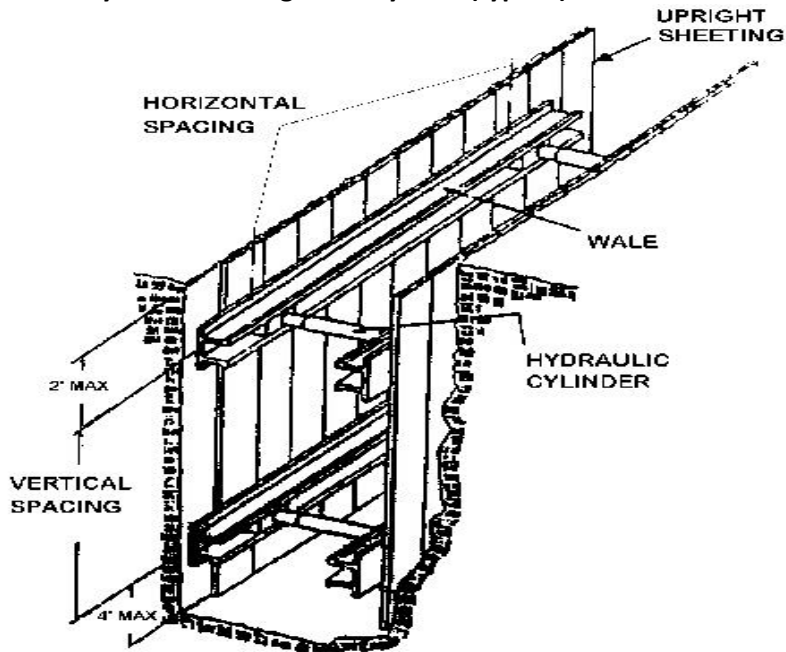
- Vertical aluminum hydraulic shoring (with plywood)



- Vertical aluminum hydraulic shoring (stacked)



- Aluminum hydraulic shoring waler system (typical)



### Shielding

Trench boxes are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents.

The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench box and the excavation side must be backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those which the system was designed to withstand.

Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching.

The box must extend at least 18 inches above the surrounding area if there is sloping toward the excavation. This can be accomplished by providing a benched area adjacent to the box.

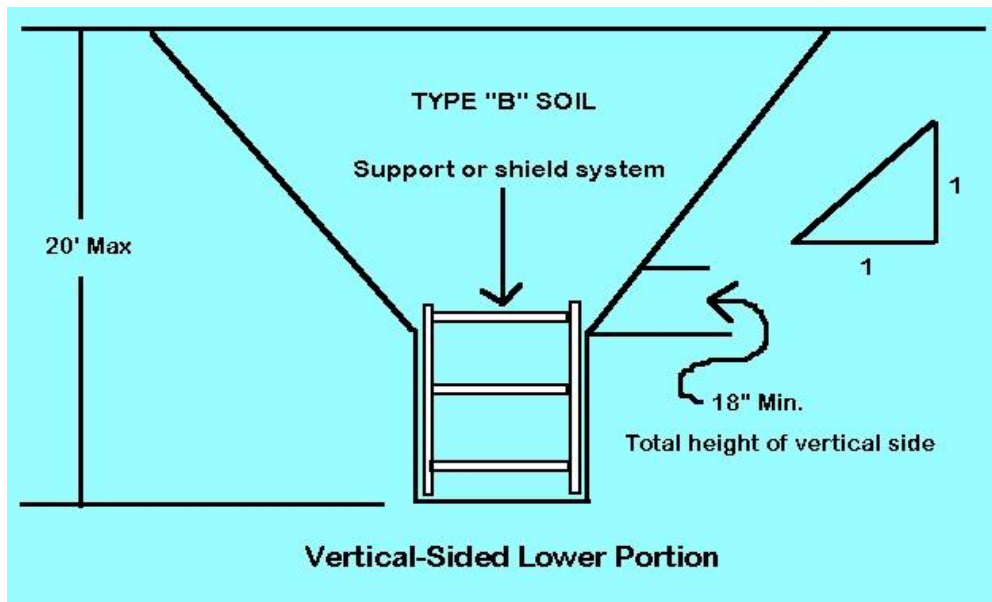
Any modifications to the shields must be approved by the manufacturer.

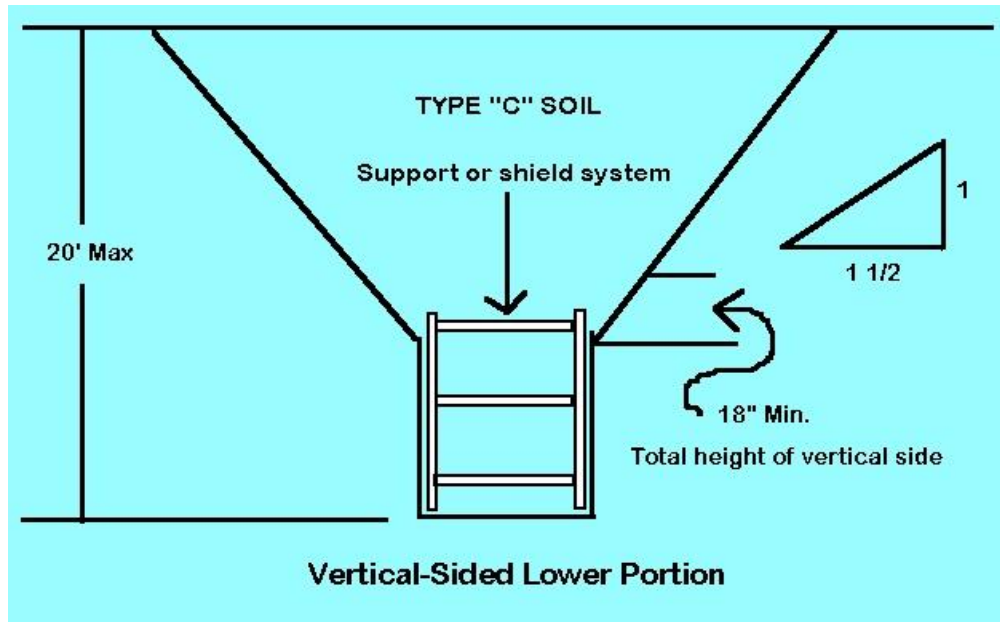
Shields may ride two feet above the bottom of an excavation, provided they are calculated to support the full depth of the excavation and there is no caving under or behind the shield.

Workers must enter and leave the shield in a protected manner, such as by a ladder or ramp.

Workers may not remain in the shield while it is being moved.

**Illustration of shielding systems in B and C type soils.**





**DAILY EXCAVATION CHECKLIST**

<b>Client</b>		Date	
Project Name		<b>Approximate Temp.</b>	
<b>Project Location</b>		<b>Approximate Wind Direction</b>	
Job Number		<b>Safety Rep</b>	
<b>Excavation Depth and Width</b>		<b>Soil Classification</b>	
<b>Protective System Used</b>			
<b>Activities in Excavation</b>			
<b>Competent Person</b>			

Excavation > 4 feet deep? \_\_\_ Yes \_\_\_ No.

If YES, fill out a Confined Space Permit PRIOR to ANY person entering the excavation.

**NOTE: Trenches over 4 feet in depth are considered excavations. Any items marked NO on this form MUST be remediated prior to any workers entering the excavation.**

YES	NO	N/A	DESCRIPTION
			<b>GENERAL</b>
			Workers protected from cave-ins & loose rock/soil that could roll into the excavation
			Spoils, materials & equipment set back at least 2 feet from the edge of the excavation
			Engineering designs for sheeting &/or manufacturer's data on trench box capabilities on site
			Adequate signs posted and barricades provided

			Training (toolbox meeting) conducted w/ workers prior to entering excavation
--	--	--	--

YES	NO	N/A	UTILITIES
			Utility company contacted & given 24 hr. notice &/or utilities already located & marked
			Overhead lines located, noted, and reviewed with the operator
			Utility locations reviewed with the operator, & precautions taken to ensure contact does not occur
			Utilities crossing the excavation supported, and protected from falling materials
			<b>Underground installations protected, supported, or removed when excavation is open</b>
			<b>WET CONDITIONS</b>
			Air in the excavation tested for oxygen deficiency, combustibles, other contaminants
			Ventilation used in atmospheres that are oxygen rich/deficient &/or contains hazardous substances
			Ventilation provided to keep LEL below 10 %
			Emergency equipment available where hazardous atmospheres could or do exist
			Safety harness and lifeline used
			Supplied air necessary (if yes, contact safety department)
			<b>ENTRY &amp; EXIT</b>
			Exit (i.e., ladder, sloped wall) no further than 25 feet from ANY worker
			Ladders secured and extended 3 feet above the edge of the trench
			Wood ramps constructed of uniform material thickness, cleated together @ the bottom
			Workers protected from cave-ins when entering or exiting the excavation

*KEEP 1 COPY OF EACH DAILY EXCAVATION CHECKLIST ON SITE FOR THE PROJECT DURATION, AND FORWARD THE ORIGINAL TO THE SAFETY MANAGER*

### SOIL ANALYSIS CHECKLIST

Client		Date	
Project Name		Job #	
Project Location		Weather	
Competent Person			
Where was the sample taken from			
Excavation length, depth, and width	L: <input style="width: 50px;" type="text"/>	D: <input style="width: 50px;" type="text"/>	W: <input style="width: 50px;" type="text"/>

#### VISUAL TEST

Particle type	Fine Grained (Cohesive)	Granular (sand/silt or gravel)	Other: <input style="width: 80%;" type="text"/>
Water Conditions	Wet <input type="checkbox"/>	Dry <input type="checkbox"/>	Seeping Water <input type="checkbox"/>
			Surface Water present <input type="checkbox"/>
			Submerged <input type="checkbox"/>
Notes	<input style="width: 95%;" type="text"/>		
Yes	No	N/A	Description
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Layered Soils Dipping Into excavation? If yes, describe:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Excavation exposed to vibrations. If yes, describe:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Previously disturbed soils?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Crack like openings or sprawling observed?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Underground utilities? If yes, what type:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Layered soils? (Note: the least stable layer controls the soil type)

#### MANUAL TEST

Plasticity	Cohesive	Non-cohesive	Dry Strength	Cohesive (broken w/ difficulty)	Granular
Wet Shake	Water comes to surface (granular material) <input type="checkbox"/>			Surface remains dry (clay material) <input type="checkbox"/>	

#### THUMB TEST Note: Used to estimate unconfined compression strength of cohesive soil.

Test Performed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A, Explain: <input style="width: 95%;" type="text"/>
Soil indented by thumb with very great effort?			
Type A			
Soil indent by thumb with some effort?			
Type B			
Soil easily penetrated several inches by thumb with little or no effort. NOTE: If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.			
Type C			

#### PENETROMETER or SHEARVANE TEST Note: Used to estimate unconfined compressive strength of cohesive soils.

Test Performed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Device Used / Serial Number: <input style="width: 95%;" type="text"/>
Soil with unconfined compressive strength of 1.5 tsf or greater			
Type A			
Soil with unconfined compressive strength of greater than 0.5 tsf and less than 1.5 tsf.			
Type B			
Soil with unconfined compressive strength of 0.5 tsf or less. Note: if the soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.			
Type C			

*No soil is Type A if fissured, subject to vibration, previously disturbed, layered dipping into excavation on a slope of 4h: 1v*

<b>SOIL CLASSIFICATION</b>			
Stable Rock	Type A	Type B	Type C
<b>SELECTION OF PROTECTIVE SYSTEM (Refer to Appendix F of 29CFR1926)</b>			
Sloping (Appendix B) Specify angle:	Timber Shoring (Appendix C)	Trench Shield Max depth in this soil:	Hydraulic Shoring (Appendix D)

Keep one copy of each Soil Analysis Checklist on site for project duration – Forward original to the Safety Director at the Main Office

## EQUIPMENT SAFETY

Any piece of equipment can be dangerous if not operated properly. You are responsible for the safe operation of the equipment. The operator must carefully read and follow any warnings, safety signs and instructions provided with or located on the equipment. Do not remove, defeat, deface or render inoperable any of the safety devices or warnings on this equipment. If any safety devices or warning have been removed, defeated, defaced or rendered inoperable, do not use the equipment. If you have any questions, or are uncertain about running a piece of equipment, do not start operating the equipment until all questions have been answered by the supervisor.

1. Do not smoke while operating any piece of equipment.
2. Operators should be trained and at least 18 years of age.
3. Always operate the machine with all the safety devices in place and in working order.
4. Stop the engine when leaving the machine or when refueling.
5. Do not refuel near open flames. Do not operate with fuel tank cap loose or missing.
6. Always keep hands, feet and clothing away from moving parts.
7. Always operate in well ventilated area.
8. Be aware of surface condition and use special care when working on uneven ground.
9. Never allow bystanders to stand close to the machine while it is being started or while it is running.
10. Never leave equipment unattended while running.
11. Never refuel engine while it is running. Allow the engine to cool before refueling. Do not remove cap from hot radiator or oil filter.
12. Never touch a hot muffler, exhaust manifold or other hot engine part.
13. Never step into traffic to operate or service equipment or to gather tools.
14. Before digging, locate and avoid all water, electrical, gas, phone and other service lines. A ruptured gas line or cut electrical cable can injure or kill you.
15. Check all fluid levels daily. Inspect for leaks and loose or missing parts.
16. Always wear a seatbelt at all times. Only operate equipment from driver's seat.
17. No Passengers
18. Do not bypass any safety devices or controls. If you do you may subject yourself and others to serious injury or death.

## TRAILER SAFETY

Any piece of equipment can be dangerous if not operated properly. You are responsible for the safe operation of this equipment. The operator must carefully read and follow any warnings, safety signs and instructions provided with or located on the equipment. Do not remove, defeat, deface or render inoperable any of the safety devices or warnings on this equipment.

1. Load 60% of weight forward of center line.
2. Do Not Overload.
3. Check with yard before hauling sand, gravel or wood.
4. Secure all parts of load so that nothing will fall causing a road hazard.
5. Inspect tire and pressure. Inflate to recommended pressure.
6. Always have safety chain connected to the passenger side of towing vehicle.
7. Use side mirrors when required.

8. Check hitch, safety chains, lug nuts, and lights about every 100 miles.
9. It is unlawful to have passengers ride on trailer.
10. Only tow trailer with proper vehicle.
11. Make sure ball is in good condition and ensure that it is the proper size.
12. Always check behind you before backing. Do not jack-knife the trailer. You are responsible for damage to your vehicle and any obstacle that may be behind you.

## HEARING CONSERVATION

### **I. PURPOSE:**

B&T Drainage, Inc. has established a Hearing conservation Program to protect worker from the hazards of noise on the job. It is not hard to exceed this level of noise on many of the jobs sites. Typically, noise levels exceeding 85 dB are experienced when working with any type of pneumatic chipper or hammer, metal saw, and grinders. See attachment I for list of some common noise levels.

### **RESPONSIBILITY:**

The Manager of Operations is responsible for the developing a written Hearing Conservation Procedure and overseeing the training of all employees in the company. The Manager of Operations is also responsible for the monitoring and administering this procedure.

### **II. PROCEDURES:**

B&T Drainage, Inc. has taken a conservative approach to this noise hazard by establishing this program. The following elements establish the program:

- a. An Audiometric Testing Program when required
- b. An Employee Education and Training Program
- c. Monitoring and Analysis of Workplace Noise Levels
- d. Providing Suitable Engineering Controls when appropriate
- e. Providing Hearing Protectors when required
- f. Maintain required records for the above.

### **AUDIOMETRIC TESTING**

Each new employee whose work exposes them to noise levels above the “action level” will receive an Audiometric test as part of a pre-screening physical examination to establish a baseline audiogram against which subsequent audiograms can be compared as required by the Standard.

Annually, all employees who are exposed to noise levels exceeding the 85 dB standard will be given a follow-up Audiometric examination to monitor for any significant changes in their hearing ability. Employees will be formally notified if there is any change in their hearing as the result of the testing. The Standard has defined this shift as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 200, 3000 and 4000 hz in either ear. In determining whether a standard

threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: "Calculation and Application of Age Correction to Audiograms."

When audiometric testing is required, each affected employee must not be exposed to any workplace noise for at least 14 hours prior to his/her test. This requirement may be met by wearing hearing protectors which will reduce the employee's exposure to a sound level of 80 db (A) or below.

Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometer does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.

An audiologist, otolaryngologist or physician will review problem audiograms and shall determine whether there is a need for further evaluation. The company will provide to the person performing this evaluation the following information:

- a. The baseline audiogram and most recent audiogram of the employee to be evaluated.
- b. Measurement of background sound pressure in the audiometric test room
- c. Records of audiometric calibrations as required

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined the employee will be informed of this fact, in writing, by the company within 21 days of determination.

Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the company will ensure that the following steps are taken when a standard threshold shift occurs:

- a. An employee not using hearing protectors will be fitted with hearing protectors, trained in their use and care, and required to use them; and
- b. An employee already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
- c. Refer the employee for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the company suspect that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
- d. Inform the employee of the need for an otological examination if a medical pathology of the ear which is unrelated to the use of hearing protector is suspected.

If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA average of 90 decibels indicates that a standard threshold shift is not persistent the company:

- a. Will inform the employee of the new audiometric interpretations; and
- b. May stop the required use of hearing protectors for that employee.

See Attachment II

### **III. EMPLOYEE EDUCATION AND TRAINING**

B&T Drainage, Inc. employees must be trained on the use of personal hearing protection equipment. Also each employee must know how to clean and maintain the hearing protection equipment. The training will cover the following:

- a. Training will be for all employees who are exposed to noise at or above the 8-hour TWA of 85 dB.
- b. The training will be repeated annually for each employee included in the hearing conservation program.
- c. The effects of noise on hearing
- d. The purpose of hearing protectors, the advantages, disadvantages, and the attenuation of various types and instruction on selection, fitting, use and care
- e. The purpose of audiometric testing, and an explanation of the test procedures.
- f. Access to information and training materials.

### **IV. MONITORING AND ANALYSIS OF WORKPLACE NOISE LEVELS**

B&T Drainage, Inc. will periodically or as necessary, conduct noise level surveys of the workplace. The results of these surveys will be made available to employees upon request.

Any job area or company location found to be in excess of the allowable designated noise levels that cannot be brought into compliance with the noise standard will be designated as an area where hearing protectors are to be worn. When signs are posted employees must wear hearing protection. The signs may read as follows:

**NOTICE  
EAR PROTECTION  
REQUIRED  
IN THIS AREA**

### **V. PROVIDE SUITABLE ENGINEERING CONTROLS**

Where appropriate, B&T Drainage, Inc. will provide engineering controls to reduce noise exposure. Due to the complexity of most job sites, it is difficult if possible to institute effective engineering controls for most noise exposures. Should this be the case, then employees will be required to wear suitable hearing protection.

### **VI. PROVIDE HEARING PROTECTORS WHERE REQUIRED**

B&T Drainage, Inc. will provide and required employees with hearing protectors if his/her 8 hour TWA is above the 85dB (A). B&T Drainage, Inc. will also make hearing protectors available to all employees exposed to a TWA above 85dB (A) at no cost to the employee. Any employee who may have a significant threshold shift of hearing level will be required to wear hearing protection if they are exposed to noise TWA of 85dB.

### **VII. RESPONSIBILITIES**

**REMEMBER**

The client determines if a unit or work area is classified as a high noise area. After the determination is made, B&T Drainage, Inc. employees will be instructed to wear the appropriate hearing protection.

**VIII RECORDKEEPING**

All record-keeping for this program will be maintained in the office. Records will include:

- a. Audiometric tests
- b. Noise surveys
- c. Employee training
- d. Engineering controls implemented
- e. Record of purchase of hearing protector

**IX. WORK REQUIRING HEARING PROTECTORS**

There are many jobs or types of work that generally produces noise level that intermittently or for short durations exceed the permissible TWA. It is the policy of B&T Drainage, Inc. to require all workers who are engaged in these jobs to wear hearing protectors. The attached list is some of those jobs. See Attachment

**X. HEARING PROTECTORS**

Employees may choose the type of hearing protection that best suits their particular assignment and personal preference for among those listed below. Each employee required to wear hearing protection is responsible for carrying hearing protection on his/her person. Hearing protection is furnished at no cost to employees.

**EAR PLUGS** – Most ear plugs, when worn properly, have a noise reduction rating (NRR) on the package. Most ear plugs have NRR of about 30.

**EAR MUFFS** – Adjustable muffs can be worn in three positions:

POSITION	NRR
1. Over the head	24 (this depends on the NRR of the Ear Muff)
2. Under the chin	20
3. Behind the head	20

**ATTACHMENT I**

The following list represents some work activities and equipment which will require the use of hearing protection:

<b>ACTIVITIES AND/OR EQUIPMENT TYPICALLY RESULTING IN HIGH NOISE LEVEL</b>	<b>ESTIMATED AVERAGE NOISE LEVEL dB(A)</b>
1. Air Arc Gouging	115

2. Air compressor	95
3. Chain saw	107
4. Electric Disc Grinder	100
5. Forklift inside a trailer	98
6. Heavy equipment working	100
7. Impact tools	108
8. Pneumatic chipping hammer	110
9. Abrasive blasting	100
10. Welding machines	95

**ATTACHMENT II**

**HEARING CONSERVATION PROGRAM**

**FOLLOW UP TRAINING RECORD**

**FROM:** \_\_\_\_\_  
 Manager or Supervisor

The employee listed below recently was found to have a confirmed significant shift in the hearing threshold (as defined by OSHA). An investigation and additional training is required. When this form is completed and reviewed with the employee, please file in the office.

**EMPLOYEE NAME:** \_\_\_\_\_  
 Print or type First, MI, Last Name

\_\_\_\_\_  
**Social Security Number or Employee Number**                      **Reported Date**

**JOB CATEGORY** \_\_\_\_\_  
 (Current Assignment)

The Potential for noise exposure and specific requirements for using hearing protection in their area should be reviewed with this employee within 2 weeks. If hearing protection requirements have not been established in this work area, it must be done as soon as possible.

The retraining for this employee should include:

- \* The temporary and permanent effects of noise on hearing
- \* Established hearing protection requirements
- \* Any questions the employee may have on the use of hearing protection

- \* The proper use of hearing protection
- \* Comments the employee has on potential off-the-job noise exposure

Comments on discussion held: \_\_\_\_\_  
 \_\_\_\_\_

I have discussed the above items with this employee:

\_\_\_\_\_  
 Manager or Supervisors Name (print)

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date of Discussion

WORK ZONE SAFETY

**POLICY**

This policy is to provide guidance and instruction to prevent incidents and injuries resulting from highway/roadway construction for all workers for B&T Drainage, Inc.; hereafter referred to as “B&T Drainage” work sites.

**SCOPE**

Applies to all B&T Drainage work sites, i.e., Company offices, client job sites, etc., that have occasion to use subcontractors.

**PROCEDURES**

**Overview**

The number of persons killed in the United States in motor vehicle crashes in work zones continue to rise. There are now more than 1,000 deaths annually. In addition, more than 40,000 people are injured each year because of vehicle crashes in a work zone. It is for this reason that we have established this Traffic Control and Work Zone Safety Program. At times the nature of our operations does not require freeway lane closures, we often find that unloading material, installing conduit in excavation, overhead lighting installation and other work activities cause workers to be adjacent to or in actual vehicular traffic. Further, our work may also expose pedestrians or bicycle traffic to hazard, and this program will address that issue as well. Obviously, we are concerned that our materials, tools, equipment, etc. could cause damage to vehicles or cause injury to the public when our work encroaches into accessible areas. But we are most concerned about the health and safety of our workers who may work in these hazardous conditions.

**Program Objectives**

- Our first and most important objective is to ensure a high level of safety for our workers, other workers, and the public.
- Our second objective is to minimize adverse traffic impacts associated with construction in terms of delays and congestion, noise, and other environmental impacts, to ensure a high level of satisfaction by our ultimate customer – the public.
- Our third objective is the identification of specific risk factors associated with individual projects that present traffic hazard conditions and the development of countermeasures to mitigate those hazards to minimize the risk.

**Program Goals**

- No workers or others will be seriously injured because of traffic accidents in our work zones, regardless of the cause of the accident.
- No members of the public traveling through our work sites will be injured because of traffic accidents caused by or made more serious by our work or traffic control operations.
- Traffic delays and congestion associated with our work activities will be held to the minimum level that can be achieved, consistent with the traffic volumes through the project, the characteristics of the roadway where the work occurs, and the nature of the work operations that must be completed.
- Interference with businesses and other activities adjacent to the project will be held to a Minimum, consistent with traffic volumes, roadway characteristics and work operations.
- Traffic controls will be carried out in a manner that ensures that emergency services in and through the project can be delivered in a timely manner, and transit operations will not be disrupted.
- Traffic controls will be conducted in a manner that provides us with adequate access to the work area to complete the planned work on schedule, in compliance with quality requirements of the contract. Efficient delivery of materials and equipment to work sites will be available.
- All traffic control operations will be in full compliance with the terms and requirements of the construction contract and/or in keeping with current States and Federal traffic control standards. Full understanding of the Manual on Uniform Traffic Control Devices (MUTCD) may be necessary to fulfill these requirements. Temporary Traffic Control Part 6 refers to the traffic control procedures and methods to be followed, and additional state addendums may apply.
- All traffic control devices, safety features, and work zone operations shall be always maintained in good condition, with full documentation of all work zones operations recorded according to the requirements of this Work Zone Program.

#### **Regulatory and Contractual Requirements**

- Each project will have a particular traffic control demands and needs. B&T Drainage will determine potential hazards related to work in and around the traffic control zone prior to the start of work. Delivery of materials in public roadway locations or adjacent to roadway locations or adjacent to roadways will be determined and scheduling and planning will be accomplished to minimize hazard.
- Any foreman, supervisor or delegate with direct work zone responsibilities will have access to the Federal MUTCD and appropriate State supplementary requirements before the start of the project.
- Typically, the General Contractor (GC) is responsible for traffic control on the construction site and coordination with the temporary traffic control plan of the GC is necessary. Additional traffic control planning may be required as determined by the scope of work.
- OSHA regulations indicate that signs, barricades, and flagger signaling activities comply with the MUTCD regulations. Violations of the MUTCD requirements in these areas could be fully citable by OSHA.
- Vehicle and traffic laws of the particular state and municipality must be followed, and permits may be required for lane or sidewalk restriction or closures. All such issues should be addressed in pre-planning meetings and in conjunction with the GC.
- Department of Transportation regulations in each State may require additional measures taken and this must be coordinated at time of job start up.

### **Worker Visibility**

- A critical element of work zone safety is high visibility of workers when adjacent to traffic.
- All workers must wear high visibility apparel when in or adjacent to traffic. Class 1, 2 or 3 garments will be used based upon specific exposure needs.
- Working during dawn or dusk conditions will require use of fluorescent colored high visibility apparel (class 2 or 3 based upon exposure).
- Yellow green apparel should be considered when a significant number of orange-colored signs, drums or vehicles are in the work zone.
- Workers will be issued appropriate high visibility vests based upon exposure. This clothing must be kept in good condition and laundered periodically to assure adequate visibility. Clothing/vests should be replaced as needed to assure color discrimination by motorist.

### **Worker Traffic Zone Training**

- All workers exposed to traffic will be trained in how to work safely near traffic.
- Any temporary traffic control measures implemented will only be complete by workers who have been fully trained and are cognizant of MUTCD requirements.
- Any specific work procedures will be established by the Supervisor, General Foreman, or delegate when work activities present traffic hazards.
- Traffic control plans will be clearly communicated to all affected personnel.
- When personnel are responsible for traffic control device maintenance, those workers will be fully trained.

### **Area Planning**

- Routes for work activity and traffic must be clearly established and marked properly. A control plan will be established to assure all parties are aware of encroachment and closures.
- Safe access and egress of workers and vehicles will be determined.
- Backing of vehicles should involve back up alarms and spotters whenever pedestrians or workers may be present.
- Overhead and underground utilities should be located and marked to prevent contact by equipment and workers.

### **Traffic Speed Control**

- Compliance with posted speed limits is vital to protect workers and the traveling public. Reduction of initial posted speed limits may be required based upon job demands and work tasks.
- Appropriate speed limits should be established and application for reductions should be coordinated with the GC or whoever is responsible for the traffic control plan.
- Assure that the determined regulatory speed is properly and clearly posted immediately preceding the work zone.
- Flaggers may be needed to monitor and slow traffic as necessary.
- Local law enforcement may be needed to enforce speed limits. Coordinate with the GC to determine if law enforcement presence will be needed at the site.

### **Separation of Traffic and Work Activities**

- Effective separation of traffic from work activity is one of the most critical aspects of work zone safety.
- Use of temporary traffic barriers, shadow vehicles or other devices must be determined and implemented according to traffic control plan.
- Factors to consider when determining what separation is needed are as follows:
  - Traffic speed
  - Traffic volume
  - Distance between workers and vehicles
  - Duration of work
  - Type of work operations
  - Physical hazards within the work zone
  - Alignment of traffic lanes through the work zone
- Coordination with GC is critical to determine work areas that require separation. Other contractors work activity may come into play when determining the work zone.
- Adequate lateral buffer space should be provided to the greatest extent possible by shifting traffic slightly away from work operation as much as available space permits.
- Where workers must work very close to traffic, a trained flagger or spotter should be used to protect workers from oncoming traffic.
- For short duration work activity like pothole patching, taking measurements, marking, etc. the operation should be planned using a flagger or at least a spotter to make sure workers are not exposed to traffic in open lanes without protection.
- Workers must not cross high speed travel lanes on foot unless the foremen, supervisor or delegate analyzes the situation and develops procedures to accommodate movement safely.
- Warning sign should be posted at locations where work vehicles regularly enter and exit traffic.

#### **Technical Requirements for Work Zone Temporary Traffic Control**

- Basic requirements are detailed in the MUTCD. This manual should be consulted when setting up a control plan.
- Flagging requirements, if applicable, mandate worker training and this should be established upon job start up.
- All manuals of traffic control will be retained on the job for ongoing review.
- Copies of any established traffic control plans will be maintained and reviewed with effected workers.
- Required signs will be determined and an adequate supply ordered to come onto the job site in advance of traffic control needs. Reasonable damage should be considered, and additional quantities should be available.
- All necessary sign supports will be ordered in quantity to allow for damage and vandalism.
- Channelizing devices (cones, drums, and barricades) must be ordered as required. Specification of 28" and 36" cones should be established to make certain that required cones are used based upon speed requirements. Type III barricades when required should be in adequate quantity to assure safe and complete closures. Channelizing devices must meet MUTCD and OSHA requirements

- Warning lights and batteries will be maintained on site when night closure or overnight securing is needed.
- Portable concrete barrier will be used when required by GC or long-term protection of workers in the work zone is needed. Appropriate warning and signage will be required.
- All barriers must be in good condition to present displacement when impacted.
- Vehicles will be installed with warning beacons, flashers and markings as required in accordance with MUTC requirements.
- Reflective markings and beacons must be kept in good condition and cleaned often to assure maximum visibility.

### **Work Zone Layout**

- Many situations follow “typical” MUTCD requirements and details should be followed specifically. The type of Temporary Traffic Control Guide layout should be clearly identified in the traffic control plan and appropriate page, or diagram reference should be made to MUTCD.
- Contract specifications or permit documents will typically include drawings or diagrams showing setups to be used for lane closures, flagger stations, shoulder closures and other typical set ups. This specification must be followed and referenced in foreman daily logs.
- Significant deviations from contract or permit layouts should be reviewed with GC and signed off before implementation.
- Almost all layouts will require some minor modifications based upon actual site conditions. The foreman, supervisor or delegate in charge will make the minor adjustments required, but it is expected that changes err on the side of additional warnings and be in the best judgment of the foreman, supervisor, or delegate. Any changes should be documented on the daily log. These adjustments would include:
  - Minor shifts in sign location (10 percent or less) to avoid driveways, intersections, other devices and to improve visibility.
  - Minor shifts in start point and length of tapers (10 percent on length, 100 ft on start point to avoid intersections and other conflicts and to improve sight distance.
  - Add supplemental signs on the left side of the road to improve visibility.
  - Reduce spacing of channelizing devices at potential problem areas
  - Other minor changes to address obvious concerns.
- Any non-typical situation should be reviewed with a traffic control qualified person or engineer, and the layout document should be reviewed with a traffic control qualified person or engineer, and the layout document should be fully documented. Written plan should be maintained on the site for ongoing crew review for adherence to requirements.
- Additional conditions may require further devices, including “pavement ends” or “bump” signs. These should be provided and documented in the plan.

### **Installing and Removing Traffic Control Set Ups**

- Periods during placement and removal of traffic control devices often present the highest risk of accident for workers and public because devices are not completely in place and workers and equipment are most exposed to traffic.

- Proper planning and careful execution of set ups and removals is needed, adhering to established procedures for protection of workers.
- Common sense and use of spotter or other means of identifying potential hazards are needed at all times when placement and removal.
- The following steps are required when setup/removal operations:
  - All fixed signs must be placed first, with covers attached so signs can be covered and uncovered quickly at the appropriate time. Covers will be placed at the end of the operation.
  - Portable signs will be deployed in the necessary location along the route.
  - Channelizing devices will be set into place in the proper pattern. Note the number of cones and angles of tapers and follow plan.
  - If setting devices on foot, make certain that a shadow vehicle is in place or worker carefully observes oncoming traffic.
  - Workers must not cross open lanes of high-speed traffic to place devices.
  - Arrow boards will be placed in the proper sequence as cones are placed. Normally, these are towed into place and should be activated when other devices are set.
  - Set up operations normally should start at the approach end and proceed downstream in the direction of traffic flow unless conditions determined by the foreman, supervisor or delegate dictate other measures and safer.
  - Removal will normally proceed in the opposite direction of set up.
  - The foreman, supervisor or delegate will be responsible for driving through all set ups after completion to make sure it meets all requirements.
  - The foreman, supervisor or delegate is also responsible for driving through removal to assure all equipment has been removed or properly secured.
- Worker safety is paramount during set up and removal operations. The following safety rules will be followed:
  - Workers are not allowed to place cones or other devices from the bed of moving pickup trucks.
  - Workers must not ride in the bed of a pickup truck during set up or any other time.
  - Workers must not place cones or other devices or otherwise work behind a backing work vehicle.
  - If a work vehicle needs to be backing, all workers must be in front of the vehicle and in sight of the driver.
  - Violations of these rules will be grounds for disciplinary action, including suspension without pay.

### **Lighting**

- Temporary lighting should be used in night work zones or when work is at dawn or dusk.

- Lighting should allow motorists/pedestrians to clearly see work area and potential hazard so they can safely travel through the work area. But make certain that lighting does not “blind” motorists traveling in proximity to the work area.
- Illumination should allow workers to see their work activity more clearly.
- Lighting should be directed so motorists can clearly identify locations of workers in the work zone.
- Overnight procedures to secure work area and protect hazards must be developed and may require auxiliary flashers or lighting that must be activated upon departing the work area.

### **Overnight Procedures**

- Work locations may require multiple days of activity and may necessitate the securing of the site overnight. The foreman, supervisor or delegate will be responsible for making sure that an adequate overnight plan has been established.
- GC will be consulted if overnight procedures require special equipment, closures, or other contractor involvement.
- The foreman, supervisor or delegate must determine the proper number of signs and channelizing devices that are needed to alert drivers and pedestrians of the hazards and any changes in the roadway or walkway.
- All such devices should be reflectorized to ensure good visibility at night. Lighting may be required based upon the hazard and risk.
- All equipment and supplies should be parked and stored in a safe location where they are not accessible to vehicles or pedestrians.
- Equipment, vehicles, and materials should be secured to prevent theft and vandalism.
- Adequate pathways must be established as needed to allow passage to retail or commercial establishments as needed. Hazards should be delineated with cones, barricades, caution tape, snow fence, etc.
- The foreman, supervisor or delegate is required to conduct a job check to verify that hazards and exposures have been minimized.
- All caution tape, delineators, cones, barricades, and signs should be checked immediately prior to closing down the job for the day and inspection noted in the daily log by the foreman, supervisor, or delegate. Corrective action should be completed before departing the job.

### **Flagger Usage and Training**

- Flaggers are in place to protect themselves, the crew, motorists, and pedestrians traveling through the work zone, and equipment. This is a critical job and one that must be taken seriously.
- Flaggers must be mentally alert, in good physical condition, be courteous but authoritative.
- All workers who flag must receive adequate training. Each State has different requirements. Most require some type of training, and many require actual certification. It is the policy that no matter what the State requirements, all workers will be properly trained before flagging.
- Training and instructions will cover at a minimum the following:
  - Flagger equipment that must be used

- Layout of the work zone and flagging station
  - Methods to signal traffic to stop, proceed or slow down
  - Methods of one-way control
  - Actual demonstration of proper flagging methodology and operations
  - Emergency vehicles traveling through the work zone
  - Handling emergency situations
  - Methods of dealing with hostile drivers
  - Flagging procedures when a single flagger is used
- Written documentation of flagger training will be maintained with other safety training records.
  - Flaggers are to be used at locations on a construction site where barricades and warning signs cannot control the moving traffic.
  - Flaggers must wear proper orange, strong yellow-green or yellow warning garments, Class 2 for daytime and Class 3 for nighttime flagging, although the regulations only require Class 2 for nighttime.
  - Proper STOP/SLOW paddles will be used following MUTCD requirements, including reflectorized material when used at night. 18" paddles are the minimum size allowed. 24" paddles should be used for speeds of 45 mph or greater. A flag may be used in emergencies but must be good grade red material at least 24" square and secured to a staff approximately 36" long.
  - Extension staff may be used for paddles for extended periods of flagging. Long staff should be 66" long and accommodate insertion of the 12" staff paddle.
  - Proper and consistent hand and paddle/flag signals must be used as specified in the MUTCD. Flaggers will be tested on appropriate signals and foremen will monitor to assure proper signals are given. Failure to provide proper signals is given. Failure to provide proper signals could expose additional liability in the event of an accident.
  - Flagger stations or positions must be located so that approaching road users have sufficient distance to react and stop at an intended stopping point. Refer to the Stopping Distance Table in the MUTCD.
  - Flagger stations must be illuminated if used at night or reduced light conditions.
  - Advance warning signs, including "flagger" warning signs must be properly positioned for worker safety.
  - Flaggers should stand either in the shoulder adjacent to the road being controlled or in a closed lane prior to stopping road users. The flagger should only stand or move into the lane being used by moving traffic after the traffic has stopped.
  - The flagger should stay in line of sight of first road user to assure visibility.
  - For operations requiring more than one flagger, portable radios will be used unless flaggers are close enough to permit voice or hand signals. Hand signals will be verified and agreed at time of initial operation.
  - Flaggers should maintain a steady flow of traffic as much as possible and minimize unnecessary stops. Work vehicles should be held until a safe gap is available whenever possible.
  - Flaggers will be relieved at least every 2 hours for a 15-minute break to assure they remain alert. No worker will be allowed to flag in excess of 10 hours in any day.
  - Drinking water and restroom facilities will be available for flaggers.

### **Additional Safety Measures**

- Safe access points will be located so workers can get into workspaces without excessive exposure to traffic.
- If safe parking areas are not available, workers will park at a central location and use work vehicles to reach the work site.
- Restroom facilities break areas and other facilities will be located to minimize worker exposure to traffic.
- Entry and exit points for work vehicles and haul trucks will be planned in advance to reduce traffic conflicts and enhance worker safety.
- Vehicles and equipment with restricted visibility to the rear may not back up in any location where workers or pedestrians are in the area unless using a spotter.
- Blind backing (no spotter) will be done only when the driver has determined that the area is free of workers or other vehicles/equipment by physically exiting the vehicle and checking to the rear.
- Drivers, when departing their vehicles, must be properly attired, including hard hat and appropriate visibility clothing (safety vest).
- In cold weather, foreman, supervisor, or delegate will assure adequate larger sized vests are available for fit over bulky outer clothing.
- Workers and foremen, supervisor or delegate should never become involved in any altercation with drivers. Simply record the plate number and description of the vehicle and driver so local law enforcement can be notified.
- Any worker who witnesses a work zone accident must report it immediately to their foreman, supervisor, or delegate. This would include incidents involving vehicles, bicyclists, pedestrians, etc.

### HEAT & COLD STRESS PROGRAM

#### **Preventing Heat-Related Illnesses (Heat Stress)**

When the body heats up faster than it can cool itself, mild to severe illnesses may develop. It's important to recognize the symptoms of heat-related illnesses and understand how to prevent, control and respond to their effects.

Supervisors will receive training in the prevention of heat related illnesses prior to supervising employees working in heat. Supervisors should be trained in the employer's heat illness procedures to prevent heat illness and procedures to follow when an employee exhibits symptoms consistent with possible heat illness, including emergency response procedures.

Employees will have access to potable drinking water and access to shade at all times.

Air temperature, humidity and clothing can increase the risk of developing heat-related illnesses. So can age, sex, weight, physical fitness, nutrition, alcohol or drug use, or pre-existing diseases like diabetes. How can you prevent or control heat-related illnesses?

- Drink water - Drink small amounts of water frequently, about a cup every 15-20 minutes. (Alcohol increases the loss of body fluids.)

- Limit exposure time and/or temperature - Try to schedule hot jobs for cooler times of the day or cooler seasons of the year. Take rest breaks in cool areas.
- Add more workers to reduce workload or reduce the workday.
- Acclimatization - Gradually adapting to heat will reduce the severity of heat stress.
- Engineering controls - Mechanize heavy jobs or increase air movement with fans or coolers.
- Wearing loose, lightweight clothing - Clothing can affect heat buildup.
- Salt tablets should not be used - Taking salt tablets can raise blood pressure, cause stomach ulcers, and seriously affect workers with heart disease.

Someone with a mild reaction to heat may have a rash called "prickly heat" or painful muscle spasms, called heat cramps, during or after activity. A mild reaction may also include fatigue or dizziness. You may notice a change in physical or mental performance and an increase in accidents. A person with a moderate reaction or heat exhaustion will have some or all of the following symptoms: excessive sweating, cold, moist, pale or flushed skin, thirst, extreme weakness or fatigue, headache, nausea, lack of appetite, rapid weak pulse, or giddiness and if not properly treated, the victim may collapse.

Anyone with mild or moderate symptoms should be moved to a cool, shaded place with circulating air. They should lie down and, if conscious, be given small sips of cool water at frequent intervals. If symptoms continue, a doctor should be called.

In severe cases of heat illness, a heat stroke may result. The victim's face is flushed red and their skin is hot and dry with no sweating. They develop a severe headache with deep, rapid breathing. They have a very high fever and may become delirious. They may become unconscious, have convulsions, or lapse into a coma. This condition is fatal unless emergency medical treatment is obtained. Immediately call for medical help. In the meantime, get them out of the hot environment. Loosen clothing and pour water over the entire body. Gets air circulating around the body.

Recognizing the warning signs and symptoms of heat-related illnesses and using preventive and control measures can reduce the frequency and severity of heat illness while increasing worker productivity.

The above evaluations and/or recommendations are for general guidance only and should not be relied upon for legal compliance purposes. They are based solely on the information provided to us and relate only to those conditions specifically discussed. We do not make any warranty, expressed or implied, that your workplace is safe or healthful or that it complies with all laws, regulations or standards.

### **Preventing Cold-Related Illnesses**

Working in the cold for prolonged periods of time can cause many physical problems. You should take precautions to prevent cold stress in the workplace. There are several types of cold stress that a person can suffer.

### **Different Types of Cold Stress**

Hypothermia is the most common type of cold stress. Hypothermia occurs when your body temperature drops from prolonged exposure in a cold environment. Your body stores energy and that keeps you warm at first but as you stay in the cold your body burns that energy and cannot replace it as quickly. That is how your temperature drops below normal.

Some of the Symptoms of Hypothermia are a slowed heart beat and irregular breathing. You could also become drowsy or feel extremely exhausted. Many people often suffer from memory lapse and difficulty speaking after hypothermia has set in. If you suspect a person is suffering from hypothermia call for medical attention immediately. While waiting for help you should keep the person in a warm room. Remove any wet clothing and wrap them in a blanket. Give them a warm drink such as hot tea. This will help raise their body temperature.

The second most popular form of cold stress is Frostbite. Is caused by the body literally beginning to freeze and usually starts in the toes or fingers which lose heat the fastest. In severe frostbite cases the tissue is permanently damaged and has to be amputated to stop the spread of dead tissue.

There are a few symptoms of frostbite the first is numbness of the area. Second is tingling or aching feelings and the third is a blue-ish waxy skin. If someone is showing symptoms of frost bite call for medical help as soon as possible. Try not to use the area of body that is suffering frostbite it is your hands try not to touch or pick up things. If your feet are frostbitten do not continue to walk on them it could cause more damage. Use warm water to help restart circulation; never rub the area it could cause the frostbite to spread. Never use a fireplace, stove or other heat source to warm up. Since the skin is numb you could get to close and cause burns.

### **How to Prevent Cold Stress**

There are simple and easy ways to prevent cold stress in the workplace. It is really all about working safely and wearing the right protective gear this is the best way to prevent cold stress in the workplace.

- Wear insulated work boots and wool socks.
- Never wear tight clothing. You have to allow room for air to circulate.
- Keep a change of socks and other clothing to switch into if anything you are wearing gets wet.
- Wear gloves and a hat at all times
- Keep warm be drinking hot liquids such as tea, coffee and hot chocolate. You can also eat soup at lunch to help warm up your core temperature.
- If at all possible take your breaks in a warm area. If there is no building available you can sit in your truck with the heat on.

Preventing cold stress in the workplace is very important. Many people are unaware that the cold can seriously injury or in extreme cases kill if the proper safety precautions are not followed.

## B&T DRAINAGE, INC. SUBSTANCE ABUSE POLICY

### Purpose and Goal

B&T Drainage, Inc. is committed to protecting the safety, health and well-being of all employees and other individuals in our workplace. We recognize that alcohol abuse and drug use pose a significant threat to our goals. We have established a drug-free workplace program that balances our respect for individuals with the need to maintain an alcohol and drug-free environment. B&T Drainage, Inc. encourages employees to voluntarily seek help with drug and alcohol problems.

### Covered Workers

Any individual, who conducts business for the Company, is applying for a position or is conducting business on the Company's property, is covered by our drug-free workplace policy. Our policy includes, but is not limited to managers, supervisors, and full-time employees.

### Applicability

Our drug-free workplace policy is intended to apply whenever anyone is representing or conducting business for the Company. Therefore, this policy applies during all working hours, whenever conducting business or representing the Company, while working or on Company property.

### Prohibited Behavior

It is a violation of our drug-free policy workplace policy to use, possess, sell, trade, and/or offer for sale alcohol, illegal drugs or intoxicants.

### Notification of Convictions

Any employee who is convicted of a criminal drug violation in the workplace must notify the company in writing within five calendar days of the conviction. The Company will take appropriate action within 30 days of notification. Federal contracting agencies will be notified when appropriate.

### Searches

Entering the Company's property constitutes consent to searches and inspections. If an individual is suspected of violating the drug-free workplace policy, he or she may be asked to submit to a search or inspection at any time. Searches can be conducted of pockets, and clothing, wallets, purses, briefcases and lunchboxes and vehicles and equipment.

### Consequences

One of the goals of our drug-free workplace program is to encourage employees to voluntarily seek help with alcohol and or drug problems. If, however, an individual violates the policy, the consequences are serious.

In the case of applicants, if he or she violates the drug-free workplace policy the offer of employment can be withdrawn. The applicant may reapply after six months and must successfully pass a pre-employment drug test.

If an employee violates the policy, he or she will be terminated from employment.

### Assistance

B&T Drainage, Inc. recognizes that alcohol and drug abuse and addiction are treatable illnesses. We also realize that early intervention and support improve the success of rehabilitation. To support our employees, our drug-free workplace policy:

1. Encourages employees to seek help if they are concerned that they or their family members may have a drug and/or alcohol problem.
2. Encourages employees to utilize the services of qualified professionals and to assess the seriousness of suspected drug or alcohol problems and identify appropriate sources of help.

### Confidentiality

All information received by B&T Drainage, Inc. through the drug-free workplace program is confidential communication. Access to this information is limited to those who have a legitimate need to know in compliance with relevant laws and management policies.

#### Shared Responsibility

A safe and productive drug-free workplace is achieved through cooperation and shared responsibility. Both employees and management have important roles to play.

All employees are required to not report to work or be subject to duty while their ability to perform job duties is impaired due to on or off duty use of alcohol or other drugs.

In addition, employees are encouraged to:

- Be concerned about working in a safe environment.
- Support fellow workers in seeking help.
- Report dangerous behavior to their supervisor

It is the supervisor's responsibility to:

- Inform employees of the drug-free workplace policy.
- Observe employee performance
- Investigate reports of dangerous practices
- Document negative changes and problems in performance
- Counsel employees as to expected performance improvement
- Clearly state consequences of policy violations.

#### Communication

Communicating our drug-free workplace policy to both supervisors and employees is critical to our success. To ensure all employees are aware of their role in supporting our drug-free workplace program, all employees will receive a written copy of the policy.

### B&T DRAINAGE, INC. PROGRESSIVE DISCIPLINE POLICY

B&T Drainage, Inc. has adopted a progressive discipline policy to identify and address employee and employment related problems. Any safety violation will be enforced by John Boyer, President of B&T Drainage, Inc. The policy applies to any and all employee conduct that the company, in its sole discretion, determines must be addressed by discipline. Of course, no discipline policy can be expected to address each and every situation requiring corrective action that may arise in the workplace. Therefore, the Company takes a comprehensive approach regarding discipline and will attempt to consider all relevant factors before making decisions regarding discipline.

Most often, employee conduct that warrants discipline results from unacceptable behavior, poor performance or violation of the Company's policies, practices or procedures. However, discipline may be issued for conduct that falls outside of those identified areas. Equally important, the Company need not resort to progressive discipline, but may take whatever action it deems necessary to address the issue at hand. This may mean that more or less severe discipline is imposed in a given situation.

Progressive discipline may be issued on employees even when the conduct that leads to more serious discipline is not the same that resulted in less severe discipline. That is, violations of different rules shall be considered the same as repeated violations of the same rule for purposes of progressive action.

Probationary employees are held to the highest standards for behavior and job performance. Progressive discipline is the exception rather than the rule for probationary employees.

B&T Drainage, Inc. will normally adhere to the following progressive disciplinary process:

1. **Verbal Caution:** An employee will be given a verbal caution when he or she engages in problematic behavior. As the first step in the progressive discipline policy, a verbal caution is meant to alert the employee that a problem may exist or that one has been identified, which must be addressed. Verbal warnings will be documented and maintained by your supervisor. A verbal caution remains in effect for three months.
2. **Verbal Warning:** A verbal warning is more serious than a verbal caution. An employee will be given a verbal warning when a problem is identified that justifies a verbal warning or the employee engages in unacceptable behavior during the period a verbal caution is in effect. Verbal warnings are documented and placed in the employee's personnel file and will remain in effect for three months.
3. **Written Warning:** A written warning is more serious than a verbal warning. A written warning will be given when an employee engages in conduct that justifies a written warning or the employee engages in unacceptable behavior during the period that a verbal warning is in effect. Written warnings are maintained in an employee's personnel file and remains in effect for three months.
4. **Suspension:** A suspension without pay is more serious than a written warning. An employee will be suspended when he or she engages in conduct that justifies a suspension or the employee engages in unacceptable behavior during the period that a written warning is in effect. An employee's suspension will be documented and, regardless of the length of the suspension issued, will remain in effect for three months.
5. **Decision Making Leave:** Generally following a suspension, an employee will be reprimanded then sent home for the day on decision making leave. This is intended to help the employee decide whether they should continue employment with the Company. If the employee returns, they will be expected to work harder than before to follow the Company guidelines and continue their employment without interruption. The other option with this leave is the employee may choose to resign because employment with the Company is not a match.
6. **Termination:** An employee will be terminated when he or she engages in conduct that justifies termination or does not correct the matter that resulted in less severe discipline.

Again, while B & T Drainage, Inc. will generally take disciplinary action in a progressive manner, it reserves the right, in its sole discretion, to decide whether and what disciplinary action will be taken in a given situation.

## EMERGENCY ACTION PLAN

### **PURPOSE**

The purpose of an Emergency Action Plan is to protect workers from serious injury, property loss, or loss of life, in the event of an actual or potential emergency. An emergency may include, but not limited to, any of the following: fire, tornado, earthquake, bomb threat, hazardous chemical spill, or active shooter.

### **PROCEDURES**

Emergency preparedness and response planning is an important factor in ensuring worker safety, protecting the environment, public safety, and company assets. Therefore, operations do not require any worker to continue operating critical equipment during an emergency evacuation. Following an emergency evacuation, no worker is permitted to re-enter the building until authorized.

A written copy of the Emergency Action Plan shall be kept in the workplace and available to workers for review.

### **Training**

The Safety Manager has overall responsibility of designating and training workers to assist in a safe and orderly evacuation as well as implementing this plan and updating as needed. Additionally, the Safety Manager will assist any worker who may need more information about the plan or an explanation of their duties under the plan. All workers shall be trained in the following areas:

- The Alarm System
- Various types of emergency scenarios (Fire, Chemical Release, Severe Weather, Lightening, etc.)
- Preferred means of reporting fires and other emergencies
- Emergency escape procedures and route assignments
- Procedures to account for all workers after emergency evacuation has been completed
- Rescue and medical duties for those workers who perform them
- Designated Meeting Areas (Muster Areas)

Refresher training is required; (1) When the plan is developed or the worker is assigned initially to a job, (2) When the worker's responsibilities under the plan change, or (3) When the plan is changed.

### **Alerting Building Occupants**

In case of a fire, call the local Fire Department at 911. In addition, the smoke alarms will alert building occupants of the need for evacuation. Any pertinent fire or rescue information should be conveyed to the Fire Department.

Workers discovering a fire, smoky condition or any other emergency shall activate the fire alarm system and make a verbal announcement immediately.

### **Evacuation Procedures**

When the fire alarm sounds or a verbal announcement is made, all workers should ensure that nearby workers are aware of the emergency, quickly shutdown operating equipment, close doors and exit the building.

All workers should proceed to their Designated Muster Area via their primary or alternate exits and await further instructions from their Safety Monitor.

REMEMBER R.A.C.E.

**Rescue:** When you discover a fire, rescue people in immediate danger if you can do so without endangering yourself.

**Alarm:** Sound the alarm by pulling a fire box and call 911 from a safe distance.

**Confine:** Close all doors, windows, and other openings.

**Evacuate:** Evacuate the building.

### **Designated Meeting Area**

When an alarm sounds or a verbal announcement is made, all occupants will proceed to the nearest exit and gather at the designated meeting area or "Muster Area" which is pictured on the facilities emergency evacuation maps throughout the facility. The "Muster Area" is designated to be the safe meeting point for all workers. Once the evacuation has been completed, the Safety Monitor shall conduct a head count. The "Receptionist" will have the responsibility of bringing the "Sign-In Roster" to the Muster Area to account for all workers and visitors after the evacuation.

### **Rescue & Medical Duties**

- Do not move injured workers.
- Always keep injured workers lying down, covered, and warm.
- Only trained workers will conduct rescue and medical duties.

## INCIDENT INVESTIGATION POLICY

### **PURPOSE**

B&T Drainage, Inc. is committed to promoting a safe and healthy environment for its employees, students, patients and visitors. Such an environment is possible only when each employee is able to perform his or her job duties in a safe, secure, and effective manner, and remains able to do so throughout the entire time they are working.

Employees who are not fit for duty may present a safety risk to themselves and to others.

### **POLICY**

This policy outlines the responsible parties and necessary actions when an employee's fitness for duty is in question, the steps necessary to assess the employee's physical or mental capabilities, necessary follow-up, and return to work.

### **RESPONSIBILITIES**

This policy covers only those situations in which an employee is (1) having observable difficulty performing his/her duties in an effective manner that is safe for the employee and/or for his or her co-workers, or (2) posing a serious safety threat to self or others. The policy prescribes the circumstances under which an employee may be referred to an independent, licensed health care evaluator for a fitness for duty evaluation should either of those situations be present.

An employee shall not be allowed to work unless he/she maintains a fitness for duty required for the safe performance of essential job functions, with or without reasonable accommodation. Each employee is required to report to work in an emotional, mental and physical condition (including

free of the effects of alcohol and drugs) necessary to perform his or her job in a safe and satisfactory manner.

This policy does not apply to employees with short term, infectious/communicable diseases (e.g., flu, colds). If an employee exhibits symptoms of an infectious/communicable disease, the supervisor may ask the employee to leave the workplace in order to have his/her symptoms evaluated by the employee's own health care provider or by B&T Drainage, Inc. occupational medicine provider.

A fitness for duty evaluation is designed to address behavioral changes in an employee that may pose a potential threat to self or others in the workplace. Application of this policy is not intended as a substitute for B&T Drainage, Inc. policies or procedures related to chronic performance or behavioral problems or as a substitute for discipline. Supervisors shall continue to address performance or behavioral problems through the performance appraisal process and to implement appropriate corrective or disciplinary action.

B&T Drainage, Inc. is required to comply with federal disability law (primarily the Americans with Disabilities Act of 1990 [ADA]). In general, the ADA prohibits: (1) employers from requiring an employee to submit to a medical examination; and (2) employer inquiries into whether an individual has a disability. However, the protections afforded to employees by the ADA are not without limits. Federal law permits the B&T Drainage, Inc. to require a medical examination of an employee if the requirement for the examination is job-related, consistent with business necessity, and if the B&T Drainage, Inc. has a reasonable belief that:

- the employee's ability to perform essential job functions may be impaired by a medical condition; or
- an employee may pose a direct threat (i.e., significant risk of substantial harm to the health and safety of self or others) due to a medical condition.

#### **1. Fitness for Duty Requirements:**

An employee is expected to perform essential job functions in a safe and effective manner, and to discuss with his/her supervisor any circumstances that may impact his/her ability to do so. The B&T Drainage, Inc. may require professional evaluation of an employee's physical, emotional or mental capacities to determine his or her ability to perform essential job functions. Such evaluations are conducted by an independent, licensed health care professional and are undertaken only after review by the coordinating team. The employee's department is responsible for paying the cost of an evaluation(s). To the extent allowed by law, the B&T Drainage, Inc. shall protect the confidentiality of the evaluation and the results.

Employees who have the responsibility for on-call shifts must meet the fitness for duty standard during the entire on-call period.

Non-compliance with a request for a fitness for duty evaluation shall be cause for disciplinary action.

The employee's satisfactory work performance is the basis for continued employment. Participation in a treatment or rehabilitation program does not guarantee continued employment and may not necessarily prevent disciplinary action for violation of B&T Drainage, Inc. policies. An employee must comply with all treatment recommendations resulting from a fitness for duty evaluation to be allowed to return to work. A salaried employee referred for an evaluation will be prohibited from appearing for work pending the completion of the evaluation and approval for return to work. During this time, applicable leave policies shall apply. A wage employee (including a temporary employee) referred for an evaluation will be prohibited from working or appearing for work until an

evaluation is completed and the employee has been approved to return to work (compensation during this time shall be discontinued).

**2. Coordinating Team:**

Before initiating an evaluation, the coordinating team shall consult with the employee's supervisor to gain a clear understanding of the behavior/circumstances that have raised questions about the employee's fitness for duty. A member of the coordinating team shall also notify the employee of the opportunity to provide any relevant previous medical or psychological treatment information. The coordinating team shall determine the appropriateness of fitness for duty testing within a reasonable time after notification from the supervisor, usually within three business days.

While the employee is prohibited from appearing for work until completion of the FFD evaluation and approval to return to work is provided, the coordinating team shall use its discretion to determine whether to allow the employee to work off-site or to represent the B&T Drainage, Inc. in any work-related capacity.

**3. Results of the Evaluation:**

The results of FFD evaluations performed by qualified, licensed health care professionals shall be presumed to be valid. Results of the evaluation will be received by B&T Drainage, Inc. as appropriate. The employee shall be notified of the results of the FFD by the evaluator and/or B&T Drainage, Inc. Only necessary information shall be shared with the coordinating team. A member of the coordinating team will communicate whether the employee may return to work to the employee's supervisor and the respective dean or vice president.

After an evaluation, information given to the employee's supervisor and respective dean or vice president shall be limited to whether the employee may:

- return to full duty;
- not return to full duty, in which case the employee will be referred to Human Resources for a benefits discussion; or
- return to full duty with reasonable accommodations to meet the evaluator's recommendations.

**4. Return to Work:**

In conjunction with the employee's supervisor, the coordinating team shall discuss whether any reasonable and necessary accommodations need to be made. Continued employment shall be contingent upon compliance with recommendations provided by the evaluator, such as periodic testing, participation in professional counseling and treatment programs. During this time, applicable leave policies and health plan benefits shall apply. In consultation with the coordinating team, the supervisor and employee should engage in an interactive process to determine if any reasonable accommodations (e.g., re-assignment of duties for a specific period of time, a flexible work schedule) should be implemented. Failure to comply with the recommendations or agreed upon accommodations may result in disciplinary action up to and including possible termination from employment.

**5. Confidentiality/Privacy of Fitness for Duty Evaluations:**

Under the Health Insurance Portability and Accountability Act (HIPAA), any document containing medical information about an employee is considered a medical record and is regarded as confidential. Records of fitness for duty evaluations shall be treated as confidential medical records

and maintained by B&T Drainage, Inc. as appropriate. This information may be shared only on a “need to know” basis. Employees may obtain a copy of the medical report from B&T Drainage, Inc. upon written request.

**6. Responsibilities:**

Employees are responsible for:

- Performing his/her job responsibilities in a safe and effective manner, with or without reasonable accommodations during the entire time at work;
- Notifying the supervisor when not fit for duty;
- Notifying the supervisor when a coworker is observed acting in a manner that indicates the coworker may not be fit for duty;
- Informing the upper level manager or calling the B&T Drainage, Inc. Human Resources for further guidance, if the supervisor’s behavior is the focus of concern.
- Providing relevant medical and psychological information when given the opportunity to do so; and
- Complying with this policy and any authorized request to submit to an evaluation.

A supervisor is responsible for:

- Observing the attendance, performance, and behavior of the employees under his/her supervision;
- Notifying B&T Drainage, Inc. Human Resources or their local HR between the hours of 8 a.m. and 5:00 p.m. when an employee is exhibiting behavior that suggests he/she may not be fit for duty;
- Following this policy’s procedures for completing an initial observation report when presented with circumstances or knowledge that indicate that an employee may not be fit for duty;
- Removing and escorting an employee deemed not fit for duty from the worksite unless he/she poses an immediate safety threat in which case the supervisor should call 911;
- Arranging transportation for the employee from the work site if necessary;
- Maintaining the confidentiality of an employee’s medical information; and
- Implementing any reasonable accommodation deemed necessary.

B&T Drainage, Inc. is responsible for:

- Soliciting information from the supervisor regarding employee behaviors or performance, and from the employee regarding any relevant previous medical or psychological treatment information;
- Identifying who will conduct the fitness for duty evaluation;
- Receiving the results of the fitness for duty evaluation;
- Communicating the results to the employee if not done so by the evaluator;
- Maintaining confidentiality except as detailed in the Confidentiality/ Privacy section above;
- Coordinating payment by the employee’s department for the fitness for duty evaluation;
- Implementing any recommendations proposed by the FFD evaluation;
- Discussing recommendations and subsequent accommodations with the supervisor; and
- Communicating with the employee as to their rights, responsibilities and employment status.

B&T Drainage, Inc. is responsible for: Paying the costs associated with a recommended fitness for duty evaluation.

Injury & Illness Contact Coordinator

In the event of an injury or illness, please notify Tami Boyer immediately at B&T Drainage, Inc. at (217) 826-6591 or (217) 822-6590. All injuries and illnesses must be reported to Pekin Insurance Companies within 24 hours. After reporting the incident, please complete the Employee Accident Statement found in the Safety Manual.

Medical Provider Referral List

Clark County Family Medicine  
890 Ridgelawn Road  
Martinsville, IL  
(217) 382-4191

Union Hospital  
1606 N. 7<sup>th</sup> St  
Terre Haute, IN 47804  
812-238-7000

King Chiropractic Clinic  
511 Locust St.  
Marshall, IL  
(217) 826-8100  
Chiropractic Physician

Regional Hospital  
3901 S. 7<sup>th</sup> St  
Terre Haute, IN 47802  
812-232-0021

Cork Medical Center  
410 N. Second St.  
Marshall, IL  
(217) 826-2361

FIRST AID

**1.0 Policy**

*To insure that prompt and effective medical assistance is provided to the employees of B&T Drainage, Inc., associates in case of workplace injury or illness, the following first aid and medical services procedure is provided.*

It is the responsibility of each manager / supervisor to assure that compliance to the First Aid & Medical Services Procedure is provided.

***This policy covers minimum performance standards applicable to all B&T Drainage, Inc. associates, employees, and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.***

## 2.0 Purpose

This First Aid & Medical Services Procedure is designed to establish specific common guidelines for Branches to follow in assuring that prompt medical attention is provided to employees suffering from either a work related or non-work related injury or illness.

Each facility and jobsite must ensure that readily available medical personnel and first aid supplies are available to all employees to provide advice and consultation within reason, regarding matters of employee occupational health and to respond in case of accident. This includes identifying and posting the location of a designated medical treatment facility and/or emergency care center in a conspicuous location at each fixed location or fixed jobsite. Should outside medical services be unable to respond in a reasonable amount of time. The facility and jobsite may use various strategies to provide access within this time frame, such as training internal personnel who will be capable of acting as voluntary first responders.

## 3.0 Scope

Applies to all B&T Drainage, Inc. Associates work sites, i.e., B&T Drainage, Inc. offices, client job sites, etc., and includes visitors, vendors, and subcontractors.

## 4.0 Definitions

**Established Medical Treatment Facility** means the occupational medical treatment provider and/or emergency care center identified as being capable of, and established by an location to initially treat employee injuries and illnesses.

**First Aid** means the following types of treatment:

- Using non-prescription medications at non-prescription strength
- Cleaning, flushing, or soaking wounds on the skin surface
- Using wound coverings, such as bandages, gauze pads, etc., or using SteriStrips or butterfly bandages
- Using hot or cold therapy
- Using any totally non-rigid means of support, such as elastic bandages, wraps, etc.
- Using temporary immobilization devices while transporting an employee, such as splints, slings, neck collars, or back boards
- Drilling a fingernail or toenail to relieve pressure, or draining fluids from blisters
- Using eye patches
- Using simple irrigation or a cotton swab to remove foreign bodies not embedded in or adhered to the eye
- Using irrigation, tweezers, cotton swab or other simple means to remove splinters or foreign material from areas OTHER than the eye
- Using finger guards
- Using massages
- Drinking fluids to relieve heat stress

**Illness** can be classified as a skin disease/disorder, respiratory condition, poisoning, or other illnesses resulting from an event in the work environment. Examples include, but are not limited to:

- Contact dermatitis
- Eczema
- Silicosis
- Asbestosis
- Toxic inhalation
- Poisonings by lead, mercury, or other metals
- Poisonings by carbon monoxide, hydrogen sulfide, or other gases
- Poisonings by organic solvents or by other chemicals
- Heatstroke, sunstroke, heat exhaustion, or other heat-related factors
- Freezing, frostbite, or other cold-related factors
- Effects of Non-ionizing radiation (welder's flash or lasers)
- Blood borne Pathogenic diseases
- Microbial Exposure
- Ionizing Radiation

**Injury** means any wound or damage to the body resulting from an event in the work environment. Examples include:

- Cut/laceration
- Puncture
- Abrasion
- Contusion/bruise
- Fracture
- Chipped tooth
- Amputation
- Insect bite
- Electrocution
- Thermal, chemical, electrical or radiation burn
- And, sprain/strain injuries to muscles, joints and connective tissues when the result from a slip, trip, fall or other similar accident

**Medical Treatment** means the managing and caring for a patient for the purpose of combating disease or disorder. The following activities are NOT medical treatment:

- First aid
- Visits to a doctor solely for observation or counseling
- Diagnostic procedures, including the administering prescription medications that are used solely for diagnostic procedures

**Work-related Injury or Illness** means an injury or illness resulting from an event or exposure in the work environment causing or contributing to the condition or significantly aggravating a preexisting condition.

**Work Environment** means includes work sites where one or more employees are present as a condition of their employment.

## 5.0 Requirements

### 5.1 Designated Medical Treatment Facility

B&T Drainage, Inc. Associates will ensure that readily available medical personnel are available to employees to provide advice and consultation within reason regarding matters of employee occupational health.

Each fixed facility and fixed jobsite must identify and post the location of a designated medical treatment facility and/or emergency care center including name, address, telephone number, and hours of operation. This information should be posted in a conspicuous location at each fixed facility or fixed job site. The designated medical treatment facility or emergency care center should maintain similar hours of operation as the facility and be able to respond to a workplace emergency within a reasonable amount of time.

### 5.2 First Aid

***ALL INJURIES, REGARDLESS OF HOW SMALL, MUST BE REPORTED TO THE EMPLOYEE'S IMMEDIATE SUPERVISOR AND TREATED AS SOON AS POSSIBLE AFTER AN ACCIDENT.***

If an employee becomes injured or ill anywhere due to a work-related or non-work related problem and needs immediate medical aid, it must be reported to his/her Supervisor or the Safety Officer. Failure to report minor injuries or to receive supervised medical treatment may result in serious infections or complications to the employee's health.

In the absence of a clinic or hospital near the workplace, OSHA regulations require that a person or persons be trained to render first aid and that first aid supplies be readily available. Although the term "readily available" has not been defined in the regulations, OSHA has indicated that 3-4 minutes is acceptable as the time frame within which to begin first aid.

Because of the potential for exposure to blood borne pathogens and significant liability concerns, there is no job in the Company that requires an employee to render First Aid or cardiopulmonary resuscitation (CPR) in the course and scope of their employment, unless such a requirement becomes necessary due to local, State or Federal Safety and Health Regulations.

Transportation of injured persons will be by ambulance unless a volunteer chooses to assist by driving the injured employee to a medical facility. If there is any question as to the best method of transportation an ambulance should be utilized.

#### 5.2a Elements of the First Responder Program should include:

1. Safety Officer must be certified in basic First Aid & CPR per a recognized certification source such as the Red Cross, local hospital, etc. The Red Cross first aid course and CPR course are approximately 8 hours in duration. CPR requires

annual refreshers. First Aid requires refreshers every three (3) years.

2. Branch Safety Officer will seek employees who wish to volunteer to be trained and certified in basic First Aid & CPR per a recognized certification source as defined by local or State requirements. These employees must maintain “current” First Aid and CPR certification, appropriately documented, in their personnel file.
3. Basic First Aid & CPR will be administered by First Responders only to stabilize the employee until professional medical attention can be provided.

### 5.3 Employee First Aid / CPR.

Employee training in basic First Aid and cardiopulmonary resuscitation (CPR) is encouraged because of its value and benefit to individuals, their families and the community.

The company also supports any employee who, while on the job, chooses to act as a “Good Samaritan” to assist a fellow employee or another person with First Aid or CPR. It is B&T Drainage, Inc.’s intent that first Aid supplies and basic personal protective equipment against blood borne pathogens be accessible to employees at every work site during all shifts.

If an employee makes the decision to provide first aid to someone, universal precautions shall be followed and it should be assumed that all blood and bodily fluids are contaminated with blood borne pathogens. In addition, they should wear protective medical gloves found in the First Aid Kit and use any other personal protective equipment (such as protective glasses with side shields or a full face shield) to help avoid exposure to blood in the eyes or on the face.

First Aid providers should follow the example of emergency medical personnel, doctors and nurses who wear personal protective equipment to prevent exposure to blood borne pathogens.

If blood or potentially contaminated material gets on the skin, it must be washed off immediately using water and a non-abrasive soap. If available, an antiseptic soap or rinse must be used. If blood ever gets in the eyes, lips, mouth or nose, the employee must go to a sink, water fountain, eye wash or body wash station and flush the area with running water as quickly as he/she can.

The supervisor must always be aware of the potential exposure to a blood borne pathogen after the employee has washed or flushed the exposed area. Decontamination of the exposed surfaces, tools and equipment should be conducted. This must be done immediately, and no later than the end of the shift or work period. **Remember that there is a vaccine for Hepatitis B.** This must be discussed with a physician as soon as possible after a potential exposure.

#### **5.4 First Aid Stations / First Aid Kits**

A First Aid Station or First Aid Kit is to be readily available to employees as described previously. For employees working off-premises, a first aid kit should be provided in each company vehicle, signed-out for use when traveling in personal vehicles and rental vehicles, or provided on the jobsite.

Whether within the facility or in a vehicle, each First Aid Kit must be stored in a properly labeled weather-proof container, stocked with the basic supplies specified in the inventory on Attachment B. The physician's approval of the inventory list is not required, but may be needed to address unusual exposure situations.

**IMPORTANT:** If an employee declines First Aid and/or medical treatment for a reported on-the-job injury after the Supervisor recommends it, that employee should NOT be allowed to continue work. Supervisors should discuss each situation with the Safety Officer or Project Manager before allowing that employee to return to duty.

The Safety Officer, or someone he/she may designate, is responsible for checking and maintaining the First Aid Cabinets. Supervisors on jobsites are responsible for assuring suitable supplies are provided in the first aid kits on-site or in their vehicles. This person will take a weekly inventory of supplies and make sure the station or kit remains adequately stocked.

Because of the variety of operations that the Company is involved in, it is suggested that consultation with the Facility's designated medical treatment facility be arranged to determine if the First Aid Kits are adequate for the operational exposures of your particular workplace. Attachment B can be photocopied and used as a guide for re-ordering supplies.

#### **5.5 Emergency Eye / Body Wash Stations**

Where the eyes and/or body of any employee may be exposed to injurious chemical / corrosive materials, suitable eye and/or body drenching and/or flushing facilities shall be provided whether at an facility or at a temporary worksite. Emergency eye and/or body wash stations can be either of temporary or permanent installation.

In areas where the extent of possible exposure to injurious chemical / corrosive materials is very low, a specially designated pressure controlled and identified water hose can be used when proper personal protective equipment also is used (e.g. full face shield). The hose system must be equipped with a proper face and body wash nozzle and provide copious amounts of low velocity potable water. An appropriate portable eye wash device containing not less than one gallon of potable water, would also be acceptable under these conditions.

Inspection and maintenance of eye wash systems should be provided at least weekly by assuring sanitary conditions and /or following the manufacturer's requirements for maintenance. Plumbed systems should also be provided a water flow test to minimize contaminants in the line. Inspection and maintenance should be properly documented.

## **5.6 Blood borne Pathogens (Universal) Precautions Training**

When an employee comes into direct contact with blood, bodily fluids or body tissues of another person, they are at risk of becoming infected with diseases that may be carried in the other person's body fluids. Accidental exposures can happen on or off the work site, in any number of day-to-day situations.

This is why the Company believes that each employee should have a basic understanding and awareness of the dangers of contracting a potentially deadly disease through such exposures. Communicating basic information about these hazards, including information contained in this policy, is part of the Company's safety and health program.

Therefore, employees should receive a basic awareness level training concerning "Universal Precautions" such that employees may follow Universal Precautions in the event of potential exposure to blood or other body fluids.

### **5.6.1 Training Requirements**

Training records must be maintained by the Branch Safety Officer containing the date of the training, a summary of the training session, names and qualifications of the instructors conducting the training and the names and job titles of the persons attending the training.

Training records must be maintained for a minimum of three (3) years from the date the training was conducted. Training must be conducted by a qualified and competent person knowledgeable in the subject matter.

### **5.6.2 First Responder Exposure**

If an employee is a First Responder or decides to be a "Good Samaritan" and provides first aid on an injured victim involving blood or bodily fluids, personal protective equipment must be used and Universal Precautions followed treating all bodily fluids as infectious

First Aid Stations must at least include the following supplies:

1. latex gloves
2. one-way valve CPR mask
3. biohazard bags

4. plastic baggies
5. tongs

### Fitness for Duty

#### **PURPOSE**

B&T Drainage, Inc. is committed to promoting a safe and healthy environment for its employees, students, patients and visitors. Such an environment is possible only when each employee is able to perform his or her job duties in a safe, secure, and effective manner, and remains able to do so throughout the entire time they are working.

Employees who are not fit for duty may present a safety risk to themselves and to others.

#### **POLICY**

This policy outlines the responsible parties and necessary actions when an employee's fitness for duty is in question, the steps necessary to assess the employee's physical or mental capabilities, necessary follow-up, and return to work.

#### **RESPONSIBILITIES**

This policy covers only those situations in which an employee is (1) having observable difficulty performing his/her duties in an effective manner that is safe for the employee and/or for his or her co-workers, or (2) posing a serious safety threat to self or others. The policy prescribes the circumstances under which an employee may be referred to an independent, licensed health care evaluator for a fitness for duty evaluation should either of those situations be present.

An employee shall not be allowed to work unless he/she maintains a fitness for duty required for the safe performance of essential job functions, with or without reasonable accommodation. Each employee is required to report to work in an emotional, mental and physical condition (including free of the effects of alcohol and drugs) necessary to perform his or her job in a safe and satisfactory manner.

This policy does not apply to employees with short term, infectious/communicable diseases (e.g., flu, colds). If an employee exhibits symptoms of an infectious/communicable disease, the supervisor may ask the employee to leave the workplace in order to have his/her symptoms evaluated by the employee's own health care provider or by B&T Drainage, Inc. occupational medicine provider.

A fitness for duty evaluation is designed to address behavioral changes in an employee that may pose a potential threat to self or others in the workplace. Application of this policy is not intended as a substitute for B&T Drainage, Inc. policies or procedures related to chronic performance or behavioral problems or as a substitute for discipline. Supervisors shall continue to address performance or behavioral problems through the performance appraisal process and to implement appropriate corrective or disciplinary action.

B&T Drainage, Inc. is required to comply with federal disability law (primarily the Americans with Disabilities Act of 1990 [ADA]). In general, the ADA prohibits: (1) employers from requiring an employee to submit to a medical examination; and (2) employer inquiries into whether an individual has a disability. However, the protections afforded to employees by the ADA are not without limits. Federal law permits the B&T Drainage, Inc. to require a medical examination of an employee if the requirement for the examination is job-related, consistent with business necessity, and if the B&T Drainage, Inc. has a reasonable belief that:

- the employee's ability to perform essential job functions may be impaired by a medical condition;
- or

- an employee may pose a direct threat (i.e., significant risk of substantial harm to the health and safety of self or others) due to a medical condition.

#### **7. Fitness for Duty Requirements:**

An employee is expected to perform essential job functions in a safe and effective manner, and to discuss with his/her supervisor any circumstances that may impact his/her ability to do so. The B&T Drainage, Inc. may require professional evaluation of an employee's physical, emotional or mental capacities to determine his or her ability to perform essential job functions. Such evaluations are conducted by an independent, licensed health care professional and are undertaken only after review by the coordinating team. The employee's department is responsible for paying the cost of an evaluation(s). To the extent allowed by law, the B&T Drainage, Inc. shall protect the confidentiality of the evaluation and the results.

Employees who have the responsibility for on-call shifts must meet the fitness for duty standard during the entire on-call period.

Non-compliance with a request for a fitness for duty evaluation shall be cause for disciplinary action.

The employee's satisfactory work performance is the basis for continued employment. Participation in a treatment or rehabilitation program does not guarantee continued employment and may not necessarily prevent disciplinary action for violation of B&T Drainage, Inc. policies. An employee must comply with all treatment recommendations resulting from a fitness for duty evaluation to be allowed to return to work. A salaried employee referred for an evaluation will be prohibited from appearing for work pending the completion of the evaluation and approval for return to work. During this time, applicable leave policies shall apply. A wage employee (including a temporary employee) referred for an evaluation will be prohibited from working or appearing for work until an evaluation is completed and the employee has been approved to return to work (compensation during this time shall be discontinued).

#### **8. Coordinating Team:**

Before initiating an evaluation, the coordinating team shall consult with the employee's supervisor to gain a clear understanding of the behavior/circumstances that have raised questions about the employee's fitness for duty. A member of the coordinating team shall also notify the employee of the opportunity to provide any relevant previous medical or psychological treatment information. The coordinating team shall determine the appropriateness of fitness for duty testing within a reasonable time after notification from the supervisor, usually within three business days.

While the employee is prohibited from appearing for work until completion of the FFD evaluation and approval to return to work is provided, the coordinating team shall use its discretion to determine whether to allow the employee to work off-site or to represent the B&T Drainage, Inc. in any work-related capacity.

#### **9. Results of the Evaluation:**

The results of FFD evaluations performed by qualified, licensed health care professionals shall be presumed to be valid. Results of the evaluation will be received by B&T Drainage, Inc. as appropriate. The employee shall be notified of the results of the FFD by the evaluator and/or B&T Drainage, Inc. Only necessary information shall be shared with the coordinating team. A member of the coordinating team

will communicate whether the employee may return to work to the employee's supervisor and the respective dean or vice president.

After an evaluation, information given to the employee's supervisor and respective dean or vice president shall be limited to whether the employee may:

- return to full duty;
- not return to full duty, in which case the employee will be referred to Human Resources for a benefits discussion; or
- return to full duty with reasonable accommodations to meet the evaluator's recommendations.

**10. Return to Work:**

In conjunction with the employee's supervisor, the coordinating team shall discuss whether any reasonable and necessary accommodations need to be made. Continued employment shall be contingent upon compliance with recommendations provided by the evaluator, such as periodic testing, participation in professional counseling and treatment programs. During this time, applicable leave policies and health plan benefits shall apply. In consultation with the coordinating team, the supervisor and employee should engage in an interactive process to determine if any reasonable accommodations (e.g., re-assignment of duties for a specific period of time, a flexible work schedule) should be implemented. Failure to comply with the recommendations or agreed upon accommodations may result in disciplinary action up to and including possible termination from employment.

**11. Confidentiality/Privacy of Fitness for Duty Evaluations:**

Under the Health Insurance Portability and Accountability Act (HIPAA), any document containing medical information about an employee is considered a medical record and is regarded as confidential. Records of fitness for duty evaluations shall be treated as confidential medical records and maintained by B&T Drainage, Inc. as appropriate. This information may be shared only on a "need to know" basis. Employees may obtain a copy of the medical report from B&T Drainage, Inc. upon written request.

**12. Responsibilities:**

Employees are responsible for:

- Performing his/her job responsibilities in a safe and effective manner, with or without reasonable accommodations during the entire time at work;
- Notifying the supervisor when not fit for duty;
- Notifying the supervisor when a coworker is observed acting in a manner that indicates the coworker may not be fit for duty;
- Informing the upper level manager or calling the B&T Drainage, Inc. Human Resources for further guidance, if the supervisor's behavior is the focus of concern.
- Providing relevant medical and psychological information when given the opportunity to do so; and
- Complying with this policy and any authorized request to submit to an evaluation.

A supervisor is responsible for:

- Observing the attendance, performance, and behavior of the employees under his/her supervision;

- Notifying B&T Drainage, Inc. Human Resources or their local HR between the hours of 8 a.m. and 5:00 p.m. when an employee is exhibiting behavior that suggests he/she may not be fit for duty;
- Following this policy's procedures for completing an initial observation report when presented with circumstances or knowledge that indicate that an employee may not be fit for duty;
- Removing and escorting an employee deemed not fit for duty from the worksite unless he/she poses an immediate safety threat in which case the supervisor should call 911;
- Arranging transportation for the employee from the work site if necessary;
- Maintaining the confidentiality of an employee's medical information; and
- Implementing any reasonable accommodation deemed necessary.

B&T Drainage, Inc. is responsible for:

- Soliciting information from the supervisor regarding employee behaviors or performance, and from the employee regarding any relevant previous medical or psychological treatment information;
- Identifying who will conduct the fitness for duty evaluation;
- Receiving the results of the fitness for duty evaluation;
- Communicating the results to the employee if not done so by the evaluator;
- Maintaining confidentiality except as detailed in the Confidentiality/ Privacy section above;
- Coordinating payment by the employee's department for the fitness for duty evaluation;
- Implementing any recommendations proposed by the FFD evaluation;
- Discussing recommendations and subsequent accommodations with the supervisor; and
- Communicating with the employee as to their rights, responsibilities and employment status.

B&T Drainage, Inc. is responsible for: Paying the costs associated with a recommended fitness for duty evaluation.

### Record Retention

#### **PURPOSE**

The purpose of this section is to provide workers and their designated representatives a right of access to relevant exposure and medical records to fulfill responsibilities under the Occupational Safety and Health Act (OSHA). Access by workers and their representatives, is necessary to yield both direct and indirect improvements in the detection, treatment, and prevention of occupational disease.

#### **SCOPE**

This section applies to all worker exposure and medical records, and analyses thereof, made, or maintained in any manner, including an in-house or contractual basis. B&T Drainage, Inc.; hereafter referred to as "B&T Drainage" shall assure that the preservation and access requirements of this section are complied with regardless of the manner in which records are made or maintained.

#### **Notification**

Upon initial employment workers will be briefed and at least annually thereafter, informed via a bulletin board or community location posting of the following:

- The existence, location, and availability of worker records for exposure to toxic substances or harmful physical agents.

- The person responsible for maintaining and providing access to the records. Contact your Resources Manager or Safety Representative to initiate this request.
- The worker right of access to those records.
- The entire section pertaining to records retention is available for worker review by contacting the Safety Representative, Human Resources, or delegate.

### **Record Keeping**

The Human Resources Manager is responsible for maintaining and providing access to workers' occupational medical records. These records are kept separately from other worker records. All medical records will be retained following local, company and jurisdictional requirements.

The medical records of workers who have worked for less than (1) year for the employer need not be retained beyond the term of employment if they are provided to the worker upon the termination of employment.

Medical records are records concerning the health status of a worker which is made or maintained by a physician, nurse or other health care provide or technician.

Medical records consist of:

- Medical and employment questionnaires or histories (including job description and occupational exposures),
- The results of medical examinations (pre-employment, pre-assignment, periodic, or episodic) and laboratory tests (including chest and other X-ray examinations taken for the purposes of establishing a baseline or detecting occupational illness, and all biological monitoring not defined as an "employee exposure record"),
- Medical opinions, diagnoses, progress notes, and recommendations,
- First aid records,
- Descriptions of treatments and prescriptions,
- Employee medical complaints.

Worker exposure records shall be maintained for the duration of employment and for 30 years thereafter and should include the following:

- Environmental (workplace) monitoring including personal, area, grab, swipe (wipe over a designated area), etc. type samples.
- Biological monitoring—level of chemical in the blood, urine, hair, fingernails, etc.
- Safety data sheets or a chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common, or trade name) of a toxic substance or harmful physical agent.

Upon written request from an approved requestor such as a local or federal jurisdiction B&T Drainage will remove all personal identifiers before releasing the medical/exposure records.

### **Access**

Each worker or designated representative has the right to request access to his/her records. B&T Drainage shall assure that access is provided in a reasonable time, place, and manner. B&T Drainage will provide a copy of the medical records within fifteen (15) working days.

The worker may access his/her records by making a request to the **Human Resources Manager or Safety Representative or delegate**. B&T Drainage will release a worker's medical records only if the worker has given specific, written consent (see Attachment 6-1).

If B&T Drainage cannot reasonably provide access to the record within fifteen (15) working days, B&T Drainage shall within the fifteen (15) working days apprise the worker or designated representative requesting the record of the reason for the delay and the earliest date when the record can be made available.

- In the case of an original X-ray, the employer may restrict access to on-site examination or make other suitable arrangements for the temporary loan of the X-ray.
- Records or copies will be provided at no cost to the worker.
  - Whenever a record has been previously provided without cost to a worker or designated representative, B&T Drainage may charge reasonable, non-discriminatory administrative costs (i.e., search and copying expenses but not including overhead expenses) for a request by the worker or designated representative for additional copies of the record.
  - No charge for an initial request for a copy of new information that has been added to a record which was previously provided.
  - No charge for an initial request by a recognized or certified collective bargaining agent for a copy of a worker exposure record or an analysis using exposure or medical records.

#### **Transfer of records**

Whenever ceasing to do business, B&T Drainage shall transfer all records subject to this section to the successor employer. The successor employer shall receive and maintain these records.

Whenever ceasing to do business and there is no successor employer to receive and maintain the records subject to this standard, B&T Drainage shall notify affected workers of their rights of access to records at least three (3) months prior to the cessation of business.

#### **References**

Code of Federal Regulation, Title 29, Part 1910.1020

**Attachment 6-1 - Release of Worker Medical Records**

**Sample Authorization letter for the release of worker medical record information to a designated representative**

I, \_\_\_\_\_, (full name of worker/patient) hereby authorize \_\_\_\_\_ (individual or organization holding the medical records) to release to \_\_\_\_\_ (individual or organization authorized to receive the medical information), the following medical information from my personal medical records:

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(Describe generally the information desired to be released).

I give my permission for this medical information to be used for the following purpose:

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But I do not give permission for any other use or re-disclosure of this information.

**(Note:** Several extra lines are provided below so that you can place additional restrictions on this authorization letter if you want to. You may, however, leave these lines blank. On the other hand, you may want to (1) specify a particular expiration date for this letter (if less than one year); (2) describe medical information to be created in the future that you intend to be covered by this authorization letter; or (3) describe portions of the medical information in your records which you do not intend to be released as a result of this letter.)

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Full name of Worker or Legal Representative

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Signature of Worker or Legal Representative & Date

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### Return to Work Coordinator

When returning to work following an injury or illness, please contact Tami Boyer at B&T Drainage, Inc. at (217) 826-6591 or (217) 822-6590.

### Return to Work Policy

It is our company's policy to make every reasonable effort to provide suitable alternative employment to an employee who is unable to perform his or her normal duties as a consequence of injury or illness. It is also our policy to:

1. Provide immediate support to the injured worker.
2. Maintain fact finding accident investigations and document the circumstances surrounding the injury.
3. Develop a Return-to Work plan with the injured worker and the medical provider.
4. Provide a concise and accurate task list to the medical care provider to assess the worker's suitability for a position.
5. Maintain communication with the injured worker and the medical care provider about the progress of the individual.
6. Provide detailed job descriptions and make accommodations for injured workers.
7. Monitor the injured worker's progress both during treatment and during his or her return to work.

It is the responsibility of the employee to:

1. Obtain medical treatment.
2. Provide the proper paperwork to the employer and provide information and influence the design of the individual plan.
3. Follow the treatment plan as close as possible.
4. Keep in regular contact with employer to communicate about progress and needs.

Guidelines:

- The company maintains the right to assign employees on modified duty to any job that will not exceed their restrictions.
- People on modified duty may be assigned to work on any shift at the discretion of the company.
- No alternate or restricted duty employee shall be permitted to work overtime.
- Whether an employee should be continued on an alternate or restricted job assignment shall be at the discretion of the company.
- Any person unable to report to work due to a work related injury must check in with the company on a weekly basis to verify there has or has not been a change in their status as to coming back to work.

Return-to- Work Employment Agreement

Employer: \_\_\_\_\_

Employee: \_\_\_\_\_

We agree that the following represents the restrictions under which you are able and have agreed to return to work as of \_\_\_\_\_

Those restrictions are as follows:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

We will not require you to perform any tasks beyond the restrictions listed above. If you are asked to perform such a task by any of our employees, please decline. They may not be aware of your restrictions. By signing below, you agree and verify that you will not do anything beyond the noted restrictions either here at work or beyond the work site (at home or recreation) until the doctor has released the restrictions and we have been notified to that effect.

Signature of Employer \_\_\_\_\_ Date \_\_\_\_\_

Signature of Employee \_\_\_\_\_ Date \_\_\_\_\_

*Re: Offer of employment*

Dear \_\_\_\_\_:

After reviewing information provided by your doctor, we are pleased to offer you the following temporary work assignment. Some light work duties may include cleaning the shop area, washing equipment, running errands, picking up supplies, and changing oil in trucks and equipment. Other tasks may be assigned based on your individual restrictions. We believe this assignment is within your capabilities as described by your doctor on the attached Return-to-Work Authorization. You will only be assigned tasks consistent with your physical abilities, skills, and knowledge. If any training is required to do this assignment, it will be provided.

Job title: \_\_\_\_\_

Description of physical requirements this position: \_\_\_\_\_

Location: \_\_\_\_\_

Duration of assignment: From: \_\_\_\_\_ To: \_\_\_\_\_

Work Hours: From: \_\_\_\_\_ To: \_\_\_\_\_ Wages: \_\_\_\_\_ [Hour/Week/Month]

Supervisor: \_\_\_\_\_

This job offer will remain open for five (5) work days from your receipt of this letter. If we do not hear from you within five (5) work days, we will assume that you have refused this offer.

We look forward to your return. If you have any questions please do not hesitate to contact me.

Sincerely,

Tami Boyer  
B&T Drainage, Inc.

RETURN-TO-WORK PROGRAM  
PROVIDER FORM

**To:** Medical Care Provider

**Subject:** Employee: \_\_\_\_\_

**From:** B&T Drainage, Inc.

**SS#:** \_\_\_\_\_

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We want to assist our employee and your patient to return to work as soon as possible and assist him/her in performing essential job functions at this institution. The information you provide on this form is vital and will be used for the following considerations:

- Allowing the employee to work without risk of further injury;
- Revision of a temporary assignment if necessary that meets the employee's needs and the needs of this institution;
- Provision of any temporary reasonable accommodations to aid the employee in performing his/her duties.

The employee's job description is attached for your consideration:

\_\_\_\_\_ Regular Job Description

\_\_\_\_\_ Temporary Assignment Job Description

If you have any questions regarding the information requested on this form, please contact:

Tami Boyer

217-826-6591

Office Manager

Telephone Number

TO BE COMPLETED BY MEDICALCARE PROVIDER

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Considering this employee's job duties and health condition, this employee may perform work in the following manner:

\_\_\_\_\_ Full Duty (no restrictions)

Beginning: \_\_\_\_\_

\_\_\_\_\_ Temporary Assignment Job Description

Beginning: \_\_\_\_\_

\_\_\_\_\_ Regular Job Description

Beginning: \_\_\_\_\_

\_\_\_\_\_ Less than Full Duty (some restrictions)

Beginning: \_\_\_\_\_

\*Additional Restrictions to Temporary Assignment Job Description should be noted on the Temporary Assignment Job Description.

\_\_\_\_\_ Off Work until Re-evaluated by Provider

Beginning: \_\_\_\_\_

Next Office Visit Scheduled: \_\_\_\_\_

Medical Care Provider's Signature

Date

\_\_\_\_\_

\_\_\_\_\_

SUMMARY – SAFETY PROGRAM POLICIES, RULES & REGULATIONS

B&T Drainage, Inc. recognizes its Safety Program to be an on-going, ever evolving, continually developing program. The safety of our employees, clients and our subcontractor's employees are our number one concern.

Communicate Policy to Workforce

Please be notified of the attached B&T Drainage, Inc. policy changes and/ or additions. All employees must be aware of workplace policies, practices, and procedures. Please read the enclosed policy changes and sign below.

I am aware of the policy revisions in the B&T Drainage, Inc. Safety Program Handbook.

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Date

## SILICA EXPOSURE PLAN

### **PURPOSE**

This Respirable Crystalline Silica Program was developed to prevent worker exposure to hazardous levels of Respirable Crystalline Silica that could result through construction activities or nearby construction activities occurring on worksites pertaining to the service provided by B&T Drainage, Inc.; hereafter referred to as “B&T Drainage”. Respirable Crystalline Silica exposure at hazardous levels can lead to lung cancer, silicosis, chronic obstructive pulmonary disease, and kidney disease. It is intended to meet the requirements of the Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153) established by the Occupational Safety and Health Administration (OSHA).

All work involving chipping, cutting, drilling, grinding, or similar activities on materials containing Crystalline Silica can lead to the release of respirable-sized particles of Crystalline Silica (i.e., Respirable Crystalline Silica). Crystalline Silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of Crystalline Silica. Many materials found on construction sites include Crystalline Silica; including but not limited to – cement, concrete, asphalt, pre-formed structures (inlets, pipe, etc.) and others. Consequently, this program has been developed to address and control these potential exposures to prevent our workers from experiencing the effects of occupational illnesses related to Respirable Crystalline Silica exposure.

### **SCOPE**

This Respirable Crystalline Silica Program applies to all workers who have the potential to be exposed to Respirable Crystalline Silica when covered by the OSHA Standard. The OSHA Respirable Crystalline Silica Construction Standard applies to all occupational exposures to Respirable Crystalline Silica in construction work, except where worker exposure will remain below 25 micrograms of Respirable Crystalline Silica per cubic meter of air (25  $\mu\text{g}/\text{m}^3$ ) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

### **RESPONSIBILITIES**

B&T Drainage firmly believes protecting the health and safety of our workers is everyone’s responsibility. This responsibility begins with upper management providing the necessary support to properly implement this program. However, all levels of the organization assume some level of responsibility for this program including the following positions.

#### **Safety Department** *(Replace with Upper Management for Smaller Contractors):*

- Conduct job site assessments for Silica containing materials and perform worker Respirable Crystalline Silica hazard assessments to determine if a worker’s exposure will be above 25  $\mu\text{g}/\text{m}^3$  as an 8-hour TWA under any foreseeable conditions
- Select and implement into the project’s Exposure Control Plan (ECP) the appropriate control measures in accordance with the Construction Tasks identified in OSHA’s Construction Standard Table 1; and potentially including (but not limited to) - a written ECP, exposure monitoring, Hazard Communication training, medical surveillance, housekeeping, and others.

**NOTE:** OSHA’s Construction Standard Table 1 is a list of 18 common construction tasks along with acceptable exposure control methods and work practices that limit exposure for those tasks.

- Ensure that the materials, tools, equipment, personal protective equipment (PPE), and other resources (such as worker training) required to fully implement and maintain this Respirable Crystalline Silica Program are in place and readily available if needed.

- Ensure that Project Managers, Site Managers, Competent Persons, and workers are educated in the hazards of Silica exposure and trained to work safely with Silica in accordance with OSHA's Respirable Crystalline Silica Construction Standard and OSHA's Hazard Communication Standard. Managers and Competent Persons may receive more advanced training than other workers.
- Maintain written records of training (for example, proper use of respirators), ECPs, inspections (for equipment, PPE, and work methods/practices), medical surveillance (under lock and key), respirator medical clearances (under lock and key) and fit-test results.
- Conduct an annual review (or more often if conditions change) of the effectiveness of this program and any active project ECP's that extend beyond a year. This includes a review of available dust control technologies to ensure these are selected and used when practical.
- Coordinate work with other employers and contractors to ensure a safe work environment relative to Silica exposure.

**Project Manager** (*Merge with Site Manager for Smaller Contractors*):

- Ensure all applicable elements of this Respirable Crystalline Silica Program are implemented on the project including the selection of a Competent Person.
- Assist the Safety Department in conduct job site assessments for Silica containing materials and perform worker Respirable Crystalline Silica hazard assessments to determine if an ECP, exposure monitoring, and medical surveillance is necessary.
- Assist in the selection and implementation of the appropriate control measures in accordance with the Construction Tasks identified in OSHA's Construction Standard Table 1; and potentially including (but not limited to) - a written ECP, exposure monitoring, Hazard Communication training, medical surveillance, housekeeping, and others.
- Ensure that workers using respirators have been properly trained, medically cleared, and fit-tested in accordance with B&T Drainage's Respiratory Protection Program. This process will be documented.
- Ensure that work is conducted in a manner that minimizes and adequately controls the risk to workers and others. This includes ensuring that workers use appropriate engineering controls, work practices, and wear the necessary PPE.
- Where there is risk of exposure to Silica dust, verify workers are properly trained on the applicable contents of this program, the project specific ECP, and the applicable OSHA Standards (such as Hazard Communication). Ensure workers are provided appropriate PPE when conducting such work.
- Competent Person and/or Site Manager (Superintendent, Foreman, etc.)
- Make frequent and regular inspections of job sites, materials, and equipment to implement the written ECP.
- Identify existing and foreseeable Respirable Crystalline Silica hazards in the workplace and take prompt corrective measures to eliminate or minimize them.
- Notify the Project Manager and/or Safety Department of any deficiencies identified during inspections to coordinate and facilitate prompt corrective action.
- Assist the Project Manager and Safety Department in conducting job site assessments for Silica containing materials and perform worker Respirable Crystalline Silica hazard assessments to determine if an ECP, exposure monitoring, and medical surveillance is necessary.

## **Workers:**

- Follow recognized work procedures (such as the Construction Tasks identified in OSHA's Construction Standard Table 1) as established in the project's ECP and this program.
- Use the assigned PPE in an effective and safe manner.
- Participate in Respirable Crystalline Silica exposure monitoring and the medical surveillance program.
- Report any unsafe conditions or acts to the Site Manager and/or Competent Person.
- Report any exposure incidents or any signs or symptoms of Silica illness.

## **DEFINITIONS**

If a definition is not listed in this section, please contact your supervisor. If your supervisor is unaware of what the term means, please contact the Competent Person or your Safety Department.

**Action Level** -a concentration of airborne Respirable Crystalline Silica of 25  $\mu\text{g}/\text{m}^3$ , calculated as an 8-hour TWA.

**Competent Person** -an individual who can identify existing and foreseeable Respirable Crystalline Silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them.

**Worker Exposure** - the exposure to airborne Respirable Crystalline Silica that would occur if the worker were not using a respirator.

**High-Efficiency Particulate Air (HEPA) Filter** -a filter that is at least 99.97 percent efficient in removing monodispersed particles of 0.3 micrometers in diameter.

**Objective Data** -information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating worker exposure to Respirable Crystalline Silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

**Permissible Exposure Limit (PEL)** - the employer shall ensure that no worker is exposed to an airborne concentration of Respirable Crystalline Silica in excess of 50  $\mu\text{g}/\text{m}^3$ , calculated as an 8-hour TWA.

**Physician or Other Licensed Health Care Professional (PLHCP)** - an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all the health care services required by the Medical Surveillance Section of the OSHA Respirable Crystalline Silica Standard.

**Respirable Crystalline Silica** - Quartz, Cristobalite, and/or Tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle size- selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality-Particle Size Fraction Definitions for Health-Related Sampling.

**Specialist** - American Board-Certified Specialist in Pulmonary Disease or an American Board-Certified Specialist in Occupational Medicine.

## **PROCEDURES**

### **Specified Exposure Control Methods**

When possible and applicable, B&T Drainage will conduct activities with potential Silica exposure to be consistent with OSHA's Construction Standard Table 1. Supervisors will ensure each worker under their supervision and engaged in a task identified on OSHA's Construction Standard Table 1 have fully and

properly implemented the engineering controls, work practices, and respiratory protection specified for the task on Table 1 (unless B&T Drainage has assessed and limited the exposure of the worker to Respirable Crystalline Silica in accordance with the Alternative Exposure Control Methods Section of this program).

The task(s) being performed by B&T Drainage identified on OSHA’s Construction Standard Table 1 is/are:  
Select any/all the following that apply:

**Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica**

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
1	Stationary masonry saws	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
2a	Handheld power saws (any blade diameter) when used outdoors	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
2b	Handheld power saws (any blade diameter) when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
3	Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less) for tasks performed outdoors only	<ul style="list-style-type: none"> <li>Use saw equipped with commercially available dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.</li> </ul>	None	None
4a	Walk-behind saws when used outdoors	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> </ul>	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		<ul style="list-style-type: none"> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>		
4b	Walk-behind saws when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
5	Drivable saws for tasks performed outdoors only	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
6	Rig-mounted core saws or drills	<ul style="list-style-type: none"> <li>Use tool equipped with integrated water delivery system that supplies water to cutting surface.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
7	Handheld and stand-mounted drills (including impact and rotary hammer drills)	<ul style="list-style-type: none"> <li>Use drill equipped with commercially available shroud or cowling with dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</li> <li>Use a HEPA-filtered vacuum when cleaning holes.</li> </ul>	None	None
8	Dowel drilling rigs for concrete for tasks performed outdoors only	<ul style="list-style-type: none"> <li>Use shroud around drill bit with a dust collection system.</li> <li>Dust collector must have a filter with 99% or greater efficiency and a filter cleaning mechanism.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		<ul style="list-style-type: none"> <li>Use a HEPA-filtered vacuum when cleaning holes.</li> </ul>		
9a	Vehicle-mounted drilling rigs for rock and concrete	<ul style="list-style-type: none"> <li>Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.</li> </ul>	None	None
9b	Vehicle-mounted drilling rigs for rock and concrete	<ul style="list-style-type: none"> <li>Operate from within an enclosed cab and use water for dust suppression on drill bit.</li> </ul>	None	None
10a	Jackhammers and handheld powered chipping tools when used outdoors	<ul style="list-style-type: none"> <li>Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10b	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10c	Jackhammers and handheld powered chipping tools when used outdoors	<ul style="list-style-type: none"> <li>Use tool equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10d	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use tool equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
11	Handheld grinders for mortar removal (i.e., tuckpointing)	<ul style="list-style-type: none"> <li>• Use grinder equipped with commercially available shroud and dust collection system.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>• Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	Powered Air-Purifying Respirator (PAPR) with P100 Filters
12a	Handheld grinders for uses other than mortar removal for tasks performed outdoors only	<ul style="list-style-type: none"> <li>• Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
12b	Handheld grinders for uses other than mortar removal when used outdoors	<ul style="list-style-type: none"> <li>• Use grinder equipped with commercially available shroud and dust collection system.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>• Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.</li> </ul>	None	None
12c	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>• Use grinder equipped with commercially available shroud and dust collection system.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>• Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		efficiency and a cyclonic pre-separator or filter-cleaning mechanism.		
13a	Walk-behind milling machines and floor grinders	<ul style="list-style-type: none"> <li>Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
13b	Walk-behind milling machines and floor grinders	<ul style="list-style-type: none"> <li>Use machine equipped with dust collection system recommended by the manufacturer.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</li> <li>When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.</li> </ul>	None	None
14	Small drivable milling machines (less than half-lane)	<ul style="list-style-type: none"> <li>Use a machine equipped with supplemental water sprays designed to suppress dust.</li> <li>Water must be combined with a surfactant.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
15a	Large drivable milling machines (half-lane and larger) for cuts of any depth on asphalt only	<ul style="list-style-type: none"> <li>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
15b	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	<ul style="list-style-type: none"> <li>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
15c	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	<ul style="list-style-type: none"> <li>• Use a machine equipped with supplemental water spray designed to suppress dust.</li> <li>• Water must be combined with a surfactant.</li> <li>• Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
16	Crushing machines	<ul style="list-style-type: none"> <li>• Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points).</li> <li>• Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>• Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station.</li> </ul>	None	None
17a	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	<ul style="list-style-type: none"> <li>• Operate equipment from within an enclosed cab.</li> </ul>	None	None
17b	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	<ul style="list-style-type: none"> <li>• When workers outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.</li> </ul>	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
18a	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	<ul style="list-style-type: none"> <li>Apply water and/or dust suppressants as necessary to minimize dust emissions.</li> </ul>	None	None
18b	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	<ul style="list-style-type: none"> <li>When the equipment operator is the only worker engaged in the task, operate equipment from within an enclosed cab.</li> </ul>	None	None

When implementing the control measures specified in Table 1, B&T Drainage shall:

- For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust
- For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust
- For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:
  - Is maintained as free as practicable from settled dust
  - Has door seals and closing mechanisms that work properly
  - Has gaskets and seals that are in good condition and working properly
  - Is under positive pressure maintained through continuous delivery of fresh air
  - Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (e.g., MERV-16 or better)
  - Has heating and cooling capabilities
- Where a worker performs more than one task included on OSHA’s Construction Standard Table 1 during a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift

### **Alternative Exposure Control Methods**

Alternative Exposure Control Methods apply for tasks not listed in OSHA's Construction Standard Table 1, or where B&T Drainage cannot not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1.

First, B&T Drainage will assess the exposure of each worker who is or may reasonably be expected to be exposed to Respirable Crystalline Silica at or above the Action Level in accordance with either the Performance Option or the Scheduled Monitoring Option.

- Performance Option – B&T Drainage will assess the 8-hour TWA exposure for each worker based on any combination of air monitoring data or objective data sufficient to accurately characterize workers exposures to Respirable Crystalline Silica.
  
- **Scheduled Monitoring Option:**
  - B&T Drainage will perform initial monitoring to assess the 8-hour TWA exposure for each worker based on one or more personal breathing zone air samples that reflect the exposures of workers on each shift, for each job classification, and in each work area. Where several workers perform the same tasks on the same shift and in the same work area, B&T Drainage will plan to monitor a representative fraction of these workers. When using representative monitoring, B&T Drainage will sample the worker(s) who are expected to have the highest exposure to Respirable Crystalline Silica.
  - If initial monitoring indicates that worker exposures are below the Action Level, B&T Drainage will assess discontinuance of monitoring for those workers whose exposures are represented by such monitoring.
  - Where the most recent exposure monitoring indicates that worker exposures are at or above the Action Level but at or below the PEL, B&T Drainage will repeat such monitoring within six months of the most recent monitoring.
  - Where the most recent exposure monitoring indicates that worker exposures are above the PEL, B&T Drainage will repeat such monitoring within three months of the most recent monitoring.
  - Where the most recent (non-initial) exposure monitoring indicates that worker exposures are below the Action Level, B&T Drainage will repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven or more days apart, are below the Action Level, at which time B&T Drainage will assess discontinuance of monitoring for those workers whose exposures are represented by such monitoring, except when a reassessment is required. B&T Drainage will reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the Action Level, or when B&T Drainage has any reason to believe that new or additional exposures at or above the Action Level have occurred.

B&T Drainage will ensure that all Respirable Crystalline Silica samples taken to satisfy the monitoring requirements of this program and OSHA are collected by a qualified individual (i.e., a Certified Industrial Hygienist) and the samples are evaluated by a qualified laboratory (i.e., accredited to ANS/ISO/IEC

Standard 17025:2005 with respect to Crystalline Silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs).

Within five working days after completing an exposure assessment, B&T Drainage will individually notify each affected worker in writing of the results of that assessment or post the results in an appropriate location accessible to all affected workers.

Whenever an exposure assessment indicates that worker exposure is above the PEL, B&T Drainage will describe in the written notification the corrective action being taken to reduce worker exposure to or below the PEL.

Where air monitoring is performed, B&T Drainage will provide affected workers or their designated representatives an opportunity to observe any monitoring of worker exposure to Respirable Crystalline Silica. When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, B&T Drainage will provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

Once air monitoring has been performed, B&T Drainage will determine its method of compliance based on the monitoring data and the hierarchy of controls. B&T Drainage will use engineering and work practice controls to reduce and maintain worker exposure to Respirable Crystalline Silica to or below the PEL, unless B&T Drainage can demonstrate that such controls are not feasible. Wherever such feasible engineering and work practice controls are not sufficient to reduce worker exposure to or below the PEL, B&T Drainage will nonetheless use them to reduce worker exposure to the lowest feasible level and shall supplement them with the use of respiratory protection.

In addition to the requirements of this program, B&T Drainage will comply with other programs and OSHA standards (such as 29 CFR 1926.57 [Ventilation]), when applicable where abrasive blasting is conducted using Crystalline Silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain Crystalline Silica.

### **Control Methods**

B&T Drainage will provide control methods that are either consistent with Table 1 or otherwise minimize worker exposures to Silica. These exposure control methods can include engineering controls, work practices, and respiratory protection. Listed below are control methods to be used when Table 1 is not followed:

List and discuss control methods

### **Respiratory Protection**

Where respiratory protection is required by this program, B&T Drainage will provide each worker an appropriate respirator that complies with the requirements of B&T Drainage's Respiratory Protection Program and the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Respiratory protection is required where specified by the OSHA Construction Standard Table 1, for tasks not listed in Table 1, or where B&T Drainage has not fully and properly implemented the engineering controls, work practices, and respiratory protection described in Table 1. Situations requiring respiratory protection include:

- Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls
- Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering, and work practice controls are not feasible
- During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL.

### **Housekeeping**

B&T Drainage does not allow dry sweeping or dry brushing where such activity could contribute to worker exposure to Respirable Crystalline Silica unless wet sweeping, HEPA-filtered vacuuming, or other methods that minimize the likelihood of exposure are not feasible.

B&T Drainage does not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to worker exposure to Respirable Crystalline Silica unless:

- The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air
- No alternative method is feasible
- Written Exposure Control Plan

When worker exposure on a construction project is expected to be at or above the Action Level, a Written ECP will be established and implemented. This ECP will contain at least the following elements:

- A description of the tasks in the workplace that involve exposure to Respirable Crystalline Silica
- A description of the engineering controls, work practices, and respiratory protection used to limit worker exposure to Respirable Crystalline Silica for each task
- A description of the housekeeping measures used to limit worker exposure to Respirable Crystalline Silica
- A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of workers exposed to Respirable Crystalline Silica and their level of exposure, including exposures generated by other employers or sole proprietors

The written ECP will designate a Competent Person to make frequent and regular inspections of job sites, materials, and equipment to ensure the ECP is implemented.

The written ECP will be reviewed at least annually to evaluate the effectiveness of it and update it as necessary. Having said this, ECP's are project specific, and most project durations do not exceed a year. The written ECP will be readily available for examination and copying, upon request, to each worker covered by this program and/or ECP, their designated representatives, and OSHA.

### **Medical Surveillance**

Medical surveillance will be made available for each worker who will be required to use a respirator for 30 or more days per year due to their Respirable Crystalline Silica exposure. Medical surveillance (i.e., medical examinations and procedures) will be performed by a PLHCP and provided at no cost to the worker at a reasonable time and place.

B&T Drainage will make available an initial (baseline) medical examination within 30 days after initial assignment, unless the worker has received a medical examination that meets the requirements of the OSHA Respirable Crystalline Silica Construction Standard within the last three years. The examination shall consist of:

- A medical and work history, with emphasis on past, present, and anticipated exposure to Respirable Crystalline Silica, dust, and other agents affecting the respiratory system in addition to any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing), history of tuberculosis, and smoking status and history
- A physical examination with special emphasis on the respiratory system
- A chest X-ray (a single postero-anterior radiographic projection or radiograph of the chest at full inspiration recorded on either film [no less than 14 x 17 inches and no more than 16 x 17 inches] or digital radiography systems) interpreted and classified according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader
- A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course
- Testing for latent tuberculosis infection
- Any other tests deemed appropriate by the PLHCP

B&T Drainage will make available medical examinations that include the aforementioned procedures (except testing for latent tuberculosis infection) at least every three years. If recommended by the PLHCP, periodic examinations can be more frequently than every three years.

B&T Drainage will ensure that the examining PLHCP has a copy of the OSHA Respirable Crystalline Silica Construction Standard, this program, and the following information:

- A description of the worker's former, current, and anticipated duties as they relate to the worker's occupational exposure to Respirable Crystalline Silica
- The worker's former, current, and anticipated levels of occupational exposure to Respirable Crystalline Silica
- A description of any PPE used or to be used by the worker, including when and for how long the worker has used or will use that equipment
- Information from records of employment-related medical examinations previously provided to the worker and currently within the control of B&T Drainage

B&T Drainage will ensure that the PLHCP explains to the worker the results of the medical examination and provides each worker with a written medical report within 30 days of each medical examination performed. The written report shall contain:

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the worker at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment
- Any recommended limitations on the worker's use of respirators
- Any recommended limitations on the worker's exposure to Respirable Crystalline Silica

- A statement that the worker should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP

B&T Drainage will also obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion shall contain only the following in order to protect the worker's privacy:

- The date of the examination
- A statement that the examination has met the requirements of the OSHA Respirable Crystalline Silica Construction Standard
- Any recommended limitations on the worker's use of respirators

If the worker provides written authorization, the written opinion shall also contain either or both of the following:

- Any recommended limitations on the worker's exposure to Respirable Crystalline Silica
- A statement that the worker should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP

If the PLHCP's written medical opinion indicates that a worker should be examined by a Specialist, B&T Drainage will make available a medical examination by a Specialist within 30 days after receiving the PLHCP's written opinion. B&T Drainage will ensure that the examining Specialist is provided with all the information that the employer is obligated to provide to the PLHCP.

B&T Drainage will ensure that the Specialist explains to the worker the results of the medical examination and provides each worker with a written medical report within 30 days of the examination. The written report will contain:

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the worker at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment
- Any recommended limitations on the worker's use of respirators
- Any recommended limitations on the worker's exposure to respirable crystalline Silica

In addition, B&T Drainage will obtain a written opinion from the Specialist within 30 days of the medical examination. The written opinion shall contain the following:

- The date of the examination
- Any recommended limitations on the worker's use of respirators
- If the worker provides written authorization, the written opinion shall also contain any recommended limitations on the worker's exposure to Respirable Crystalline Silica

### **Hazard Communication**

B&T Drainage will include Respirable Crystalline Silica in B&T Drainage's Hazard Communication Program established to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

B&T Drainage will ensure that each worker has access to labels on containers of Crystalline Silica and those containers respective Safety Data Sheets (SDS's).

All workers will be trained in accordance with the provisions of the OSHA Hazard Communication Standard and the Training Section of this program. This training will cover concerns relating to cancer, lung effects, immune system effects, and kidney effects.

B&T Drainage will ensure that each worker with the potential to be exposed at or above the Action Level for Respirable Crystalline Silica can demonstrate knowledge and understanding of at least the following:

- The health hazards associated with exposure to Respirable Crystalline Silica
- Specific tasks in the workplace that could result in exposure to Respirable Crystalline Silica
- Specific measures B&T Drainage has implemented to protect workers from exposure to Respirable Crystalline Silica, including engineering controls, work practices, and respirators to be used
- The contents of the OSHA Respirable Crystalline Silica Construction Standard
- The identity of the Competent Person designated by B&T Drainage
- The purpose and a description of B&T Drainage's Medical Surveillance Program

B&T Drainage will make a copy of the OSHA Respirable Crystalline Silica Construction Standard readily available without cost to any worker who requests it.

### **Recordkeeping**

B&T Drainage will make and maintain an accurate record of all exposure measurements taken to assess worker exposure to Respirable Crystalline Silica. This record will include at least the following information:

- The date of measurement for each sample taken
- The task monitored
- Sampling and analytical methods used
- Number, duration, and results of samples taken
- Identity of the laboratory that performed the analysis
- Type of personal protective equipment (PPE), such as respirators, worn by the workers monitored
- Name, social security number, and job classification of all workers represented by the monitoring, indicating which workers were monitored

B&T Drainage will ensure that exposure records are maintained and made available in accordance with 29 CFR 1910.1020. Exposure records will be kept for at least 30 years.

The employer shall make and maintain an accurate record of all objective data relied upon to comply with the requirements of the OSHA Respirable Crystalline Silica Construction Standard. This record shall include at least the following information:

- The Crystalline Silica-containing material in question
- The source of the objective data
- The testing protocol and results of testing
- A description of the process, task, or activity on which the objective data were based
- Other data relevant to the process, task, activity, material, or exposures on which the objective data were based

B&T Drainage will ensure that objective data are maintained and made available in accordance with 29 CFR 1910.1020. Objective data records will be kept for at least 30 years.

B&T Drainage will make and maintain an accurate record for each worker enrolled in the Medical Surveillance portion of this program. The record shall include the following information about the worker:

- Name and social security number
- A copy of the PLHCPs' and/or Specialists' written medical opinions
- A copy of the information provided to the PLHCPs and Specialists

B&T Drainage will ensure that medical records are maintained and made available in accordance with 29 CFR 1910.1020. Medical records will be kept under lock and key for at least the duration of employment plus 30 years. It is necessary to keep these records for extended periods because Silica-related diseases such as cancer often cannot be detected until several decades after exposure. However, if a worker works for an employer for less than one year, the employer does not have to keep the medical records after employment ends if the employer gives those records to the worker.

### **PROGRAM EVALUATION**

This program will be reviewed and evaluated on an annual basis by the Safety Department unless changes to operations, the OSHA Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153), or another applicable OSHA Standard require an immediate re-validation of this program.

### JOB HAZARD ANALYSIS

#### **Purpose:**

The purpose of the Hazard Analysis is to provide a method for a supervisor and his/her crew to inspect an upcoming job, identify potential hazards related to that job, and to arrive at agreement on the development of a Safe Work Plan for completing their assignment.

#### **POLICY:**

Once the client/owner has issued a permit, it is each B&T Drainage, Inc. employee's responsibility to ensure that the Safe Work Plan for the work he/she is about to do is properly developed. After receiving a valid work permit from the client/owner and before starting a job, each crew shall review the permit requirements and perform a thorough Hazard Analysis. The Hazard Analysis process serves as B&T Drainage, Inc. Safe Work Plan. As such, by completing the process and signing on the back of the form, employees are indicating that they are prepared to accomplish the assigned task efficiently and safely. In the event conditions change, the Hazard Analysis Form must be updated. Potential hazards, including those specific to the task and those general to the work area, must be discussed and a plan formulated to eliminate or minimize identified hazards. Each person on the crew must understand his/her role relating to the tasks at hand. When a new worker is assigned to a job in progress, the Hazard Analysis must be reviewed with this person and he/she must sign the form before beginning work.

#### **PROCEDURE:**

Once the client/owner work permit has been issued, the assigned crew shall conduct a thorough Hazard Analysis session at the job site, which includes, but is not limited to:

Walking the job and reviewing all elements of the assignment. The supervisor shall identify all equipment that is to be worked on.

Identifying existing and/or potential hazards and take appropriate action to eliminate or minimize identified hazards; reaching agreement on the safest plan to complete the assigned task. Each person on the crew must thoroughly understand their role in the upcoming tasks.

Evaluating PPE requirements and upgrading permit required PPE or providing additional PPE whenever necessary to provide maximum level of employee protection.

Ensuring that all workers know and are properly trained for their assignment(s).

Posting the completed form(s) along with the work permit in a conspicuous place in the work area. In the event it is not possible to post the form(s), they shall be kept readily available at the job site. The forms shall be kept in a manner that protects them from weather damage.

Whenever possible the supervisor shall be involved in the Hazard Analysis Session. However, there are times when this is not possible. Should the supervisor find that he/she will not be available, he/she shall assign a competent person to lead the session. As soon as practical following the beginning of a job, the supervisor shall review all Hazard Analysis Forms of crews assigned to him/her and sign the back of the form in the section provided.

#### GENERAL INSTRUCTIONS:

Print and make sure the form is legible/readable. The only place you do not print required information is when you place your signature on the back of the form.

Involve the entire crew in the process. The more eyes and experience used to identify hazards, the better.

Whenever possible, the completed Hazard Analysis should be reviewed for proper completion and signed by the designated lead person, foreman, supervisor or Safety dept. representative before the work is started. If this is not possible, the form should be reviewed as soon as practical.

When the form (s) is completed, it must be posted & readily available at the job site.

#### Front of Hazard Analysis Form:

Description of job – The first step of hazard analysis is to accurately describe the work to be performed. This will provide the basis for the rest of the process. At the top of the form, provide a brief, but specific description of the job you will perform.

Date and Time – Enter the date the work will be performed and the time you started the Hazard Analysis process.

Location – Enter the name of the facility where the work will be performed. For example:

Supervisor – Enter the name of the immediate foreman or supervisor.

Client Contact – Enter the name of the client contact person for that job.

Crew – Clearly print the name(s) of each person that will be working on the job. This may include non-B&T Drainage, Inc. employees, such as other contractors or client personnel working with you.

Unit – Enter the name of the unit where the work will be performed. For example:

Equipment – Enter the number or name of the equipment you will be working on. Be as specific as possible. Make sure that you are preparing to work on the right equipment. If there is no number or name for the equipment, enter the number or name of the equipment it is connected to. For example:

Product – Enter the name of the product or material that is present or that was present when the equipment/line was in service. In addition, if the equipment/line was flushed or cleaned before the work is performed, indicate that on the form.

Permit Numbers – Enter the number from the client permit(s) in the appropriate section. Some jobs may have multiple permits.

Location of – (Enter the location of the nearest):

Telephone – This is the telephone that would be used to report an emergency (i.e. – operators shack). If there is no telephone in the immediate area, indicate how you would report an emergency (i.e. – radio, cell phone).

Emergency Phone No.(s) – Enter the phone number(s)/radio channel(s) for reporting emergencies at that location

Fire Extinguisher – Enter the location of the nearest portable fire extinguisher. Be sure to check the extinguisher and verify that it is fully charged, is operational, and has been inspected within the past year. Report any extinguisher that appears to be inoperable, damaged, discharged or in need of service.

Eyewash/Safety Shower – Enter the location of the nearest eyewash/safety shower. If it is alarmed, check with the unit operator before activating. If it is not connected to an alarm system, verify that it is operational by activating the control lever/device, until the water flows clear. Once the system is flushed be sure to replace the protective caps on the eyewash applicators.

Yes, No, N/A Questions – Each one of these questions requires an answer. Carefully consider each question and how it will affect or apply to the work being performed. If the question doesn't apply to the job, mark it "N/A" (Not applicable). Each question is important.

Back of Hazard Analysis form -

Fall Protection – Answer the first question in this section. If you check "No", then you can move on to the next section. If you check "Yes", then you must complete the entire Fall Protection section. Make sure that workers are properly trained in the use of fall protection equipment.

Scaffold User Inspection – Answer the first question of this section. If you check "No" then you can move on to the next section. If you check "Yes", then you must conduct a thorough inspection of the staging prior to use and complete the entire Scaffold User Inspection section.

If the scaffold is yellow-tagged, identify the hazard(s) that require the yellow tag (i.e. – hole in deck, missing guardrail, restricted access).

Job Steps – Briefly outline or list the steps necessary to safely complete the job from start to finish. For example:

Inspect/Prepare job site, obtain permit, complete Hazard Analysis form and review with crew, obtain/inspect tools and PPE, perform job, cleanup, return tools.

Existing Hazards – List hazards that are present at the job site. These will primarily be existing physical hazards. For example:

Elevated work, uneven surfaces, confined space, high noise levels, pinch points, conflicting work above/below, weather conditions.

Potential Hazards – List hazardous conditions that may be created/exposed while doing the work. For example:

Hot Pipes, product release, exposure to hazardous material(s), sparks/slag, heavy lifting, explosive atmosphere.

Action Taken To Eliminate or Minimize Hazards – List what you are going to do to eliminate or control each of the identified hazards.

Crew/Employee Signatures – Now that you have filled in the blanks and answered the questions, review the Hazard Analysis form with all crewmembers and any other contractor client personnel working on the job. When each crew member understands the hazards present, is properly trained for their assigned task and understands how to complete the work safely, they must sign their name in the same numbered space as they printed their name on the front of the form. Do not sign if you don't understand or aren't properly trained.

Hazard Analysis session lead by – The supervisor or foreman or lead person that conducts the Hazard Analysis review with all crew members and checks the form for proper completion must print and sign their name and indicate the date and time the review was held.

Now you can start the job! Remember, the form is complete, but the process continues. Always remain alert for changing conditions. The Hazard Analysis form must be modified/updated if conditions change or new hazards are found. Any modifications must be communicated with all crewmembers.

\*Remember to review the Hazard Analysis with any new crewmembers that are added while the job is in progress. Their name(s) and signature(s) must also be added to the Hazard Analysis form.

Post all completed forms in a conspicuous and readily available location.

HAZARD ANALYSIS/SAFE WORK PLAN – GENERAL WORK						
THIS CREW IS TO PERFORM THE FOLLOWING:						
DATE TIME	LOCATION			LOCATION OF:	PPE Check Applicable	
SUPERVISOR		CLIENT CONTACT		Telephone	<b>MINIMUM</b> Hard Hat, Safety Glasses with Side Shields, Goggles, Plugs, Gloves, Fire Retardant Coveralls, Work Boots  <b>ADDITIONAL</b> <b>ALWAYS</b> provide maximum level of worker protection Vibration Dampening Gloves Knee Pads Face Shield Ear Muffs Safety Harness & Lanyard Supplied Air Half Face Respirator Full Face Respirator Acid Gear Rain Suit Rubber Gloves Rubber Boots Other	
CREW: (Print name below and sign in the same numbered space on the back of this sheet.		UNIT		Emergency Phone No. (s)?		
<input type="checkbox"/>	<input type="checkbox"/>	EQUIPMENT		Fire Extinguisher		
<input type="checkbox"/>	<input type="checkbox"/>	What product is/was in equipment?		Eyewash/Safety Shower		
<input type="checkbox"/>	<input type="checkbox"/>	All permit numbers must be listed below.		Evacuation Area Primary:		
<input type="checkbox"/>	<input type="checkbox"/>	HOT WORK #		Secondary:		
<input type="checkbox"/>	<input type="checkbox"/>	COLD WORK #				
<input type="checkbox"/>	<input type="checkbox"/>	UNIT ENTRY #		IF IN DOUBT,?? STOP AND ASK!!		
<input type="checkbox"/>	<input type="checkbox"/>	CONFINED SPACE #				
<input type="checkbox"/>	<input type="checkbox"/>	OTHER #				
Crew PSM trained?	YES	NO	N/A	Motorized equipment inspected?	YES	NO
Crew properly trained for job?	YES	NO	N/A	Operator(s) trained? Operator(s) on approved list?	YES	NO
Entire crew knows emergency evacuation procedure?	YES	NO	N/A	Rigging (slings, ropes, wire ropes, come-alongs, chain hoists) inspected and found safe?	YES	NO
Actions taken to prevent worker exposure to Hazardous Material?	YES	NO	N/A	Equipment blocked, de-pressured and drained?	YES	NO
Crew knows potential hazards?	YES	NO	N/A	Equipment locked/tagged out?	YES	NO
Crew knows location of SDS?	YES	NO	N/A	GFCI's/low voltage lighting used?	YES	NO

Entire crew familiar with safety manual?	YES	NO	N/A	Crew knows hand signals?	YES	NO
Weather presents a problem?	YES	NO	N/A	Crew aware of pinch points?	YES	NO
Conflicting jobs in area?	YES	NO	N/A	Tools/equipment inspected and found safe?	YES	NO
Barricades installed as needed & tagged?	YES	NO	N/A	Tool holders available for use with knocker wrench?	YES	NO
Work area clean, orderly & safe?	YES	NO	N/A	Equipment blinded?	YES	NO
Hoses and cords out of walkways?	YES	NO	N/A	Correct type of blinds & gaskets for job?	YES	NO
Drains properly covered?	YES	NO	N/A	Is work in confined space?	YES	NO
Work area clear of flammable hazards?	YES	NO	N/A			

**PLAN YOUR WORK, AND THEN WORK YOUR PLAN SAFELY!!!**

FALL PROTECTION						
Is work being performed at an unprotected elevated area where workers may be exposed to a fall of 6 feet or more? Note: Client/Owner or working conditions may require fall protection at lower elevations. If yes, complete the following information.					Yes	No
Have workers that require fall protection been provided with a full body harness, appropriate lanyard(s) with shock absorbing device and boom strap (if needed)?	Yes	No	Is static line required? If yes, has it been inspected by a competent person prior to use?	Yes	No	
Have all workers completed fall protection training?	Yes	No	Are adequate anchor points present?	Yes	No	
Has all fall protection equipment been inspected prior to use and found to be in safe condition?				Yes	No	
List any other fall protection equipment required:						
SCAFFOLD USER INSPECTION: Does job require use of scaffold? YES <input type="checkbox"/> NO <input type="checkbox"/> If yes, complete the section below.						
Inspect the following items before using (Check box when found safe for use) <input checked="" type="checkbox"/>						
Top and mid rails in place <input type="checkbox"/>			Bars and clamps tight and secure <input type="checkbox"/>			
Toe boards and falling object protection in place and secure <input type="checkbox"/>			Ladders in place and secure <input type="checkbox"/>			
Weather conditions do not present a hazard <input type="checkbox"/>			Holes in decks adequately covered <input type="checkbox"/>			
Planks in safe condition and secured <input type="checkbox"/>			Free of slipping and/or tripping hazard <input type="checkbox"/>			
Personnel barriers installed on hot lines/equipment <input type="checkbox"/>			Scaffolding properly tagged <input type="checkbox"/>			
Free of overhead hazards <input type="checkbox"/>			Enter Maximum Load Allowed			
List any hazards:			(Heavy Duty Formula is Square Feet x 75 PSF = Max Capacity in pounds)			
Steps of Task (List steps necessary to completed the task)	Potential Hazards Evaluate hazards associated with Tools being used, Methods employed to accomplish task, Materials required to complete task, and Working Environment/Conditions		Controls (Identify preventative measures to be used to control each identified hazard)		PSM standards require employees to be trained on the hazards associated with each task. Do not sign this form unless you have been trained and understand the potential hazards associated with this task. If you have not been trained, do not understand or feel you can not complete this job safely, speak to your supervisor before starting work.	
					Sign your name:	
					1	
					2	
					3	
					4	

			5
			6
			7
			8
			9
			10

Hazard Analysis session lead by:                      (circle one)                      Supervisor                      Lead Person                      Other

---

Print Name:                      Signature:                      Date:                      Time:

Reviewed By:                      (circle one)                      Supervisor                      Safety                      Other

---

Print Name:                      Signature:                      Date:                      Time:

---

## NEW HIRE ORIENTATION PROGRAM

All employees of B&T Drainage, Inc. are hired through local union halls. They are required to abide by all requirements made by the union. Before beginning work at B&T Drainage the new hires are given the following documents:

- B&T Drainage Safety Program
- Drug Policy Memo

New hires are required to submit the following paperwork to Tami Boyer, Office Manager:

- Form I-9
- Consent to Testing
- Copy of Driver's License, Passport, or Birth Certificate
- Employee Information Sheet
- W-4

## SUBCONTRACTOR SAFETY MANAGEMENT

### **PURPOSE**

To set forth a basis for the selection of safe subcontractors and to set forth procedures to assure that the subcontractor's safety activities are equal to or exceed those of B&T Drainage

### **POLICY**

Subcontractors for B&T Drainage, Inc.; hereafter referred to as "B&T Drainage" work sites shall be selected and managed in a manner consistent with the overall Company safety objectives, policies, and procedures embodied in the other sections of this manual.

### **SCOPE**

Applies to all B&T Drainage work sites, i.e., Company offices, client job sites, etc., that have occasion to use subcontractors.

### **DEFINITIONS**

**Experience Modification Rate (EMR)** is a term related to Workers' Compensation insurance and means a factor developed by measuring the difference between an employer's actual past claim experience and the expected or actual experience of the industry classification of the employer. Depending on the workers compensation program in which the subcontractor participates, the EMR may be determined by a single state entity or a multi-state agency such as the National Council on Compensation Insurance (NCCI). The EMR is based on a point scale where 1.0 means average or expected losses for that type of industry classification. EMR's below 1.0 means below average loss history and EMR's above 1.0 mean above-average loss history.

**Hours of Exposure** means the total number of hours that all a company's workers are exposed to occupational injuries or illnesses during a normal work year. Salaried and hourly workers are included. Straight-time and over-time hours are included.

**Subcontractor** for purposes of this section, means a person or business, which has a standard subcontract agreement with B&T Drainage, as an "independent contractor" (not a worker), to provide some portion of the fieldwork on a project for B&T Drainage.

## **PROCEDURES**

### **Subcontractor Selection**

Form 5-1.1 of Appendix 5-1 is a Pre-Qualification Questionnaire that shall be used to capture the information noted within this section. It is required that safety performance be considered initially, and annually thereafter, in the selection of subcontractors, using the following criteria:

### **Experience Modification Rate ("EMR")**

Prospective subcontractors shall be required to furnish their EMR for the past three years. This information should come directly from the subcontractor's broker. An EMR greater than 1.0 can indicate an employer with a high frequency and/or severity of workers compensation claims. In the event of an EMR greater than 1.0, a more detailed evaluation of their safety program is required.

### **OSHA Log**

Prospective subcontractors shall be required to submit copies of OSHA logs (or equivalent summary data) for the previous three years and applicable hours of exposure. Incident frequency and severity rates should be examined and compared for acceptability with:

- Comparable incident rates for relevant work sites (if available)
- Industry average incident rates for their Standard
- Industrial Code (SIC or NAICS code) as published by the Bureau of Labor Statistics
- An incident rate specified by B&T Drainage
- Safety Coordinator or delegate

### **Evaluation of Subcontractor Safety Program**

The prospective subcontractor shall demonstrate that their program meets or exceeds B&T Drainage's safety program requirements, industry standards or governing jurisdiction. The following areas are a minimum that shall be addressed by the subcontractor:

- The program should be industry specific, not generic, and should be responsive to the exposures prevalent in the industry and anticipated on the prospective project
- There should be elements of supervisor accountability for safety, accidents, and claim costs
- Safety meetings should be held regularly, with documentation as to the subject, who attended, and a review of past losses
- Safety audits (inspections) should be conducted by the subcontractor on a regular basis.
- Audit results should be documented to identify deficiencies and corrective action taken
- The program should provide for worker safety training, including the documentation thereof.

### **OSHA Citations**

The prospective subcontractor shall be required to provide information (reason, corrective action, and fines) regarding OSHA citations during the past three years. A history of frequent violations, infrequent

but repeated violations, or violations applicable to the work to be performed would warrant further investigation.

### **Pre-Job Planning**

The understanding of B&T Drainage and the subcontractor on important issues should be written and signed by both parties as part of the subcontract agreement and scope of work. All subcontractors are required to report incidents/injuries immediately or as soon as possibly to B&T Drainage. The subcontractor and B&T Drainage will review and assign notification and recordkeeping requirements.

Examples of such issues would be:

- Provision of tools and equipment and inspection thereof
- Performance in accordance with OSHA and other regulatory bodies
- Provision of all necessary personal protective equipment (PPE), training on its use, and enforcement of usage at the worksite
- Responsibility for housekeeping and debris removal efforts
- Responsibility for utility mark out, maintenance, and protection of traffic on underground and road projects during the project
- Defining the roles and responsibilities for the supervision and direction of the subcontractors
- Reporting and recordkeeping of incidents/injuries including near misses

### **Typical Actions Recommended During Performance of Work**

Include subcontractors in the following safety activities:

- Manager Audits
- Safety Meetings
- Training Sessions
- Safety Audits
- Work Observations
- Job Safety Analysis Systems
- Hazard Analysis including Site inspections and hazards created by others
- Injury Intervention Processes
- Root Cause Analysis
- Client-Required Programs

### **Post Job Review**

A post job review will be performed to evaluate the overall safety performance of the subcontractor.

Appendix 5-1

## **COMPANY NAME SUBCONTRACTOR PRE-QUALIFICATION QUESTIONNAIRE**

All subcontractors are required to complete this questionnaire. The contents of this questionnaire will be considered confidential and used solely to determine your company's qualifications and will not be disclosed to the project staff. Please direct any questions, and return this completed form, to:

**B&T Drainage**  
13094 N St Hwy 1 Marshall, IL 62441  
Telephone: 217-826-6591

**GENERAL INFORMATION.** Please fill in the following:

Name of Business: \_\_\_\_\_  
Street Address: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_  
City, State, Zip Code: \_\_\_\_\_  
Telephone Number \_\_\_\_\_ Fax Number: \_\_\_\_\_  
Person to Contact: \_\_\_\_\_

**ORGANIZATION.** Please indicate your firm's legal structure:

This firm is a: ( ) C Corporation ( ) S Corporation ( ) Partnership  
( ) Sole Proprietor ( ) Limited Liability Company

Federal Employer Identification Number: \_\_\_\_\_

Names, Titles and ages and length in position of Officers, Managers, or Principals:

\_\_\_\_\_

Name Title Age Time in Position

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Is your firm a qualified minority business? \_\_\_\_\_ Certification No.: \_\_\_\_\_

**WORK CLASSIFICATION**

Please list the type(s) of work you are interested in bidding:

Please list the geographic areas you prefer to work in:

**WORK EXPERIENCE**

Please attach a list of the major projects your firm currently has in progress showing the project name, location, owner, architect/engineer, general contractor, contract amount, percent complete and scheduled completion date, and contact person.

Please attach a list of the major projects your firm has completed in the last three years showing the project name, location, owner, architect/engineer, general contractor, contract amount and completion date, and contact person.

**FINANCIAL INFORMATION**

Please attach your firm’s most current financial statements (audited, if available), for the entity that will be signing the subcontract.

**REFERENCES**

**Bank Reference**

Name  
Contact Person  
Telephone

**Bonding Reference**

Bonding Company:  
Bonding Agent:  
Name  
Address  
Phone #  
Bonding Capacity: \$ \_\_\_\_\_ Per Project  
\$ \_\_\_\_\_ Aggregate  
Date, amount, and type of last bond issued:  
Bond Rate:

**Credit References**

Name  
Contact Person  
Telephone

**CONTRACTOR PROFILE**

Current Number of workers:  
Office \_\_\_\_\_ Field \_\_\_\_\_

Does your firm operate as a Union shop? ( ) Yes ( ) No  
Merit shop? ( ) Yes ( ) No

**SAFETY, HEALTH AND ENVIRONMENTAL**

Please list your firm’s Workers Compensation Interstate Experience Modification Rate.

Does your company have a written safety program? ( ) Yes ( ) No

**INSURANCE**

Attach the certificate provided by your insurance carrier.

**ADDITIONAL INFORMATION**

Please list any additional information that you feel will help us determine your firm’s qualifications and expertise:

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---

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**This Pre-qualification Questionnaire was completed by:**

**Name:** \_\_\_\_\_ **Title:** \_\_\_\_\_

**Date:** \_\_\_\_\_

#### General Waste Management

Prior to beginning a new project B&T will estimate the amount of waste that will be generated and the need for containers and waste removal will be determined. Waste materials will be safely stored and handled to minimize the potential for a spill or impact to the environment. At all times, receptacles will be covered to prevent dispersion of waste materials and to control the potential for run-off.

B&T employees will be instructed on the proper handling, storage, and disposal of wastes, including non-hazardous wastes, trash and scrap materials. If hazardous wastes are generated, B&T employees will be trained to ensure proper disposal. At all times, B&T will be mindful of opportunities to reuse or recycle.

#### Stop Work Authority

The purpose B&T's Stop Work Authority (SWA) Program is to provide employees and contract workers with the responsibility and obligation to stop work when a perceived unsafe condition or behavior may result in an unwanted event. B&T Drainage considers no activity to be so urgent or important that its standards for environmental protection, safety or health may be compromised. Employees and contract workers have the right and responsibility not to perform tasks or activities they feel pose undue risk to themselves, co-workers or the environment. Stop work actions take precedence over all other priorities and procedures.

Training regarding this SWA program will be conducted as part of all new employee and contractor orientations. This training will include education on:

- The importance of SWA
- The benefits of SWA
- B&T's commitment to SWA
- SWA roles and responsibilities
- The contents of this program and SWA procedures

It's B&T's policy that:

- All employees, contractors and employees of contractors have the authority and obligation to stop any task or work when the control of health, safety and environmental (HSE) risks are not clearly established or understood.

- No work will resume until all SWA issues and concerns have been adequately resolved.
- No form of retribution or intimidation directed at any employee exercising their stop work authority will be tolerated.

#### STOP WORK AUTHORITY ROLES AND RESPONSIBILITIES

- B&T employees and contract workers are responsible for initiating stop work intervention when appropriate, supporting the intervention of others, reporting all stop work actions and assisting in the investigation of SWA matters.
- Foremen, supervisors and managers—Foremen, supervisors and managers should promote a culture where SWA is exercised freely, work to investigate and address SWA concerns and ensure all SWA concerns are addressed before work resumes. These individuals ensure all necessary stop work follow-up is completed and that all stop work reports are filed and reviewed.
- Safety directors—Safety directors provide training on workplace HSE risks. They also provide training materials, support employees, maintain associated documentation and monitor compliance of the SWA program. All SWAs concerns will be documented by the safety director to assess trends and share lessons learned.
- Senior management—Senior management creates a culture that promotes SWA, allows SWA to be exercised freely, establishes clear expectations and responsibilities, resolves SWA conflicts when they arise and holds accountable anyone who chooses not to comply with established SWA policies. They also hold employees and contractors accountable for full compliance with the SWA program. All stop work reports will be reviewed by senior management.

#### STOP WORK AUTHORITY PROCEDURES

SWA is executed using a several-step process that generally includes **STOP, NOTIFY, INVESTIGATE, CORRECT, RESUME, FOLLOW UP and DOCUMENT**. While situations may differ, the following steps should be the framework for all SWA interventions.

1. **Stop work**—When a person identifies a perceived unsafe condition, act, error, omission or lack of understanding, a SWA intervention shall be immediately initiated with the person(s) potentially at risk. Once a stop work intervention has been initiated, all work must stop immediately. If the supervisor is readily available and the affected person(s), equipment or environment is not in imminent danger, coordinate the stop work action through the supervisor. The stop work action should be clearly identified as a stop work action and initiated in a noncombative manner directly with those at risk. Stop work interventions should be initiated in a positive manner by briefly introducing yourself and starting a conversation with the phrase “I am using my stop work authority because.” Using this phrase will clarify the user’s intent and set expectations as detailed in this procedure.
2. **Notify**—Notify all affected personnel and supervisors of the stop work action. If necessary, stop work activities that are associated with the work area in question. Make the area(s) as safe as possible by removing personnel and stabilizing the situation.
3. **Investigate**—Once the work is stopped and all affected personnel and supervisors are notified, the issue will be investigated to determine the cause of the unsafe condition, act, error, omission or lack of understanding and potential ways to correct the issue.

4. **Correct issues**—If all parties come to an agreement that the condition or behavior is safe to proceed without modifications, then resume work. If it is determined and agreed that the stop work issue is valid, then every attempt should be made to resolve the issue to the satisfaction of all affected persons before work is restarted. This may require modifications of the working environment or the introduction of new controls. If the stop work issue cannot be resolved immediately, suspend work until a proper resolution is achieved. When opinions differ as to the validity of the stop work issue or adequacy of the resolution actions, John Boyer, President, makes the final determination.
5. **Resume operations**—The affected area(s) will be reopened for work by personnel with restart authority. All affected employees and contractors will be notified of what corrective actions were implemented and that work will recommence. No work will resume until all issues and concerns have been addressed.
6. **Conduct follow-ups**—The desired outcome of any SWA intervention is to address safety concerns to the satisfaction of all involved persons/parties prior to resuming work. While most issues can be resolved in a timely fashion, occasionally additional investigation and corrective actions may be required to identify and address root causes of the safety concern. SWA interventions that require additional investigation or follow-up will be handled utilizing B&T's existing protocols and procedures for examining HSE risks.
7. **Document**—All SWA interventions initiated under the authority of this program shall be documented on B&T's "Stop Work Authority Reporting Form." Reports should include as much detail about the intervention as reasonably possible. At minimum, all reports should include the following information:
  - i. Date of the SWA intervention;
  - ii. Employee(s)/worker(s) involved;
  - iii. Description of the unsafe condition or hazard that triggered the SWA intervention;
  - iv. Corrective action used to correct the condition or hazard, if applied; and
  - v. Remaining unsafe conditions or hazards that must be addressed.

All SWA incident report forms will be reviewed by B&T management to ensure compliance with this program, determine the quality of intervention, identify and address workplace hazards, and identify opportunities for improving the program. All SWA incident reports will be maintained by B&T for a minimum of two years.

**Stop Work Authority Reporting Form**

**STOP WORK INTERVENTION INFORMATION**

Supervisor:	Date of Stop Work:	Customer Name:
Project Name/Description:		

**WORKERS INVOLVED**

First Name	Last Name	Job Title	Contact Info

**DESCRIPTION OF THE EVENT OR PERCEIVED STOP WORK CONDITION**

--

**CORRECTIVE ACTION TAKEN/HOW RECURRENCE WILL BE PREVENTED**

**REMAINING UNSAFE CONDITIONS OR HAZARDS THAT MUST BE ADDRESSED**

**MANAGEMENT EVALUTION**

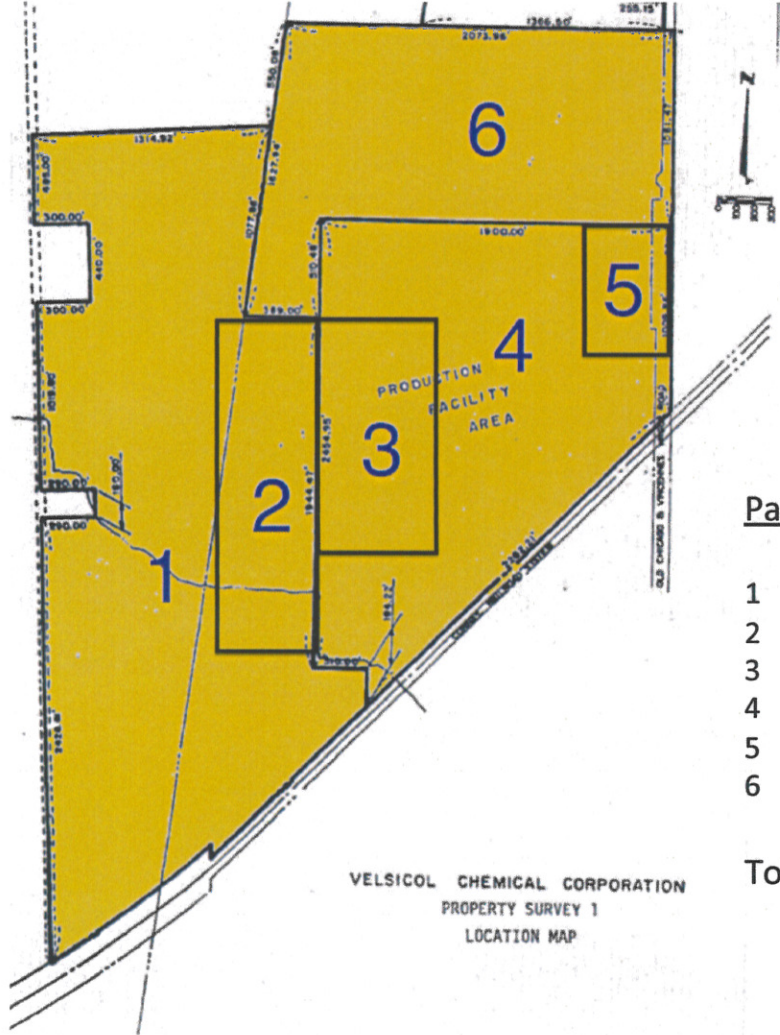
**SUBMITTED BY:**

**REVIEWED BY:**

**TODAY'S DATE:**

# APPENDIX 4

# Property Areas



<u>Parcel</u>	<u>Acreage</u>	<u>Description</u>
1	110.28	Farmland – No Restrictions.
2	17.72	Farmland – Plant corn, wheat, soybeans
3	23.20	Facility – Cap – Can do nothing is this area.
4	55.65	Facility – Outside cap – Can develop with restrictions.
5	5.22	Former parking lot – No restrictions
6	57.54	Current soccer field– No restrictions
<b>Total</b>		<b>269.61</b>

# APPENDIX 5

Jennifer T. Nijman  
jn@nijmanfranzetti.com

Susan M. Franzetti  
sf@nijmanfranzetti.com

November 22, 2011

Gaylene Vasaturo  
U.S. Environmental Protection Agency  
Mail Code C-14J  
77 West Jackson Boulevard  
Chicago, IL 60604

Illinois Environmental Protection Agency  
Chief, Bureau of Land  
Attn: Kim Geving, Division of Legal Counsel  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276

Mayor, City of Marshall  
City Hall  
201 S. Michigan Avenue  
P.O. Box 298  
Marshall, IL 62441

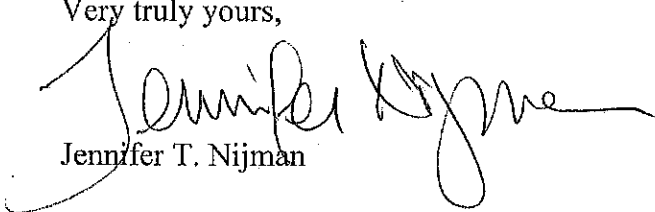
Clark County Board  
Attn: County Clerk  
County Courthouse  
501 Archer Avenue  
Marshall, IL 62441

Dear Madam or Sir:

Enclosed for your records is an Environmental Covenant relating to property located in the City of Marshall, Clark County, Illinois. The property was the former location of a Velsicol Chemical LLC plant that has been remediated as described in Section 5(B) of the Environmental Covenant. The remediation included filing and recording certain use restrictions concerning the property. This Environmental Covenant sets forth updated activity and use limitations. Pursuant to Section 17(C), you are being provided a copy of the Environmental Covenant in recorded form, for your information.

If any questions, please contact the undersigned.

Very truly yours,

  
Jennifer T. Nijman

JTN/lbb  
Enclosure

cc: A. Enrique Huerta (w/enclosure)



Image# 000275580015 Type: AGREE  
Recorded: 11/03/2011 at 01:04:30 PM  
Receipt#: 2011-00003632  
Total Amt: \$64.00 Page 1 of 15  
IL Rental Housing Fund: \$0.00  
Clark County, IL  
Wm. C. Downey Clerk/Recorder  
File# 2011-00002607

BK 99 PG 29-43 copy

This instrument was prepared by:

Name: Deborah Garber  
Associate Regional Counsel (C-14J)  
U.S. Environmental Protection Agency, Region 5

Address: Office of Regional Counsel  
77 West Jackson Boulevard  
Chicago, IL 60604

Please return this instrument to:

Name: Bernard Schorle  
Regional Project Manager (SR-6J)

Address: U.S. Environmental Protection Agency, Region 5  
77 West Jackson Boulevard  
Chicago, Illinois 60604

**ENVIRONMENTAL COVENANT**  
Replacing and Superseding 1989 Deed Restrictions and 2008  
Restatement and Clarification of Deed Restrictions

1. This Environmental Covenant is made this 28<sup>th</sup> day of September, 2011, by and among Velsicol Chemical LLC (Grantor) and the Holders/Grantees further identified in paragraph 3 below pursuant to the Uniform Environmental Covenants Act, 765 ILCS Ch. 122, as amended from time to time (UECA) for the purpose of subjecting the Property to the activity and use limitations described herein.

2. **Property and Grantor.**

A. Property: The real property subject to this Environmental Covenant, is located in the City of Marshall, Clark County, Illinois, and is comprised of the "Facility"

(defined as the former active area of the plant site, encompassing the chemical manufacturing processes and hazardous waste and wastewater storage and disposal areas, and excluding the plant office and parking lot areas) as legally described and depicted on the map in Appendix A, and the "Agricultural Soils" consisting of approximately 17.72 acres located west of and adjacent to the Facility, and legally described and depicted on the map in Appendix B; together, the Facility and the Agricultural Soils are hereinafter referred to as the "Property".

B. Grantor: Velsicol Chemical LLC hereinafter "Velsicol") is the current fee owner of the Property and is the "Grantor" of this Environmental Covenant. The mailing address of Velsicol is 10400 W. Higgins Rd, Suite 600, Rosemont, IL 60018-3713.

**3.  Holders (and Grantees for purposes of indexing).**

A. Illinois EPA is a Holder (and Grantee for purposes of indexing) of this Environmental Covenant pursuant to its authority under Section 3(b) of UECA. The mailing address of the Illinois EPA is 1021 N. Grand Avenue East, P.O. Box 19276, Springfield, IL 62794-9276.

B. Velsicol is a Holder (and Grantee for purposes of indexing) of this Environmental Covenant pursuant to UECA. Regardless of any future transfer of the Property, Velsicol shall remain a Holder of this Environmental Covenant. Velsicol is to be identified as both Grantee and Grantor for purposes of indexing.

4. **Agencies.** The U.S. Environmental Protection Agency (U.S. EPA) and Illinois EPA are "Agencies" within the meaning of Section 2(2) of UECA. The Agencies have approved the environmental response project described in paragraph 5 below and may enforce this Environmental Covenant pursuant to Section 11 of UECA.

**5. Environmental Response Project and Administrative Record.**

A. This Environmental Covenant arises under an environmental response project as defined in Section 2(5) of UECA.

B. The Property constitutes the Velsicol Chemical Corporation, Marshall, Illinois Superfund Site, which the U.S. EPA, pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), as amended, 42 U.S.C. § 9605, placed on the National Priorities List, set forth at 40 C.F.R. Part 300, Appendix B. In a Record of Decision (ROD) signed by the U.S. EPA Regional Administrator on September 30, 1988 and the Illinois EPA Director on September 26, 1988, the Agencies approved a plan for environmental remediation of the Property. The Facility was the former location of Velsicol Chemical Corporation's chemical manufacturing plant and associated waste management units (2, 4 and 5/6 ponds). This plant manufactured the pesticide chlordane and

other organochemicals. All production ceased in 1988. Velsicol dismantled and removed all equipment and structures from the Facility and undertook appropriate closure and post-closure activities. In a consent decree entered on September 14, 1989 in the U.S. District Court for the Southern District of Illinois captioned United States of America and People of the State of Illinois v. Velsicol Chemical Corporation, Civil action # 89-4128 (“Consent Decree”), Velsicol, the Settling Defendant, agreed to implement the remedial action plan in the ROD, including the following response actions: excavation of contaminated soils in specified areas of the former manufacturing facility to specified depths; excavation of contaminated sediments from the 2 and 4 ponds and backfilling with clean soil; excavation of contaminated sediments from an unnamed tributary to East Mill Creek that flows westerly through the Property; consolidation of the excavated soils and sediments from the above three actions on top of the 5/6 pond; treatment of the excavated material by in-place chemical stabilization and placement of a RCRA Subtitle C-compliant media cap over the regraded 5/6 pond; realignment of the unnamed tributary channel on Velsicol’s land and backfilling of the abandoned sections of the existing tributary channel; construction of a groundwater collection drain; treatment (in an on-site treatment system) of the extracted groundwater with discharge to the local POTW. The remedial action plan required implementation and compliance with land and groundwater activity and use limitations at the Property in order to prevent unacceptable exposures from hazardous substances remaining at the Property and to prevent interference with the remedial actions.

C. The response actions required by the ROD have been implemented, and Velsicol has been conducting operation and maintenance of the remedy since 1995. Such operation and maintenance includes capture and treatment of contaminated groundwater under the Property until specified cleanup standards are achieved pursuant to Paragraph 12.J of the Consent Decree. Velsicol further implemented the land and groundwater activity and use restrictions by filing and recording certain Deed Restrictions concerning the Property. The Deed Restrictions were recorded in 1989 as Exhibit I to the Consent Decree (Office of the Recorder of Clark County, Illinois at page 131-204 of Miscellaneous Book 48). The Deed Restrictions were restated and clarified in 2008 in the Restatement and Clarification of Deed Restrictions (Office of the Recorder, Clark County, Illinois, Book 95, pages 478-484).

D. This Environmental Covenant supersedes the Deed Restrictions and the Restatement and Clarification of Deed Restrictions referred to in Paragraph 5.C above. The Activity and Use Restrictions and associated terms and conditions set forth herein as applicable to the Property replace the Activity and Use Restrictions set forth in the 1989 Deed Restrictions and 2008 Restatement and Clarification of Deed Restrictions. Velsicol may execute and record a Release of the Deed Restrictions referred to in Paragraph 5.C above upon entry of this Environmental Covenant.

E. Grantor wishes to cooperate fully with the Agencies in the implementation, operation, and maintenance of all response actions at the Property.

F. The Administrative Record for the environmental response project at the Property is maintained at the U.S. EPA Superfund Record Center, 7<sup>th</sup> Floor, 77 West Jackson Blvd, Chicago, Illinois 60604. Persons may also contact Tom Reuter, IEPA, Bureau of Land, #24, 1021 N. Grand Avenue East, P.O. Box 19276, Springfield, IL 62794-9276 for the Administrative Record or other information concerning the Property.

6. **Grant of Covenant. Covenant Runs With The Land.** Grantor creates this Environmental Covenant pursuant to UECA so that the Activity and Use Limitations and associated terms and conditions set forth herein shall “run with the land” in accordance with Section 5(a) of UECA and shall be binding on Grantor, its heirs, successors and assigns; and on all present and subsequent owners, occupants, lessees or other person acquiring an interest in the Property.

7. **Activity and Use Limitations.** The following Activity and Use Limitations apply to the use of the Property.

A. Land Use Restrictions:

1. There shall be no use for any purpose of the portion of the Property comprising the 5/6 pond area and its RCRA cap, comprising 23.20 acres, as shown and legally described in Appendix C.

2. The portion of the Property comprising the Facility (excluding the 5/6 pond area which is subject to the prohibition in Subparagraph A above), as shown and legally described in Appendix A, may be used for commercial and/or industrial purposes only, subject to the following conditions:

a. No building or structure may be constructed with a basement or below ground facilities.

b. No excavation shall be conducted below the clean fill layer without prior approval of U.S. EPA.

c. No use for food preparation and/or restaurant/banquet facilities unless U.S. EPA and IEPA determine that such use presents no unacceptable risk to human health.

d. No use for public and private preschools, elementary and secondary schools and day care centers unless U.S. EPA and IEPA determine that such use presents no unacceptable risk to human health.

3. There shall be no use of the Agricultural Soils, as shown and legally described on Appendix B, except for cultivation of corn, soybeans or wheat. This restriction shall remain in full force and effect until residual chlordane levels in the Agricultural Soils have attained background levels of chlordane in similar soils used for agricultural purposes.

B. Restrictions on Groundwater Use: Except as required as part of a U.S. EPA or Illinois EPA approved response activity, there shall be no installation of wells or consumptive or other use of the groundwater underlying the Property. This restriction shall remain in full force and effect until U.S. EPA determines, in writing, that the Cleanup Standard set forth in Paragraph 12.J of the Consent Decree has been achieved and no further groundwater remediation is required.

C. No Interference with Remedial Action: There shall be no use of or activity at the Property that would interfere with or adversely affect the integrity or protectiveness of the remedial action or the operation and maintenance of any remedial action component, including

but not limited to the 5/6 pond cover, groundwater treatment plant or monitoring wells, unless prior written approval is obtained from U.S. EPA.

8. **Right of Access.** Grantor consents to officers, employees, contractors, and authorized representatives of the Holders, Illinois EPA and U.S. EPA entering and having continued access at reasonable times to the Property for the following purposes:

- A. Overseeing the environmental response project described in paragraph 5 above;
- B. Monitoring and conducting periodic reviews of the environmental response project described in paragraph 5 above including without limitation, sampling of air, water, groundwater, sediments and soils;
- C. Conducting such response, operation and maintenance activities as may be required or authorized under the Consent Decree;
- D. Verifying any data or information submitted to U.S. EPA or Illinois EPA by Grantor and Holders; and
- E. Verifying that no action is being taken on the Property in violation of the terms of this instrument, the environmental response project described in paragraph 5 above or of any applicable federal or state environmental laws or regulations;

Nothing in this document shall limit or otherwise affect U.S. EPA and Illinois EPA's rights of entry and access or U.S. EPA's and Illinois EPA's authority to take response actions under CERCLA, the National Contingency Plan ("NCP"), RCRA or other federal and state law.

9. **Reserved rights of Grantor:** Grantor hereby reserves unto itself, its successors, and assigns, including heirs, lessees and occupants, all rights and privileges in and to the use of the Property which are not incompatible with the activity and use limitations identified herein.

10. **No Public Access and Use:** No right of access or use by the general public to any portion of the Property is conveyed by this instrument.

11. **Future Conveyances, Notice and Reservation:**

A. Grantor agrees to include in any future instrument conveying any interest in any portion of the Property, including but not limited to deeds, leases and mortgages, a notice and reservation which is in substantially the following form:

**THE INTEREST CONVEYED HEREBY IS SUBJECT TO AND GRANTOR SPECIFICALLY RESERVES THE ENVIRONMENTAL COVENANT EXECUTED UNDER THE UNIFORM ENVIRONMENTAL COVENANTS ACT (UECA) AT 765 ILCS CH. 122 RECORDED IN THE OFFICIAL PROPERTY RECORDS OF Clark COUNTY, ILLINOIS ON**

**AS DOCUMENT NO. \_\_\_\_\_, IN FAVOR OF  
AND ENFORCEABLE BY GRANTOR AS A UECA HOLDER, THE  
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY AS A UECA  
AGENCY AND HOLDER AND THE U.S. ENVIRONMENTAL  
PROTECTION AGENCY AS A UECA AGENCY.**

B. Grantor agrees to provide written notice to Illinois EPA and U.S. EPA as set forth at Paragraph 6.A of the Consent Decree. Such Notice to the Agencies shall be sent as specified in Paragraph 16, below.

**12. Enforcement and Compliance.**

A. **Civil Action for Injunction or Equitable Relief.** Violations of this Environmental Covenant may be enforced pursuant to Section 11 of the UECA (765 ICLS 122/11) through a civil action for injunctive or other equitable relief, including violation of the Activity and Use Limitations under Paragraph 7 and denial of Right of Access under Paragraph 8.

B. **Other Authorities Not Affected. No Waiver of Enforcement.** All remedies available hereunder shall be in addition to any and all other remedies at law or in equity, including CERCLA. Nothing in this Environmental Covenant affects U.S. EPA or Illinois EPA's authority to take or require performance of response actions to address releases or threatened releases of hazardous substances or pollutants or contaminants at or from the Property, or to enforce a consent order, consent decree or other settlement agreement entered into by U.S. EPA or Illinois EPA. Enforcement of the terms of this instrument shall be at the discretion of the Holders, the U.S. EPA and Illinois EPA and any forbearance, delay or omission to exercise its rights under this instrument in the event of a breach of any term of this instrument shall not be deemed to be a waiver by the Holders, U.S. EPA or Illinois EPA of such term or of any subsequent breach of the same or any other term, or of any of the rights of the Holders, U.S. EPA or Illinois EPA of such term or of any subsequent breach of the same or any other term, or of any of the rights of the Holders, U.S. EPA or Illinois EPA.

C. **Former Owners And Interest Holders Subject to Enforcement.** An owner of the fee simple, or other person that holds any right, title or interest in or to the Property, remains subject to enforcement with respect to any violation of this Environmental Covenant by the owner in fee simple or other person which occurred during the time when the owner in fee simple or other person was bound by this Environmental Covenant regardless of whether the owner in fee simple or other person has subsequently conveyed the fee title, or other right, title or interest, to another person.

**13. Waiver of Certain Defenses:** This Environmental Covenant may not be extinguished, limited, or impaired through issuance of a tax deed, foreclosure of a tax lien, or application of the doctrine of adverse possession, prescription, abandonment, waiver, lack of enforcement, or acquiescence, or similar doctrine as set forth in Section 9 of UECA.

**14. Representations and Warranties:** Grantor hereby represents and warrants to the Illinois EPA, U.S. EPA and any other signatories to this Environmental Covenant that, at the

time of execution of this Environmental Covenant, that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good and lawful right and power to sell and convey it or any interest therein, that the Property is free and clear of encumbrances

**15. Amendment or Termination.** This Environmental Covenant may be amended or terminated pursuant to Sections 9 and/or 10 of the UECA (765 ICLS 122/9), If Grantor no longer owns the Property at the time of a proposed amendment or termination by consent, and if Grantor no longer exists or cannot be located with the exercise of due diligence, or if Grantor fails within 60 business days to respond to receipt of a written request for its consent to an amendment or termination of this Environmental Covenant (which request for consent shall include a statement that Grantor waives its right to consent for failure to respond within such time), Grantor shall be deemed to have waived the right to consent to an amendment or termination of the Environmental Covenant.

**16. Notices:** Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing and shall either be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Grantor:

Velsicol Chemical LLC  
c/o A. Enrique Huerta  
Senior Environmental Project Manager  
Memphis Environmental Center, Inc.  
1199 Warford Street  
Memphis, TN 38108

To Agencies:

U.S. Environmental Protection Agency  
Superfund Division Director  
77 West Jackson Boulevard  
Chicago, IL 60604

Illinois Environmental Protection Agency  
Chief, Bureau of Land  
1021 N. Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276

**17. Recording and Notice of Environmental Covenant, Amendments and Termination.**

A. The Original Environmental Covenant. An Environmental Covenant must be recorded in the Office of the Recorder or Registrar of Titles of the county in which the property that is the subject of the Environmental Covenant is located pursuant to Section 8 of the UECA (765 ICLS 122/8). Within sixty (60) days after the Illinois EPA and U.S. EPA (whichever is

later) sign and deliver to Grantor this Environmental Covenant, the Grantor shall record this Environmental Covenant in the office of the County Recorder or Registrar of Titles for the County in which the Property is located.

B. Termination, Amendment or Modification. Within sixty (60) days after Illinois EPA and U.S. EPA (whichever is later) sign and deliver to the owner of the fee simple any termination, amendment or modification of this Environmental Covenant, the owner of the fee simple shall record the amendment, modification, or notice of termination of this Environmental Covenant in the office of the County Recorder or Registrar of Titles in the county in which the Property is located.

C. Providing Notice of Covenant, Termination, Amendment or Modification. Within 30 days after recording this Environmental Covenant, the Grantor shall transmit a copy of the Environmental Covenant in recorded form to:

- i. the Illinois EPA;
- ii. the U.S. EPA;
- iii. each person holding a recorded interest in the Property;
- iv. each person in possession of the Property; and
- v. each political subdivision in which the Property is located.

Within 30 days after recording a termination, amendment or modification of this Environmental Covenant, the owner of the fee simple shall transmit a copy of the document in recorded form to the persons listed in items i to v above.

18. Compliance Reporting. The Grantor is required pursuant to Addendum #4 to the Operation and Maintenance Plan, which is Appendix 7 to the Consent Decree, to monitor the effectiveness of, and submit to U.S. EPA and Illinois EPA on an annual basis, a written report that includes confirming compliance with the Activity and Use Limitations provided in Paragraph 7. Such annual reports are required by the Operation and Maintenance Plan to be submitted on or before each May 12<sup>th</sup>, pursuant to Paragraphs 27 and 79 of the Consent Decree. Grantor, pursuant to Addendum #4 to the Operation and Maintenance Plan, is required to notify the U.S. EPA and Illinois EPA as soon as possible of any actions or conditions that would constitute a breach of the Activity and Use Limitations in Paragraph 7.

19. **General Provisions:**

A. Controlling law: This Environmental Covenant shall be construed according to and governed by the laws of the State of Illinois and the United States of America.

B. Liberal construction: Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the grant to effect the purpose of this instrument and the policy and purpose of the environmental response project and its authorizing legislation. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

**C. No Forfeiture:** Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.

**D. Joint Obligation:** If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

**E. Captions:** The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.

**20. Effective Date.** This Environmental Covenant is effective on the date of acknowledgement of the signature of the Illinois EPA and U.S. EPA, whichever is later.

**21. List of Appendices:**

**Appendix A – Legal Description and map of the Facility**

**Appendix B – Legal Description and map of the Agricultural Soils**

**Appendix C – Legal Description and map of the 5/6 Pond area of the Facility**

[Signature Pages to follow]

THE UNDERSIGNED REPRESENTATIVE OF THE GRANTOR REPRESENTS AND CERTIFIES THAT HE/SHE IS AUTHORIZED TO EXECUTE THIS ENVIRONMENTAL COVENANT.

IN WITNESS WHEREOF, THIS INSTRUMENT HAS BEEN EXECUTED ON THE DATES INDICATED BELOW:

FOR THE GRANTOR:

Velsicol Chemical LLC

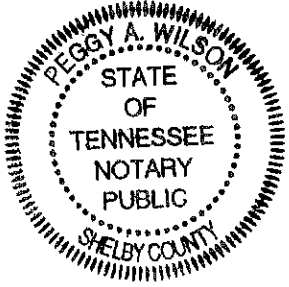
By *[Signature]* (signature)  
George Harvell, Vice President

Tennessee )  
State of Illinois )  
County of *Shelby* ) SS.

On *August 15*, 20*11*, this instrument was acknowledged before me by, George Harvell, Vice President, Memphis Environmental Center, Velsicol Chemical, LLC, on behalf of Velsicol Chemical LLC].

*Peggy A. Wilson* (signature)  
Notary Public  
My Commission Expires *May 11, 2015*

**My Commission Expires:  
May 11, 2015**



FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

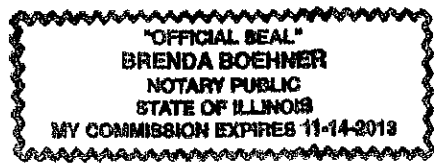
By *Lera Bonnett* (signature)

\_\_\_\_\_ (printed name), Interim Director  
Illinois Environmental Protection Agency

State of Illinois        )  
                                  ) SS.  
County of                )

This instrument was acknowledged before me on 9-21, 2011, by Brenda Boehner a delegate of the Interim Director of the Illinois Environmental Protection Agency, a state agency, on behalf of the State of Illinois.

Brenda Boehner (signature)  
Notary Public  
My Commission Expires 11-14-13



**FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

On behalf of the Administrator of the  
United States Environmental Protection Agency

By: Richard C Karl  
Richard C. Karl, Director  
Superfund Division  
U.S. Environmental Protection Agency, Region 5

STATE OF ILLINOIS            )  
  ) SS.  
COUNTY OF COOK            )

The foregoing instrument was acknowledged before me this 28<sup>th</sup> day of SEPTEMBER, 2011, by Richard C. Karl, Director, Superfund Division, Region 5 of the United States Environmental Protection Agency.

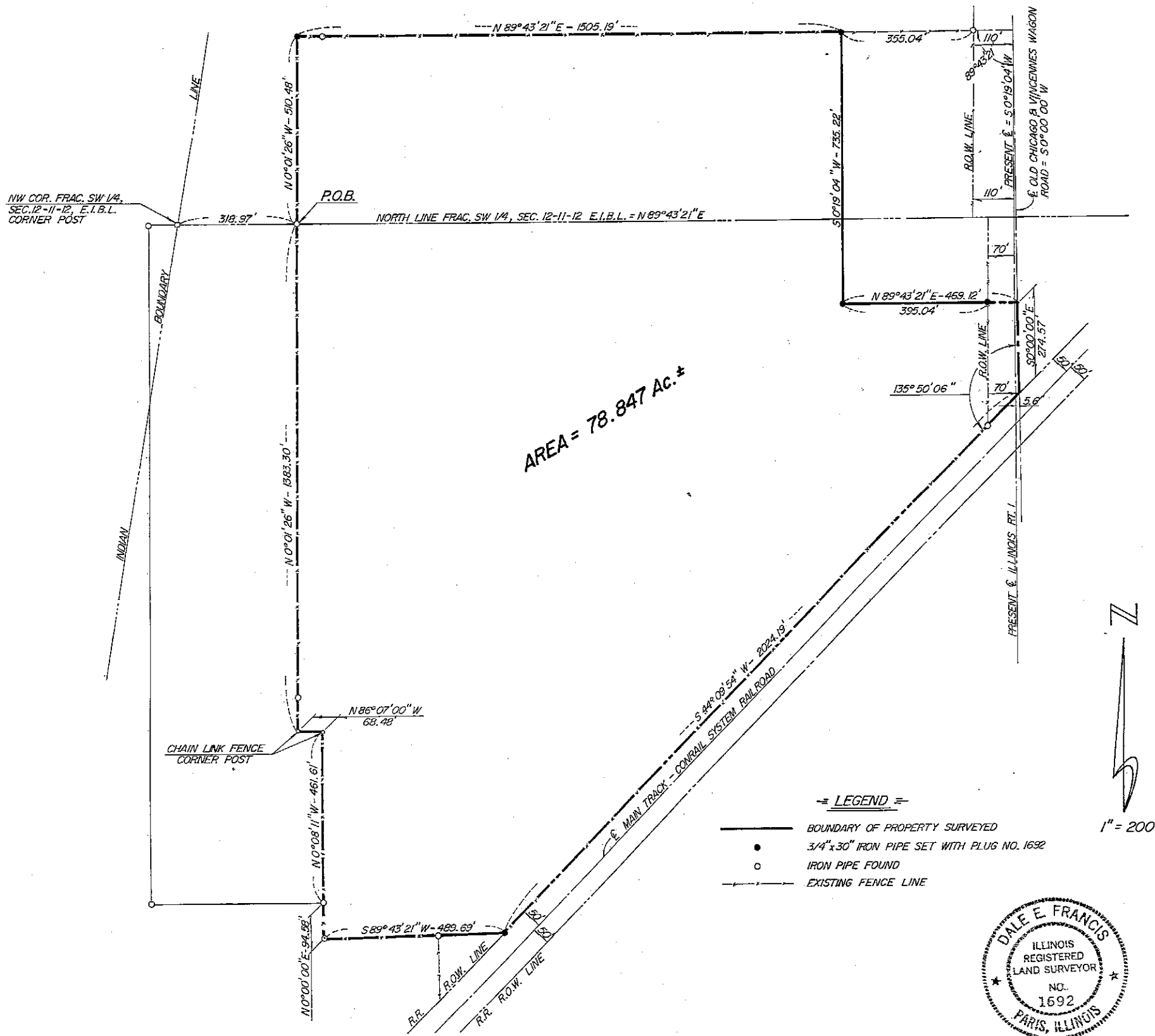
John V Fagiolo (signature)  
Notary Public  
My Commission Expires 3/13/14



PLAT OF SURVEY  
DESCRIPTION OF PROPERTY SURVEYED

A part of the fractional W-1/2 of Section 12, Township 11 North, Range 12 West, of the 2nd P.M., that lies East of the Indian Boundary Line, more particularly described as follows:

Commencing at a corner post marking the Northwest corner of the fractional SW-1/4 of said Section 12 (said point being on the Indian Boundary Line); thence on an assumed bearing of North 89 degrees 43 minutes 21 seconds East along the North line of said fractional SW-1/4, 318.97 feet to an iron pipe marking the True Point of Beginning; thence North 0 degrees 01 minutes 26 seconds West, 510.48 feet; thence North 89 degrees 43 minutes 21 seconds East, 1505.19 feet; thence South 0 degrees 19 minutes 04 seconds West, 735.22 feet; thence North 89 degrees 43 minutes 21 seconds East, 469.12 feet to a point in a line established to be the centerline of the old Chicago and Vincennes Wagon Road; thence South 0 degrees 00 minutes 00 seconds East along said centerline 274.57 feet to a point marking the intersection of said centerline and the Northwesterly right of way line of the Conrail System (formerly the Pennsylvania Railroad); thence South 44 degrees 09 minutes 54 seconds West along said right of way line 2024.19 feet; thence South 89 degrees 43 minutes 21 seconds West, 489.69 feet; thence North 0 degrees 00 minutes 00 seconds East, 94.58 feet; thence North 0 degrees 08 minutes 11 seconds West, 461.61 feet to a chain link fence corner; thence North 86 degrees 07 minutes 00 seconds West, 68.48 feet to another chain link fence corner; thence North 0 degrees 01 minutes 26 seconds West, 1383.30 feet to the point of beginning, being all situated in Marshall Township, Clark County, Illinois, and containing 78.847 Acres more or less.



THIS AREA IS NOT LOCATED IN ANY SPECIAL FLOOD HAZARD AREA AS IDENTIFIED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

THE ABOVE DESCRIBED PROPERTY IS WITHIN ONE AND ONE HALF MILES OF THE CITY OF MARSHALL, CLARK COUNTY, ILLINOIS.

APPENDIX "A" - DESCRIPTION OF FACILITY

VELSICOL CHEMICAL CORPORATION  
SURVEYED & PLATTED FOR THE EXCLUSIVE USE OF

I, DALE E. FRANCIS, ILLINOIS REGISTERED LAND SURVEYOR, NO. 1692 DO HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE PLAT SHOWN HEREON IS A TRUE AND CORRECT REPRESENTATION OF A SURVEY MADE UNDER MY DIRECTION.

DIMENSIONS ARE GIVEN IN FEET AND DECIMALS OF A FOOT AND ALL MONUMENTS ARE SET AS SHOWN.

DATED THIS 28<sup>th</sup> DAY OF March, 1989 A.D.

*Dale E. Francis*  
DALE E. FRANCIS,  
ILLINOIS REGISTERED LAND SURVEYOR NO. 1692

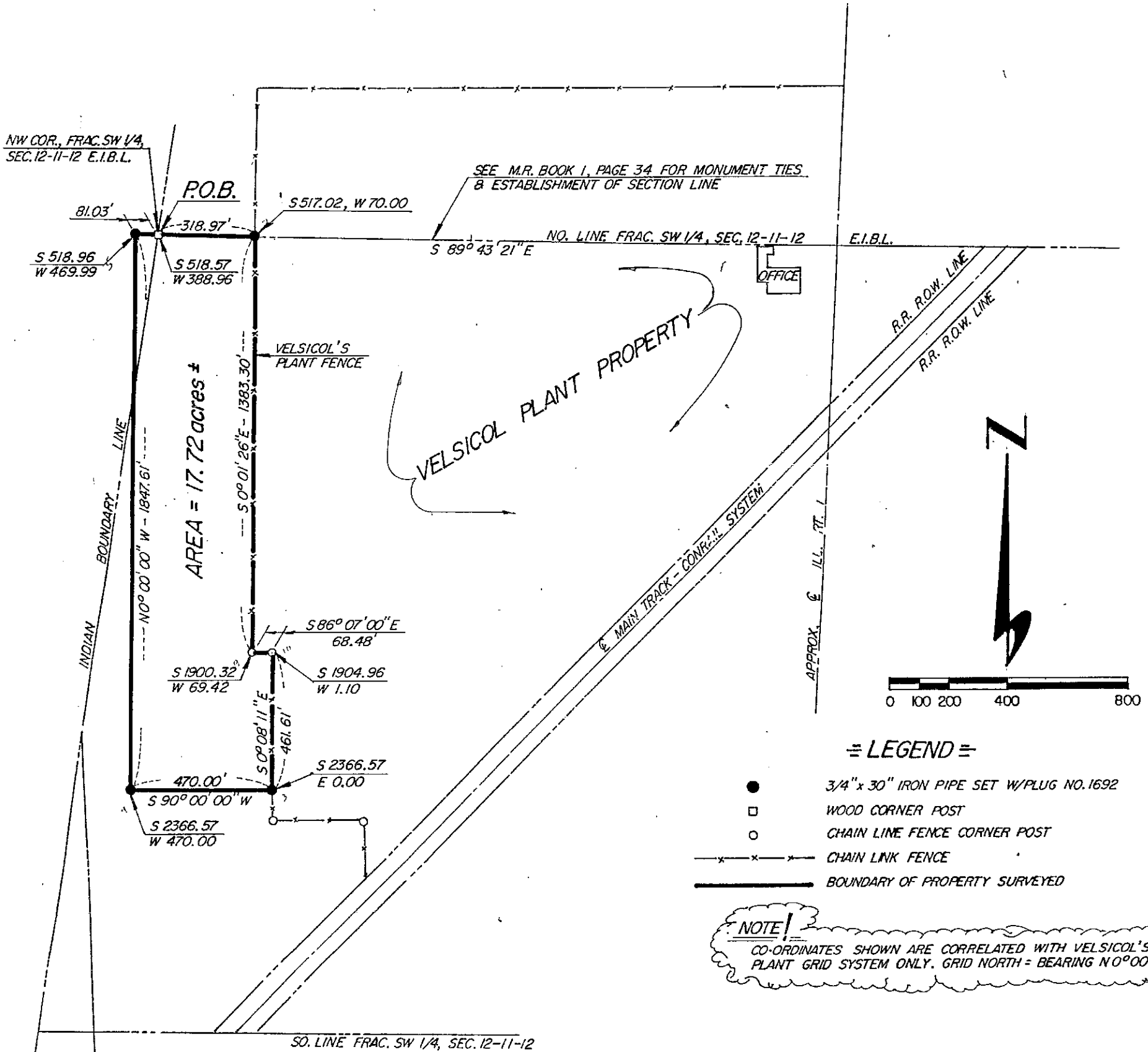


# PLAT OF SURVEY

## DESCRIPTION OF PROPERTY SURVEYED

A part of the Fractional S.W. 1/4 of Section 12, lying East of the Indian Boundary Line, and a part of the Fractional East 1/2 of Section 14, lying West of the Indian Boundary Line, all in Township 11 North, and Range 12 West of the 2nd P.M., described as follows:

**BEGINNING** at a corner post marking the N.W. Corner of said Fractional S.W. 1/4; thence on an assumed bearing of south 89 degrees, 43 minutes, 21 seconds east, along the North line of said Fractional S.W. 1/4, 318.97 feet to an iron pipe; thence south 0 degrees, 01 minutes, 26 seconds east, 1383.30 feet along the existing Velsicol Chemical Corporation's plant fence to a fence corner post; thence south 86 degrees, 07 minutes, 00 seconds east along said fence, 68.48 feet to a fence corner post; thence south 0 degrees, 08 minutes, 11 seconds east, along said fence 461.61 feet to an iron pipe; thence south 90 degrees, 00 minutes, 00 seconds west, 470.00 feet to an iron pipe; thence north 0 degrees, 00 minutes, 00 seconds west, 1,847.61 feet to an iron pipe; thence south 89 degrees, 43 minutes, 21 seconds east, 81.03 feet to the Place of Beginning, being all situated in Marshall Township, Clark County, Illinois, and containing 17.72 Acres, more or less.



THIS AREA IS NOT LOCATED IN ANY SPECIAL FLOOD HAZARD AREA AS IDENTIFIED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

THE ABOVE DESCRIBED PROPERTY IS WITHIN ONE AND ONE HALF MILES OF THE CITY OF MARSHALL, CLARK COUNTY ILLINOIS.

SURVEYED & PLATTED FOR THE EXCLUSIVE USE OF VELVICOL CHEMICAL CORP.

**APPENDIX "B"**

**SURVEYOR'S CERTIFICATE**

I, Dale E. Francis, Illinois Registered Land Surveyor, No. 1692 do hereby certify that to the best of my knowledge and belief, the Plat shown hereon is a true and correct representation of a survey made under my direction.

Dimensions are given in feet & decimals of a foot and all monuments are set as shown.

Dated this 1st day of FEBRUARY, 1989, A. D.

*Dale E. Francis*  
Dale E. Francis,  
Illinois Registered Land Surveyor No. 1692

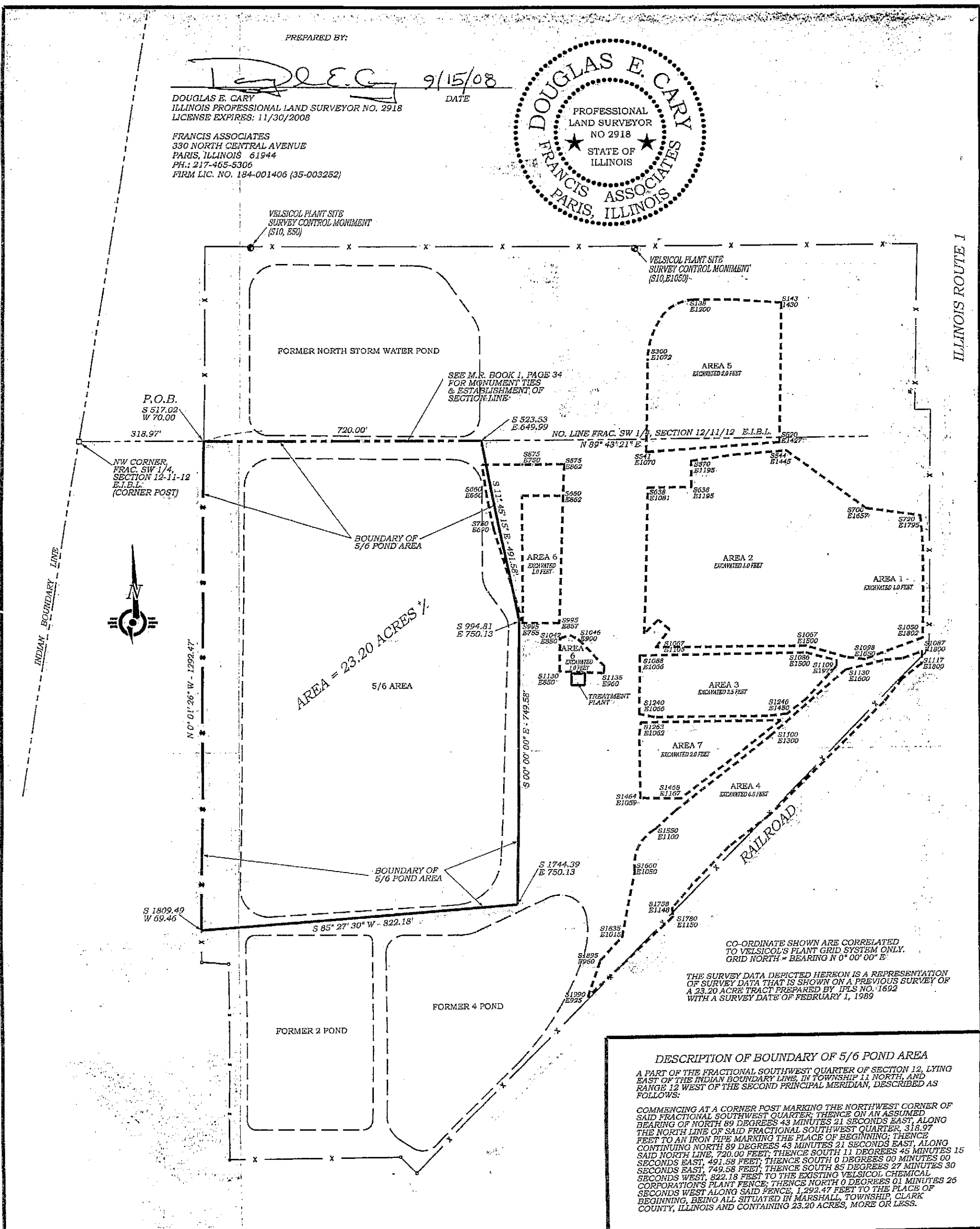
Job File No. V-73

PREPARED BY:

DOUGLAS E. CARY  
ILLINOIS PROFESSIONAL LAND SURVEYOR NO. 2918  
LICENSE EXPIRES: 11/30/2008

9/15/08  
DATE

FRANCIS ASSOCIATES  
330 NORTH CENTRAL AVENUE  
PARIS, ILLINOIS 61944  
PH.: 217-465-5306  
FIRM LIC. NO. 184-001406 (35-003252)



AREA = 23.20 ACRES +/-  
5/6 AREA

CO-ORDINATE SHOWN ARE CORRELATED TO VELSICOL'S PLANT GRID SYSTEM ONLY. GRID NORTH = BEARING N 0° 00' 00" E.

THE SURVEY DATA DEPICTED HEREON IS A REPRESENTATION OF SURVEY DATA THAT IS SHOWN ON A PREVIOUS SURVEY OF A 23.20 ACRE TRACT PREPARED BY IPLS NO. 1692 WITH A SURVEY DATE OF FEBRUARY 1, 1989

**DESCRIPTION OF BOUNDARY OF 5/6 POND AREA**  
A PART OF THE FRACTIONAL SOUTHWEST QUARTER OF SECTION 12, LYING EAST OF THE INDIAN BOUNDARY LINE, IN TOWNSHIP 11 NORTH, AND RANGE 12 WEST OF THE SECOND PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS:  
COMMENCING AT A CORNER POST MARKING THE NORTHWEST CORNER OF SAID FRACTIONAL SOUTHWEST QUARTER; THENCE ON AN ASSUMED BEARING OF NORTH 89 DEGREES 43 MINUTES 21 SECONDS EAST, ALONG THE NORTH LINE OF SAID FRACTIONAL SOUTHWEST QUARTER, 318.97 FEET TO AN IRON PIPE MARKING THE PLACE OF BEGINNING; THENCE CONTINUING NORTH 89 DEGREES 43 MINUTES 21 SECONDS EAST, ALONG SAID NORTH LINE, 720.00 FEET; THENCE SOUTH 11 DEGREES 45 MINUTES 15 SECONDS EAST, 491.58 FEET; THENCE SOUTH 0 DEGREES 00 MINUTES 00 SECONDS EAST, 749.58 FEET; THENCE SOUTH 85 DEGREES 27 MINUTES 30 SECONDS WEST, 822.18 FEET TO THE EXISTING VELSICOL CHEMICAL CORPORATION'S PLANT FENCE; THENCE NORTH 0 DEGREES 01 MINUTES 26 SECONDS WEST ALONG SAID FENCE, 1,292.47 FEET TO THE PLACE OF BEGINNING, BEING ALL SITUATED IN MARSHALL, TOWNSHIP, CLARK COUNTY, ILLINOIS AND CONTAINING 23.20 ACRES, MORE OR LESS.

FRANCIS ASSOCIATES  
CONSULTING ENGINEERS  
LAND SURVEYORS  
330 NORTH CENTRAL AVENUE  
PARIS, ILLINOIS 61944  
PH. (217) 465-5306

SCALE  
PLAN: 1" = 250'  
DRAWN BY: D. CARY  
DATE: 09.15.08  
REVISED DATE:

FRANCIS ASSOC. FILE NO.  
V-79

VELSICOL CHEMICAL CORPORATION  
MARSHALL, ILLINOIS SITE



Image# 000275590003 Type: AFFIDAV  
Recorded: 11/03/2011 at 01:13:25 PM  
Receipt#: 2011-00003632  
Total Amt: \$31.00 Page 1 of 3  
IL Rental Housing Fund: \$0.00  
Clark County, IL  
Wm. C. Downey Clerk/Recorder  
File# 2011-00002608

BK **99** PG **44-46** COPY

**This instrument was prepared by:**

Name: Jennifer T. Nijman  
Nijman Franzetti LLP

Address: 10 S. LaSalle Street, Suite 3600  
Chicago, IL 60603

**Please return this instrument to:**

Name: A. Enrique Huerta  
Senior Environmental Project Manager

Address: Memphis Environmental Center, Inc  
1199 Warford Street  
Memphis, TN 38108

**RELEASE OF DEED RESTRICTIONS**

Releasing 1989 Deed Restrictions and 2008 Restatement and Clarification of  
Deed Restrictions as Superseded by 9/28/2011 Environmental Covenant

1. This Release of Deed Restrictions is made this 12 day of October, 2011,  
for the purpose of releasing the 1989 Deed Restrictions and 2008 Restatement and Clarification  
of Deed Restrictions, as described herein, due to the fact that the 1989 Deed Restrictions and  
2008 Restatement and Clarification of Deed Restrictions were replaced and superseded by the  
Environmental Covenant dated September 28, 2011.

2. **Background.**

A. **Property:** The real property subject to this Release of Deed Restrictions  
is owned by Velsicol Chemical LLC (Velsicol) and is located in the City of Marshall,

Clark County, Illinois (Property). The Property constitutes the Velsicol Chemical Corporation, Marshall, Illinois Superfund Site, which the United States Environmental Protection Agency (U.S. EPA), pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), as amended, 42 U.S.C. § 9605, placed on the National Priorities List, set forth at 40 C.F.R. Part 300, appendix B. In a Record of Decision (ROD) signed by the U.S. EPA Regional Administrator on September 30, 1988 and the Illinois EPA Director on September 26, 1988, the Agencies approved a plan for environmental remediation of the Property. In a consent decree entered on September 14, 1989 in the U.S. District Court for the Southern District of Illinois captioned United States of America and People of the State of Illinois v. Velsicol Chemical Corporation, Civil action # 89-4128 ("Consent Decree"), Velsicol, the Settling Defendant, agreed to implement the remedial action plan in the ROD. The remedial action plan required, among other remedies, implementation and compliance with land and groundwater activity and use limitations at certain areas of the Property in order to prevent unacceptable exposures from hazardous substances remaining at areas of the Property and to prevent interference with the remedial actions.

B. The response actions required by the ROD have been implemented and Velsicol has been conducting operation and maintenance of the remedy since 1995. Velsicol further implemented the land and groundwater activity and use restrictions by filing and recording certain Deed Restrictions concerning areas of the Property. The Deed Restrictions were recorded in 1989 as Exhibit I to the Consent Decree (Office of the Recorder of Clark County, Illinois at page 131-204 of Miscellaneous Book 48). The Deed Restrictions were restated and clarified in 2008 in the Restatement and Clarification of Deed Restrictions (Office of the Recorder, Clark County, Illinois, Book 95, pages 478-484).

### 3. Release.

A. On September 28, 2011, Velsicol, the U.S. EPA and the Illinois EPA entered into an Environmental Covenant that supersedes and replaces the Deed Restrictions and the Restatement and Clarification of Deed Restrictions referred to in Paragraph 2.B above. The Activity and Use Restrictions and other terms and conditions set forth in the Environmental Covenant replace and supersede the terms of the 1989 Deed Restrictions and 2008 Restatement and Clarification of Deed Restrictions in their entirety, such that the 1989 Deed Restrictions and 2008 Restatement and Clarification of Deed Restrictions have no effect and are no longer valid.

B. The Environmental Covenant specifically provided that "Velsicol may execute and record a Release of the Deed Restrictions" upon entry of the Environmental Covenant.

C. The Environmental Covenant was signed on September 28, 2011, and properly recorded on 3<sup>rd</sup> day of November, 2011 at the Office of the Recorder, Clark County, Illinois, Book 99, pages 29-43 of Misc. Record

D. By this Release of Deed Restrictions, the Environmental Covenant contains the only applicable activity and use restrictions and associated terms and conditions relating to the Property, effective as of the date the Environmental Covenant was recorded.



## DECLARATION FOR THE RECORD OF DECISION

### Site Name and Location

Velsicol Chemical Corporation  
Marshall, Illinois

### Statement of Basis and Purpose

This decision document presents the selected remedial action for the Velsicol Chemical Corporation site, in Marshall, Illinois, developed in accordance with CERCLA, as amended by SARA, and the National Contingency Plan. This decision is based on the administrative record for this site. The attached index identifies the items that comprise the administrative record upon which the selection of the remedial action is based.

The State of Illinois has concurred in the selected remedy.

### Description of Selected Remedy

The final remedy at the Velsicol Chemical Corporation's Marshall, Illinois facility consists of the following:

- Excavate 24 inches of contaminated sediments in the unnamed tributary between the plant site and Velsicol's western property boundary. Additional segments in the unnamed tributary will be excavated as determined on the basis of additional sampling until background concentrations of chlordane are reached. The on-site section of the unnamed tributary will be backfilled with clay and revegetated. A new diversion channel will be constructed.
- Excavate contaminated plant production area soils to predetermined depths, backfill with clean soil, regrade the plant area to provide effective surface water drainage and establish a vegetated cover over the entire site.
- Excavate six inches of contaminated sediment from the base and sides of the 2 Pond and 4 Pond, backfill each impoundment with clean soil, grade the area to provide surface water drainage and establish a vegetated cover. Decontaminated debris from decommissioning of the facility will be placed and compacted in the bottom of these ponds.
- Consolidate all excavated material from the plant site, the unnamed tributary and the 2 Pond and 4 Pond on top of the 5/6 Pond, treat the excavated material by in-place chemical stabilization, and provide a Resource and Conservation Recovery Act (RCRA) compliant multimedia cap over the regraded 5/6 Pond.
- Construct a groundwater collection drain east of the 5/6 Pond. Dispose of extracted groundwater via the on-site deep injection well, in accordance with the terms of the Consent Decree or treat the extracted groundwater to established clean-up objectives using primarily granular activated carbon prior to off-site discharge.

- Monitor groundwater and surface cover conditions. Operate and maintain all remedial systems.
- Apply and enforce land use and deed restrictions in accordance with the terms of the Consent Decree.

Declaration

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate for this remedial action, and is cost-effective. This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

for Frank M. Covington  
Regional Administrator

9/30/88  
Date

The Illinois Environmental Protection Agency finds the selected remedy to be appropriate as declared above under the requirements of CERCLA, as amended by SARA, and the NCP. The State of Illinois, through the Illinois Environmental Protection Agency, concurs with the decision the Regional Administrator has made in the exercise of his authority in selecting this remedy.

Bernard P. Killian  
State Director

9/26/88  
Date

RECEIVED

OCT 5 1988

IEPA-DLPC

VELSICOL CHEMICAL CORPORATION  
MARSHALL, ILLINOIS SITE

ROD DECISION SUMMARY

SEPTEMBER 21, 1988

VELSICOL CHEMICAL CORPORATION  
MARSHALL, ILLINOIS SITE

ROD DECISION SUMMARY INDEX

- I. Site Name, Location and Description
- II. Site History and Enforcement Activities
- III. Community Relations
- IV. Scope and Role of Operable Unit or Response Action
- V. Site Characteristics
- VI. Summary of Site Risks
- VII. Documentation of Significant Changes
- VIII. Description of Alternatives
- IX. Summary of Comparative Analysis of Alternatives
- X. Selected Remedy
- XI. Statutory Determinations

Appendix A - Figures and Tables for Decision Summary Discussion  
Appendix B - Responsiveness Summary  
Appendix C - Site Administrative Record

Velsicol Chemical Corporation  
Marshall, Illinois Site  
ROD Decision Summary

I. SITE NAME, LOCATION, AND DESCRIPTION

Site Description

This Velsicol Chemical Corporation manufacturing facility is located in east-central Illinois, approximately one mile north of the City of Marshall, Clark County, Illinois, along State Highway Route 1. Interstate Highway 70 is approximately 0.6 miles north of the plant. The regional location and vicinity maps of the Velsicol site are shown in Figures 1 and 2 in Appendix A.

Velsicol's property occupies an area of approximately 420 acres, of which 86 acres are utilized for the production facility and on-site ponds. The site map is shown in Figure 3. The production facility occupies 50 acres of the easterly portion of the plant area. Immediately west of the production facility, 14 acres are devoted to stormwater management ponds (Pond 2, Pond 4 and North Stormwater Pond). Since 1965 all process wastewater, and since 1974, additionally all surface water from the facility, has been deep well injected on-site. The 5/6 Pond occupies an area of approximately 22 acres and contains the majority of waste solids/sludges generated over the plant's lifetime until 1980. These wastes were chemically stabilized, temporarily covered with clay and revegetated by Velsicol in the early 1980's. The major portion of the remaining 334 acres, owned by Velsicol, is leased for crop farming.

A Conrail railroad right-of-way parallels the southern boundary of the site. A spur of the Conrail track enters the facility from the south and is used for delivery of raw materials to the plant. An unnamed tributary to East Mill Creek flows westerly through the southwestern corner of the site. The tributary travels approximately 2.5 miles prior to its confluence with East Mill Creek.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Velsicol Chemical Corporation Site in Marshall, Illinois, was an active chlordane manufacturing facility until August, 1987 when USEPA and Velsicol reached an agreement cancelling the registration of products containing chlordane and heptachlor. The plant had been operating since the mid-1930's for the production of petroleum derivatives from petroleum by-products. Finished products included a variety of resins (styrene/vinyl toluene copolymer and methylcyclopentadiene/dicyclopentadiene monomers), solvents and rubber extenders. Production of chlordane began in the mid-1940's. The manufacturing operations at the facility remained essentially unchanged until 1979, at which time Velsicol withdrew from the resin market. Manufacture of technical grade chlordane had been the sole product at this facility since 1980.

Hazardous wastes generated from various manufacturing activities at the plant were stored in on-site impoundments in the past. Accidental and intentional releases of these wastes to East Mill Creek tributaries have occurred from time to time during the period the ponds were in operation. All the ponds that were previously used for the waste storage (Hex Ponds and 5/6 Pond) are no longer in use. The contents of the Hex Ponds, some contaminated plant area soils and visually contaminated sediments from Ponds 2 and 4 were transferred to the 5/6 Pond and stabilized with cement and fly ash. This stabilization program was started in 1983 and completed in 1984. A temporary, vegetated clay cover has been in place over the 5/6 Pond since 1985.

The Velsicol/Marshall site was proposed for inclusion on the National Priorities List (NPL) in December, 1982 and finalized in September, 1983. The Illinois Environmental Protection Agency (IEPA) accepted lead responsibilities for conduct of a Remedial Investigation/Feasibility Study (RI/FS), with support from USEPA. Negotiations were carried out with Velsicol Chemical Corporation throughout 1984 and 1985 toward an agreement to allow them the opportunity to voluntarily undertake an appropriate RI/FS. However, these negotiations were unsuccessful and a state-lead RI/FS was initiated in September, 1985. The remedial investigation field work took place from May, 1986 through September, 1987. The final report documenting the findings of the RI was issued on February 19, 1988. The Public Comment Feasibility Study report was released on July 15, 1988, as was the Agencies' proposed plan. A Special Notice Letter was also sent to the Velsicol Chemical Corporation on July 15, 1988, beginning the moratorium period on Remedial Design/Remedial Action (RD/RA) settlement discussions.

Six formal negotiation meetings have taken place between Velsicol, the USEPA, the IEPA, the Illinois Attorney General's Office (IOAG) and the United States Department of Justice (U.S. DOJ). A draft RD/RA consent decree was issued to Velsicol in late July, 1988. Discussions on legal issues have been concurrent with technical sessions. A draft good faith proposal to conduct the Remedial Design and Remedial Action was received from Velsicol on August 31, 1988. A final good faith proposal was received on September 15, 1988.

### III. COMMUNITY RELATIONS

The Illinois Environmental Protection Agency (IEPA) has been responsible for conducting a community relations program for this site. A Community Relations Plan was submitted to, and approved by, the USEPA in November 1985. Interviews with neighbors, concerned citizens and community leaders indicated a community-wide consensus that environmental contamination attributed to Velsicol needed to be investigated. The community relations program emphasized:

- a. Initial visits with site neighbors and community leaders,
- b. Establishment of a local repository of documents,

- c. Assistance to news media in Illinois and Indiana to inform the public of ongoing activities and the results of the investigation.

Milestone activities conducted by Community Relations staff during the RI/FS included:

- \* Interviews with neighbors near site and with community leaders,
- \* Establishment of a repository of public documents at the Marshall Public Library,
- \* Development of a mailing list (150+) of site neighbors, interested citizens and organizations, news media, and elected officials in local, county and state government,
- \* Periodic news releases announcing startup of various levels of investigation at the site, on-site activities and results of investigations,
- \* Fact sheet #1 explaining the results of the remedial investigation.
- \* Paid newspaper advertisements announcing the RI public meeting and FS public hearing,
- \* A public meeting in February 1988 to meet concerned citizens and discuss results of remedial investigation. Approximately 50 people attended the meeting,
- \* Fact sheet #2 explaining the results of the feasibility study and setting forth the proposed plan in accordance with CERCLA Section 117,
- \* Public hearing on feasibility study and proposed plan in July, 1988. Approximately 40 people attended the hearing,
- \* Separate meetings with community leaders to discuss feasibility study and proposed plan.

A responsiveness summary addressing comments and questions received during the public comment period on the RI/FS and proposed plan is attached as Appendix B.

#### IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

This is the first and only operable unit at the site and addresses all affected media: soils, sediments, groundwater and surface water.

#### V. SITE CHARACTERISTICS

The remedial investigation characterized the nature and extent of actual or potential contamination associated with the site. The following activities were accomplished as part of the RI:

- Review of existing data
- Geophysical surveys in western agricultural land
- Surface and stratified sampling of plant soils, agricultural soils, 5/6 pond stabilized sludges and bottom clay, creek sediments, and on-site pond sediments
- Nested groundwater monitoring well installation and sampling
- 5/6 Pond leachate sampling
- Creek and on-site pond surface water sampling
- Fish sampling in East Mill Creek and Mill Creek (background stream)
- Ambient air sampling of waste impoundment and background areas

General conclusions about the site and this contamination assessment are presented below:

### Groundwater

The extent of groundwater contamination was assessed by the sampling of 40 groundwater monitoring wells screened into both the upper and lower hydrogeological units at 18 locations. These locations were selected to define groundwater contamination within the plant area, downgradient of the existing pond system, and upgradient of the plant area. The general locations of the monitoring wells are shown in Figure 4. Additional monitoring wells were installed by Velsicol around the 2 and 4 Ponds as part of a separate activity, but for which data has been collected and reviewed.

The direction of horizontal groundwater flow is basically from east to west. The velocity of potentially contaminated groundwater flow through the upper unit west of the on-site ponds is estimated to range from approximately 2 to 5 feet/year. The corresponding velocity within the bedrock unit is estimated to range from approximately 3 to 8 feet/year.

The hydrogeologic investigation determined that some component of groundwater from both hydrogeologic units discharges to the unnamed tributary west of Pond 2. Preliminary estimates based on horizontal flow patterns and vertical gradient directions suggest that about 40 to 60 percent of the water in the upper hydrogeologic unit that has passed beneath the 5/6 Pond and the Pond 2 could be discharging to the unnamed tributary. Similarly, about 10 to 30 percent of the water in the lower hydrogeologic unit that has passed beneath the ponds could be discharging to the unnamed tributary. Therefore, the unnamed tributary is the primary receptor for groundwater discharge and completed pathway of groundwater migration in the vicinity of the southwestern corner of the site.

Significant pesticide contamination was not detected in groundwater west of the existing pond system. Wells screened into the unstabilized spur east of the 5/6 Pond (well G205M) and in the production area (wells G217M and G218M) were significantly contaminated with volatile and semi-volatile organic compounds. Volatile and semi-volatile organic compounds were found in trace amounts in wells west of the existing pond system. These findings suggest that organic constituents are greatly attenuated or are not being transported to downgradient wells in

significant concentrations at this time. Groundwater sampling and geophysical study indicated that chlorides, which are more mobile than organics, have migrated west of the pond systems. The geologic materials present at the site, clayey soils, appear to act as a barrier to the movement of organic contamination. Inorganic metals contamination in groundwater was present at low concentrations adjacent to and west of 5/6 Pond and Pond 2. Table 1 in Appendix A presents the range of chemicals and their concentrations found during the groundwater investigation.

### Soils

Sampling and analyses of soils was conducted to determine the presence and extent of residual contamination in that media both on and off site. Surface soil, three-foot and six-foot soil borings were performed in the agricultural land, west and north of the Velsicol facility, and in the general plant production area. Analytical results are summarized in Table 2 in Appendix A.

The results of pesticide analyses from the soil borings in the agricultural land indicate that pesticide contamination above background levels most frequently occurred directly west of the 5/6 Pond and southwest of Pond 2. Volatile contamination in the agricultural land soil was minimal. Smaller amounts of semi-volatile contamination were detected only at one location west of the 5/6 Pond.

The plant area soil characterization focused on the most highly contaminated areas or suspected areas of contamination. The results indicate that the plant area soils are significantly contaminated with organic compounds.

Very high concentrations of pesticides, volatile and semi-volatile organics were detected in the stabilized waste material in the 5/6 Pond. Leachability testing indicated the pesticide compounds were not leachable. The leachability of several volatile and semi-volatile organic compounds were significantly reduced because of the stabilization treatment.

Permeability testing of soil samples from the 5/6 Pond bottom showed a range of permeabilities from  $3.4 \times 10^{-8}$  to  $9.3 \times 10^{-9}$  cm/sec. These results indicate that the soils directly beneath the 5/6 Pond are highly impermeable and would minimize vertical migration of contaminants. However, leachable contaminants can migrate west of the 5/6 Pond as shown by the low-level groundwater contamination of the wells immediately west of the 5/6 Pond.

### Surface Water and Sediments

Surface water and sediment samples were taken to determine the presence and magnitude of contamination in on-site ponds and in the unnamed tributary to East Mill Creek. Analytical data are summarized in Table 3 and 4 for waters and sediments of the ponds and creek, respectively.

Very low levels of organic and inorganic contamination were detected in creek water samples. Creek sediments were not significantly contaminated with volatile organics. However, creek sediments were significantly contaminated with chlordane and several semi-volatile organic compounds at concentrations much higher than those found in background samples. Pesticide and semi-volatile contamination was found at the farthest downstream sampling location at the western edge of the Velsicol property, almost one-half mile west of the facility.

Water from Ponds 2 and 4 and the North Stormwater Pond and sediments from Ponds 2 and 4 were analyzed to determine the presence and magnitude of contamination in them from plant runoff. Moderate chlordane contamination was found only in sediments from Pond 2. Moderately high volatile and semi-volatile organic compounds were detected in the sediments from Pond 2 and to a lesser extent, Pond 4.

#### Fish

Whole and fillet fish samples of the three trophic levels were collected from three locations ranging to three and one-half miles downstream of the Velsicol property. The samples were only analyzed for HSL pesticides and PCBs. Fish samples collected downstream of the facility in East Mill Creek are contaminated with alpha-chlordane in higher concentrations in comparison with similar fish samples from the adjacent background stream.

#### Air

Air sampling around the waste impoundments indicated several volatile organic compounds, chlordane, and hexachlorocyclopentadiene were present in air samples at very low concentrations. Volatile organics were generally also detected at the background location. Due to the very low concentrations of contaminants present in air sampling, fugitive emissions from the existing pond system were not considered significant.

### VI. SUMMARY OF SITE RISKS

As part of the remedial investigation for the Velsicol site, a risk assessment was developed to evaluate actual and potential human health and environmental threats from the site under a "no action" and an "abandonment" scenario. The no action scenario assumed that no remedial action would take place and the site would continue to function as an active chemical manufacturing plant. The abandonment scenario assumed that Velsicol ceased to be an active manufacturing plant with minimal shutdown procedures. Under that scenario, the potential risks from unsecured site access and discontinuation of routine maintenance of plant facilities were evaluated.

The risk assessment identified the exposure pathways in which people can potentially come into contact with contaminants from the site, under current site conditions, and exposures that could result from

abandonment of the site (Table 5). Potential exposure pathways for this site can be divided into two major categories:

1. Exposure associated with the migration of contaminants into the unnamed tributary, including direct contact by aquatic organisms and/or humans, or indirect exposure through consumption of fish; and
2. Exposures associated with trespassing on the site or activities associated with future site development and use.

Exposure through the use of the shallow groundwater was not considered under either alternative evaluation because of the limited groundwater yield and the use of municipal water by nearby residences.

The risk assessment evaluated the potential exposures based on the contaminant data gathered during the remedial investigation phase. The major results of the risk assessment are summarized in Table 6.

Under the no-action alternative, the major pathway of concern is through fish ingestion. Excess cancer risks were above  $1 \times 10^{-6}$  for chlordane and heptachlor. The exposure data assumed that adults consumed 3.5 pounds of fish per year for a period of 10 years. During a public meeting held on 10 February 1988, in Marshall, Illinois, local officials informed the IEPA and USEPA that East Mill Creek was a popular area for fishing. Based on this new information, the exposure data was reassessed and excess cancer risks recalculated for a fish consumption of 7 pounds per year for a period of 30 years. For comparison, the new excess cancer risk with these assumptions is calculated to be  $2.30 \times 10^{-5}$  for fish containing maximum levels of chlordane and heptachlor. The corresponding background cancer risk for fish affected by local agricultural soil runoff is  $2.2 \times 10^{-6}$ .

Under the abandonment alternative, excess cancer risk from fish consumption is elevated, as is noncarcinogenic risk. Excess cancer risk is also elevated for trespassers due to direct contact and inhalation of contaminated soil particles or volatilized compounds. Chemicals of potential concern, in addition to the pesticides, chlordane and heptachlor, include hexachlorocyclopentadiene, benzene, chloroform, phthalates, polycyclic aromatic hydrocarbons, lead, phenol, and toluene.

Another potential environmental risk exists under both alternatives through recharge of contaminated groundwater into the unnamed tributary, immediately adjacent to the Velsicol facility. Surface water contaminant levels in the unnamed tributary did not exceed Federal Ambient Water Quality criteria based on the RI data; however, the concentrations of contaminants in the groundwater partially recharging to the unnamed tributary did exceed these criteria for several metals and chlordane.

## VII. DOCUMENTATION OF SIGNIFICANT CHANGES

The Agency draft feasibility study report was issued on June 10, 1988. In a pre-negotiation meeting on June 21, 1988, followed by written

correspondence on June 30, 1988, Velsicol informed the agencies that the Marshall, IL facility would close no later than August 30, 1988.

The letter stated that it was currently "far too uneconomical to continue manufacturing operations at the facility," and that the company had "unsuccessfully spent tremendous effort to find replacement products which could fill the capacity of the facility."

The proposed plan, therefore, first recommended a modified remedial alternative which called for complete and thorough excavation of contaminated soils in the plant production area which would become accessible due to closure of the plant and removal of all structures and associated piping. Secondly, the proposed plan pointed out that the existing deep well injection system might not be considered for long-term disposal of extracted contaminated groundwater due to the company's initial position that it was in favor of closure of the two wells.

This proposed plan was issued on July 15, 1988, as was the Special Notice Letter to Velsicol officially starting the 60 day moratorium on negotiations toward a voluntary settlement for Remedial Design/Remedial Action work. As a result of plant closure, the scope of the consent decree negotiations has been expanded to include RCRA closure of the regulated units and closure or operational requirements of the deep injection wells under the UIC program. As of September 21, 1988, six technical and consent decree negotiation sessions have been held with the responsible party. A final "good faith" proposal was received on September 15, 1988.

#### VIII. DESCRIPTION OF ALTERNATIVES

The feasibility study process identifies, screens, then develops remedial alternatives to effectively mitigate existing and/or potential public health and environmental threats posed by the site.

Site-specific remedial action goals included:

- Minimization of existing direct contact and ingestion risks from contaminated soils/sediments on and off-site.
- Minimization of potential direct contact, inhalation and ingestion risks from soils/sediments on-site.
- Minimization of direct contact and ingestion risks from contaminated groundwater off-site.
- Minimization of future groundwater contamination on-site; restoration of existing and future contaminated groundwater.

The following is a summary of the findings of the feasibility study for the Velsicol/Marshall site, as detailed in the proposed plan. As previously noted in Section VII, Documentation of Significant Changes, modifications in the design and implementation of the preferred alternative are being considered in ongoing RD/RA negotiations. These details will be outlined in Section X., Selected Remedy.

For the Velsicol site, the Agencies considered at a minimum the development of: an alternative involving treatment as a principal element to reduce toxicity, mobility or volume of site waste; an alternative involving containment of site waste with little or no treatment, but which is protective of human health and the environment; and a no action alternative as a baseline for comparison.

Engineering judgment was used to assemble alternatives using the best technologies currently available. Applicable remedial technologies considered for contaminated soil and sediment included: excavation and direct containment in an engineered landfill either on-site or off-site; excavation followed by containment with chemical stabilization in an on-site landfill; excavation and incineration either on-site or off-site; and in-place containment and stream relocation for creek sediments only, in combination with any of the above cited technologies for other contaminated soils and sediments.

The applicable remedial technologies considered for contaminated groundwater included: collection either through an interceptor trench system or extraction well network, followed by either on-site treatment utilizing physical/chemical systems and then surface water discharge, or direct disposal utilizing the existing deep well injection system.

The assembled remedial alternatives were screened based on their site-specific effectiveness (i.e., protection of human health and the environment and reliability), implementability (i.e. technical feasibility and compliance with identified State and Federal requirements) and relative costs (i.e., capital and operation and maintenance).

Based on this initial analysis, soils and sediment alternatives involving disposal in an off-site landfill and on-site or off-site incineration were eliminated. Chemical stabilization has been demonstrated to provide significant treatment benefits through immobilization of site-specific contaminants. Although not equivalent to the destruction of wastes using incineration, with proper management of residuals, stabilization technology is considered effective and less costly, and is consistent with management requirements for the existing 5/6 Pond. Accordingly, off-site landfilling was eliminated because on-site landfilling provides the same environmental benefits at a lower cost and without risks or time delays associated with transportation of wastes off-site.

Seventeen remedial alternatives were developed for contaminated soil and sediment at the Velsicol/Marshall site, including the no-action case. These are individually outlined in the attached summary table. Each source material alternative must be combined with one of the two contaminated groundwater action alternatives to develop a complete remedial action plan for this site. Long-term groundwater monitoring is also required to evaluate a remedies effectiveness. The common remedial components are briefly highlighted here.

## Excavation

Chemical-specific remedial clean-up objectives have been developed during the feasibility study for plant area and agricultural soils, and Pond 2/4 sediments and the unnamed tributary. Excavation volumes have been estimated after review of RI data, based upon achieving the site-specific clean-up objectives. The estimated volume used for comparison of alternatives is 71,000 cubic yards. This amount is reduced by approximately 4,000 cubic yards in alternatives considering in-place containment of creek sediments. The FS report documents the assumptions used in the volume estimates.

## On-Site Containment

Excavated contaminated soils and sediments have two alternative disposal locations: either on top of the existing 5/6 Pond unit or in a new RCRA landfill cell immediately west of the 5/6 Pond on land currently used for agricultural production.

Excavated contaminated soils and sediments can further be subjected to chemical stabilization through mechanical mixing with pozzolan-type chemical reagents such as cement kiln dust in conjunction with containment in either unit. This treatment process was used effectively for the highly contaminated waste sludges deposited previously in the 5/6 Pond.

Following consolidation on top of the 5/6 Pond, with or without chemical stabilization treatment, two cover systems are considered, based on meeting applicable technical requirements of the Resource Conservation and Recovery Act (RCRA). A capping system for a disposal unit, among other things, must be as impermeable as its bottom liner. Two multilayer capping options are therefore considered, one utilizing a single clay layer of proper thickness and sufficient compaction, and the other utilizing less clay in combination with a synthetic liner. The new RCRA cell would require the latter multimedia cap, due to the extremely low permeability associated with its engineered liner system.

## In-Place Containment of Creek Sediments

As mentioned previously, several alternatives feature excavation of contaminated soils and on-site sediments, with in-place containment and isolation of creek sediments. These alternatives involve capping creek sediments with a compacted layer of clay and then clean backfill to surrounding grade. The unnamed tributary would be realigned to divert and convey surface water flows. In addition, the contaminated sediments would be isolated from contact with groundwater through installation of a shallow subsurface drainage system.

## Groundwater Collection

Both groundwater alternatives under consideration in the feasibility study employed the same collection system. This consisted of interceptor trench/tile lines within the shallow till aquifer which

captured and extracted contamination from two discrete source areas. It was proposed that one trench be located on the western edge of the 5/6 Pond and the western and southern edges of the 2/4 Pond area. This trench system would insure contaminant capture from these sources prior to recharge to the unnamed tributary water course. The other trench system would be located on the eastern edge of the 5/6 and 2/4 Ponds to primarily intercept contaminated groundwater identified from upgradient plant production areas. Additionally, the eastern trench would assert a positive collective influence on any leachate from the 5/6 Pond. Establishment of the eastern trench system would reduce the time required to mitigate the groundwater contamination from these areas. Both trenches would drain toward their centers where collection manholes would be located. A local leachate collection system in the existing 5/6 Pond would also be operated, as necessary. Extracted groundwater would be pumped to either an on-site treatment facility or the existing deep well injection system under the two groundwater alternatives developed.

#### Groundwater Treatment/Disposal

Hydrogeologic characteristics established for the unconsolidated materials at the site generally indicate that a low flow will be present in these trenches due to the "tightness" of existing clayey soils. However, based on the RI data, in relation to the remedial clean-up objectives established, extracted groundwater would require treatment, using primarily granular activated carbon prior to discharge to the unnamed tributary. One groundwater alternative therefore utilized a storage tank and treatment unit within a diked containment area proposed for agricultural land adjacent to the creek and west of the pond areas.

The other viable groundwater option considered, given continued plant operation, was direct pumping of contaminated water from the trenches to the deep well pre-treatment system for combination with plant waters for subsequent injection. The quality and quantity of the trench water was estimated to have insignificant impact on that system.

A common element of both groundwater programs is regular perimeter monitoring of the shallow and deeper aquifers to detect any leakage outside the collection network, and which then would be used to assess corrective action. The groundwater pump and treat system would also require monitoring to assess its effectiveness and progress.

#### IX. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The remedial alternatives that were developed in the Velsicol/Marshall feasibility study were evaluated using the following "nine criteria". Advantages and disadvantages of each alternative were then compared to identify the preferred alternative that provides the best balance among these nine criteria.

- Overall protection of human health and the environment
- Compliance with ARARs

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility or volume
- Short-term effectiveness
- Implementability
- Cost
- Support Agency acceptance
- Community acceptance

The IEPA and USEPA identified their preferred alternative in the proposed plan for the Velsicol/Marshall site as 2A-1, Modified, in combination with GW-2 based on all information currently available (see remedial alternatives summary, Table 7). This preferred alternative, or proposed remedial action plan, included excavation of contaminated plant area and agricultural soils and pond and creek sediments; consolidation of these wastes with stabilization on top of the 5/6 Pond followed by construction of a RCRA compliant, multimedia cap. This source type action would be combined with collection of contaminated groundwater in interceptor trenches, followed by treatment in an on-site facility and discharge to the unnamed tributary. The remedy would then require regular maintenance and monitoring. These alternatives will therefore be highlighted in the discussion of the evaluation criteria which follows.

However, as previously noted, announcement of plant closure by the company on June 21, 1988 changed or eliminated some of the remedial alternatives under consideration in the feasibility study. As stated previously, Velsicol had informed the agencies that it is their intention to: remove all chemicals from the facility, move or salvage all equipment, and demolish remaining structures for on-site disposal. Velsicol had also initially stated it was their intention to properly plug and abandon the two existing on-site deep injection wells and the observation well. That action would have eliminated consideration of the company's deep injection well No. 2 as a long-term groundwater disposal option. It is anticipated that the active deep well may, however, at a minimum be used in the short-term for disposal of contaminated surface water generated through construction of the site remedy.

These changed conditions, known prior to issuance of the proposed plan, are incorporated into the discussion of alternatives and evaluation criteria which follows. Further modifications of the design details of the preferred alternative (2A-1 modified with GW-2) as given in the proposed plan are under consideration as the result of RD/RA settlement negotiations with Velsicol. These details are outlined and evaluated in Section X., Selected Remedy.

### Overall Protection

All of the alternatives, with the exception of the no action alternative, would provide adequate protection of human health and the environment by eliminating, reducing or controlling risks through various combinations of treatment and/or engineering controls, and institutional controls.

The preferred alternative includes excavation/backfilling of contaminated soil and sediment areas with consolidation on top of the existing 5/6 Pond unit. This allows for management and monitoring of only one hazardous waste unit on the site. The consolidation of wastes on top of the 5/6 Pond is accompanied by treatment through chemical stabilization, followed by capping with a highly impermeable multimedia cover system. This preferred source alternative, in combination with groundwater interceptor trench systems which collect all releases from the disposal unit and plant areas with residual contamination for subsequent treatment and discharge, mitigates existing and/or potential threats from direct contact and groundwater/surface water exposures.

#### Compliance with ARARs

All alternatives, except the no action alternative, would conceptually meet all identified applicable or relevant and appropriate State and Federal requirements which are outlined in Section XI., Statutory Determinations.

#### Long-Term Effectiveness and Permanence

The preferred soil and sediment alternative proposes to treat wastes on top of the 5/6 Pond through chemical stabilization to significantly reduce the mobility of the contaminants in conjunction with consolidation in controlled, compacted lifts on top of the 5/6 Pond. Mobility is further proposed to be reduced through use of a highly impermeable multimedia cover system. Additionally, any leachate from this unit would be collected and treated through the proposed interceptor trench and treatment/disposal system. This combination of treatment and engineering control, as well as normal access and deed restrictions, provides for complete control of the environmental situation at the site. Permanence would, in effect, be achieved with proper management of the remedy, which would include operation and maintenance of the groundwater collection/treatment system, maintenance of the soil covers/caps, and groundwater and treatment facility effluent sampling. The other soil and sediment alternatives utilizing the new RCRA cell would conceivably require additional operation and maintenance and monitoring activities.

#### Reduction of Toxicity, Mobility, or Volume

The preferred soil and sediment alternative, and others utilizing the chemical stabilization process, will achieve an estimated greater than 90% average reduction in mobility of volatile contamination over those alternatives involving only containment. Semi-volatile and pesticide contamination becomes practically unleachable. Toxicity and volume differences among alternatives are not a significant factor. However, the addition of reagents in the stabilization process will increase the volume of materials to be contained on the 5/6 Pond. The 22 acre 5/6 Pond conceptually covers enough area to make feasible vertical expansion of this unit for the estimated waste volume in the proposed plan of 80,000 cubic yards. If utilized, the groundwater treatment alternative

effectively reduces the toxicity of contaminated groundwater by primarily adsorbing organic contamination onto granular activated carbon. This system will require periodic maintenance by regenerating or replacing the spent carbon. Use of the deep injection well system will effectively limit mobility of contaminants by placing them in an isolated injection zone.

#### Short-Term Effectiveness

All of the soil and sediment alternatives present some degree of risk to laborers, the community, and the environment during the two-to-three season remedial construction phase. The relative remoteness of the site, the use of standard health and safety equipment/procedures, and engineering controls such as dust suppression and clean water diversion, will minimize these threats. An air monitoring program will be implemented during remedial construction to monitor the effectiveness of controls for worker and public protection. The preferred alternative will conceptually take less time to implement than alternatives proposing construction of an additional new on-site RCRA landfill cell.

#### Implementability

All soil and sediment alternatives, and the groundwater alternatives, propose to utilize proven engineering and construction technologies and are readily implementable. Ease of implementability is, therefore, not a significant factor in selection among alternatives.

#### Cost

The capital engineering and construction costs, and the present worth costs for: operation and maintenance, normal replacement, and monitoring for a nominal 30-year operating life are given in the remedial alternative summary table. The total estimated cost for implementation of alternative 2A-1, modified, with increased plant soil excavation as estimated in the proposed plan, is \$8,342,510. In combination with alternative GW-2 which is costed at \$738,400, the total remedial action plan cost is estimated at \$9,080,910. Additionally, long-term groundwater monitoring costs must be considered.

#### Support Agency Acceptance

USEPA, Region V, supports the preferred alternative. The Illinois/Indiana section of the Remedial Enforcement Response Branch has been intimately involved in the development and implementation of this state-lead RI/FS. Additionally, USEPA and the State are jointly involved in RD/RA settlement negotiations with Velsicol. The Region is, therefore, fully informed and supportive of modifications to the preferred alternative which have taken place as a result of those negotiations.

#### Community Acceptance

As noted previously in the Community Relations section (III), a comprehensive program has been undertaken for this RI/FS. Project

information has been distributed to an extensive list of public officials, the media and concerned private individuals, as well as Velsicol Chemical Corporation and their representatives. Small group and open public meetings were held at the completion of both the RI and FS reports.

The responsiveness summary attached to this ROD Decision Summary details oral comments received at the recent public hearing from citizens and the Marshall Chamber of Commerce, as well as the only written comments received, from Velsicol and their consultants. For conciseness and clarity, these comments are paraphrased and grouped together where possible, before a response is given.

In general, no comments were received from the general public which conceptually disagreed with the components of the agencies' preferred alternative identified in the proposed plan. Nor were any comments received which promoted any other remedial alternative developed in the FS, or variation thereof. Velsicol Chemical Corporation has, however, submitted extensive comments on the scope of the remedial action required for this site. These comments have been carefully considered and promptly addressed throughout the study, as well as at this stage in the responsiveness summary. The technical details of a negotiated settlement on an approvable responsible party site remedy are the subject of the following section.

#### X. SELECTED REMEDY

Before recent remedy discussions from RD/RA settlement negotiations can be outlined, the agencies' preferred alternative as presented in the proposed plan should be reviewed. It consisted of soil and sediment alternative 2A-1, modified, in combination with groundwater alternative GW-2. The elements of that preferred alternative are highlighted below.

- Excavation of all contaminated soils and sediments identified in the FS, with optimum soil removal in plant area "hotspots" that will become accessible due to proper structure demolition and elimination of unnecessary service roadways. The total soil excavation quantity under this modified alternative was estimated to be approximately 80,000 cubic yards.
- Backfilling of excavated areas with clean clay, regrading for positive surface drainage and establishment of a vegetative cover to facilitate off-site stormwater runoff.
- Consolidation of contaminated wastes on top of the existing 5/6 Pond, with treatment in-place provided by chemical stabilization by controlled mechanical mixing of reagents and wastes by conventional construction equipment during placement of lifts of material.
- Vertical extension of the existing localized leachate collection system on the western edge of the unit. Capping of the modified 5/6 Pond with a RCRA compliant multimedia cover system.

- Collection of contaminated groundwater through installation of two interceptor trench systems in the shallow aquifer: one immediately downgradient of the 5/6 and 2/4 Ponds and one downgradient of the highly contaminated plant process areas.
- Treatment of extracted groundwater in an on-site system and subsequent discharge to the unnamed tributary. The potential exists for use of deep injection well No. 2 for direct disposal of contaminated groundwater, and surface water through the initial remedial construction phase..
- Evaluation of the effectiveness of the remedy through regular monitoring and reporting on: shallow and deeper groundwater at the perimeter of the site, effluent from the groundwater treatment facility, and the cover systems (particularly over the 5/6 Pond unit); development of contingency plans to address any environmental problems.
- Access and land use restrictions.

This remedial action plan, with proper operation and maintenance, permanently reduces primarily the mobility of site contamination through a combination of treatment, engineering and institutional controls. The existing and potential threats associated with direct contact with wastes or migration through the shallow groundwater and/or surface water pathways is effectively mitigated. The technologies proposed are well proven, and the necessary construction, labor, equipment and materials are readily available.

In summary, the IEPA and USEPA believe this preferred alternative would be protective of human health and the environment, would attain ARARs and would be cost-effective while implementing a permanent, environmentally sound solution for the entire Velsicol/Marshall site, that employs alternative treatment technology.

As indicated previously, modifications to the scope of work of the various remedial components outlined above have been discussed with Velsicol in the context of settlement for voluntary implementation of the selected remedy. Conceptually, the goals of the agencies' preferred remedial alternative are not compromised. The ensuing discussion documents changes in the conceptual design and implementation of the selected remedy from that in the proposed plan, and provides the rationale for those changes.

#### Unnamed Tributary and East Mill Creek

The RI identified significant contamination of creek sediments from the facility to Velsicol's western property boundary (see attached site map, Figure 3). The site-specific clean-up objectives developed for various media by the IEPA Clean-up Objectives Team (COT) are also attached to this Decision Summary (Table 8). Additional information on this process is included in the FS. Sediment sampling further downstream in the unnamed tributary and East Mill Creek into which it empties was not

undertaken during the RI. However, fish analytical results from these reaches indicate elevated levels of chlordane compared to background levels established in the adjacent Mill Creek.

Remediation of this off-site area will include excavation of contaminated sediment in the unnamed tributary from the southeastern edge of the facility to Velsicol's western property line. Initially, a boundary survey will be completed on this section of the creek to establish its exact course through the property. The approach to excavation will be construction oriented. The depth of excavation will be six inches below the 18 inch depth of contamination observed in the RI. This would result in approximately 2,200 c.y. of creek sediment to be consolidated and stabilized in-place on top of the 5/6 Pond.

In order to minimize downstream impacts associated with excavation of the creek, and then to eliminate surface water flow through that section, a permanent diversion channel will be constructed prior to excavation of contaminated sediments (see final remedy conceptual plan, Figure 5). This side channel would parallel the existing one, crossing it at midpoint through this section due to the given facility and stream configuration. Any clean stormwater during construction would be pumped across this intersection. Contaminated water collected in the existing creek excavations would be dealt with as other on-site stormwater is. Excavated clayey soil from the new channel will be used to backfill the existing one in discrete, compacted lifts to meet the surrounding field grade. Positive drainage patterns will be established and the entire affected area revegetated or farmed. Sensitive sections of the new channel will be protected with appropriately sized rock.

A conservation dry dam exists on East Mill Creek approximately three miles downstream of Velsicol's western property boundary. This man-made feature acts as a sediment trap and appears to be a likely end point for contaminant build-up. The FS proposes additional sediment sampling in this section at 1,000 ft. intervals with three depth composites (0-6", 6"-12" and 12"-18") for the primary contaminant of concern, chlordane, during remedial design. Samples will be taken at each interval in local areas of sediment deposition, as opposed to swift moving channel areas. It is also proposed that background stream sediment chlordane concentrations be established in East Mill Creek, above its confluence with the unnamed tributary. Available data suggests that the average concentration of chlordane in local stream sediments ranges from 10-20 ug/kg. Any sediment excavation beyond Velsicol's western property boundary will focus only on stream sections with sediment build-up, as opposed to sections of exposed bedrock. Additionally, consideration will be given when evaluating the limits of the scope of this work to minimizing damage to the stream and the surrounding property. Velsicol has assumed an excavation quantity of approximately 8,000 c.y. from this section in their RD/RA technical proposal. This sediment would also be consolidated and stabilized in-place on top of the 5/6 Pond.

#### Agricultural Land Soils

An extensive soil sampling program was implemented in agricultural lands west and north of the facility during the RI. Clean-up objectives based

on protection of human health and the environment have been established for off-site soils, as for other media, by IEPA COT (see attached summary, Table 8). However, the background concentration of chlordane in central Illinois agricultural soils has been observed at 50 ppb.

The proposed plan advocated removal of surface soils to a depth of one foot (10,000 c.y.) for soil borings with chlordane concentrations above background, and consolidation of these soils with stabilization in-place on top of the 5/6 Pond. The impacted area would then be regraded for positive drainage and revegetated or placed back into crop production.

The selected alternative instead of excavation of these minimally contaminated soils involves in-situ management with crop restrictions for the fields controlled by Velsicol. A regular program of pH testing and amendment with agricultural ground limestone to maintain a minimum pH of 6.5 will be implemented. Conservation practices such as no-fall-tilling will be used to minimize surface erosion. Additionally, land use restrictions as agreed, will allow growth of only corn, soybeans or wheat. No vegetable crops for direct human consumption will be grown. The land may also be used for forage crop production, but no direct grazing of livestock will be allowed. This management program will effectively mitigate contaminant transport through groundwater or surface water and limit translocation to crops.

#### 2/4 Ponds

The 2 Pond ultimately receives all stormwater runoff from the plant area. The 4 Pond currently serves as a back-up to the 2 Pond, being connected by a culvert. These ponds were visibly "cleaned" to the underlying natural clay liner in preliminary reclamation work performed by Velsicol in the early 1980's.

The RI sampling indicated some contamination above established clean-up levels in the bottom six-inch sediment layer. There was also contamination of similar constituents observed in the pond waters and on-line oily-water separator. This contamination appears to be the result of plant production area runoff subsequent to recent cleaning activities.

The 2 Pond will be the logical impoundment in which stormwater should be collected during remedial construction. As such, work will be sequenced around its use until the initial remedial action is complete, and surface water runoff is of a quality to directly discharge off-site.

The remedial action identified for this area in the proposed plan assumed continued plant use of this impoundment to contain stormwater prior to deep well pretreatment and injection. The plan included excavation of the six-inch contaminated sediment layer below the high water-line, plus an additional six-inches (one foot total depth) which amounted to approximately 15,200 c.y. This material would then be consolidated and stabilized in-place on top of the 5/6 Pond.

However, Velsicol has indicated in recent settlement discussions that these ponds (as well as the north stormwater pond which requires no

remediation) will have no long term use under plant closure. Therefore, a modification to the remedy for this area as indicated in the proposed plan includes excavation of the six-inch "sediment cake" below high pool level from both ponds (approximately 7,600 c.y.) and consolidation of this material with stabilization on top of the 5/6 Pond, as probably the last phase of source removal. The southern portion of the modified groundwater interceptor trench system would extend into the area of the existing 4 Pond, thus capturing local residual contamination in the saturated zone. This remedial component is discussed in detail under the on-site groundwater section. The excavated ponds would be backfilled to surrounding plant grade with clean clays in discrete, compacted lifts. Burial of decontaminated, non-degradable debris from on-site demolition of structures and foundations will be allowed in the pond bottoms, with careful backfilling to avoid future settlement. The finished area will be contoured for positive drainage and revegetated.

#### Plant Production Area Soils

The intent of surface samples and borings within the plant production area during the RI was to characterize areas of known contamination. The levels of contamination observed were compared to the clean-up objectives established for on-site soils. The plant area/sampling plan (Figure 6) and data table are attached in Appendix A. The remedial concept for this area was, again, developed in the FS with continued plant operation in mind. It called for excavation where feasible to the depths of significant contamination found in each area. Congested process areas where excavation was impracticable were identified to be capped with clay or asphalt/concrete. In conjunction with this program, spill/leak containment facilities would be proposed to be upgraded to insure no future recontamination of soils. Excavation would have resulted in an estimated 41,500 c.y. to be consolidated and stabilized in-place on top of the 5/6 Pond. Areas impacted by excavation would be backfilled with clean clay, regraded and revegetated. The objective was to consolidate source materials into a secure management unit, and to create a "clean" plant surface, free of risks associated with direct contact or surface erosion.

The modified version of this remedial component presented in the proposed plan attempted to account for additional excavation from plant process areas which would be readily accessible if all tanks, structures and associated piping were removed in plant closure as indicated by Velsicol. Approximately 10,000 c.y. of additional excavation would be generated from around and beneath these structures using the same depths identified for each individual area. The conceptual plan of backfilling, regrading and revegetating the disturbed area remained unchanged, recognizing that a more complete and integrated surface cover configuration could be achieved under this scenario.

The plan described above, and its modification under plant closure, involved comprehensive remedial design soil sampling over the established plant grid to refine the excavation quantity for construction bidding purposes. It also would involve extensive confirmatory sampling during construction to monitor compliance with clean-up objectives.

An alternative to this intensive sampling process is adopted in conjunction with the proposed groundwater restoration program. In lieu of verification sampling, each plant area will be excavated to the observed depth of significant contamination plus an additional six-inches to insure removal of gross contamination. The exception to this plan is area 4, where excavation will be to a depth of six feet as the saturated zone will have been encountered. Residual contamination left in-place at this depth will be addressed by the groundwater interceptor trench system.

This excavation scheme yields approximately 86,000 c.y. of source material. Velsicol asked the agencies to consider partial excavation credit in plant areas 4 and 6 where preliminary remedial action was taken during the initial 5/6 Pond stabilization work. Preliminary information provided indicates that soil removal has occurred from approximately 16,500 s.f. in area 4 along an abandoned railroad spur, and 120,000 s.f. in area 6 which was formerly used for tanks. Volume calculations using corresponding depths for each area result in a total excavation reduction of 8,100 c.y. Minimal soil sampling will be included in the RD for these areas only, to confirm this previous removal of significant contamination. An additional 10,000 c.y. of excavation will be available during the remedial action to remove other significantly contaminated pockets, most likely around former process areas. A total of approximately 87,900 c.y. of source materials may therefore be excavated from the plant production area and consolidated and stabilized in-place on top of the 5/6 Pond (see attached removal volume summary, Table 9). Disturbed plant production areas will be backfilled to grade with clean clay from other Velsicol property, regraded to drain, topsoil added and vegetation established.

#### 5/6 Pond

A site total of approximately 97,700 c.y. (without consideration of off-property creek sediments) of contaminated soils/sediments originating from the unnamed tributary, 2/4 Ponds and plant production area are currently identified for consolidation with in-place stabilization on top of the existing 22 acre 5/6 Pond. This disposal unit contains approximately 300,000 c.y. of wastes from previous manufacturing activities. These highly contaminated sludges were subjected to chemical stabilization with cement-type materials and fly-ash and temporarily covered with 18 inches of clay with vegetation by Velsicol between 1982 and 1985.

The scope and sequencing of excavation, incorporation of stabilizing agents and compaction in controlled lifts on top of the pond will be developed in the RD workplan. Extensive testing of admixtures and mechanical mixing procedures was completed by Velsicol in their original sludge stabilization effort. An abbreviated field pilot program will be completed during the RD to tailor the optimum proportion of reagents, moisture and mixing sequence for the specific soils and sediments to be stabilized during this final remedy.

It is estimated that addition of stabilizing agents to contaminated soils/sediments on top of the 5/6 Pond will result in a 20 percent increase in the volume of material to be accommodated by the 5/6 Pond. Assuming that maximum compactive effort is used to eliminate any excavation "swell", final placement of the stabilized waste would amount to an increase of approximately 3.5 ft. to the existing pond elevation. It has been determined by Velsicol that the integrity of the impoundment berms will be maintained under this load plus that of the final cap, and that direct runoff can be handled properly.

The proposed plan called for a RCRA Subtitle C compliant final cap to be constructed over the completed 5/6 Pond. A multimedia cap provides the greatest degree of protection among caps from the elements over this above-grade impoundment by minimizing infiltration into the stabilized waste. With the stabilization treatment providing further protection by severely limiting the leachability of contaminants, minimal groundwater releases can be expected from the unit. What leachate that will be generated will be addressed through the groundwater interceptor trench system.

The proposed plan recommended the following geographical region-specific RCRA model cap cross-section:

- 24" of compacted clay
- overlain by minimum 20 mil thick synthetic liner
- overlain by 12" drainage layer
- overlain by filter fabric
- overlain by 24" of topsoil
- graded to drain (2-4% slope) and finished with low maintenance vegetation

The selected modification of this cap design involves reducing the thickness of the drainage layer (by six inches), and increasing the thickness of the upper soil layer (by six inches) while substituting a lesser quality soil material for topsoil. These changes reduce the estimated cost of this cover system but maintain the proper freeze-thaw protection over the bottom clay layer, while allowing for proper internal drainage.

The profile for the modified multimedia cap is therefore as follows:

- 24" of compacted clay
- overlain by minimum 30 mil thick (HDPE) synthetic liner
- overlain by 6" drainage layer
- overlain by filter fabric
- overlain by 24" of clean soil fill
- overlain by 6" of topsoil
- graded to drain (2-4% slope) and finished with low maintenance vegetation

An operation and maintenance program for the 5/6 Pond cover will be developed in the RD work plan. It will include regular inspection and erosion repair, as well as optimal liming, fertilization, reseeding and mowing by the Velsicol maintenance crew present on-site.

## On-Site Groundwater

An extensive groundwater monitoring well network was installed and sampled during the RI. Two areas of contamination were observed. Groundwater within the plant production area is significantly contaminated in comparison to site-specific IEPA COT clean-up/discharge objectives. This contamination is generally limited to the uppermost aquifer below the surface, as it moves westward with upgradient flows toward recharge of the unnamed tributary. No actual measurements of groundwater quality were taken beneath the 5/6 Pond, nor was a transport modeling effort undertaken as part of this study. Groundwater immediately west of the impoundments was found to be contaminated with low level organics and inorganics, compared to COT objectives. A plume of mobile chlorides has been tracked several hundred feet away from that area. The FS estimated 40-60 percent of water from the upper hydrogeologic unit in the vicinity of the 5/6 and 2 Ponds would discharge to the unnamed tributary based on horizontal flow patterns and vertical gradients. Therefore, the potential for contaminant release from shallow groundwater to surface water has been established and should be addressed.

The primary goal of the groundwater remedial action is to prevent the release of contaminated groundwater from the site. The other goal is to restore the affected environment beneath the facility, with use of institutional controls until restoration is achieved.

The groundwater collection plan developed in the FS and recommended in the proposed plan involved interception of contaminated water from each of the areas identified, through the use of shallow pipe and gravel backfilled trench drains. One trench would be located immediately downgradient of the 5/6 and 2 ponds, being approximately 2,450 ft. long and 15 ft. deep (bottom of till layer). An estimated steady-state flow rate of 1,870-3,000 gallons/day was expected. The other trench was proposed to be located immediately upgradient of the 5/6 and 4 ponds, being approximately 940 feet long and 15 feet deep with an expected flow rate of 600 to 1,350 gallons/day. These two trench systems would be sloped to drain by gravity toward sumps in the center of each, with transmission pumps and lines from the sumps to the treatment system.

The on-site treatment system conceptually designed for the FS and proposed plan relied primarily on carbon adsorption to meet the IEPA/COT clean-up objectives prior to controlled discharge to the unnamed tributary (see attached list of, and rationale for, chemical-specific objectives for groundwater and surface water, Table 8). The storage tank and treatment columns were tentatively located next to the creek in a diked containment area in agricultural land west of the 5/6 and 2 Ponds. The combined groundwater influent, and effluent, would be regularly monitored to evaluate the effectiveness of the system. The FS costed operation and maintenance of this system is over a nominal thirty year period, although the actual lifetime will be dictated by the field effectiveness of the system to restore the quality of groundwater to below the established objectives.

There is potential for likely use of the existing active deep injection well (No. 2) for disposal of contaminated surface water during remedial construction. The proposed plan contemplated use of this well for both stormwater, and groundwater from the trench system and 5/6 Pond drain, however, the regulatory as well as technical feasibility of this disposal option is complex, and remains unresolved at this time. Dialogue between the agencies and Velsicol has recently intensified on this matter to develop operation and closure requirements to be incorporated in the Consent Decree.

The selected alternative to the groundwater remedy in the proposed plan involves extension and partial realignment of the trench system on the eastern side of the 5/6 Pond, with elimination of the western trench.

This modified trench would be oriented in a north-south direction immediately east of the 5/6 Pond. It would be approximately 1,200 ft. long, extending from the north end of 5/6 southward into what is currently the 4 Pond area, but which will be backfilled with clay during remediation. The trench depth will reach to immediately above the "bedrock" hydrogeologic unit, 15-20 ft. below the surface. This trench, containing a drain tile and properly sized granular backfill, will be sloped to collection manholes from which leachate with a steady-state flow of approximately 700 gallons/day will be pumped. Recent computer modeling by Velsicol has indicated that this trench configuration will influence groundwater flow in the upper unit over a distance of 800 ft. in both directions after 10 years of operation. This trench system will therefore theoretically control any future releases from the 5/6 pond, as well as the plant production area. With continued proper operation and maintenance over time, this system will effectively remove significant contaminants from the impacted aquifer beneath the site.

The current status of the deep injection wells is as follows: the Agencies have agreed with Velsicol on immediate and routine testing and monitoring requirements for showing mechanical integrity of well No. 2. A corrective action plan for well No. 2 will be developed, if necessary, after the initial suite of tests/logs are evaluated. The details of closure plans for well No. 2 have been finalized and closure plans for well No. 1 and the observation well have been conceptually agreed to.

The Agencies currently advocate use of the mechanically sound deep well No. 2 for disposal of site runoff during construction activities over the next three to four years. Once remedial activities are complete, site surface water discharge will technically be feasible, and use for disposal of surface water will no longer be necessary. Use for disposal of contaminated groundwater is being evaluated. Velsicol has agreed that if they decide to discontinue use of deep well No. 2, or regulatory requirements force them to, that an on-site alternative treatment system to be detailed in the RD/RA contingency plan would be put into service. The Agencies support this approach which is consistent with the groundwater alternatives developed under plant operation in the FS. The details for operation and/or closure of the deep injection wells will be finalized in the Consent Decree.

## Monitoring and Reporting

Because contaminants will be managed on-site, there is a need for regular monitoring of their condition. The exact details of sampling and documentation will be outlined in the site operation and maintenance plan and quality assurance project plan developed as part of remedial design activities.

The FS and proposed plan recommended monitoring the groundwater in both hydrogeologic units at the perimeter of the facility. The primary point of compliance to be focused on will be the downgradient edge of the 5/6 and 2 Ponds. This plan utilized twelve western wells installed during the RI, as supplemented with four new wells at two new locations on the eastern side of the site. The FS conservatively proposed sampling of this network for organics and inorganics on a quarterly basis for a nominal 30 year period. This groundwater sampling plan would be assessed every five years, and possibly modified, based on observations during each period. Similarly, the FS recommended monthly sampling for organic and inorganic parameters of the on-site treatment unit effluent for a period of 10 years, to be reassessed thereafter. It was also anticipated that a quarterly report on observations and activities at the site, such as repair to the 5/6 Pond cap, would be submitted to the agencies, with all "post-remedial action" work being summarized on at least a five year basis for review, as required by SARA. Contingency plans would be developed during remedial design to respond to and correct any environmental problems in a timely fashion.

The details of the groundwater monitoring network and plan are as follows. All wells installed during the study, plus the 2/4 Pond network installed by Velsicol and the proposed new background wells and piezometers will have water level measurements taken and reported on a quarterly basis (see Figure 7, Appendix A).

Groundwater samples for chemical analyses for the volatile fraction (most mobile contaminants of concern) will be taken on a semi-annual basis with total organics and pesticide analyses at the end of a two year period after remedial construction.

The nine well network for chemical analyses is shown in Figure 8, Appendix A. Velsicol has the opportunity to submit a revision to this chemical monitoring plan at any time, however, the agreed semi-annual plan will continue until modifications are approved. It is conceivable that the groundwater trench system (which will be monitored for an indicator list of contaminants on a monthly basis) will eventually influence all releases from the 5/6 and 2/4 Pond areas and thereby allow downgradient monitoring reductions.

## Access and Land Use Restrictions

The proposed plan recommends site access and land use restrictions, without offering any details on these continuous post-remediation tasks. Velsicol has indicated that they will maintain an on-site

presence throughout plant decommissioning and remedial activities. The plant perimeter fence, with controlled access points, will remain; with adjustments made during and after construction. The groundwater remedy will conceivably require routine inspection and maintenance. This factor, coupled with the potential liabilities associated with the site and a desire to protect the sensitive cover systems, will most likely lead Velsicol to permanently employ a small resident staff at the former facility.

The details of land use restrictions will be finalized in the Consent Decree. A notation on the deed to the facility will indicate that the land has been used to manage hazardous waste and its use is restricted according to 40 CFR Subpart G regulations. In addition, Velsicol owns and controls a large amount of agricultural land around the plant, particularly to the north and west. They have indicated that they do not intend to sell any of those holdings at this time. However, the potential exists for industrial/commercial development to the north near Interstate 70 where several businesses have recently located. The Agencies will recommend, through the Consent Decree, that an adequate buffer zone be maintained by the company around the site. Of particular concern would be control of the agricultural lands identified with special in-situ management requirements, and the capped quarter-mile long section of the unnamed tributary to the current western Velsicol property boundary.

#### Summary of Selected Remedy

Conceptually, the selected remedy put forth in this Decision Summary is identical to that recommended in the proposed plan. The technical details of some of the remedial components have been modified, without compromising their environmental purpose. These modifications are logical outgrowths of that originally developed in the feasibility study as presented for public comment. The agencies believe this final alternative will be protective of human health and the environment, will attain ARAR's and will be cost-effective while implementing a permanent, environmentally sound solution for the entire Velsicol/Marshall site, that employs alternative treatment technology.

### XI. STATUTORY DETERMINATIONS

#### Protection of Human Health and the Environment

The selected remedy reduces risks to human health and the environment by excavating contaminated soils and sediments, treating them through chemical stabilization, and then covering them with an impermeable multimedia cap. Collection of groundwater through a trench system will prevent off-site migration and reduce the threat of direct contact with contamination in surface water.

Health based chemical specific clean-up objectives for groundwater, soils and sediments were developed by IEPA's Clean-up Objectives Team (COT). As previously noted, clean-up objectives are listed for each contaminant found on-site in Table 8, Appendix A.

The Illinois Environmental Protection Agency has developed a process in which the agency's various divisions follow procedures similar to classic risk assessment/risk management in order to develop chemical-specific clean-up objectives for contaminated sites which the agency addresses through its various programs. Two teams of specialists, the Clean-up Objectives Team (COT) and the Coordinated Permit Review Committee (CPRC), establish site-specific health-based clean-up objectives for types of regulated clean-ups such as RCRA closures, clean-up of spills and leaks and remediation of Superfund Sites. The COT/CPRC process was used to establish site-specific clean-up levels for the following media that will be addressed in this remedial action:

1. Plant soils and 2/4 Pond sediments;
2. Unnamed tributary sediments and surface water;
3. Groundwater

Since all remediation activities will take place within a secure area owned by Velsicol, it is believed that the general Marshall community will not be affected in the short term by the remedial action. Prudent construction and operation practices such as dust suppression, air monitoring, and clean water diversion and sediment trapping during remediation will minimize off-site migration of contaminants via the air or surface water pathways.

#### Attainment of Applicable or Relevant and Appropriate Requirements

Section 121(d) of SARA requires that remedial actions meet legally applicable or relevant and appropriate requirements (ARARs) of other environmental laws. These laws may include: the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Clean Air Act (CAA), the Safe Drinking Water Act (SDWA), and any state law which has stricter requirements than the corresponding Federal law. A "legally applicable" requirement is one which would legally apply to the response action if that action were not taken pursuant to Section 104 or Section 106 of CERCLA. A "relevant and appropriate requirement" is one that, while not legally applicable to the remedial action, addresses problems or situations sufficiently similar to those encountered at the site that their use is well suited to the remedial action.

Non-promulgated advisories or guidance documents issued by federal or state governments do not have the status of ARARs; however, where no applicable or relevant and appropriate requirements exist, or for some reason may not be sufficiently protective, non-promulgated advisories or guidance documents may be considered in determining the necessary level of clean-up for protection of human health and the environment.

The clean-up levels identified by COT for the tributary surface water and groundwater are also ARARs -- i.e. promulgated State water quality standards and Federal Ambient Water Quality Criteria which are

applicable or relevant and appropriate to the remedial action. However, there are no State or Federal ARARs for the contaminants found in the soils and sediments at the Velsicol site. The COT/CPRC clean-up levels for these soils and sediments fall into the category of non-promulgated advisories, which were considered by the Agencies in determining the volumes of soils and sediments to be excavated from the unnamed tributary, 2 and 4 Ponds and plant production area to assure protection of human health and the environment.

The following is a description of the ARARs for the different components of the remedy and an explanation of how this remedial action meets those requirements:

### Soils and Sediment Excavation

The selected alternative calls for the excavation of contaminated soils from the plant production area and sediments from the unnamed tributary and 2 and 4 Ponds for consolidation and in-place stabilization on the 5/6 Pond. The ponds, tributary and plant production area are contiguous to the 5/6 Pond and constitute a single area of contamination.

RCRA Subtitle C closure requirements are applicable to areas of a site that contain RCRA characteristic or listed hazardous waste and that waste was received or managed after November 19, 1980, the effective date of RCRA. If the 2 and 4 Ponds, unnamed tributary and plant production area meet this definition they must be closed in accordance with RCRA closure requirements.

The 2 and 4 Ponds are used to collect and store storm water prior to its disposal by deep well injection. The storm water is not considered a "hazardous waste" as defined under RCRA. The unnamed tributary sediments became contaminated prior to the effective date of RCRA from discharges of plant process waste and storm water runoff. Thus, the RCRA closure requirements are not applicable to the 2 and 4 Ponds or the unnamed tributary. The plant production area includes hazardous waste storage and pretreatment tanks, a drum storage area, former tank farm and chemical manufacturing facilities. Soils beneath the production area are contaminated with hazardous constituents. This contamination is due to leaks and spills from these facilities over the history of plant operation. It is not known whether contamination occurred before or after the effective date of RCRA; nor was the soil contamination attributable to any specific hazardous waste management unit. The RCRA Subtitle C closure requirements are applicable to the RCRA-regulated hazardous waste management facilities in the plant production area, such as the storage and pretreatment tanks; these requirements would not be applicable to those portions of the plant production area not used for management of RCRA hazardous waste.

Nevertheless, the entire production area as well as the 2 and 4 Ponds and tributary sediments contain RCRA hazardous constituents that have been released, or have the potential to be released to

groundwater or surface water offsite. Therefore, the Agencies determined that RCRA closure requirements are relevant to remediation of these areas. After consideration of RCRA Subtitle C closure requirements, it was determined that "clean closure" is the appropriate standard for the unnamed tributary. The on-site portion of the tributary and the off-site portion of the tributary will be excavated until background levels of chlordane and heptachlor in Illinois streams has been attained. For the plant production and the 2 and 4 Pond areas, "clean closure" is not possible because of existing groundwater contamination beneath the facility. "Closure in-place" is not deemed appropriate because the contaminants in the plant area soils and 2 and 4 Pond sediments are the primary source of this groundwater contamination, and one of the goals of CERCLA is removal to the maximum extent practicable of source materials. Leaving these materials in-place would greatly increase the time necessary for groundwater remediation. It was determined that a "hybrid closure" approach is more appropriate under the circumstances at the facility. This approach combines certain appropriate aspects of RCRA "clean closure" with appropriate aspects of RCRA "closure in-place." At this site, all equipment and structures in the production area will be decontaminated or disposed of as hazardous waste; contaminated soils as identified by sampling in the RI will be removed to the 5/6 Pond and a groundwater collection and treatment/disposal system will capture and treat/dispose of contaminated groundwater. The excavation of plant soils and 2 and 4 Pond sediments will remove the threat to human health from exposure through contact, as well as minimize the source of groundwater contamination to be remediated.

RCRA Section 3004(u) and 3004(v) and 40 CFR Part 264, Subpart F require corrective action for releases of hazardous wastes or constituents from any "solid waste management unit" (SMU) at facilities requiring a RCRA operating permit, including a post-closure permit. Velsicol operated under RCRA interim status until August 30, 1988, and SMUs at the facility are subject to these corrective action requirements as a part of closure of the facility. The 2 and 4 Ponds are not SMUs because the storm water runoff is not a "solid waste" under RCRA. The tributary is a SMU, which is defined by USEPA as "any discernable waste management unit from which hazardous constituents may migrate, irrespective of whether the unit was intended for the management of solid or hazardous waste." Prior to 1964, and during uncontrollable storm events thereafter, the unnamed tributary was used to receive discharges from waste management units. USEPA has also interpreted the term "solid waste management unit" to include areas associated with production processes at facilities which have become contaminated as a result of "routine and systematic" release of wastes or hazardous constituents from wastes." A product may become a waste if it is abandoned or discarded. The production area soils at the Velsicol site have become contaminated from releases from production processes; it is not known whether these

releases were "systematic" or "routine." Nevertheless, RCRA corrective action authorities are relevant and appropriate to the remediation of the plant production area because releases of hazardous constituents to the soils and groundwater in this area have occurred which threaten human health and the environment, and releases to the groundwater will continue to occur unless the source material is removed. In conformance with these authorities, contaminated soils in the tributary and plant production area are being removed and contaminated groundwater under the plant area will be remediated (see discussion below pertaining to groundwater collection and treatment/disposal).

#### Groundwater Collection and Treatment/Disposal

This component of the remedial action consists of collection of groundwater in a trench system situated between the plant production area and the 5/6 Pond. This system will capture contaminants migrating from the 5/6 Pond, as well as the plant production area. As stated above, RCRA Section 3004(u) and Subpart F regulations apply to releases from solid waste management units at RCRA facilities.

The RCRA Subpart F regulations require the establishment of concentration limits for hazardous constituents released from solid waste management units and the treatment of groundwater exceeding those limits at the "point of compliance" as defined at 40 CFR 264.95. The "point of compliance" for groundwater migrating from the plant production area is its western boundary. The COT health-based clean-up levels for the groundwater were determined by the Agencies to constitute appropriate alternate concentration limits (ACLs). USEPA/IEPA may adopt an ACL as the groundwater protection standard in lieu of "background levels" or "maximum concentration limits" if the ACL "will not pose a substantial present or potential hazard to human health or the environment as long as the (ACL) is not exceeded". Groundwater collected from the trench system at the point of compliance will be treated to achieve the COT levels. Since the affected groundwater is not used for drinking water, Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) under the Safe Drinking Water Act are not "applicable" standards. Further, since there is no potential for future use of the affected groundwater as drinking water between the source of contamination and the point of discharge to the unnamed tributary, MCLs and MCLGs are not "relevant and appropriate" standards.

The discharge of treated groundwater to the unnamed tributary is regulated by the Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES). Discharge to the tributary is an on-site action; as such the site is exempt from the procedural and administrative requirements of the NPDES (including the requirement to have a discharge permit from the state). However, substantive requirements of the Clean Water Act must be complied with. Thus,

for this site, discharge limits must be established which are based on application of Best Available Technology (CWA Section 301(b)) or more stringent limits, if necessary, to assure that the receiving water meets applicable state water quality standards (CWA Section 302). The CWA also requires monitoring of the discharge to assure that the discharge limits are being met (40 CFR Part 122.44(1)). The COT clean-up levels for groundwater referred to above satisfy the CWA requirements for discharge limits for the discharge of groundwater to the unnamed tributary. Since the COT levels are based on the state water quality standards, where available, and, Federal Ambient Water Criteria, they will ensure that the general use water quality standards are maintained in the unnamed tributary.

(An alternative to treatment of contaminated groundwater and discharge to the unnamed tributary proposed by Velsicol, is to discharge the groundwater directly to deep injection well No. 2 on-site. In this case that injection well must meet the operating requirements of the Safe Drinking Water Act, Underground Injection Control (UIC) Program, 40 CFR Parts 144-147. Also, the disposal of the groundwater in injection well No. 2 must be in compliance with all land disposal restrictions promulgated in 40 CFR Part 148 which are currently in effective or may become effective during the course of the groundwater remediation process).

Section 303 of the CWA requires States to promulgate state water quality standards for surface bodies of water in the state, based on designated uses of the water bodies. The state water quality standards are based on Federal Ambient Water Quality Criteria developed by USEPA. CERCLA remedial actions involving surface bodies of water must ensure that applicable state water quality standards are met. CERCLA also provides that Federal Ambient Water Quality Criteria should be met where relevant and appropriate to the circumstances at the site. The unnamed tributary and East Mill Creek are designated general use waters under Illinois Administrative Code (IAC) Section 303.201 and must meet general use water quality standards specified in 35 IAC Section 302, Subpart B. (The general use standards protect aquatic life from toxic substances but do not apply to waters used for public water supplies.) Thus, the general use water quality standards are applicable clean-up standards for remediation of the tributary, where available, and are supplemented by Ambient Water Quality Criteria for protection from consumption of fish which were determined to be relevant and appropriate.

#### Consolidation of Contaminated Soils and Sediments on Existing 5/6 Pond

Excavated soils and sediments will be consolidated and stabilized in-place on top of the 5/6 Pond. Hazardous waste was managed in the 5/6 Pond after July 26, 1982; therefore, the 5/6 Pond is a RCRA "regulated unit" subject to all Subtitle C requirements. The 5/6 Pond will be closed leaving previously disposed wastes and the

excavated soils and sediments from this CERCLA action in place. Therefore, pursuant to 40 CFR 264.310, the 5/6 Pond must have a final cover which minimizes liquid migration, minimizes maintenance, promotes drainage, accommodates subsidence and has a permeability less than or equal to the permeability of the natural subsoils present. This remedial action provides for a final cover with a synthetic liner that meets these requirements, having a permeability of  $10^{-11}$  cm/sec. This permeability is much greater than that of the bottom clay layer of the 5/6 Pond.

In addition to a final cover, the regulation requires long-term maintenance and monitoring to maintain the cap's integrity, ensure collection of leachate, prevent damage from run-on and runoff and ensure operability of a RCRA-complaint groundwater monitoring system. RCRA land disposal restrictions govern the disposal of hazardous wastes in landfills. Because contaminated soils and sediments will be consolidated and stabilized within the same area of contamination, specifically on top of the 5/6 Pond, "disposal" will not occur and these requirements would not be applicable to this remedial action. Moreover, the concentration of the hazardous constituents in the soils and sediments to be consolidated and stabilized on the 5/6 Pond is significantly lower than that of the hazardous wastes previously disposed of and stabilized in the 5/6 Pond. Therefore, the addition of this remedial volume of stabilized material will have no significant effect on the mobility of contaminants from the unit. For this reason any land disposal restrictions affecting hazardous constituents found in these soils and sediments, which may become effective prior to completion of this remedy, are determined not to be relevant and appropriate to consolidation of the CERCLA soils and sediments on the 5/6 Pond.

RCRA Subpart F groundwater protection regulations also apply to the 5/6 Pond. When hazardous constituents are detected at the "point of compliance", a groundwater monitoring system must be maintained and groundwater protection standards established and met.

For the 5/6 Pond the "point of compliance" is the western boundary of the 5/6 Pond. Since hazardous constituents have been detected at this boundary, existing groundwater monitoring wells will continue to be used for compliance monitoring pursuant to 40 CFR 264.99. This existing system complies with the requirements of 40 CFR 264.97. The ACL levels identified above are the concentration limits that will trigger corrective action if monitoring shows they are being exceeded. At the present time, these levels have not been exceeded.

The groundwater collection trench located between the 5/6 Pond and the plant production area is calculated to create a zone of capture which will include any releases from the 5/6 Pond. However, the monitoring wells on the western boundary of the 5/6 Pond will identify any migration of contaminants that might evade capture in the trench system. If such migration occurs at levels exceeding the ACLs, appropriate corrective action will be implemented.

### Cost Effectiveness

The total present worth cost of the preferred alternative in the proposed plan was \$9,080,910. The cost of the selected remedy as negotiated with Velsicol in their good faith proposal has not been calculated, but is comparable to the preferred alternative. This preferred alternative was selected over less expensive alternatives which do not provide for treatment of soils and groundwater because the additional protection provided by treatment was judged to outweigh the cost. The more expensive alternatives, including construction of a new on-site RCRA compliant cell for disposal of treated soils, were not judged to be significantly more protective than use of the existing 5/6 Pond as proposed in the selected remedy.

### Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy includes treatment of excavated soils with chemical stabilization and provides for treatment of collected groundwater prior to discharge from the site. This remedy was judged to provide the best balance of protectiveness, effectiveness and cost. It was selected and has been modified to be compatible with overall plans for closure of the site. This remedy utilizes treatment technologies to the maximum extent practicable for this site and offers a greater degree of permanence than capping without treatment.

### Preference for Treatment as a Principal Element

The selected remedy treats both contaminated soils and groundwater under an off-site discharge scenario; thus, it utilizes treatment to address the principal threats posed by the site.

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APPENDIX A  
FIGURES AND TABLES  
FOR  
ROD DECISION SUMMARY  
VELSICOL/MARSHALL, ILLINOIS SITE

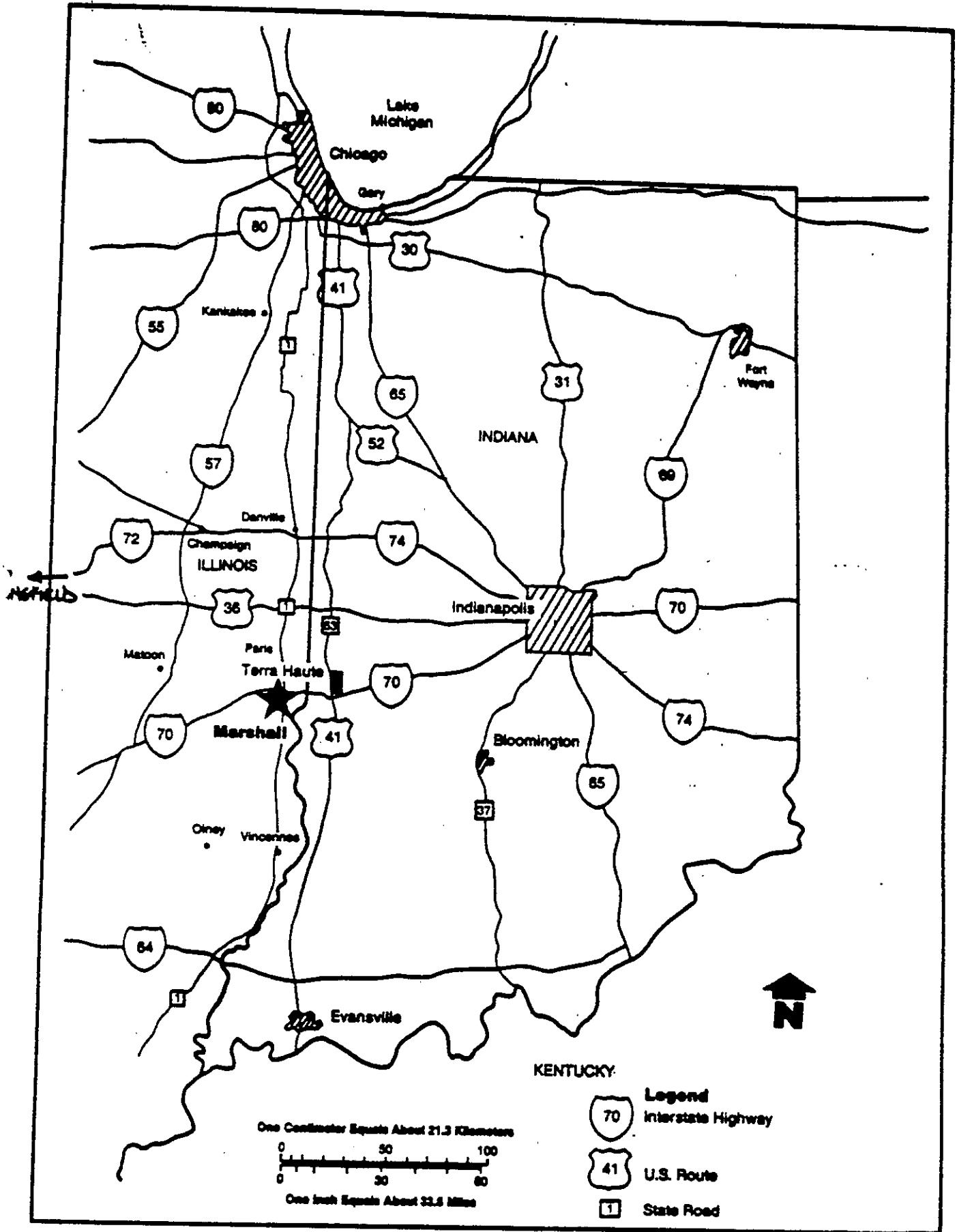


FIGURE 1 LOCATION MAP, VELSICOL CHEMICAL CORP., MARSHALL IL.

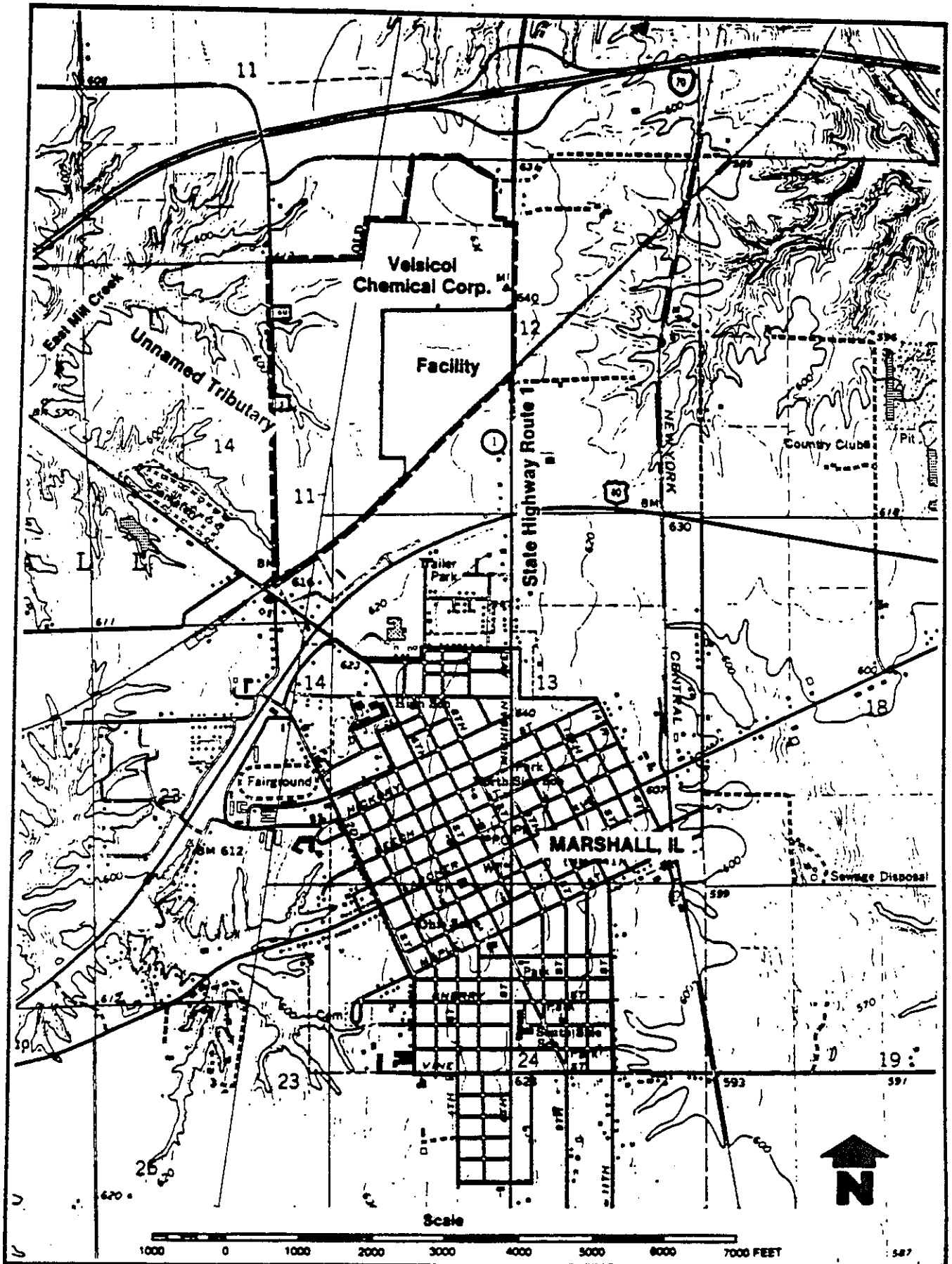
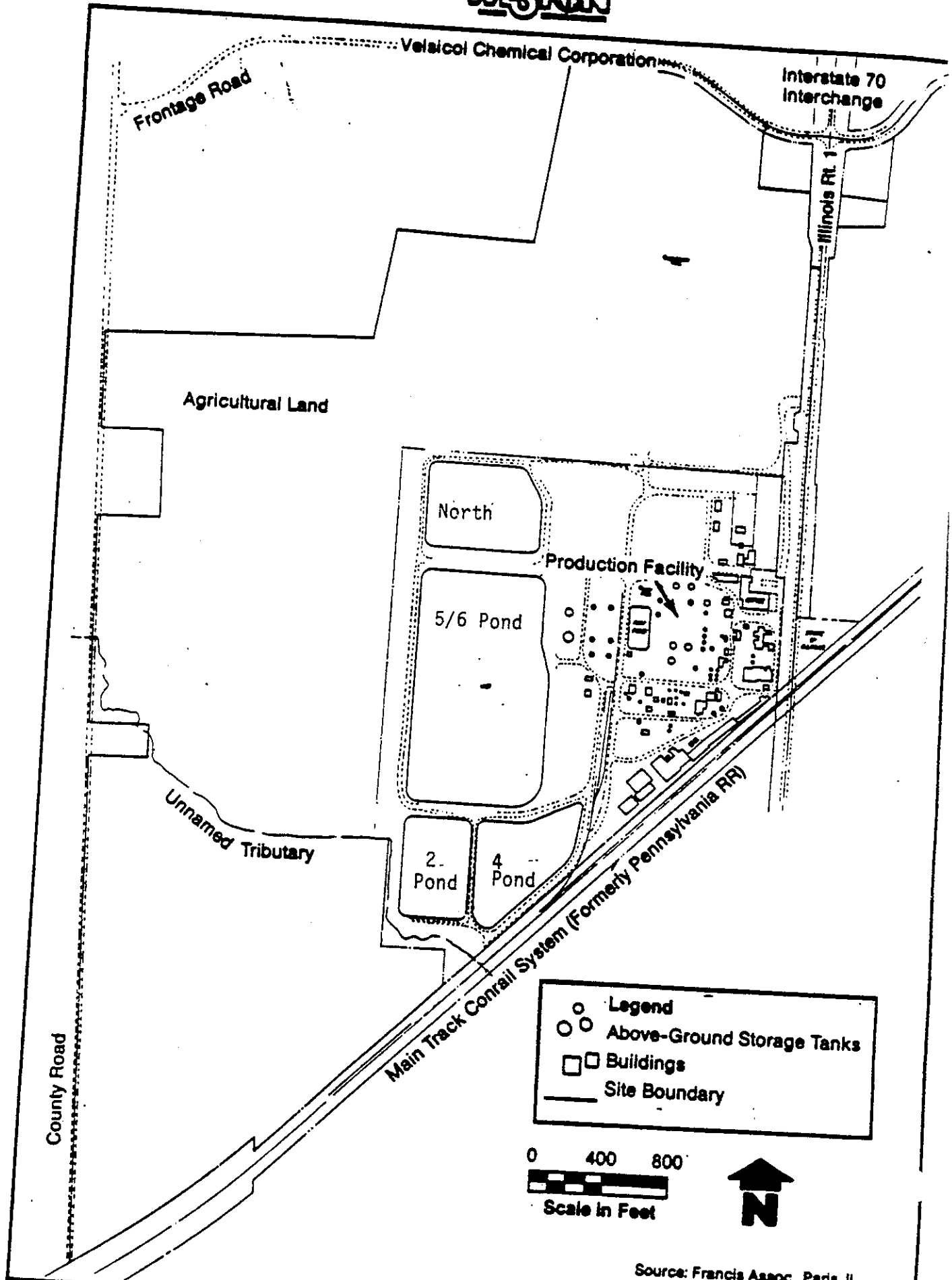


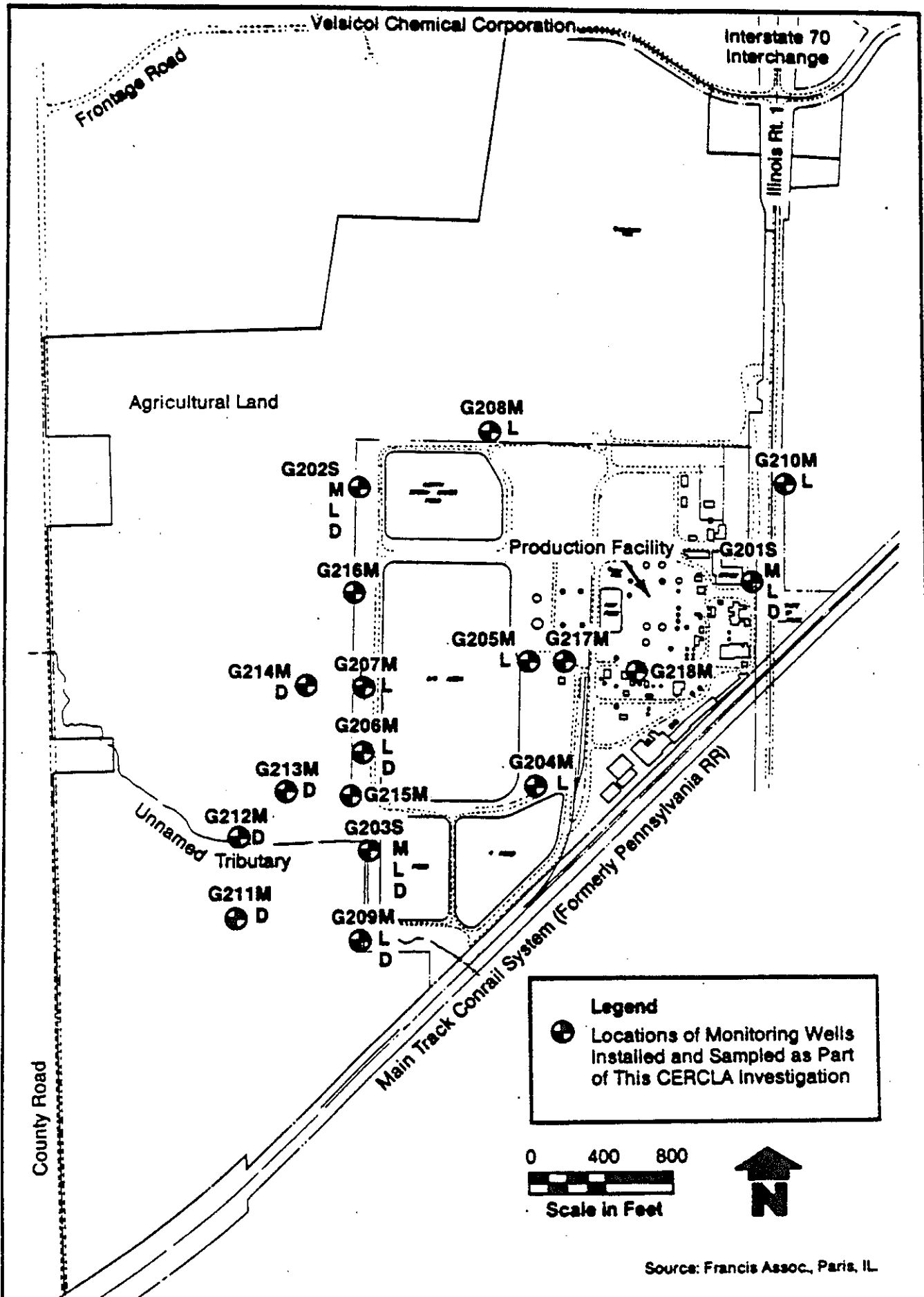
FIGURE 2 VICINITY MAP - VELSICOL CHEMICAL CORP., MARSHALL, IL

**WESTON**



Source: Francis Assoc., Paris, IL

FIGURE 3\* - SITE MAP VELSICOL CHEMICAL CORPORATION



**Legend**

⊕ Locations of Monitoring Wells Installed and Sampled as Part of This CERCLA Investigation



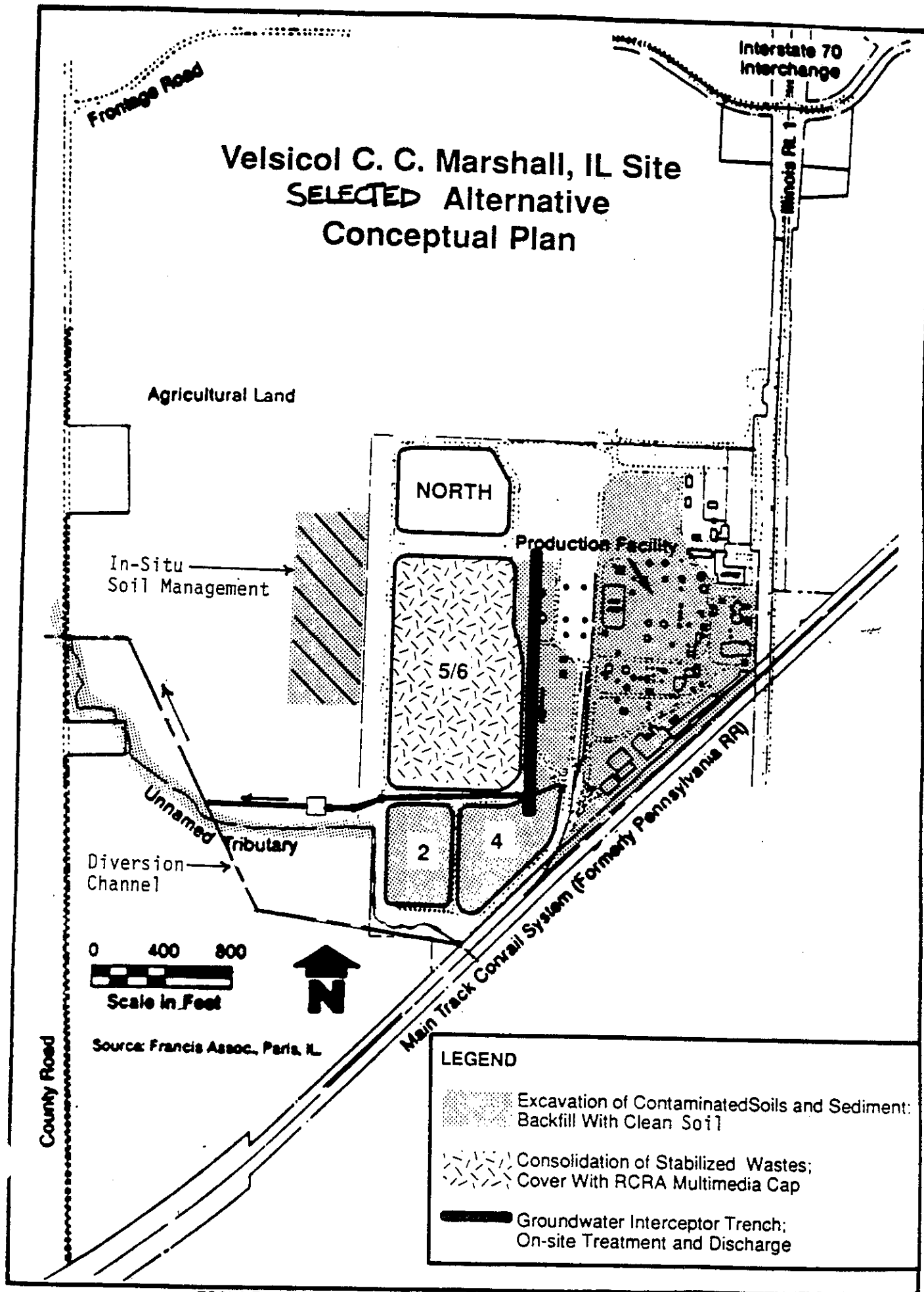


FIGURE 5

VELSICOL CHEMICAL CORPORATION

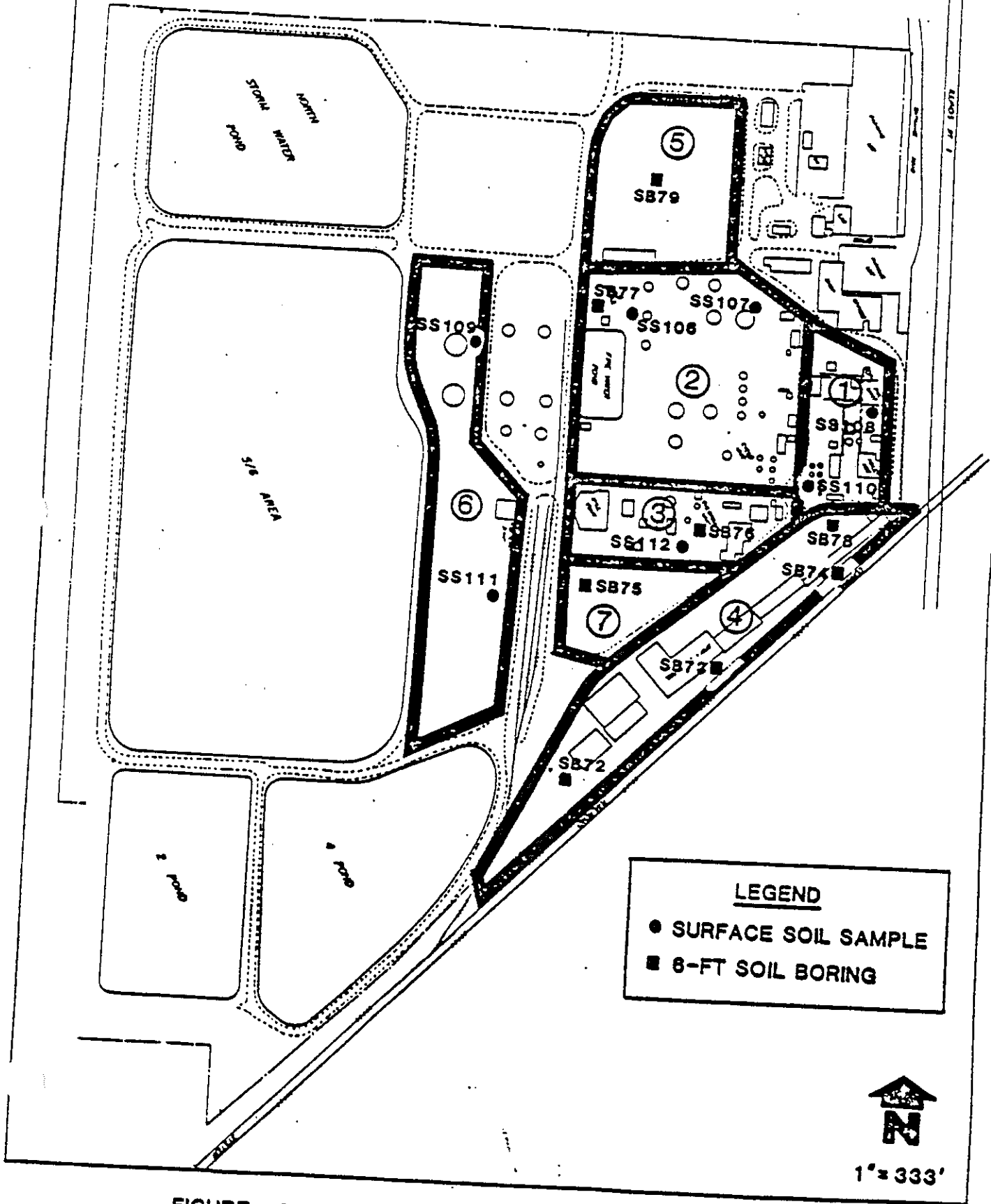
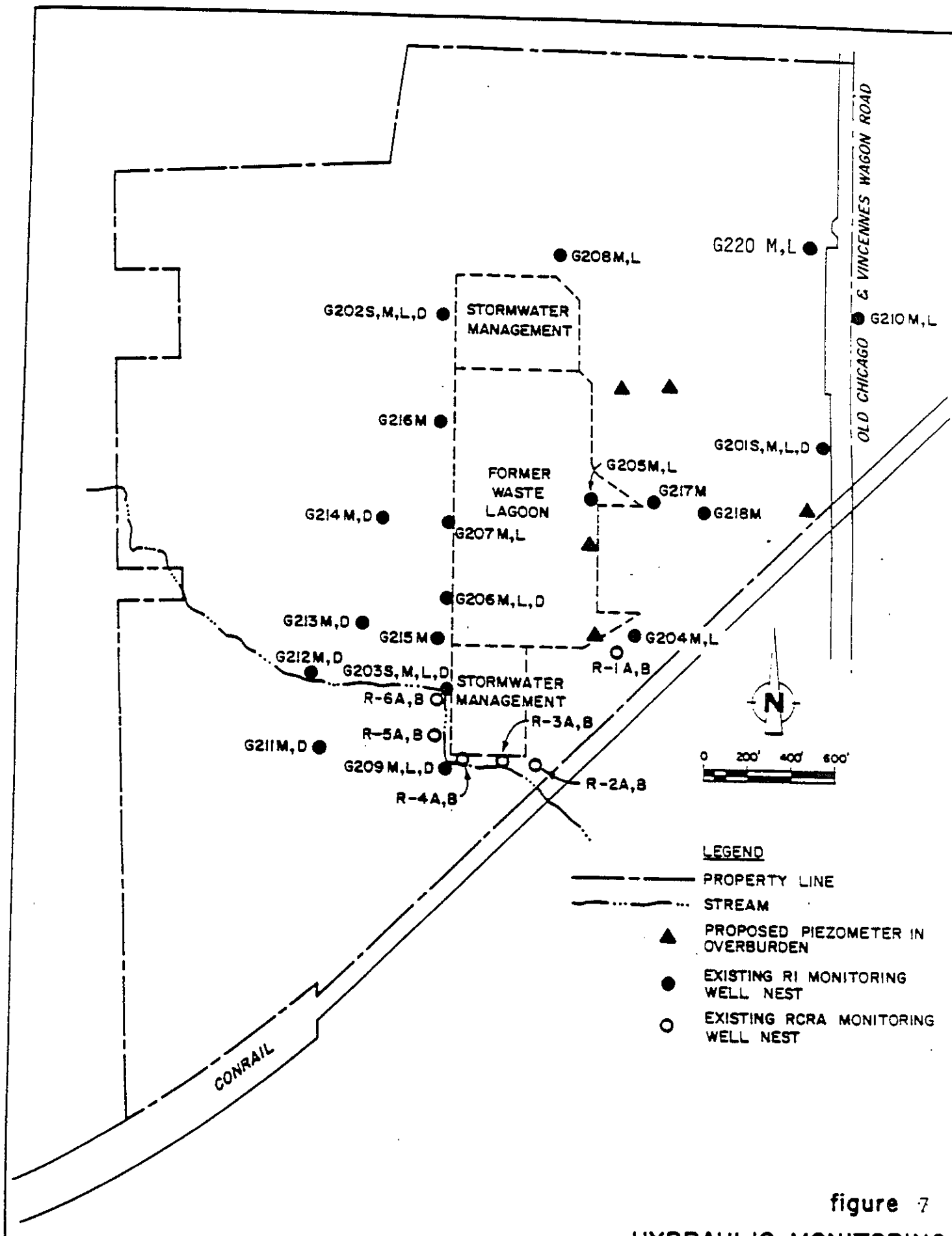


FIGURE 6 DIVISION OF PLANT AREA FOR SOIL SAMPLING

FIGURE 6 - EXPLANATION

DIVISION OF PLANT AREA SOILS

<u>Section</u>	<u>Description</u>	<u>Sample Taken From Section</u>
1	RMC Area	SS108, SS110
2	Central Production Area	SS106, SS107, SB77
3	Chlordane Production Area	SS112, SB76
4	Resin/Blending/Storage/Loading	SB72, SB73, SB74, SB78
5	Former RMC Storage Tanks	SB79
6	Dicyclo Storage and Former RMC Storage Area	SS109, SS111
7	BF <sub>3</sub> Area	SB75



- LEGEND**
- PROPERTY LINE
  - ... STREAM
  - ▲ PROPOSED PIEZOMETER IN OVERBURDEN
  - EXISTING RI MONITORING WELL NEST
  - EXISTING RCRA MONITORING WELL NEST

figure 7  
HYDRAULIC MONITORING

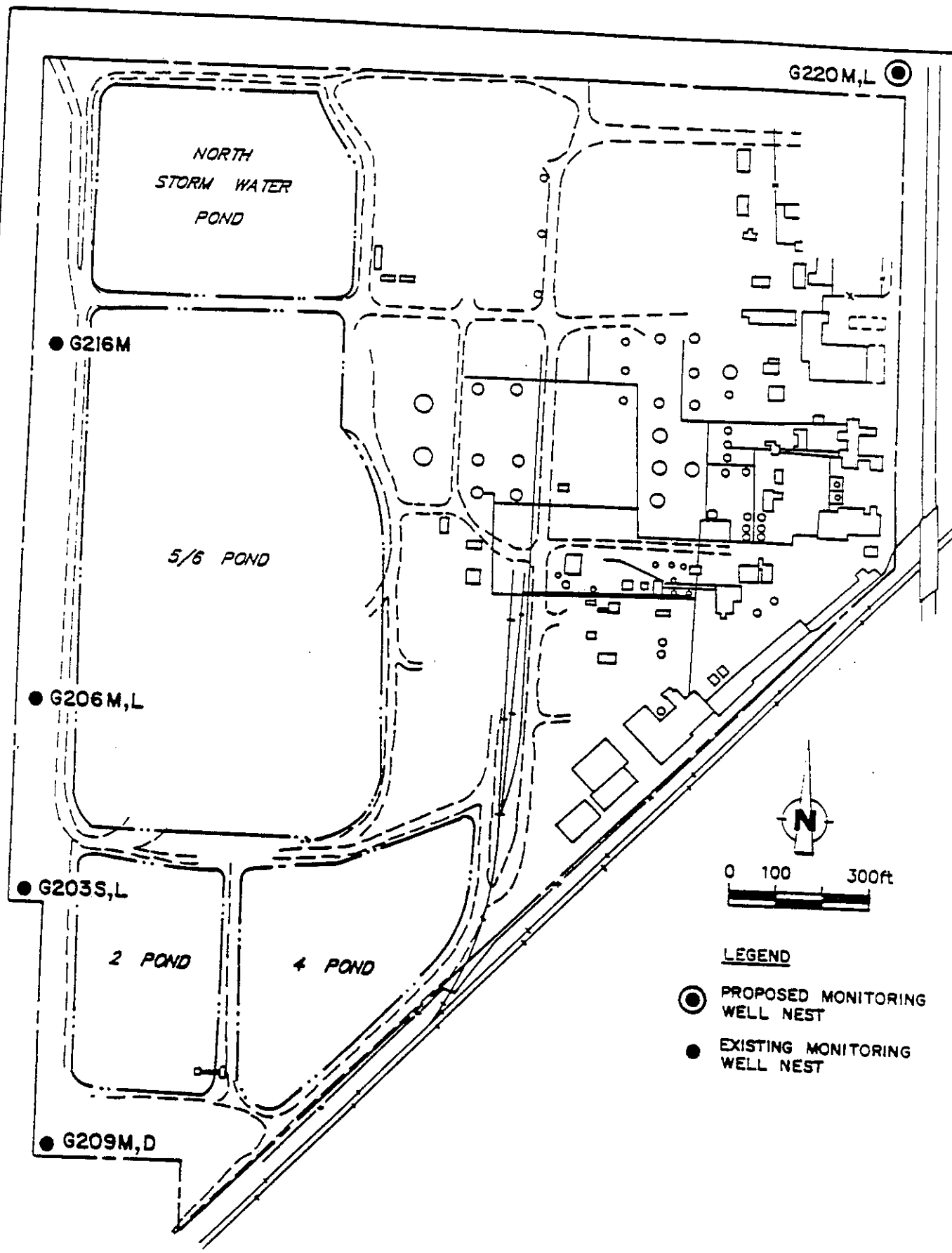


figure 3  
 WATER QUALITY MONITORING

TABLE 1

RANGE OF SELECTED CHEMICAL CONSTITUENTS  
DETECTED AT THE VELSICOL SITE IN GROUNDWATER

<u>Volatile Organics</u>	<u>West of Plant Area*</u>		<u>Plant Area**</u>	
	<u>Shallow Wells</u> <u>(ug/l)</u>	<u>Deep Wells</u> <u>(ug/l)</u>	<u>Shallow Wells</u> <u>(ug/l)</u>	<u>Deep Wells</u> <u>(ug/l)</u>
1,2-Dichloroethane	ND	ND	ND-15J	ND
1,2-Dichloroethane	ND	ND	ND-14J	ND
Benzene	ND-11	ND-2J	ND-280,000	ND-3.3J
Bromomethane	ND	ND	ND-67	ND
2-Butanone	ND	ND-66	ND-120	ND-210
Carbon Disulfide	ND	ND	ND-1300	ND
Carbon Tetrachloride	ND	ND-1J	ND-210,000	ND
Chlorobenzene	ND-2.8J	ND-2.1J	ND-1100	ND
Chloroform	ND-4.9	ND-6	ND-14,000	ND
Ethylbenzene	ND	ND	ND-1100	ND-1.1J
2-Hexanone	ND	ND	ND-130	ND
4-Methyl-2-pentanone	ND	ND	ND-470	ND
Styrene	ND	ND	ND-1800	ND
Toluene	ND-5.7	ND-2J	ND-12,000	ND-1.9J
Trichloroethylene	ND	ND	ND-6.8J	ND
Xylenes (Total)	ND	ND	ND-3000	ND
<u>Semivolatile Organics</u>				
Acenaphthene	ND	ND	ND-6J	ND
Benzo(a)pyrene	ND	ND	ND-2	ND
Benzoic Acid	ND	ND	ND-220J	ND
Benzyl Alcohol	ND	ND-12	ND-170	ND
Bis(2-ethyl hexyl)phthalate	ND-890 <sup>(1)</sup>	ND-430 <sup>(1)</sup>	ND-14J	ND-2J
Butylbenzylphthalate	ND-22	ND-25	ND-4J	ND-2.1J
Dibenzofuran	ND	ND	ND-3J	ND
1,2-Dichlorobenzene	ND	ND	ND-56	ND
1,3-Dichlorobenzene	ND	ND	ND-12	ND
1,4-Dichlorobenzene	ND	ND	ND-110	ND
2,4-Dimethylphenol	ND	ND	ND-4J	ND
Dimethylphthalate	ND-1J	ND	ND	ND-19
4,6-Dinitro-2-methylphenol	ND	ND-6	ND	ND
Di-n-Butylphthalate	ND-2J	ND-2J	ND-6J	ND
Di-n-octylphthalate	ND-9J	ND-15	ND-14	ND-21
Fluorene	ND	ND	ND-5J	ND
Hexachlorocyclopentadiene	ND	ND	ND-100	ND
Hexachloroethane	ND	ND	ND-13	ND
2-Methylnaphthalene	ND	ND	ND-1100	ND-2J
Phosphorane	ND	ND	ND-220	ND-2J
Naphthalene	ND	ND-0.58J	ND-2200	ND-5J
Nitrobenzene	ND	ND	ND-40	ND

TABLE 1 (continued)

RANGE OF SELECTED CHEMICAL CONSTITUENTS  
DETECTED AT THE VELSICOL SITE IN GROUNDWATER

	<u>West of Plant Area*</u>		<u>Plant Area**</u>	
	<u>Shallow Wells</u> <u>(ug/l)</u>	<u>Deep Wells</u> <u>(ug/l)</u>	<u>Shallow Wells</u> <u>(ug/l)</u>	<u>Deep Wells</u> <u>(ug/l)</u>
<u>Semivolatile Organics</u>				
Pentachlorophenol	ND	ND	ND-3J	ND-2J
Phenanthrene	ND	ND	ND-6J	ND
Phenol	ND	ND	ND-610	ND
<u>Pesticides</u>				
Chlordane	NS	ND	ND-0.25J	ND-0.65
A-BHC	NS	ND	ND-9.7	ND
D-BHC	NS	0.18	ND-85	ND
Transnonochlor	ND	ND	ND	ND-0.23
<u>Inorganics</u>				
Antimony	ND	ND	ND	ND
Arsenic	ND-2.8	ND-25	ND	ND
Barium	ND-325	ND-192	ND-586	ND-51
Beryllium	ND-2.2	ND-3.1	ND-2.5	ND
Boron	ND-41,700	ND-455	ND-157	ND-179
Cadmium	ND-5.5	ND-3.0	ND	ND
Chromium	ND-18	ND-11	ND-15	ND-14
Cobalt	ND-0.6	ND-6.0	ND-60	ND
Copper	ND-32	ND-14	ND-12	ND-12
Lead	ND-13	ND-18	ND-7.7	ND
Mercury	ND-0.4	ND-0.3	ND-0.4	ND
Nickel	ND-9.9	ND-104	ND-300	ND-104
Selenium	ND-6.3	ND	ND	ND
Thallium	ND	ND-5.5	ND-2.0	ND
Vanadium	ND-14	ND-10	ND-13	ND-4.4
Zinc	ND-2160	ND-148	ND-114	ND-114

NOTE: \*Groundwater monitoring wells west of the plant area include the following well locations: G202, G203, G206, G207, G209, G211, G212, G213, G214, G215 and G216.

\*\*Groundwater monitoring wells in the plant area include the following locations: G201, G204, G205, G208, G210, G217 and G218.

NS - Not sampled.

ND - Not detected.

J - Value reported is greater than the instrument detection limit, but less than the required contract detection limit.

214M and D wells had high values only during one phase of sampling and was not detected during the other round of sampling. High values obtained may be due to sample contamination.

TABLE 2

**RANGE OF SELECTED CHEMICAL CONSTITUENTS  
DETECTED AT THE VELSICOL SITE IN SOILS**

	Agricultural Land		Plant Area	
	0-1.5 ft (ug/kg)	>1.5 ft (ug/kg)	0-1.5 ft (ug/kg)	>1.5 ft (ug/kg)
<u>Volatile Organics</u>				
Benzene	ND	1	ND-180,000	ND-5700
2-Butanone	ND	ND	ND-14J	ND-860J
Carbon Disulfide	ND	ND	ND-2J	ND-7
Ethylbenzene	ND	ND	ND-340,000	ND-5200
Tetrachloroethylene	ND	ND-1	ND	ND
Toluene	ND	ND-2.1	ND-710,000	ND-8800
Styrene	ND	ND	ND-180,000	ND-6600
Xylenes (Total)	ND	ND	ND-280,000	ND-4100
<u>Semivolatile Organics</u>				
Acenaphthene	ND	ND	ND	ND-970
Acenaphthylene	ND-67	ND	ND	ND-800
Anthracene	ND	ND	ND	ND-280J
Benzo(a)anthracene	ND	ND	ND	ND-190J
2-Chlorophenol	ND	ND	ND-82J	ND-82J
Di-Ethylphthalate	ND	ND	ND	ND-180J
Hexachlorobutadiene	ND	ND	ND	ND-87J
bis(2-ethylhexyl)phthalate	ND	ND	ND-220J	ND-4600
Butylbenzylphthalate	ND	ND	ND-280J	ND-230J
Chrysene	ND	ND	ND	ND-990J
Dibenzofuran	ND	ND	ND	ND-1500
Di-n-butylphthalate	ND-170	ND-130	ND-210J	ND-320J
Di-n-octylphthalate	ND	ND	ND-320J	ND-860
Fluoranthene	ND	ND	ND-81J	ND-140J
Fluorene	ND	ND	ND-52J	ND-3600
Hexachlorocyclopentadiene	ND	ND	ND	ND-1600
2-Methylnaphthalene	ND-160	ND-79	ND-760	ND-30,0
2-Methylphenol	ND	ND	ND	ND-110J
Naphthalene	ND-300	ND-160	ND-120,000J	670-52K
N-Nitrosodiphenylamine	ND	ND-96	ND-200,000J	ND-42J
Phenanthrene	ND-200	ND-110	ND-370J	ND-10K
Phenol	ND	ND	ND	ND
Pyrene	ND-98	ND-57	ND-130J	ND-1100

TABLE 2 (continued)

RANGE OF SELECTED CHEMICAL CONSTITUENTS  
DETECTED AT THE VELSICOL SITE IN SOILS

<u>Pesticides</u>	<u>Agricultural Land</u>		<u>Plant Area</u>	
	<u>0-1.5 ft</u> <u>(ug/kg)</u>	<u>&gt;1.5 ft</u> <u>(ug/kg)</u>	<u>0-1.5 ft</u> <u>(ug/kg)</u>	<u>&gt;1.5 ft</u> <u>(ug/kg)</u>
Aldrin	ND-77	ND	ND	ND
Dieldrin	ND-110	ND-24	ND	ND
Chlordane	ND-760	ND-120	ND-69,000	ND-10,50
Heptachlor	ND-17	ND-18	ND-4300	ND-370
Heptachlor Epoxide	ND-56	ND-17	ND-1100	ND-240
Alpha Chlordane	ND-9.6	ND-13	720-4200	ND-6400
Gamma Chlordane	ND-25	ND-5.3	860-7200	ND-4500
Oxychlordane	ND-3J	ND	ND	ND
Cis-nanochlor	ND-93.J	ND-0.3J	ND-1000	ND-150J
Transnanochlor	ND-9.3	ND-16	280-4400	ND-1100

Polychlorinated Biphenyls (PCBs)

None detected

<u>Inorganics</u>	<u>(mg/kg)</u>	<u>(mg/kg)</u>	<u>(mg/kg)</u>	<u>(mg/kg)</u>
Antimony	ND	ND	ND	ND
Arsenic	ND-6.6	ND-15	X	X
Barium	68-194	64-234	X	46-310
Beryllium	ND-0.9	ND-1.0	ND	ND
Boron	ND-64	ND-67	X	21-83
Cadmium	ND-6.3	0.3-11	X	1-7.2
Chromium	4.4-30	ND-41	X	ND-23
Cobalt	ND-28	ND-19	ND-8.9	ND
Copper	7.2-13	5-20	X	5.6-19
Lead	13-15	10-15	X	X
Mercury	ND-0.38	0.1-0.2	0.12-1.2	ND-0.42
Nickel	ND-21	3.7-22	X	9.6-25
Selenium	ND-2.4	2-4	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	0.3-0.5	ND	ND
Vanadium	13-47	24-44	X	16-49
Zinc	20-54	16-61	X	40-125

K - Multiply the results by 1,000.

ND - Not detected.

J - Value reported is greater than the instrument detection limit but less than required contract detection limit.

X - Results are invalid due to spike and duplicate analyses not within control limits.

TABLE 3

RANGE OF SELECTED CHEMICAL CONSTITUENTS  
DETECTED AT THE VELSICOL SITE IN  
POND WATER AND SEDIMENTS

	Pond 2		Pond 4	
	Water (ug/l)	Sediment (ug/kg)	Water (ug/l)	Sediment (ug/kg)
<u>Volatile Organics</u>				
Benzene	8.2-8.8	110	ND	3J-7J
Carbon Disulfide	ND	ND	ND	ND-25
Chloroform	1.1J-1.2J	ND	ND	ND
Ethylbenzene	ND	120	ND	ND
Toluene	4-4.2	ND	ND	ND
Xylenes (Total)	ND	350	ND	ND
<u>Semivolatile Organics</u>				
Acenaphthene	ND	380J	ND	ND
Bis(2-ethylhexyl)phthalate	1J-4J	ND	ND	ND-71J
Chrysene	ND	ND	ND	ND-55J
Di-n-butylphthalate	ND	ND	ND	41J-48J
Fluoranthene	ND	ND	ND	38J-51J
Fluorene	ND	760J	ND	ND-53J
2-Methylnaphthalene	ND	4600	ND	ND-220J
Naphthalene	ND	15000	ND	440J-920J
Phenanthrene	ND	1400	ND	96J-170J
Phenol	ND	ND	ND	ND
Pyrene	ND	340	ND	83-110
<u>Pesticides</u>				
Chlordane	45-50	24,000J	ND	ND
<u>Inorganics</u>				
	(mg/l)	(mg/kg)	(mg/l)	(mg/kg)
Arsenic	ND	ND	ND	7.5
Barium	ND	143	ND	170
Beryllium	ND	ND	ND	ND
Boron	337-346	ND	502	45
Chromium	53	ND	37	ND
Cobalt	ND	ND	ND	ND

TABLE 3 (continued)

RANGE OF SELECTED CHEMICAL CONSTITUENTS  
DETECTED AT THE VELSICOL SITE IN  
POND WATER AND SEDIMENTS

<u>Inorganics</u>	Pond 2		Pond 4	
	<u>Water</u> <u>(ug/l)</u>	<u>Sediment</u> <u>(ug/kg)</u>	<u>Water</u> <u>(ug/l)</u>	<u>Sediment</u> <u>(ug/kg)</u>
Copper	ND	19	ND	14
Lead	ND	30	ND	ND
Mercury	ND	ND	ND	ND
Nickel	ND	ND	ND	25
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Zinc	ND-31	76	ND	ND

ND - Not detected.

J - Value reported is greater than the instrument detection limit but less than the required contract detection limit.

TABLE 4

RANGE OF SELECTED CHEMICAL CONSTITUENTS  
DETECTED AT THE VELSCOOL SITE IN UNNAMED CREEK  
WATER AND SEDIMENTS

<u>Volatile Organics</u>	Creek Water (ug/l)	Background (ug/l)*	Sediment (ug/kg)	Background (ug/kg)**
Carbon Disulfide	ND	ND	2J-9J	ND
Ethylbenzene	ND	ND	2J-48	ND
Styrene	ND	ND	ND-98	ND
Toluene	ND	ND	ND-5.9J	2J
Tetrachloroethene	ND	ND	ND	2J
Xylenes (Total)	ND	ND	ND-100	ND
<u>Semivolatile Organics</u>				
Acenaphthene	ND	ND	210J-4600	ND
Anthracene	ND	ND	53J-560	ND
Benzo(a)anthracene	ND	ND	53J-560	ND
Benzo(b)fluoranthene	ND	ND	72J-180J	56J-10
Bis(2-ethylhexyl)phthalate	ND-41	ND-18	ND-310	ND-110
Chrysene	ND	ND	ND-97J	ND-38J
Dibenzofuran	ND	ND	ND-250J	ND
Di-n-butylphthalate	ND-132	ND	1J-132	110J-3
Di-n-octylphthalate	ND-2J	ND	ND-45J	ND-56J
Fluoranthene	ND	ND	ND-280J	ND-82J
Fluorene	ND	ND	ND-4300	ND
2-Methylphenol	ND	ND	ND-910	ND
Naphthalene	ND	ND	ND-99K	ND
N-Nitrosodiphenylamine	ND-4J	ND-3J	ND-750	52J-92
Pentachlorophenol	ND-5J	ND	ND	ND
Phenanthrene	ND	ND	ND-5500	ND
Phenol	ND-51	ND	ND	ND
Pyrene	ND-1J	ND	ND-2300	ND
<u>Pesticides</u>				
Chlordane	ND	ND	ND-250,000	350-61

TABLE 4 (Continued)

RANGE OF SELECTED CHEMICAL CONSTITUENTS  
 DETECTED AT THE VELSICOL SITE IN UNNAMED CREEK  
 WATER AND SEDIMENTS

<u>Inorganics</u>	<u>Creek Water (ug/l)</u>	<u>Background (ug/l)*</u>	<u>Sediment (mg/kg)</u>	<u>Background (mg/kg)**</u>
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND-11	ND
Barium	ND-130J	ND	42-196	111-196
Beryllium	ND	ND	ND	ND-1.3
Boron	ND-561	ND	ND-80	ND-60
Cadmium	ND	ND	3.9-11	ND-9.2
Chromium	ND	ND	ND-31	ND
Cobalt	ND	ND	ND-32	ND-9.3
Copper	ND	ND	6.5-20	9.7-24
Lead	ND-4.6J	ND-3.2J	ND-21	ND
Mercury	ND-0.21	ND-0.26	ND-0.13	ND
Nickel	ND	ND	ND-42	12-26
Selenium	ND	ND	ND	ND
Silver	ND	ND-10	ND-1.5	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	10-49	34-210
Zinc	ND-123	21-53	ND-105	58-82

ND - Not detected.

J - Value reported is greater than the instrument detection limit but less than the required contract detection limit.

\* - Upstream of Velsicol site (sample SW80).

\*\* - Upstream of Velsicol site (sample SD93).

K - Multiply the results by 1000.

TABLE 5.  
POTENTIAL EXPOSURE PATHWAYS  
VESIOL SITE

Contaminant Source	Contaminant Release	Contaminant Transport	Exposure Point	Exposure Route	Exposed Population
Contaminated sediments	Sediments to water column	Creek water	Unroad tributary	Absorption/Ingestion	Bathers and children wading in creek
	Sediments to water column	fish	Unroad tributary	Ingestion/bioaccumulation	Aquatic organisms and people who consume fish
Contaminated soils	Direct contact	Trespassers	On site	Ingestion/dermal absorption	Trespassers and other future site users
	Wind or mechanical erosion	Air	On site	Inhalation	Trespassers and other site users
	Run-Off	Solidified in water and suspended in water	Unroad tributary	Ingestion/bioaccumulation	Aquatic organisms and people who consume fish

TABLE 6  
SUMMARY OF RISK ASSESSMENT  
VELSICOL SITE

<u>Exposure Pathway</u>	<u>Risk Characterization</u>
Fish Consumers	
No-Action Alternative	Excess cancer risk for maximum levels of contaminants is $6.00 \times 10^{-6}$ for adults. Sensitivity analysis indicates this risk may be as high as $2.3 \times 10^{-5}$ . Noncarcinogenic risks were not elevated.
Abandonment Alternative	Excess Cancer risk for maximum levels of contaminants is $7.23 \times 10^{-4}$ for adults. Noncarcinogenic risks were significantly elevated.
Trespassers under Abandonment Alternative	Excess cancer risks for maximum levels of contaminants were $1.25 \times 10^{-5}$ for dermal absorption and $1.0 \times 10^{-5}$ for inhalation exposures.  Noncarcinogenic risks were not elevated.

TABLE 7

SUMMARY OF DEVELOPED REMEDIAL ALTERNATIVES FOR THE VELISCOL/MARSHALL SITE

Number	SOIL AND SEDIMENT ALTERNATIVES (4)				REMEDY DESCRIPTION				Estimated Total Cost (1) (\$ Present Worth)	Estimated Implementation Period (Months) (2)
	Plant Soil Ag. Soil 2/4 Pond Sediment	Creek Sediment	Remedial Component	Excavation	Excavation	Containment Location	Cover System 5/6 Pond	Cover System New RCRA Cell		
1A-1	Excavation	Excavation	Containment Eng. Controls	Excavation	on 5/6 pond	Multimedia	-	5,554,800	24	
1A-2						Single Layer Clay	-	4,692,100 (6)	24	
1B-1					New on-site RCRA cell	Multimedia	Multimedia	7,128,000	36	
1B-2						Single Layer clay	Multimedia	6,265,300	36	
1C-1					on 5/6 pond	Multimedia	-	5,677,500	24	
1C-2						single layer clay	-	4,814,600	24	
1D-1					New on-site RCRA cell	Multimedia	Multimedia	7,250,600	36	
1D-2						single layer clay	Multimedia	6,367,800	36	
2A-1					on 5/6 pond	Multimedia	-	7,584,100 (5)	24	
2A-2						single layer clay	-	6,721,600	24	
2B-1					New on site RCRA cell	Multimedia	Multimedia	9,932,600	36	
2B-2						single layer clay	Multimedia	9,059,400	36	
2C-1					on 5/6 pond	Multimedia	-	7,644,000	24	

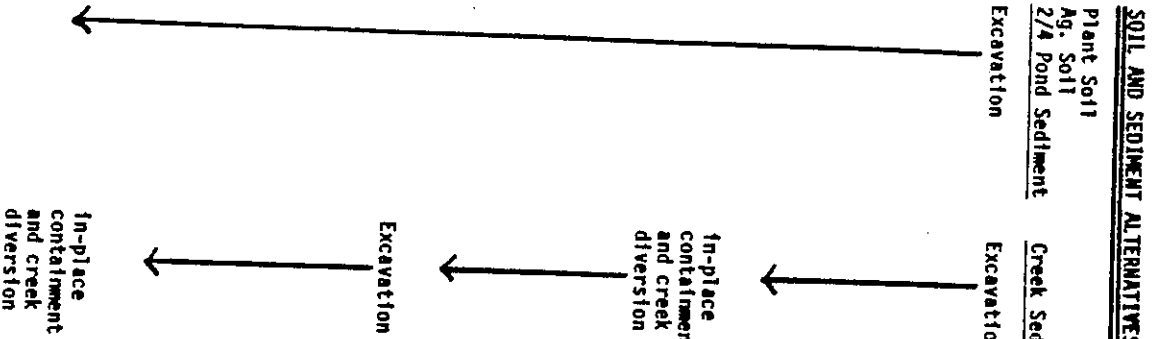


TABLE 7 (continued)

3 (No action source)	Left in place	Left in-place	none	none				
2C-2	~	~	~	"	single layer clay	-	6,781,200	24
2D-1	~	~	~	new on site RCRA cell	multimedia	multimedia	9,992,300	36
2D-2	~	~	~		single layer clay	multimedia	9,129,300	36

GROUNDWATER ALTERNATIVES

Number	Groundwater	Remedial Component	Estimated Total Cost(1) (\$ Present Worth)	Estimated Implementation Period (Months)(2)
GW-1	collection french drains	disposal in existing deep well	310,300	6
GW-2	collection french drains	on site treatment; off-site discharge	738,400	6
GW-3	(no action groundwater) place	none	710,700	-(3)

- (1) Estimated total remedial costs include capital construction costs and the present worth costs for: operation and maintenance, normal replacement, and monitoring for an assumed 30 year operating life. The FS report should be consulted for further details.
- (2) Estimated implementation period is for actual construction of remedial components following detailed design and contractor procurement activities.
- (3) Involves no remedial work but regular groundwater monitoring of site perimeter.
- (4) Total remedial action plan involves combination of one source action with one groundwater action alternative.
- (5) The costs of alternative 2A-1, modified for additional plant soil excavation estimated in the proposed plan due to removal of facilities is \$8,342,510.
- (6) The costs for alternatives utilizing a single layer cap have been revised from those presented in the proposed plan due to omission of the cost for a geotechnical filter fabric liner.

## INTRODUCTION TO TABLE 8

### CLEANUP OBJECTIVES RATIONALE

This case concerns an NPL site for which a Remedial Investigation (RI) and Endangerment Assessment (EA) have been submitted by an Agency contractor. The case has been referred to COT for the establishment of ARARs and "To be considered" cleanup objectives in order to proceed with the Feasibility Study. The RI has documented some areas of heavy contamination within the boundaries of the still-operating plant and areas of minor contamination within the facility's boundaries which are not part of the plant's daily operations. Off-site areas of contamination also exist, mainly as a result of past breaches in the water containment system. It is proposed that all RCRA and CERCLA concerns be addressed in one Record of Decision for the site. Therefore, cleanup objectives for clean closure are proposed for on-site and off-site areas of concern (soils, sediments, surface water, and groundwater).

Since the site is not known to be in the vicinity of any active wells, COT is proposing cleanup objectives based on general use water quality standards or Ambient Water Quality Criteria (AWQC) for protection of ingestion of contaminated aquatic organisms, where available. Illinois general use standards protect the state waters for aquatic life, agricultural use, primary and secondary contact use, industrial use and aesthetic quality, as defined in 35 IAC 302.208. Where a chemical has been detected in off-site surface waters or sediments, the more stringent of the general use standard or the AWQC is the preferred cleanup objective, while for the on-site areas of concern, the general use values are the proposed cleanup objectives. The chemicals of concern in each medium and the ranges of concentrations detected during the RI are listed in the contractor's "Request for ARARs" document. COT's recommendations for cleanup objectives will be limited to: (1) the indicator chemicals selected for the EA; (2) those chemicals found in the RI to be within two orders of magnitude of previously-established general use cleanup objectives or AWQCs for protection of ingestion of contaminated aquatic organisms; (3) those chemicals found in the RI which have not previously been addressed by COT (given for CPRC's consideration, even if the chemical may not exceed the proposed cleanup objective); and, (4) for inorganics, those chemicals found in the RI to be more than twice the background concentration in the same medium or to be above Illinois general use water quality standards. Where proposed objectives are below Acceptable Detection Limits (ADLs), the ADL is given for comparison.

Relevant data was not found to permit recommending cleanup objective for 2-hexanone, di-n-octylphthalate, dibenzofuran, alpha- and delta-BHC, cis- and trans-nonachlor, and oxychloridane. COT suggests that if these compounds are detected after the other cleanup objectives have been achieved, the appropriate objectives should be determined at that time.

TABLE -8

## CHEMICAL-SPECIFIC OBJECTIVES FOR GROUNDWATER AND SURFACE WATER

VELSICOL SITE			
<u>Parameter</u>	<u>Objective</u> ( $\mu\text{g/l}$ )	<u>Decision</u> <u>Basis</u>	<u>ADL</u> ( $\mu\text{g/l}$ )
Benzene <sup>1</sup>	2,000	1/10 TLM-96	NA <sup>2</sup>
Bromomethane	1,100	1/10 TLM-96	NA
Carbon Disulfide	13,500	1/10 TLM-96	NA
Carbon Tetrachloride	4,300	1/10 TLM-96	NA
Chlorobenzene	1,600 and Mixture 1	1/10 TLM-96	NA
Chloroform <sup>1</sup>	15.7 (Off Site)	AWQC, 10-6	NA
	1,300 (On Site)	Risk Level 1/10 TLM-96	NA
Ethylbenzene	3,200 (On & Off Site)	1/10 TLM-96	NA
2-Hexanone	ND <sup>3</sup>	---	---
4-Methyl-2-Pentanone	50,900	1/10 TLM-96	NA
Styrene <sup>4</sup>	2,505 (On & Off Site)	1/10 TLM-96	NA
Toluene	1,300 (On & Off Site)	1/10 TLM-96	NA
Xylenes (Total)	2,100 (On & Off Site)	1/10 TLM-96	NA
Benzoic Acid	18,000	1/10 TLM-96	NA
Benzyl Alcohol <sup>4</sup>	1,000	1/10 TLM-96	NA
Bis(2-Ethylhexyl)Phthalate	69 (On & Off Site)	1/10 TLM-96	NA
Butylbenzyl Phthalate	232	1/10 TLM-96	NA
Di-n-butyl Phthalate	73 (On & Off Site)	1/10 TLM-96	NA
Di-n-octyl Phthalate	ND	---	---
Dibenzofuran <sup>4</sup>	ND	---	---
Dinitro-orthocresol (4,6-Dinitro-2-Methylphenol)	23	1/10 TLM-96	50
1,2-Dichlorobenzene	560 and Mixture 1	1/10 TLM-96	NA
1,3-Dichlorobenzene	620 and Mixture 1	1/10 TLM-96	NA
1,4-Dichlorobenzene	430 and Mixture 1	1/10 TLM-96	NA

TABLE 8 (Continued)  
 CHEMICAL-SPECIFIC OBJECTIVES FOR GROUNDWATER AND SURFACE WATER

<u>Parameter</u>	<u>VELSICOL SITE Objective (ug/l)</u>	<u>Decision Basis</u>	<u>ADL (ug/l)</u>
Hexachlorocyclopentadiene <sup>1,4</sup>	0.7	1/10 TLM-96	4.0
Hexachloroethane <sup>4</sup>	98	1/10 TLM-96	NA
Isophorone <sup>4</sup>	14,500	1/10 TLM-96	NA
Naphthalene	230 (On & Off Site)	1/10 TLM-96	NA
2-Methyl Naphthalene	900 (On & Off Site)	1/10 TLM-96	NA
<u>Carcinogenic PNAs (Total)</u> <sup>1,5</sup>	0.031 (Off Site)	AWQC, 10 <sup>-6</sup> Risk Level	---
Benzo(a)anthracene	1.0 (On Site)	1/10 TLM-96	0.13
Benzo(a)pyrene	0.5 (On Site)	1/10 TLM-96	0.23
Benzo(b)fluoranthene	ND	---	0.18
Chrysene	ND	---	1.5
Dibenzo(a,h)anthracene	ND	---	0.3
<u>Non-carcinogenic PNAs (Total if no carcinogenic PNAs detected)</u> <sup>1,6</sup>	54 (Off Site)	AWQC	---
<u>Non-carcinogenic PNAs (Total if other carcinogenic PNAs detected)</u> <sup>1,6</sup>	5.4 (Off Site)	1/10 AWQC	---
Acenaphthene	60.8 (On Site)	1/10 TLM-96	18
Acenaphthalene	ND	---	10
Anthracene	2.3 (On Site)	1/10 TLM-96	6.6
Benzo(g,h,i)perylene	ND	---	0.76
Benzo(k)fluoranthene	ND	---	0.17
Fluoranthene	398 (On Site)	1/10 TLM-96	NA
Fluorene	ND	---	2.1
Indeno(1,2,3-c,d)pyrene	ND	---	0.43
Phenanthrene	10 (On Site)	1/10 TLM-96	6.4
Pyrene	ND	---	2.7

TABLE 8 (Continued)  
 CHEMICAL-SPECIFIC OBJECTIVES FOR GROUNDWATER AND SURFACE WATER  
 VELSICOL SITE

<u>Parameter</u>	<u>Objective</u> <u>(ug/l)</u>	<u>Decision</u> <u>Basis</u>	<u>ADL</u> <u>(ug/l)</u>
Nitrobenzene <sup>4</sup>	4,300	1/10 TLM-96	NA
N-Nitrosodiphenylamine	16.1 (Off Site)	AWQC, 10-6 Risk Level	10
	585 (On Site)	1/10 TLM-96	NA
Pentachlorophenol	2.4 (On & Off Site)	1/10 TLM-96	36
Phenols (Total) <sup>1,7</sup>	100	35 IAC 302.208	NA
Chlordane <sup>1</sup>	0.00048 (Off Site)	AWQC, 10-6 Risk Level	0.5
	0.2 (On Site)	1/10 TLM-96	
Alpha-BHC <sup>4</sup>	ND	---	0.03
Delta-BHC <sup>4</sup>	ND	---	0.09
t-Nonachlor <sup>4</sup>	ND	---	---
Barium	5,000	35 IAC 302.208	---
Boron	1,000	35 IAC 302.208	---
Copper	20	35 IAC 302.208	---
Lead <sup>1</sup>	100	35 IAC 302.208	---
Zinc	1,000	35 IAC 302.208	---

Mixture 1: In order to protect aquatic life against potential additive toxicity, no compound should exceed its individual cleanup objective. In addition, the following equation should also be satisfied (all values in ug/l):

$$\frac{[\text{Chlorobenzene}]}{1,600} + \frac{[1,2\text{-Dichlorobenzene}]}{560} + \frac{[1,3\text{-Dichlorobenzene}]}{620} + \frac{[1,4\text{-Dichlorobenzene}]}{430} \leq 1.0.$$

TABLE 8 (Continued)  
CHEMICAL-SPECIFIC OBJECTIVES FOR GROUNDWATER AND SURFACE WATER  
VELSICOL SITE

Notes:

- 1 Selected as indicator chemical.
- 2 Not applicable; cleanup objective greater than ADL.
- 3 Not determined; aquatic toxicity data not found.
- 4 Chemical not previously addressed by COT.
- 5 Cleanup objective for off-site surface waters is for the sum of the concentrations of listed carcinogenic PNAs. Cleanup objective for on-site groundwater and surface waters are the aquatic toxicity values for listed carcinogenic PNAs.
- 6 Cleanup objective for off-site surface waters is for the sum of the concentrations of listed non-carcinogenic PNAs if no carcinogenic PNAs are detected at appropriate ADLs. If carcinogenic PNAs are detected, cleanup objective will incorporate a 10-fold safety factor to protect against additive effects of non-carcinogenic PNAs (cleanup objective = 5.4 µg/l). Cleanup objective for on-site groundwater and surface waters are the aquatic toxicity values for listed non-carcinogenic PNAs.
- 7 Total phenols includes phenol (indicator chemical), 2-methylphenol, and 2,4-dimethylphenol.

TABLE 8 (continued)  
 CHEMICAL-SPECIFIC OBJECTIVES FOR SOIL AND SEDIMENT

VELSICOL SITE			
<u>Parameter</u>	<u>Objective (mg/kg)</u>	<u>Decision Basis</u>	<u>AOL (mg/kg)</u>
Benzene <sup>1</sup>	2.0	1/10 TLM-96	NA <sup>2</sup>
Ethylbenzene	3.2	1/10 TLM-96	NA
Toluene <sup>1</sup>	1.3	1/10 TLM-96	NA
Styrene <sup>3</sup>	2.5	1/10 TLM-96	NA
Xylenes (Total)	2.1	1/10 TLM-96	NA
Bis(2-Ethylhexyl) Phthalate	0.069	1/10 TLM-96	0.330
Butylbenzyl Phthalate	0.232	1/10 TLM-96	0.330
Di-n-butyl Phthalate	0.073	1/10 TLM-96	0.330
Di-n-octyl Phthalate	ND <sup>4</sup>	---	---
Diethyl Phthalate	ND	---	---
Dibenzofuran <sup>3</sup>	ND	---	---
Hexachlorobutadiene	0.45	1/10 TLM-96	0.230
Hexachlorocyclopentadiene <sup>1,3</sup>	0.00075	1/10 TLM-96	0.330
N-Nitrosodiphenylamine	0.585	1/10 TLM-96	0.330
Naphthalene	0.230	1/10 TLM-96	0.330
2-Methylnaphthalene	0.900	1/10 TLM-96	0.330
<u>Carcinogenic PNAs (Total)<sup>1</sup></u>	0.010	20 x TCLP	---
Benzo(a)anthracene	0.020	20 x TCLP	0.087
Benzo(a)pyrene	0.010	20 x TCLP	0.015
Benzo(b)fluoranthene	ND	---	0.012
Chrysene	ND	---	0.100
Dibenzo(a,h)anthracene	ND	---	0.020

TABLE - 8 (Continued)  
 CHEMICAL-SPECIFIC OBJECTIVES FOR SOIL AND SEDIMENT  
 VELSICOL SITE

<u>Parameter</u>	<u>Objective (mg/kg)</u>	<u>Decision Basis</u>	<u>ACL (mg/kg)</u>
<u>Non-carcinogenic PHAs (Total)</u> <sup>1</sup>	0.046	20 x TCLP	---
Acenaphthene	1.216	20 x TCLP	1.200
Acenaphthalene	ND	---	---
Anthracene	0.046	20 x TCLP	0.660
Benzo(g,h,i)perylene	ND	---	0.061
Benzo(k)fluoranthene	ND	---	0.011
Fluoranthene	7.960	20 x TCLP	0.140
Fluorene	ND	---	0.140
Indeno(1,2,3-c,d)pyrene	ND	---	0.029
Phenanthrene	ND	---	0.560
Pyrene	ND	---	0.180
Phenols (Total) <sup>1,5</sup>	100 µg/l (EP Tox)	35 IAC 302.208	NA
Chlordanes (Total) <sup>1,6</sup>	0.0002	1/10 TLM-96	0.080
Heptachlor <sup>1,3,7</sup>	0.0013	1/10 TLM-96	0.008
Oxychlordane <sup>3</sup>	ND	---	---
Cis-, Trans-Nonachlor <sup>3</sup>	ND	---	---
Barium	5,000 µg/l (EP Tox)	35 IAC 302.208	---
Boron	1,000 µg/l (EP Tox)	35 IAC 302.208	---
Copper	20 µg/l (EP Tox)	35 IAC 302.208	---
Lead <sup>1</sup>	100 µg/l (EP Tox)	35 IAC 302.208	---
Zinc	1,000 µg/l (EP Tox)	35 IAC 302.208	---

NOTES:

1 Selected as indicator chemical.

2 Not applicable; cleanup objective greater than ACL.

TABLE 8 (Continued)  
CHEMICAL-SPECIFIC OBJECTIVES FOR SOIL AND SEDIMENT

- 3 Chemical not previously addressed by COT.
- 4 Not determined; aquatic toxicity data not found.
- 5 Total phenols includes phenol (indicator chemical), 2-methylphenol, and 2,4-dimethylphenol.
- 6 Total chlordanes includes cis and trans isomers. Background residues are above cleanup objectives.
- 7 Background residues may be above cleanup objectives.

TABLE 9

PLANT SITE SOIL EXCAVATION VOLUMES  
MARSHALL PLANT SITE

AREA	(1) GROSS SURFACE AREA TO BE EXCAVATED (S.F.)	SURFACE AREA PREVIOUSLY REMEDIATED	NET SURFACE AREA TO BE EXCAVATED	DEPTH OF EXCAVATION (FT.)	(2) VOLUME OF SOIL EXCAVATION (C.Y.)
1	83,000	--	83,300	1.0	3,074
2	213,000	--	213,000	1.0	7,889
3	77,000	--	77,000	3.5	9,981
4	185,000	16,500	168,500	6.0	37,444
5	158,000	--	158,000	2.0	11,704
6	220,000	120,000	100,000	1.0	3,704
7	54,000	--	54,000	2.0	4,000
SUBTOTAL					77,796
CONTINGENCY					10,000
TOTAL VOLUME OF SOIL EXCAVATION					87,796 (87,800)

IEPA FIGURE  
(87,900 C.Y.)

Note:

- (1) Surface areas taken from Table A-3 of Public Comment Feasibility Study by Roy F. Weston, Inc., July 15, 1988
- (2) Table from CRA RD/RA SOW August 29, 1988.

APPENDIX B  
RESPONSIVENESS SUMMARY  
VELSICOL/MARSHALL, ILLINOIS SITE

## APPENDIX B

IN THE MATTER OF )  
VELSICOL CHEMICAL CORPORATION )  
REMEDIAL INVESTIGATION, ) IEPA File 9048  
FEASIBILITY STUDY AND )  
PROPOSED PLAN )  
PUBLIC HEARING )

### Responsiveness Summary

#### RESPONSIVENESS SUMMARY OVERVIEW

The Illinois Environmental Protection Agency (IEPA) and the U.S. Environmental Protection Agency (USEPA) recently held a public comment period from June 23, 1988 through August 12, 1988 for interested parties to comment on the Proposed Plan and the Remedial Investigation/Feasibility Study (RI/FS) for resolving contamination problems at the Velsicol/Marshall site. The required public hearing on July 27, 1988 focused on the results of the FS and the Agencies' preferred remedial alternative (proposed plan). The public comment period was held in accordance with the Federal Superfund Law (CERCLA Section 117) and applicable Illinois state law.

The purpose of this responsiveness summary is to document the agencies' responses to comments received during the public comment period. These comments were considered prior to selection of a final remedy for the Velsicol/Marshall site which is detailed in the agencies' Record of Decision (ROD).

#### BACKGROUND ON COMMUNITY INVOLVEMENT

As the lead agency for the RI/FS, the IEPA was responsible for conducting the community relations program for this project. A community relations plan was approved by USEPA for this site in November 1985. It established a process to develop a two-way flow of project information between local officials, concerned citizens, the media and the IEPA. A comprehensive information repository was maintained at the Marshall public library with the assistance of their staff. Numerous press releases and fact sheets were issued to announce field activities and the findings of both the RI and the FS. The local media were instrumental in responsibly reporting these details. A public meeting on the findings of the RI was held in Marshall in February 1988. Community relations activities are summarized in the ROD, if additional information is desired.

#### PUBLIC HEARING

The required public hearing on the proposed plan was held from 6:30 p.m. - 9:00 p.m. on July 27, 1988, at the Colonial Kitchen Restaurant on the northwest side of Marshall, Illinois. Approximately forty persons attended (not counting governmental officials) including several local officials or their representatives, Velsicol officials and members of the press (television and newspaper).

SUMMARY OF SIGNIFICANT COMMENTS RECEIVED DURING THE PUBLIC COMMENT  
PERIOD AND AGENCIES' RESPONSES

Questions and comments received during the public comment period are paraphrased and organized into two discrete sections within this summary: those received at the hearing and the written comments from Conestoga-Rovers and Associates Limited for Velsicol. The agencies' response is given after each individual question or comment.

Responses to Comments and Questions Received at Public Hearing

Question 1:

What are the agencies going to do for the plant employees now that the facility is closing?

Response:

The agencies can do nothing to directly compensate employees for either loss of employment or job related health problems. Concerns should be directed to Velsicol. The agencies are proceeding with a Remedial Action program to mitigate current and potential risks associated with the site.

Question 2:

Why was off-site landfilling considered as a remedial alternative?

Response:

The Feasibility Study process reviews a wide range of technologies to address the identified environmental problems. Off-site landfilling of hazardous substances in a compliant, permitted facility is a viable disposal option. In this specific case, other on-site remedial technologies were available at a much lower cost without potential risks from transportation of these wastes to such a facility.

Question 3:

Why should people of the community believe the agencies' study (particularly the Risk Assessment) when plant employees have not shown adverse health effects?

Response:

The Risk Assessment completed for the site did not calculate exposures for plant employees. It is assumed they are healthy individuals who follow company health and safety protocol in carrying out their job functions. The site-specific assessment focused on involuntary exposures to the public (youth/adults) and the environment under a plant operation and abandonment scenario.

Question 4:

Why don't the agencies spend funds at more hazardous sites, rather than the Velsicol/Marshall facility?

Response:

There is a rigorous process for scoring sites and placing them on the National Priority List (NPL). Once finalized on that list, a Remedial Investigation (RI) and possibly a Feasibility Study (FS) is required. The Velsicol/Marshall site was among the first eleven in Illinois to be placed on the NPL and is currently being addressed along with these others in an orderly manner.

Question 5:

Are there any chemicals associated with the site that are acutely toxic to a passerby?

Response:

Without consideration for releases from the active manufacturing operations, the contaminants at their concentrations identified in the study promote long-term chronic health effects from repeated direct exposures. Therefore, acute effects from inhalation exposures off-site are highly unlikely.

Question 6:

Why couldn't the agencies have directed Velsicol to undertake Remedial Actions a long time ago?

Response:

Over the years, several agencies have identified deficiencies in the Velsicol plant operation and have directed the company to take action to protect the environment. In 1972, the Illinois Pollution Control Board (IPCB) ordered Velsicol to deepwell inject all plant process waste following discharges of contaminants to the East Mill Creek system. In 1973, the IPCB ordered Velsicol to deepwell all waters that collect on the site following more incidents of contamination of the creek. The Superfund program which gives the agencies authority to negotiate settlements with responsible parties or undertake actions themselves came into existence in 1980. No superfund activities can be initiated until a site is placed on the NPL. Superfund discussion on this site with Velsicol began in 1984. Velsicol had the opportunity to undertake the remedial investigation in 1985 but the company was unwilling to meet the state and federal regulatory requirements. Thereafter in late 1985, the IEPA began fund-financed investigation at the site.

Question 7:

Is it possible for Velsicol's Marshall facility to remain open and also complete this Superfund remedial action?

Response:

Yes, the Remedial Investigation and Feasibility Study was completed on the premise that the plant would remain in operation. The preferred alternative recommended in the proposed plan was only modified to account for additional plant production area soils after Velsicol confirmed plant closure in a letter to the Agency dated June 30, 1988. This letter stated that the company, "had unsuccessfully spent tremendous effort to find replacement products which could fill the capacity of the facility. As a consequence, we have come to the conclusion that it is far too uneconomical to continue manufacturing operations at the [Marshall] facility."

Question 8:

Is Velsicol responsible for all costs associated with the remedial action even if the agencies perform the work?

Response:

Yes, the principal responsible parties (PRPs) at a Superfund site, in this case the Velsicol Chemical Corporation, are ultimately responsible for all response costs in accordance with CERCLA/SARA and the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). Under a fund-lead action, the government usually completes the study and implements the remedy, then seeks recovery of costs (with an option for treble damages) from the responsible party. The responsible party has limited opportunity to take over the response action at the conclusion of the RI/FS, which is the point at which the Velsicol/Marshall project is currently at, providing they have the resources and capability to implement the selected remedy and reimburse government costs.

Question 9:

If Velsicol committed the resources to implement the selected remedy, could they stay in operation at the facility?

Response:

Yes, as emphasized in a previous response, the RI/FS was completed under the premise that the facility would remain in operation. Even if Velsicol elected not to directly participate in the Superfund remedial action, the facility could have continued to operate. The work would be completed by the agencies, and cost recovery actions pursued.

Question 10:

Does the Superfund program address environmental problems associated with municipal landfills and other types of sites?

Response:

Yes, the Superfund program addresses a wide range of sites that possess significant existing or potential threats to public health or the environment. However, as stated in a previous response, these sites are subjected to a rigorous scoring system once a preliminary assessment and site investigation has been completed. If they score above a cutoff point of 28.5, they are eligible for inclusion on the NPL and subsequent superfund monies (assuming the responsible parties do not take the lead). If they score below that cutoff point they will be addressed on a priority basis by state Superfund programs, if available. Illinois has a very active state Superfund program.

Question 11:

What agencies/departments are responsible for responding to releases from a low level nuclear waste site, such as the one under consideration for Clark County?

Response:

The owner/operator of such a facility is ultimately responsible for corrective actions at their site. They are regulated by specific federal and state entities, namely the nuclear regulatory commission and the Department of Nuclear Safety, respectively. It is assumed that these programs would provide assistance in emergency response actions.

Question 12:

If additional soil contamination is found through the sampling work planned during the remedial design phase, will there be sufficient funding to address it?

Response:

Yes, under the scenario that the agencies would undertake the remedial action work, excavation and other quantities would be refined during the remedial design phase, and appropriate funds, including construction contingency monies, would be allocated to address actual field conditions. The FS only attempts to develop order of magnitude costs so that comparisons can be made among the range of remedial alternatives under consideration.

Question 13:

Should Velsicol be held accountable for contaminant exposures to plant workers?

Response:

This is not an appropriate question for the agencies, but rather should be taken up between the employer and employee. Velsicol has offered employment to workers, who have voluntarily accepted it. Velsicol has implemented a site-specific health and safety program to protect them to the level the company feels necessary, and the worker presumably have at the minimum followed that plan.

Question 14:

Will Velsicol be compensated for two years of lost productivity in their agreement to withdraw chlordane from the U.S. market?

Response:

USEPA Region 5 and IEPA have limited knowledge of the voluntary agreement on chlordane between Velsicol and USEPA. This information is being sought, and a response will be provided at a later time. To our knowledge the agreement only allowed Velsicol to use up existing stocks of chlordane, but did not compensate them for future lost production.

Comment 15:

The Marshall area Chamber of Commerce urged the agencies to:

1. Conduct hazardous waste training for local contractors, costs to be absorbed by IEPA/USEPA.
2. Use local contractors, when available and practical, during the clean-up process.
3. Remain cognizant of current and former Velsicol employees with hazardous waste training and utilize their talents in the clean-up process.

Response:

Response actions at Superfund sites containing hazardous wastes/substances requires specialty construction contractors. They must possess the proper equipment to carry out such work, as well as a staff that is highly trained in personal/site safety procedures and is physically fit and under medical surveillance. The agencies cannot directly fund these training activities.

If this project proceeds using Superfund monies, the agencies will be required to competitively let a construction contract following federal procurement regulations. The selected lowest responsible, responsive contractor would be awarded the job. That firm would be able to utilize local subcontractors as appropriate, if so desired. Under this arrangement, it would seem logical to utilize former plant employees with hazardous waste training in some labor positions, if possible.

Under the scenario where Velsicol carries out the remedial action, the company would not be constrained by federal procurement regulations, however, health and safety requirements would still apply. Velsicol has told the agencies that they remain committed to utilizing former employees and local services where possible, if they implement the selected remedy.

Question 16:

What will the agencies do with the product that is going to replace chlordane?

Response:

Those products will also be regulated by USEPA, requiring proper registration and use.

Question 17:

Isn't the replacement product for chlordane acutely toxic?

Response:

Yes, this product has been shown in laboratory testing to be more acutely toxic than chlordane, however, its persistence in the environment is much less than chlordane.

Question 18:

Isn't this replacement product significantly more expensive than chlordane?

Response:

Yes, at this time it apparently is more expensive.

Question 19:

Does the government allow chlordane, or a variation thereof, to be imported for use in the U.S.?

Response:

USEPA Region 5 and IEPA have no knowledge of this activity at this time. An inquiry has been made to USEPA headquarters, and any other information will be made available at a later time.

RESPONSES TO VELSICOL'S COMMENTS ON THE PUBLIC COMMENT  
FEASIBILITY STUDY

Connestoga-Rovers & Associates (CRA) on behalf of Velsicol Chemical Corporation submitted the only written technical comments to the Public Comment Feasibility Study report and proposed plan.

Velsicol and the regulatory agencies exchanged draft information regularly throughout the RI/FS process. Velsicol received an agency draft copy of the FS report on 15 June 1988, and provided comments on that version of the FS report on 30 June 1988. Velsicol's preliminary comments made on the agency draft FS are similar to those made on the public comment FS and therefore are not addressed in this addendum.

The following is a point-by-point response to the comments submitted by CRA on the Public Comment FS report. Each comment is briefly recapped, referenced to its location in the original transmittal, and followed by the agencies' response.

Comment 1:

After the plant is decommissioned, the abandonment scenario will be changed entirely. As a consequence, risks will be far lower. (pp. 1-3, item a)

Response:

The site remediation is based on reducing risks associated with existing contamination at the site for both the no-action and abandonment conditions. Although increased risks were projected under the abandonment scenario, IEPA has determined that reduced remedial effort will not result from the proposed plant closure. Therefore, it is not necessary to revise the risk assessment as suggested by Velsicol.

Comment 2:

The unnamed tributary and East Mill Creek contain few fish large enough to eat and could not sustain a yield of seven pounds of fish per person per year for local residents. (pp. 3-4, item b)

Response:

It is true that the fish caught during the RI in the unnamed tributary and East Mill Creek are generally small, however of edible size. Conversations with Marshall Community officials and the public during

the public meeting on 10 February 1988 and actual observation of fishermen's debris during fish sampling indicates that the unnamed tributary is a viable spot for fishing. As presented in the RI report, it is likely that larger fish may not have been collected due to the limited width of seine net and obstructions within the tributary. The matter of sustainable yield from the tributary is not relevant to the risk assessment because risk is calculated on a per-person basis. Even if only a limited population were eating the contaminated fish, the risk from that exposure would be equal to the reported value. Consumption of seven pounds of fish per year was used in the sensitivity analysis to determine what additional risk would result by fish consumption of approximately twice the amount considered for the low average intake in the risk assessment. Seven pounds of fish consumption per year per person is considered reasonable given the fishing activities in the unnamed tributary.

Comment 3:

There is no proof that groundwater contaminates the unnamed tributary. (p.4, item c)

Response:

The groundwater near the stream is known to be contaminated, (See Table 6-4 of the FS) and the contaminants are known to leach and migrate. The tributary's status as a low-flow intermittent stream prevents rigorous calculation of a mass flux of contaminant into the stream, but the low flow of the stream guarantees that contaminants that enter the tributary by groundwater recharge have a low dilution factor.

Comment 4:

The FS must consider the effect of the dismantling of the facility and securement of the property. (p 5, item a)

Response:

The implications of decommissioning the plant and on-site remediation are presented in Section 2.0 of the Public Comment FS addendum report.

Comment 5:

The chlorides in the groundwater west of the 5/6 pond may have come from above-ground releases. (p 5, item b)

Response:

Chlorides in groundwater are related to past waste disposal activities in the 5/6 pond prior to stabilization and could also be attributed to

intentional and accidental releases of wastes from storage ponds most recently during 1976 and 1979. The EM survey also confirmed the presence of an irregular plume of elevated conductivities in groundwater west of Pond 2 and 5/6 Pond. If this contamination was due to only surface infiltration, the contaminant front would move down-gradient only from the defined surface water course to which it was released.

Comment 6:

The groundwater contamination is only potential; transport is not demonstrated; and only infrequent monitoring is needed. (p. 5, item c)

Response:

At the time of RI sampling, groundwater west of the ponds exhibits levels of contamination. Leachable organic contamination is present within the 5/6 Pond, and the groundwater flows westward beneath the 5/6 Pond. Therefore, reference to potentially contaminated groundwater is appropriate. The observed elevated contamination in groundwater (especially east of the 5/6 Pond) and the westward groundwater movement strongly indicate the need for groundwater remediation, and therefore consideration of "no-action" alternative with infrequent long term monitoring as suggested by Velsicol is not appropriate.

Comment 7:

No compelling evidence indicates that the agricultural soil contamination came from the facility. (p. 6, item d)

Response:

The agricultural soil, especially at several contiguous locations west of the 5/6 Pond, had higher levels of pesticides than typically found in agricultural soils in central Illinois. In addition, these soils have non-pesticide contamination, as presented in Table 1-3 and Appendix A of the FS report. Therefore, Velsicol's conclusion that residuals in agricultural soils are the consequence of typical agricultural practices is not supported by the results of soil sampling.

Comment 8:

The lack of sediment samples downstream from the Velsicol property prevents adequate analysis of risk and invalidates the selected cleanup area. (p. 7, item e)

Response:

The RI clearly established that the sediments up to Velsicol's western property boundary are highly contaminated. The FS clearly states that

the extent of contamination further downstream from the Velsicol property needs to be assessed by sampling (Section 6.4, Page 6.23 of FS report). The ROD will address the need to sample creek sediments beyond Velsicol's property, as well as to establish local background pesticide levels. The results will be used to define the extent of sediment removal beyond the Velsicol property. The uncertainty surrounding sediment removal only affects the precise area to be restored which is a design function and not the general need to restore the creek.

Comment 9:

The pond area sediments are relatively clean. Only minute concentrations of contaminants were found. (p. 7, item f)

Response:

The purpose of pond sediment sampling was to determine the presence or absence of hazardous substances. Hazardous substances are confirmed to be present in pond sediments.

Comment 10A:

The chlordane found in fish samples probably came from agricultural samples. (p. 7, first part of item g)

Response:

The fish downstream of the Velsicol facility exhibited increased chlordane contamination compared to the chlordane concentration found in similar fish from the background location on the adjacent watershed.

Comment 10B:

The inability of the highly trained field team to catch many fish demonstrates the irrelevance of fish contamination. (p 7, second part of item g)

Response:

The general fish issue was addressed in the RI report, but the point regarding the field team's small catch merits special attention. A number of factors contribute to the fish yield. First, the seine net did not form an impassable barrier due to obstructions in the stream and depth of pools. Second, the crew seined only one pass over all locations in an eight hour sampling and processing event.

Comment 11:

The decommissioning of the manufacturing facility invalidates the assumptions of the abandonment scenario's risk assessment. (p. 8-9, item h)

Response:

This comment is addressed in response to comment 1.

Comment 12:

The effect of contaminated groundwater on surface water must be rigorously calculated. (p. 9-10, item i)

Response:

The technical obstacles to rigorous calculation of contaminant flux and the compelling reasons to expect contamination for the purposes of the FS were discussed previously in response to comment 3.

Comment 13A:

It is unreasonable to increase the assumed fish consumption from 3 to 7 pounds for risk assessment. (p. 10, first part of item j)

Response:

The standard mathematical modeling practice of sensitivity analysis requires that input variables (such as fish consumption) be varied to determine their influence on the output variables (such as risk). Consumption of seven pounds of fish by an individual during the period of one year is considered reasonable.

Comment 13B:

The fish in East Mill Creek are too small and too few for people to eat. (p. 11, second part of item j)

Response:

The fish size and quantity issues were discussed in response to comment 10B. It must be stressed that risk is calculated on an individual basis, and the quantity of fish that would be necessary to feed the entire local community is irrelevant.

Comment 13C:

Access to East Mill Creek is limited. (p. 12, third part of item j)

Response:

Easy access to the stream is available at bridges. The field crew, for instance, required no exceptional effort to reach the creek at the locations sampled. The presence of pop cans and fishermen's debris demonstrates that people do fish in the creek.

Comment 14:

Rigorous evaluation of contaminant flux from groundwater to the unnamed tributary is needed. (p. 12-13, item k)

Response:

The issue of transport of contaminants from groundwater to the tributary was previously addressed in response to comment 3. Risks have been identified only for fish consumption due to contaminated sediments in the unnamed tributary. No risks have been identified for surface water within the unnamed tributary although there is a theoretical contribution.

Comment 15:

Monitoring, not remediation is needed for groundwater from the site. (p. 13, item 1)

Response:

Remediation and monitoring are required by CERCLA regulations, given the extent of contamination and potential transport in groundwater.

Comment 16:

The agency has no factual basis to assume that sediments west of the Velsicol property are contaminated. (p. 14, item m)

Response:

These issues were previously discussed in response to comment 8.

Comment 17:

Groundwater does not contaminate the creek. (p. 14, item n)

Response:

Groundwater recharges the unnamed tributary. Although the contamination is low at the present time, the contaminant movement through the groundwater and subsequent recharge of the unnamed tributary has the potential for significant contaminant release.

Comment 18:

The abandonment scenario is impossible. (p. 15, item o)

Response:

The contamination present in the plant area soil requires remediation regardless of abandonment scenario. If remedial action doesn't occur, and off-site surface water and on-site access is allowed, the abandonment scenario would be realized.

Comment 19:

The 2 and 4 Ponds are not demonstrated to contaminate groundwater or surface water. (p. 15, item p)

Response:

The pond sediments contain hazardous substances as does the water, and the bottom of the ponds are not lined. Contamination is observed immediately downgradient of the ponds. These factors taken together indicate that Ponds 2 and 4 have at a minimum the potential to release contaminants to the groundwater. The issue of adversely impacting human health and the environment on their own is not appropriate. As considered in the FS evaluation, the removal of pond sediments would eliminate this potential pathway.

Comment 20:

If barrier walls are eliminated in the technology screening, then they must be eliminated from the extraction system. (p. 16, item q)

Response:

The reference to barrier walls used in extraction system discussion in Table 3-4 is not correct. There is no barrier wall in the proposed extraction system.

Comment 21:

Groundwater need not be evaluated for collection and treatment/disposal. (p 16, item r)

Response:

The need for groundwater treatment has been addressed in response to comment 6.

Comment 22:

Diversion should be carried forward to the detailed analysis of alternatives. (p. 16, item s)

Response:

This technology is commonly used as part of capping of the site and should not be considered an applicable technology by itself.

Comment 23:

Capping of the entire plant site is a reasonable technology to consider. (p. 17, item t)

Response:

Capping of the entire site, although possible, has not been considered due to the clear technical superiority and regulatory preference of consolidation of wastes in a single location. Also, the presence of an existing waste disposal unit requiring capping (the 5/6 Pond) provides a sound technical basis to consolidate and cap contaminated materials at a single location.

Comment 24:

In-situ stabilization of the plant soils and creek and pond sediments is a reasonable technology to consider. (p. 17, item u)

Response:

Stabilization is considered, but only after consolidation. Successful stabilization requires a homogeneous, intimate and complete mixture of soil with a stabilizing agent. Such a mixture is far easier to achieve in a compact reworked soil mass than in the spatially dispersed native state.

Comment 25:

Based on the preceding comments, the table for screening available remedial technologies should be revised. (p. 17, item v)

Response:

Based on the preceding responses, the table does not require revision.

Comment 26:

The FS states there are "no significant human health risks identified for the groundwater west of the impoundments." Therefore, there is no need to evaluate groundwater technologies. (p. 18, item w)

Response:

Actually, the FS states, "No present significant human health risks are identified for groundwater west of the impoundments. However, migration of contaminants from the ponds has been observed. The primary remediation action goal for groundwater will be to prevent recharge of contaminated groundwater to the unnamed tributary." (Emphasis added.)

Comment 27:

The Assembled Alternatives should include in-situ treatment and tributary realignment. (p. 18, item x)

Response:

In-situ treatment was, and should be, screened out at the preliminary screening as discussed earlier. Tributary realignment with in-situ capping of sediments in the unnamed tributary was carried through detailed evaluation of alternatives.

Comment 28:

Screening of soil and sediment must include in-situ treatment and diversion of the tributary. (p. 18, item y)

Response:

In-situ treatment was, and should be, screened out as discussed above. Diversion of the tributary with in-situ capping of the sediment was carried forward through detailed evaluation.

Comment 29:

COT criteria have been elevated to the level of ARAR's. Such an elevation is inconsistent with CERCLA guidelines (p. 19, item z)

Response:

The COT criteria<sup>(1)</sup> are not ARAR's but instead objectives to be considered. They are used because there are no federal standards or criteria for soil and sediment contamination remediation. The criteria are not arbitrary, but instead the result of an established

(1) Reference to COT soil/sediment objectives only

process within IEPA that develops site-specific objectives for all affected media. The criteria inherently receive peer review because they are the consensus of several offices within IEPA. Additionally, they have been reviewed and approved for use by USEPA through the FS process. The public has been given an opportunity to comment on the chemical specific cleanup objectives through the FS public comment process. Velsicol has been given that same opportunity, as well as advance review during the agency draft FS period. No specific comments have been received on the appropriateness of the established criteria or alternatives, therefore, no responses are necessary.

Comment 30:

The FS does not account for prior remedial activities in Areas 4 and 6 of the plant. (p. 20, item aa)

Response:

Prior remedial activities conducted by Velsicol in Areas 4 and 6 will be considered in soil removal from plant areas. This will be based on documentation provided by Velsicol on the exact location and extent of removal accomplished in these areas which has not been received at this time.

Comment 31:

Pesticides in agricultural soils probably came from agricultural chemicals. (p. 20, item bb)

Response:

This was discussed in response to comment 7.

Comment 32:

Additional creek sediment samples are needed to define the length of creek remediation. (p. 20, item cc)

Response:

The steps that will be taken to address this concern were previously addressed in response to comment 8.

Comment 33:

How were the COT criteria determined? (p. 21, item dd)

Response:

As stated in the FS, the multidisciplinary COT group considers "what must be protected..., whether there is an especially sensitive population to be protected, whether contamination in one medium may pose a problem in another medium, and whether there is enough information to propose cleanup objectives." Tables 6-7 of the FS explicitly state the "decision basis" for each criterion with a site-specific rationale provided in Appendix C.

Comment 34:

In-situ stabilization should be carried forward for further analysis. (p 21, item ee)

Response:

As previously discussed, in-situ stabilization of plant soils and pond/stream sediment was eliminated from detailed consideration, and therefore there is no need to identify the associated processes and costs.

Comment 35:

The cover design should be modified to include a less expensive mix of locally available materials. (p. 21-22, item ff)

Response:

It is acceptable to alter the precise composition of the multilayer cap to use inexpensive, locally available materials, provided that the impermeability of the cap and establishment of a protective vegetative cover is not changed. The revised cap design proposed by Velsicol will be considered and could be used instead of the "model" multilayer cap specified in the FS report if it is determined to be applicable.

Comment 36:

The groundwater treatment system requires bench-scale tests, a pre-treatment system, air stripping, and possibly pretreatment for iron and manganese removal. Also, the FS makes no provision for monitoring and control. (p. 22-23, item gg)

Response:

The conceptual design for the FS determined by comparison of the level of contaminants present in groundwater with the clean up objectives, that the proposed treatment system utilizing activated carbon is adequate. Factory-assembled activated carbon units are

equipped with proper controls and monitoring instrumentation such as pressure gauges. Based on the contaminant levels and cleanup objectives, air stripping is not determined to be necessary. Extracted groundwater is not likely to have high suspended solids warranting filtration prior to activated carbon absorption.

Comment 37:

No groundwater collection system should be built, but if one must be built, it should eliminate the proposed western French drain. The western drain would induce migration of contaminants from beneath the 5/6 Pond and contaminate the areas west of the pond. (p. 23, item hh)

Response:

The groundwater interception system does influence groundwater contaminant migration. It cannot be true, however, that the western trench can mobilize contaminants which are otherwise immobile. Like the eastern trench, the western trench only captures mobile, liquid-phase contaminants. It also cannot be true that the western trench could induce additional groundwater contamination west of the 5/6 Pond and the trench itself which would be located immediately adjacent to the waste unit, in an area already affected by contaminant migration. The trench would create a local groundwater divide, across which contaminants would not travel. As for the proposal to build a single trench only to the east of the 5/6 Pond, it has not been demonstrated by Velsicol at this time that the east trench could capture contaminants from the west side of the 5/6 Pond.

Comment 38:

FS cost estimates should show quantities and unit cost for each line item. Costs should reflect the local prices for local labor and materials rather than national averages. (p. 23-24, item ii)

Response:

At the remedial design stage it will indeed be necessary to show explicit quantities, unit costs, and local prices. For the FS stage, however, such an exercise would contribute little to the alternative screening process. The goal in the FS is to develop order-of-magnitude costs to assist in relative comparison of the alternatives. A refined cost analysis would not be necessary to achieve the goal of the FS.

Comment 39:

The Cleanup Objectives are not sufficiently documented, (p. 24, item jj)

Response:

Cleanup Objectives presented in Table 6-7 and 6-8 and the rationale in Appendix C are based on the evaluation of site contamination by the COT and CROPA groups within IEPA. The decision basis for each chemical is cited in these tables.

Comment 40:

Hazardous substances - not hazardous waste - is the proper term for the materials at the Velsicol site. (p. B1, item 1)

Response:

The more general term is hazardous substances. No determination has been made for the purposes of this CERCLA study if soil/sed. contamination would qualify as "hazardous waste". RCRA "Hazardous Wastes" have been utilized, generated and disposed of within the plant area.

Comment 41:

The proper reference to CERCLA is not Subpart F Section 300.66, but instead Section 300.68. (p. B2, item 2)

Response:

The comment is correct. Appendix B contains correction pages for the affected pages.

Comment 42:

Velsicol will no longer be a chlordane production facility, so references to active manufacture will not be correct. (p. B2, item 3)

Response:

At the time the FS was written, the facility was to remain open. It would require unnecessary expenditures of resources and time to retroactively prepare an altered FS to reflect the closing. Instead, this addendum, the ROD, and the remedial design will address the impact of the plant closing.

Comment 43:

Process wastes, not hazardous wastes, were stored in the ponds. (p. B3, Item 4)

Response:

The process wastes may or may not be hazardous wastes, but clearly are hazardous substances for the purposes of this CERCLA study.

Comment 44:

The word significant is an unduly vague description of soil contamination. (p. B3, item 5)

Response:

Table 1-3 of the FS contains quantitative measures of the extent of soil contamination.

Comment 45:

The 2 and 4 Ponds are not RCRA hazardous waste ponds, even if they have RCRA-compliant monitoring wells. (p. B3, item 6)

Response:

Regardless of whether the ponds are RCRA hazardous waste ponds, their monitoring system does conform to RCRA compliance monitoring requirements. The RCRA monitoring requirements are relevant and appropriate.

Comment 46:

The excavated soil will not contain hazardous waste, so it need not be stored in a RCRA cell. (p. B4, item 7)

Response:

The agency could offer arguments for classification of these soils as hazardous waste, but in any case, the RCRA requirements are relevant and appropriate, regardless of applicability.

Comment 47:

The soils are not hazardous waste, so RCRA land bans would not apply. (p. B4, item 8)

Response:

The reference to land ban restrictions is included as a consideration for acceptance of wastes by an off-site land disposal facility. Landfill operators may tend to be cautious in their interpretation of land ban regulations.

Comment 48:

The soils are not hazardous waste, so RCRA landfill groundwater monitoring requirements would not apply. (p. B4, item 9)

Response:

The RCRA requirements are relevant and appropriate.

Comment 49:

The soils are not hazardous waste, so RCRA landfill minimum technology requirements would not apply. (p. B5, item 10)

Response:

The RCRA requirements are relevant and appropriate.

Comment 50:

The soils are not hazardous waste, so RCRA landfill requirements would not apply. (p. B5, item 11)

Response:

Again, the RCRA requirements are relevant and appropriate for consideration of the new on-site cell.

Comment 51:

The soils are not hazardous waste, so RCRA landfill groundwater monitoring requirements would not apply. (p. B5, item 12)

Response:

Again, the RCRA requirements are relevant and appropriate and can be used as a basis for groundwater monitoring.

Comment 52:

The soils are not hazardous waste, so RCRA requirements would not apply. (p. B6, item 13)

Response:

This has been addressed previously in response to several comments. The RCRA requirements are relevant and appropriate.

Comment 53:

Regulatory uncertainty is no reason to view deep well injection unfavorably. (p. B6-B7, item 14)

Response:

Deep well injection has historically fallen under complex restrictions. Because the groundwater treatment scheme is envisioned to last at least 30 years, it is prudent to consider whether the implemented solution will remain feasible for many years into the future. More specifically in the near-term, there are concerns about the integrity of the existing injection wells at the Velsicol facility. If the wells are not secure, their regulatory acceptability for permitted operation could not be guaranteed.

Comment 54:

The words heavy and minor are vague. (p. B7, item 15)

Response:

Table 1-3 of the FS contains quantitative measures of soil contamination.

\*\*\*\*\*

Copies of this responsiveness summary were mailed in October 1988 to those who registered at the hearing, to all who sent in written comments and to anyone who requested a copy.

The following items are available for examination and review:

1. Copies of the Public Hearing Notice,
2. Proposed Project Plan,
3. Transcript of Hearing,
4. Public Hearing Attendance Record,
5. Hearing Record Exhibit List of all letters, documents and notices, and
6. All letters, documents and notices contained in the Hearing Record.

For Further Information

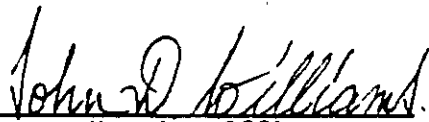
Questions about the hearing process and about access to exhibits should be directed to the IEPA Hearing Officer, John Williams, 217/782-5544.

Questions about the RI (Remedial Investigation), the FS (Feasibility Study) and the Proposed Plan should be directed to the IEPA Project Manager, Kurt Neibergall, 217/782-6760.

Copies of the transcript of the July 27, 1988, hearing can be purchased from Maninfior Reporting, 1612 Lafayette, Box 1036, Mattoon, Illinois 61938, or phone 800/346-2986.

Additional copies of this responsiveness summary are available from Bill Hammel, IEPA Community Relations, 217/782-5562.

Signed:   
IEPA Project Manager

Signed:   
Agency Hearing Officer

Date: September 26, 1988

Illinois Environmental Protection Agency  
2200 Churchill Road  
Post Office Box 19276  
Springfield, Illinois 62794-9276  
Phone: 217/782-3397

BH:bjh/sp/2666j/1,8

APPENDIX C  
ADMINISTRATIVE RECORD  
VELSICOL/MARSHALL, ILLINOIS SITE

# APPENDIX C

## ADMINISTRATIVE RECORD

As of September 21, 1988

The following list of documents were available for public inspection at the Superfund public repository located at the Marshall Public Library in Marshall and at the IEPA Community Relations Office in Springfield. Draft documents that were shared with Velsicol (responsible party) were also placed in the public repository. Draft documents in the repository were subsequently replaced with final documents.

TITLE	AUTHOR	DATE	PAGES
Various Background Articles		00/00/00	8
Site Maps		00/00/00	4
Site Inspection Report	CEMays - USEPA	82/09/07	14
Velsicol Chemical Site Visit June 17, 1983	MO Toole	83/06/27	1
Why Velsicol?	Greenpeace	84/00/00	2
Newsclip Series Marshall Independent	GGravemier	84/05/07-24	15
Review of Velsicol materials re Capping Program for 5/6 Pond	JPGibb - IENR	84/08/27	4
Preliminary Assessment	RLang - IEPA	84/09/20	28
Letter to W. Child - IEPA re: Review of Site Activities re 5/6 pond	JSBrown - Velsicol	84/10/03	9
Hydrogeologic Study Monitor Well Installation Velsicol Site Marshall, IL		85/00/00	113
Illinois Fish Contaminant Monitoring Program Memorandum of Agreement		85/05/00	38
Memo to file re: Velsicol - Technical Reports 4/16/85 Meeting	MNienkerk - IEPA	85/05/01	3

TITLE	AUTHOR	DATE	PAGES
Statement of Work for a RI/FS at Velsicol Chemical Corp. Attachment I	IEPA	85/05/10	31
Memo to file re: Agency Position regarding Disposal Water from IEPA Well Installation Activities at Velsicol	JFrank - IEPA	85/09/26	13
Newsclips from Marshall Independent	GGravemier	85/10/03	4
Personnel Safety Plan Velsicol Chemical Plant Revision 2	IEPA	85/10/28	96
Community Relations Plan with cover letter	BHammel - IEPA	85/10/29	19
Hydrogeological Work Plan RI/FS Velsicol Site	IEPA	85/11/01	16
Letter to WRadlinski-IEPA re: Approval of Site Safety Plan with minor changes	KDYeates - USEPA	85/11/05	2
Field Sampling Protocols		86/02/00	12
Newsclip from Marshall Independent		86/05/05	1
Press Release: Start of geophysical investigations	BHammel - IEPA	86/05/06	2
Geophysical Survey Report Velsicol Chemical	RFWeston, Inc.	86/06/00	200
Work/QA Plan Short Form Velsicol Chemical Corp.	RFWeston, Inc.	86/07/18	61
Health and Safety Plan for Velsicol Site	RFWeston, Inc.	86/07/25	129
Project Outline and Proposal Report for RI/FS at Velsicol Chemical, Marshall, IL	RFWeston, Inc.	86/07/30	66

TITLE	AUTHOR	DATE	PAGES
Preliminary Report for Velsicol, Marshall, IL	RFWeston, Inc.	86/07/30	108
Sampling and Analysis Plan Velsicol Chemical Corp. Marshall, IL	RFWeston, Inc.	86/10/00	54
QAPP Velsicol Chemical Corp. Marshall, IL Site	RFWeston, Inc.	87/01/08	196
Press Release: Start of phase II of environmental investigation	BHammel - IEPA	87/02/05	2
Chlordane Chemical Information Sheet	IEPA	87/03/00	2
Phase I Hydrogeological Memorandum for Velsicol Marshall Site	RFWeston, Inc.	87/04/09	185
QAPP Addendum for Air Sampling and Analysis Velsicol Chemical Corp. Marshall, IL Site	IEPA	87/06/00	22
Press Release: Final phase of environmental investigation	BHammel - IEPA	87/06/18	2
QAPP Addendum for Fish Sampling and Analysis Velsicol Chemical Corp. Marshall, IL Site	RFWeston, Inc.	87/07/24	82
Phase II Technical Memorandum for Velsicol, Marshall Site	RFWeston, Inc.	87/07/31	192
Mini-air QAPP	RFWeston, Inc.	87/08/25	31
Environmental Risk	USEPA	87/11/00	50
Fact Sheet #1 RI report	BHammel - IEPA	88/01/00	2
Press Release: RI Public Meeting	BHammel - IEPA	88/02/03	2
Remedial Investigation Report, Velsicol Site, Marshall, Illinois	RFWeston, Inc.	88/02/19	300

TITLE	AUTHOR	DATE	PAGES
Remedial Investigation Report, Velsicol Site, Appendices	RFWeston, Inc.	88/02/19	300
Request for Applicable, or Relevant and Appropriate Requirements for Remedial Alternatives, Velsicol Site, Marshall, Illinois	RFWeston, Inc.	88/03/03	42
Addendum to Remedial Investigation Report, Section 8, Velsicol Site, Marshall, Illinois	RFWeston, Inc.	88/03/10	60
Newsclips from Marshall Independent	GGravemier	88/06/16	2
Newsclip from Paris Beacon News	TBear	88/06/22	1
Newsclip from Casey Reporter	RHarrison	88/06/23	1
Fact Sheet #2 Proposed Plan	BHammel - IEPA	88/07/00	12
Proposed Plan	KNeibergall - IEPA	88/07/12	22
Public Comment Feasibility Study, Velsicol Site Marshall, Illinois	RFWeston, Inc.	88/07/15	165
Newsclip from Marshall Independent	GGravemier	88/07/18	2
Press Release: FS Public Hearing	BHammel - IEPA	88/07/19	2
Transcript of FS Hearing		88/07/27	58
Newsclip from Tribune Star	SLoughlin	88/07/28	1
Comments on RI from Conestoga-Rovers and Associates Limited with Responses from RFWeston, Inc., 9 documents, beginning January 12, 1988.		88/08/12	122

TITLE	AUTHOR	DATE	PAGES
Newsclip from Marshall Independent	RHarrison	88/07/28	2
Draft Statement of Work* RD/RA, Velsicol Plant Site Marshall, IL	CRA, Ltd.	88/08/29	36
Proposed Groundwater Collection Drain Design Calculations Velsicol Plant Site, Marshall, IL	CRA, Ltd.	88/08/29	23
Addendum to Public Comment Feasibility Study, Velsicol Site, Marshall, IL	RFWeston, Inc.	88/09/02	72
CRA Drain Design Evaluation* Velsicol/Marshall Site	RFWeston, Inc.	88/09/02	2
Final Statement of Work* RD/RA, Velsicol Plant Site Marshall, IL	CRA, Ltd.	88/09/12	38

\*These documents are not in Marshall Repository but are available for inspection at IEPA (Springfield) and USEPA (Chicago).

WH:dls/2656j.sp

VELSICOL

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**FILE COPY**

015

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF ILLINOIS

UNITED STATES OF AMERICA, and  
PEOPLE OF THE STATE OF ILLINOIS,  
Plaintiffs,

v.

VELSICOL CHEMICAL CORPORATION,  
Defendant.

CIVIL ACTION NO.

STUART J. ORTIARE  
CLERK U.S. DISTRICT COURT  
SOUTHERN DISTRICT OF ILLINOIS  
CENTON LITE

1989 SEP 14 PM 3:46

**FILED**

CONSENT DECREE

RECEIVED

OCT 06 1989

IEPA-DLPC

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APPENDICES	TITLE
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II	Statement of Work
III	Well Plugging and Abandonment Plans
IV	Sediment Sampling Plan
V	Mechanical Integrity Testing Plan
VI	Decommissioning Plan For Hazardous Waste Management Units
VII	Operating and Maintenance Plan

EXHIBIT	TITLE
1	Deed Restrictions

CONSENT DECREE

This Consent Decree is entered into by Plaintiffs, United States of America and State of Illinois, and Defendant, Velsicol Chemical Corporation, pursuant to Sections 106, 107 and 122 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), as amended, 42 U.S.C. Sections 9606, 9607 and 9622.

## I.

BACKGROUND

WHEREAS, Defendant is the owner and operator of a facility formerly used for chlordane manufacturing in Marshall, Clark County, Illinois (the "Facility") as specifically defined in Paragraph 3.G of this Consent Decree;

WHEREAS, hazardous waste has been generated, treated, stored and disposed at the Facility prior to and after November 19, 1980, the applicable date which renders facilities subject to the interim status requirements under Sections 3004 and 3005 of the Resource, Conservation and Recovery Act of 1976 (RCRA) as amended, 42 U.S.C. Sections 6924 and 6925;

WHEREAS, because of the actual and potential release of hazardous substances from the Facility, and pursuant to Section 105 of CERCLA, 42 U.S.C. Section 9605, U.S. EPA placed the Facility on the National Priorities List, which is set forth at 40 CFR 300, Appendix B, by publication in the Federal Register on September 8, 1983, 48 Fed. Reg. 40658 (1983);

WHEREAS, in January, 1986, the Illinois Environmental Protection Agency ("IEPA"), under a Cooperative Agreement with the United States Environmental Protection Agency ("U.S. EPA"), commenced a Remedial Investigation and Feasibility Study ("RI/FS") pursuant to 40 CFR 300.68 for the Facility;

WHEREAS, IEPA completed a Remedial Investigation ("RI") Report on February 19, 1988, and completed a "Public Comment" Feasibility Study ("FS") Report on July 15, 1988;

WHEREAS, on February 10, 1988, IEPA conducted a public informational meeting in Marshall, Illinois to discuss the findings of the completed RI;

WHEREAS, in conjunction with the Public Comment FS, the U.S. EPA and IEPA (the "Agencies") developed a proposed plan for remedial action at the Facility (the "Proposed Plan");

WHEREAS, on or about July 15, 1988, IEPA, pursuant to Section 117 of CERCLA, 42 U.S.C. Section 9617, published notice of the completion of the Public Comment FS and of the Proposed Plan in a major newspaper of general circulation and provided opportunity for public comment on the RI, FS and Proposed Plan to be submitted in writing to IEPA by August 12, 1988 and/or orally at a public hearing held in the City of Marshall, Illinois, on July 27, 1988;

WHEREAS, IEPA, pursuant to Section 117 of CERCLA, 42 U.S.C. Section 9617, has kept a transcript of the public hearing and has made this transcript available to the public as part of the administrative record located at U.S. EPA, Region V, 230 South Dearborn Street, Chicago, Illinois; IEPA, 2200 Churchill Road,

Springfield, Illinois: and at the Marshall Public Library, 612 Archer Avenue, Marshall, Illinois;

WHEREAS, on July 15, 1988, U.S. EPA, pursuant to Section 122 of CERCLA, 42 U.S.C. Section 9622, notified the Defendant that the U.S. EPA determined it to be a potentially responsible party ("PRP") regarding the proposed remedial action at the Facility;

WHEREAS, in accordance with Section 121(f)(1)(F) of CERCLA, 42 U.S.C. Section 9621(f)(i)(F), U.S. EPA notified the State of Illinois on July 15, 1988 of negotiations with the Defendant regarding the scope of the remedial design and remedial action for the Facility, and the State agreed to participate in the negotiations and be a party to any settlement:

WHEREAS, pursuant to Section 122(j) of CERCLA, 42 U.S.C. Section 9622(j), on July 15, 1988, U.S. EPA notified the Federal natural resource trustee of negotiations with the Defendant on the subject of addressing the release or threatened release of hazardous substances at the Facility. No notice has been made by IEPA to the State natural resource trustee, because no State trustee has been appointed to date;

WHEREAS, certain persons have provided comments on the FS and Proposed Plan, and to such comments IEPA provided a summary of responses, all of which have been included in the administrative record referred to above;

WHEREAS, upon consideration of the Proposed Plan and the public comments received, the Agencies have reached a decision on a final Remedial Action Plan, which is embodied in a document called

a Record of Decision ("ROD") signed by the IEPA Director on September 26, 1988, and the U.S. EPA Regional Administrator on September 30, 1988, which included a discussion of the Agencies' reasons for the final plan and for any significant changes from the Proposed Plan, and which is attached as Appendix I to this Consent Decree:

WHEREAS, IEPA, pursuant to Section 117(b) of CERCLA, 42 U.S.C. Section 6917(b), has provided public notice of adoption of the final Remedial Action Plan embodied in the ROD, including notice of the ROD's availability to the public for review in the same locations as the administrative record referred to above;

WHEREAS, pursuant to Section 117(d) of CERCLA, 42 U.S.C. Section 9617(d), the notice is being published in a major local newspaper of general circulation and the notice includes an explanation of any significant changes and the reasons for such changes from the Proposed Plan;

WHEREAS, on June 21, 1988, the Defendant notified U.S. EPA and IEPA (the "Agencies") of its decision to cease manufacturing operations at the Facility as of August 30, 1988, and to dismantle and remove, all equipment and structures from the Facility and undertake appropriate closure and post closure activities:

WHEREAS, pursuant to Section 121(d)(1) of CERCLA, 42 U.S.C. Section 6921(d)(1), Plaintiffs and Defendant ("the Parties") believe that the Remedial Action Plan adopted by the Agencies will attain a degree of cleanup of hazardous substances, pollutants and contaminants released into the environment and of control of

further release which at a minimum assures protection of human health and the environment at the Facility;

WHEREAS, the Parties believe the Remedial Action Plan adopted by the Agencies will provide a level or standard of control for such hazardous substances, pollutants, or contaminants which at least attains legally applicable or relevant and appropriate standards, requirements, criteria, or limitations under Federal environmental law (including RCRA closure and corrective action requirements promulgated pursuant to Sections 3004 and 3005 of RCRA, 42 U.S.C. Sections 6924 and 6925) or State environmental or facility siting law in accordance with Section 121(d)(2) of CERCLA, 42 U.S.C. Section 6921(d)(2), and that the Remedial Action Plan is in accordance with Section 121 of CERCLA, 42 U.S.C. Section 6921, and with the National Contingency Plan ("NCP"), 40 CFR Part 300;

WHEREAS, the Parties have developed a Statement of Work ("SOW") that describes the implementation of the tasks set forth in the Remedial Action Plan in the ROD;

WHEREAS, the Agencies have determined that the SOW is consistent with the final Remedial Action Plan in the ROD:

WHEREAS, the Defendant agrees to implement the tasks described in the SOW as set forth in the Appendix II of this Consent Decree and incorporated by reference into this Decree, and the Agencies have determined that the work required under the Consent Decree will be done properly by the Defendant and that the Defendant is qualified to implement the Remedial Action Plan contained in the ROD and the SOW:

WHEREAS, the Agencies have determined that the activities to be undertaken pursuant to this Consent Decree satisfy all substantive State and Federal requirements for final closure, post closure care and corrective action under RCRA; and

WHEREAS, the Parties recognize, and intend to further hereby, the public interest in the expedition of the cleanup of the Facility and avoiding prolonged and complicated litigation between the Parties:

NOW, THEREFORE, it is hereby Ordered, Adjudged and Decreed:

II.

JURISDICTION

1. This Court has jurisdiction over the subject matter herein, and over the parties consenting hereto. The Defendant shall not challenge this Court's jurisdiction to enter and enforce this Consent Decree.

III.

PARTIES BOUND

2. This Consent Decree applies to and is binding upon the undersigned parties and their officers, employees and agents, and their successors and assigns. The undersigned representative of each party to this Consent Decree certifies that he or she is fully authorized by the party or parties whom she or he represents to enter into the terms and conditions of the Consent Decree and to execute and legally bind that party to it. The Defendant shall provide a copy of this Consent Decree to the contractor hired to

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perform the work required by this Consent Decree and shall require the contractor to provide a copy thereof to any subcontractor retained to perform any part of the work required by this Consent Decree.

#### IV.

##### DEFINITIONS

3. Whenever the following terms are used in this Consent Decree and the Appendices attached hereto, the following definitions specified in this Paragraph shall apply:

A. "Agencies" means the U.S. Environmental Protection Agency and the Illinois Environmental Protection Agency.

B. "Agricultural Soils" means soils in an area bound on the north by a line extending west 400 feet from the northwest corner of the 5/6 Pond, on the south by a line extending west 400 feet from the southwest corner of the 2 Pond, on the east by the west sides of the 5/6 Pond and 2 Pond, and on the west by a line parallel to the east boundary extending from the northern to the southern boundary lines, and which shall be subject to deed restrictions on land use as set forth in Paragraph 6.D. of this Consent Decree.

C. "Consent Decree" means this Decree, all exhibits and appendices hereto, and any documents incorporated therein.

D. "Contaminated Equipment and Structures" means all equipment and structures used for production, storage, and disposal

at the Facility (including equipment used during the remedial action).

E. "Contractor" means the company or companies retained by or on behalf of Defendant to undertake and complete the work required by this Consent Decree. Each contractor and subcontractor shall be qualified to do those portions of the work for which it is retained. Each contractor and subcontractor shall be deemed to be related by contract to the Defendant within the meaning of 42 U.S.C. Section 9607(b).

F. "Engineer" means the company or companies retained by the Defendant to prepare the construction plans and specifications necessary to accomplish the remedial action described in the SOW which is attached to this Consent Decree as Appendix II.

G. "Facility" means the former active area of the Defendant's plant Site, encompassing the chemical manufacturing processes and hazardous waste and wastewater storage and disposal areas, and excluding the plant office and parking lot areas as delineated on Figure 2.1 of Appendix 11.

H. "Future Liability" refers to liability arising after the Agencies Certification of Completion of Remedial Construction issued pursuant to Paragraph 79.

I. "Hazardous Waste" shall have the meaning provided in Section 1004(5) of RCRA, 42 U.S.C. Section 6903 and 40 CFR 261.3.

J. "Hazardous Substance" shall have the meaning provided in Section 101(14) of CERCLA, 42 U.S.C. Section 9601(14).

K. "Hazardous Waste Management Units" shall have the meaning provided in 40 CFR 260.10.

L. "IEPA" means the Illinois Environmental Protection Agency.

M. "Local Background Levels of Chlordane in Illinois Stream Sediments" means concentrations of chlordane in sediment samples taken at locations in local Illinois streams that are similar to the Unnamed Tributary in size and surrounding land use, as approved by the Agencies, in accordance with the Sediment Sampling Plan which is Appendix IV to this Consent Decree: or literature derived average concentrations of chlordane in sediments of local Illinois streams that are similar in size and surrounding land use, as approved by the Agencies.

N. "National Contingency Plan" or "NCP" shall be used as that term is used in Section 105 of CERCLA, 42 U.S.C. Section 9605.

O. "Onproperty Creek Sediments" means contaminated sediments in the Unnamed Tributary between the Facility and Defendant's western property boundary as shown on Figure 2.1 of Appendix II to this Consent Decree.

P. "Offproperty Creek Sediments" means sediments in the Unnamed Tributary between Defendant's western property boundary and the conservation dry dam located approximately three miles downstream, that contain concentrations of chlordane above Local Background Levels of Chlordane in Illinois Stream Sediments.

Q. "Parties" means the Plaintiffs and Velsicol Chemical Corporation.

R. "Plaintiffs" means the United States of America and the State of Illinois, and their agencies and departments.

S. "Plant Soils" means soils located at the Facility which are delineated as Areas 1 through 7 in Figure 2.4 of Appendix II to this Consent Decree.

T. "Remedial Construction" means the undertaking of the following tasks at the Site in accordance with the SOW, the Well Plugging and Abandonment Plan which is attached as Appendix III to this Consent Decree, and the approved Interim Work Plan, Design Criteria Report and RA Work Plan:

(1) Legal survey of the bounds of the Unnamed Tributary on Defendant's property;

(2) Closure of Waste Disposal Well No. 1 and the Devonian monitoring well;

(3) Excavation of Offproperty Creek Sediments and Onproperty Creek Sediments;

(4) Realignment of Unnamed Tributary on Defendant's property with a new excavated channel and backfilling and vegetation of the existing channel;

(5) Excavation of contaminated sediments from the 2 Pond and 4 Pond; decontamination and placement of demolition debris; backfilling of ponds with clean soil, grading and establishment of vegetated cover over regraded areas;

(6) Excavation of contaminated Plant Soils; backfilling with clean soil, regrading and establishment of vegetated cover over regraded areas;

(7) Consolidation of all excavated material from the Site on the 5/6 Pond: treatment of excavated material by in-place chemical stabilization; and placement of RCRA-compliant multimedia cap over the regraded 5/6 Pond;

(8) Construction of groundwater collection drain and pumping system east of the 5/6 Pond: collection of groundwater for subsequent disposal or treatment/discharge;

(9) Construction, if required pursuant to this Decree, of an on-site groundwater treatment system;

(10) Installation of monitoring and recording instrumentation, security fence, monitoring wells and any other equipment necessary for performance of required operation, maintenance and monitoring activities.

U. "Response Costs" means any costs incurred by plaintiffs pursuant to 42 U.S.C. Sections 9601 et seq.

V. "Site" means the Facility plus the Agricultural Soils and the Unnamed Tributary.

W. "Statement of Work" or "SOW" means the document attached as Appendix II to this Consent Decree that describes the implementation of the Remedial Action Plan embodied in the ROD and that summarizes and describes the tasks to be completed by Defendant for remedial design and remedial action at the Site.

X. "5/6 Pond" means a former disposal area for plant production wastes as shown on Figure 2.3 of Appendix II to this Consent Decree, in which all excavated soils and sediments from this remedial action will be consolidated, stabilized and capped.

Y. "State" means the State of Illinois.

Z. "United States" means the United States of America.

AA. "Unnamed Tributary" refers to a tributary of the East Mill Creek that flows westerly through the southwestern corner of Defendant's property and approximately 2.5 miles beyond Defendant's western property line to its confluence with East Mill Creek.

BB. "U.S. EPA" means the United States Environmental Protection Agency.

CC. "U. S. DOJ" means the United States Department of Justice.

DD. "Work" means the design, construction, implementation and maintenance in accordance with this Consent Decree, of the tasks described in this Decree; the SOW, Well Plugging and Abandonment Plans, Sediment Sampling Plan, Mechanical Integrity Testing Plan, Decommissioning Plan for Hazardous Waste Management Units, and Operating and Maintenance Plan attached as Appendices II through VII hereto; and the Interim Work Plan, Design Criteria Report, RA Work Plan and any other plans, reports or schedules. required to be submitted pursuant to this Consent Decree.

## V.

### GENERAL PROVISIONS

#### 4. Commitment of Defendant:

The Defendant agrees to finance and perform the Work as defined in Paragraph 3.DD hereof, including closure of Hazardous Waste Management Units; remedial design; remedial action; mechanical integrity testing and necessary repairs of WDW No. 2; plugging and abandonment of WDW No. 1 and the DOW; plugging and abandonment of WDW No. 2 if required pursuant to Paragraph 10.J hereof; and operation, maintenance and monitoring work at the Site.

#### 5. Permits and Approvals:

A. All activities. undertaken by the Defendant pursuant to this Consent Decree shall be undertaken in accordance with the requirements of all applicable local, state and federal laws,

regulations and permits. The United States and the State have determined that the obligations and procedures authorized under this Consent Decree are consistent with the authority of the United States and the State under applicable law to establish appropriate remedial measures for the Site.

B. Pursuant to Section 121(e) of CERCLA, 42 U.S.C. Section 6921(e), no federal, state, or local permits or closure plans are required for work conducted entirely on the Site, as described in the Statement of Work and this Consent Decree. The Defendant shall obtain all permits or approvals necessary for off-site work under federal, state or local laws and shall submit timely applications and requests for any such permits and approvals.

C. The standards and provisions of Section XIV describing Force Majeure shall govern delays in obtaining permits required for the Work and also the denial of any such permits.

D. The Defendant shall include in all contracts or subcontracts entered into for work required under this Consent Decree, provisions stating that such contractors or subcontractors, including their agents and employees, shall perform all activities required by such contracts or subcontracts in compliance with all applicable laws and regulations. This Consent Decree is not, nor shall it act as, nor is it intended by the Parties to be, a permit issued pursuant to any federal or state statute or regulation.

## 6. Conveyance of the Facility and Deed Restrictions

A. The Site may be freely alienated or leased provided that at least sixty (60) days prior to the date of such alienation or lease, Defendant notifies Plaintiffs of such proposed alienation, or lease, the name of the grantee or lessee, and a description of the Defendant's obligations hereunder, if any, to be performed by such grantee or lessee. The Defendant's alienation or lease of the Site or any portion thereof shall not relieve Defendant of its obligation to perform pursuant to this Decree.

B. Any deed, title, lease or other instrument conveying or granting an interest in the Site shall contain a notice that the Site is the subject of this Consent Decree, setting forth the style of the case, case number, and Court having jurisdiction herein.

c. Within thirty (30) days after entry of this Consent Decree, the Defendant shall record with the Recorder's Office, Clark County, State of Illinois the deed restrictions attached as Exhibit 1 hereto and a copy of this Consent Decree (without Appendices), against the deeds covering the Facility, Agricultural Soils and Unnamed Tributary on Defendant's property.

## VI.

### PERFORMANCE OF THE WORK BY DEFENDANT

7. All remedial design work to be performed by the Defendant pursuant to this Consent Decree shall be under the direction and supervision of a qualified professional Engineer. Prior to the

initiation of remedial design work for the Facility, the Defendant shall notify the Agencies, in writing, of the name and qualifications of any Engineer proposed to be used in carrying out the remedial design work to be performed pursuant to this Consent Decree. Selection of any such Engineer shall be subject to approval by the Agencies, which approval shall not be unreasonably withheld.

8. All remedial action work to be performed by the Defendant pursuant to this Consent Decree shall be under the direction and supervision of a qualified professional Engineer. Prior to the initiation of remedial action work at the Site, the Defendant shall notify the Agencies, in writing, of the name and qualifications of the proposed Engineer, and the names of principal contractors and/or subcontractors proposed to be used in carrying out the work to be performed pursuant to this Consent Decree. Selection of any such Engineer or contractor and/or subcontractor shall be subject to approval by the Agencies, which approval shall not be unreasonably withheld.

9. Appendices II through VII to this Consent Decree describe the tasks to be performed for the completion of Work at the Site. Appendices I through VII are incorporated into and made an enforceable part of this Consent Decree.

10. The following work shall be performed:

A. By February 15, 1989, the Defendant shall submit to the Agencies for approval an Interim Work Plan for removal of sediments in the 2 and 4 Ponds. The Interim Work Plan shall be

developed in conformance with the technical requirements of the SOW. This plan shall include a Health and Safety Plan.

B. Within thirty (30) calendar days of the effective date of this Consent Decree, the Defendant shall submit a Design Criteria Report to the Agencies for the remedial design at the Site. The Design Criteria Report shall be developed in conformance with the SOW, U.S. EPA Superfund Remedial Design and Remedial Action Guidance and any additional guidance documents provided to Defendant by U.S. EPA or IEPA on a timely basis. The preliminary design, pre-final design and final design documents shall be submitted by the Defendant to the Agencies according to the schedules in the SOW and the approved Design Criteria Report.

C. Within sixty (60) calendar days of the approval of the Design Criteria Report, Defendant shall submit a work plan to the Agencies for the remedial action at the Site (RA Work Plan). The RA Work Plan shall be developed in conformance with the SOW, U.S. EPA Superfund Remedial Design and Remedial Action Guidance and any additional guidance documents provided to Defendant by U.S. EPA or IEPA on a timely basis.

D. The RA Work Plan submittal shall include, but not be limited to: (1) a sampling and analysis plan; (2) a health and safety/contingency plan; (3) a plan for satisfaction of permitting requirements; (4) a quality assurance project plan; and (5) an operation and maintenance plan. The RA Work Plan shall also include a schedule for implementation of the Remedial Construction tasks and submittal of RA reports.

E. Within 120 calendar days of the effective date of this Consent Decree the Defendant shall submit a work plan to the Agencies for bench scale and laboratory testing of the stabilization technology to be used on the soils and sediments to be stabilized on the 5/6 Pond (Treatment Technology Testing Work Plan). The Treatment Technology Testing Work Plan shall be developed in conformance with the SOW, U.S. EPA Superfund Remedial Design and Remedial Action Guidance and any additional guidance documents provided to Defendant by U.S. EPA or IEPA on a timely basis.

F. The Design Criteria Report, Treatment Technology Testing Work Plan, RA Work Plan and other required documents and reports (hereinafter referred to as "documents") shall be subject to review and approval by the Agencies.

G. Within thirty-five (35) calendar days of receipt of any document, the Agencies will notify Defendant, in writing, of approval or disapproval of the document, or any part thereof, or will advise the Defendant that a longer review period is necessary. In the event of any disapproval, the Agencies shall specify, in writing, all deficiencies and requested modifications to the document. Nothing in this provision shall negate U.S. EPA's or IEPA's right to approve or disapprove a submittal by the Defendant should the time period stated in this Subparagraph be exceeded by the Agencies. In order to insure prompt review by the Agencies of documents submitted by the Defendant, the Agencies will, subsequent to receipt of the document:

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(1) Use best efforts to notify the Defendant within 14 calendar days if the Agencies will need longer than the 35 day review period; and

(2) Agree to attend meetings requested by the Defendant to discuss the documents on mutually agreed to dates during the Agencies' review period.

H. Within thirty (30) calendar days from receipt of any document disapproval from the Agencies, or after such additional time as the Parties may agree to in writing, the Defendant shall submit a revised document to the Agencies which adequately addresses the requested modifications or shall provide a notice of dispute pursuant to Section XV below. Should the Agencies exceed the allotted review period the time allowed the Defendant to revise the document will be extended by mutual agreement.

I. Mechanical Integrity Testing of WDW No. 2

(1) Within sixty (60) calendar days of the effective date of this Consent Decree, or by September 1, 1989, whichever is earlier, the Defendant shall complete mechanical integrity testing of WDW No. 2 in accordance with the procedures set forth in Appendix V of this Consent Decree. The purpose of this testing is to verify the well's integrity for continued use as part of the final remedial action and for storm water disposal during Remedial Construction.

(2) Within fifteen (15) calendar days following completion of the testing required by Subparagraph I.(1) above, the Defendant shall submit a report of the results, including all raw

data generated during testing, to the Agencies. Based upon the Agencies' review of the test results, the Agencies shall notify the Defendant in writing of their determination as to whether or not the tests demonstrate the mechanical integrity of WDW No. 2. If the Agencies or the Defendant determine that the tests failed to demonstrate the mechanical integrity of WDW No. 2, the Defendant shall immediately cease all disposal in WDW No. 2, or, in the event the Parties disagree about the tests' outcome, shall submit the matter to dispute resolution pursuant to Section XV.

(3) Within thirty (30) calendar days of receipt of a determination by the Agencies that the tests required by Subparagraph I.(1) above failed to demonstrate the mechanical integrity of WDW No. 2, the Defendant shall submit a plan and schedule for the repair and immediate retesting of WDW No. 2, or, the Defendant shall submit a certification that it has permanently ceased use of WDW No. 2. A plan submitted pursuant to this subparagraph shall be subject to review and approval by the Agencies pursuant to Subparagraphs F, G and H of this Paragraph 10.

(4) If mechanical integrity tests performed immediately following completion of repairs to WDW No. 2 fail to demonstrate its mechanical integrity, as determined by the Agencies or the Defendant, the Defendant shall cease use of the WDW No. 2 and certify thereto in writing within two (2) days of receipt of such determination, or, in the event the Parties disagree about the tests' outcome, shall submit the matter to dispute resolution pursuant to Section XV.

(5) If the Agencies determine that the testing required by Subparagraph (1) or (3) above successfully demonstrates the mechanical integrity of WDW No. 2, the Defendant shall retest WDW No. 2 on an annual basis commencing one year from the date of receipt of the Agencies' determination. The Defendant shall follow the testing procedures set forth in Appendix III and shall submit the results to the Agencies in accordance with Subparagraph (2) above. In the event of a determination by the Agencies or the Defendant that any such tests fail to demonstrate mechanical integrity of WDW No. 2, the Defendant shall immediately cease all disposal in WDW No. 2 and follow the provisions of Subparagraphs I.(3) and I.(4) above, or, in the event the Parties disagree about the tests' outcome, shall submit the matter to dispute resolution pursuant to Section XV.

J. Closure of WDW No. 1 and WDW No. 2 and the DOW

(1) Within sixty (60) calendar days of the effective date of this Consent Decree, the Defendant shall commence closure of WDW No. 1 and the DOW and proceed expeditiously to complete closure in accordance with the Well No. 1 Plugging and Abandonment Plan set forth in Appendix III to this Consent Decree. In any event, such closure shall be completed within eighteen (18) months from the effective date of this Decree unless a later date is approved in writing by the Agencies.

(2) Within sixty (60) days after the Defendant has permanently ceased use of WDW No. 2 pursuant to Subparagraph I.(3) above, or upon its own volition, the Defendant shall commence

closure of WDW No. 2 in accordance with the Well No. 2 Plugging and Abandonment Plan set forth in Appendix III to this Consent Decree. Such closure shall be completed within eighteen (18) months of commencement of closure unless a later date is approved in writing by the Agencies.

(3) Within eighteen (18) months after the Defendant has ceased use of WDW No. 2 pursuant to Subparagraph I.(4) above, it shall commence closure of WDW No. 2 in accordance with the Well NO. 2 Plugging and Abandonment Plan set forth in Appendix III to this Consent Decree. Such closure shall be completed within eighteen (18) months of commencement of closure unless a later date is approved in writing by the Agencies.

(4) The Defendant shall close WDW No. 2 no later than six months after demonstrating compliance with the cleanup standard in Paragraph 12.J, unless the Defendant has applied for a permit for operation of WDW No. 2 from IEPA, and no final determination denying the permit has been made.

K. Design of Groundwater Treatment System

On or before July 1, 1990, the Defendant shall submit a work plan to the Agencies for design, construction, operation and maintenance of a groundwater treatment system capable of meeting the cleanup standards for groundwater set forth in Table 8 of Appendix I (or any revised standards incorporated into this Consent Decree pursuant to Paragraph 12.0). The work plan shall include a schedule for construction of the groundwater treatment system. This work plan shall be subject to review and approval by the

Agencies .in accordance with Subparagraphs F through G of this Paragraph. 10.

L. Implementation Of Approved Documents

The Defendant shall proceed to implement the work detailed in the Interim Work Plan, Design Criteria Report and RA Work Plan upon approval by the Agencies. Unless otherwise directed by the Agencies, the Defendant shall not commence field activities until approval by the Agencies of the work plan describing such activities. The fully approved documents shall be deemed incorporated into and made an enforceable part of this Consent Decree. All Work, including the remedial design, remedial action and operation, maintenance and monitoring work at the Site, shall be conducted in accordance with the National Contingency Plan, the U.S. EPA Superfund Remedial Design and Remedial Action Guidance, the SOW and the requirements of this Consent Decree, including the standards, specifications and schedules contained in Appendices II through VII and in the approved Interim Work Plan, Design Criteria Report and RA Work Plan.

M. The Defendant shall implement the closure of Hazardous Waste Management Units at the Facility in accordance with the Decommissioning Plan for Hazardous Waste Management Units, Appendix VI to this Decree.

N. The Defendant shall conduct groundwater monitoring at the downgradient perimeter of the 5/6 Pond and maintenance of the final cap in accordance with the Operation and Maintenance Plan in

the approved RA *Work Plan* for at least thirty years following completion of Remedial Construction.

O. Notwithstanding any other provision of this Consent Decree, the Defendant may, at its option, perform a focused FS for the purpose of developing additional remedial alternatives for remediation of the Offproperty Creek Sediments. The additional remedial alternatives to be considered are other than excavation and on-site stabilization and containment of the sediments as required by this Decree, and those previously considered in the ROD. The FS should be developed in conformance with the standards set forth in Section 121 of CERCLA, the NCP, U.S. EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, March 1988 (OSWER Directive 9355.3-01, draft) and any additional guidance documents provided to Defendant by U.S. EPA or IEPA on a timely basis.

Such focused FS shall be submitted to the Agencies no later than June 30, 1990. The focused FS will be reviewed in accordance with Section 117 of CERCLA 42 U.S.C. Section 9617.

P. In the event of a conflict between the SOW and the approved Design Criteria Report, the Design Criteria Report shall control. In the event of a conflict between the SOW and the approved RA *Work Plan*, the RA *Work Plan* shall control. In the event of a conflict between any provision of this Consent Decree and the SOW, the Design Criteria Report or the RA *Work Plan*, the Consent Decree shall control.

11. The Parties acknowledge and agree that neither the SOW, the Design Criteria Report nor the RA Work Plan constitutes a warranty or representation of any kind by Plaintiffs that the SOW, Design Criteria Report or RA Work Plan will achieve the cleanup standards set forth in the ROD and in Paragraph 12 below and shall not foreclose Plaintiffs from seeking performance of all terms and conditions of this Consent Decree, including the applicable cleanup standards.

12. The following performance and cleanup standards apply to the activities undertaken pursuant to this Consent Decree:

A. Onproperty Creek Sediments shall be excavated to a depth of 24 inches.

B. Offproperty Creek Sediments shall be excavated until Local Background Levels of Chlordane in Illinois Stream Sediments or Agency approved, risk based cleanup targets are attained.

C. Sediments from the base and sides of Ponds 2 and 4 shall be excavated to a depth of 6 inches below the high water mark of each pond.

D. Plant Soils:

(1) Soils in Areas 1 and 2 shall be excavated to a depth of one foot.

(2) Soils in Area 3 shall be excavated to a depth of 3.5 feet.

(3) Soils in Area 4 other than that portion that was previously excavated by the Defendant shall be excavated to a depth of 6 feet.

(4) Soils in Areas 5 and 7 shall be excavated to a depth of 2 feet.

(5) Soils in Area 6 other than that portion that was previously excavated by the Defendant shall be excavated to a depth of one foot.

(6) In addition to soils excavated pursuant to Subparagraphs (1) through (5) above, the Defendant shall excavate up to 10,000 cubic yards of soils in any of the seven areas below the prescribed removal, depths upon a determination by the Agencies, during the time of excavation, that such soils are contaminated. Total soil excavation pursuant to this subparagraph shall be limited to 10,000 cubic yards.

E. Agricultural Soils shall be used only for growing corn, soybeans or wheat, until such time that the residual chlordane in the soil reaches the level of background concentrations for like land used for agricultural purposes. Until such time, lime shall be applied to avoid acidity, in accordance with normal agricultural practices.

F. Surface water of the Unnamed Tributary, after completion of Remedial Construction, shall not exceed the chemical-specific concentrations for surface water set forth in Table 8 of Appendix I (or any revised clean-up standards incorporated into this Consent Decree pursuant to Paragraph 12.0).

G. The final cover placed on the 5/6 pond shall meet the requirements of the RA Work Plan. Maintenance and monitoring of

the 5/6 pond cover will be in accordance with the Operation and Maintenance Plan in the approved RA Work Plan.

H. Contaminated Equipment and Structures from the Hazardous Waste Management Units shall be managed in accordance with 40 CFR 265.111, 265.197 and the Decommissioning Plan for Hazardous Waste Management Units in Appendix VI. Contaminated Equipment and Structures to be discarded from other plant areas shall be decontaminated and disposed in the 2 and 4 Ponds in accordance with the approved Interim Work Plan and RA Work Plan.

I. Surface water collected during the remedial action shall meet the chemical-specific concentrations for surface water set forth in Table 8 of Appendix I (or any revised cleanup standards incorporated into this Consent Decree pursuant to Paragraph 12.0) prior to discharge of such surface water into the Unnamed Tributary.

J. Groundwater collection, and disposal or treatment pursuant to this Decree shall continue until untreated extracted ground water meets the chemical-specific concentrations for groundwater set forth in Table 8 to Appendix I (or any revised cleanup standards incorporated into this Consent Decree pursuant to Paragraph 12.0).

K. Groundwater treated for discharge to the Unnamed Tributary shall meet the chemical-specific concentrations for groundwater set forth in Table 8 of Appendix I (or any revised cleanup standards incorporated into this Consent Decree pursuant to

Paragraph 12.0) prior to discharge of such treated groundwater into the Unnamed Tributary.

L. In addition to any controls established in the approved RA Workplan, air emissions resulting from soil and sediment excavation, placement, and stabilization, and groundwater extraction and treatment will not exceed particulate matter and ozone Ambient Air Quality Standards established under the Clean Air Act, 42 U.S.C. 7401 et seq. and the Illinois Environmental Protection Act, Ill. Rev. Stat., Ch. 111-1/2, pars. 1001, et seq.

M. Groundwater collected in the groundwater collection drain shall be monitored in accordance with the Operation and Maintenance Plan in the approved RA Work Plan.

N. Groundwater at the downgradient perimeter of the 5/6 pond and the upgradient monitoring well nest will be monitored in accordance with the SOW and the Operation and Maintenance Plan in the approved RA Work Plan.

0. Modification of Cleanup Standards

(1) Defendant may petition the Agencies to revise the Consent Decree and the ROD with respect to any cleanup standard listed in Table 8 of the ROD and Appendix I to this Decree. With respect to any proposed revised standard for remediation of groundwater, the petition must address the criteria for adopting Alternate Concentration Limits in 40 CFR 264.94(b) or establish background concentrations in accordance with 40 CFR 264.97. With respect to any proposed revised discharge limit to the Unnamed Tributary, the petition must demonstrate that the proposed limit is

consistent with the requirements of 40 CFR Part 125, Subpart A and all other requirements for establishing discharge limits under the National Pollutant Discharge Elimination System Program. The Agencies shall notify the Defendant in writing of their approval or disapproval of any petition submitted pursuant to this subparagraph. Upon approval, the ROD shall be modified and such revised cleanup standard(s) shall be deemed incorporated into this Consent Decree.

(2) Defendant may challenge the Agencies' determination under Subparagraph (1) in accordance with the dispute resolution provisions of Section XV of the Decree.

(3) In the event that Plaintiffs disagree as to their response to any petition submitted pursuant to this paragraph, the dispute shall be resolved in accordance with Section XV.B hereof.

13. The Defendant shall demonstrate compliance with chemical-specific cleanup standards set forth in Paragraph 12 of this Decree as follows:

A. Compliance with the cleanup standard set forth in Subparagraph B shall be determined in accordance with the approved RA Work Plan.

B. Unless proven otherwise, compliance with the cleanup standard set forth in Subparagraph F shall be deemed demonstrated, so long as any discharge to the Unnamed Tributary meets the cleanup standards described in Subparagraphs I and K.

C. Compliance with Subparagraph I shall be determined by sampling and analysis in accordance with the approved RA Work Plan.

D. Compliance with Subparagraph J shall be determined by semi-annual monitoring of the groundwater monitoring wells and the groundwater collection trench for a minimum of two years for all of the Target Compound List (TCL) parameters listed in the SOW. This monitoring shall be in addition to the routine monitoring required by the SOW and the Operation and Maintenance Plan in the approved RA Work Plan. Compliance is defined as meeting all chemical-specific concentrations for groundwater set forth in Table 8 to Appendix I (or any revised clean-up standards incorporated into this Consent Decree pursuant to Paragraph 12.0) in all of the groundwater monitoring wells and in the groundwater collection trench for four consecutive sampling events.

E. Compliance with Subparagraph X shall be determined by monthly sampling and analysis of the treated groundwater at the point of discharge to the Unnamed Tributary in accordance with the approved RA Work Plan. Compliance must be maintained for the entire period of time that groundwater is treated and discharged to the Unnamed Tributary pursuant to this Consent Decree.

F. Compliance with Subparagraph L shall be determined by ambient air quality monitoring in accordance with the approved RA Work Plan. Compliance must be demonstrated and maintained throughout the period of Remedial Construction and during any period groundwater is treated for discharge to the Unnamed Tributary.

14. The Defendant shall certify compliance with the performance standards set forth at Subparagraphs A, C, D, E, G, H,

M and N of Paragraph 12 after completion of Remedial Construction pursuant to Paragraph 79 of this Decree.

VII.

DISPOSAL/TREATMENT OF WATER

15. Stormwater and/or contaminated groundwater collected and removed by the groundwater collection drain pursuant to this Decree, may be disposed of in WDW No. 2 so long as the following conditions are met:

A. Such disposal is in accordance with all applicable Federal or State statutes and regulations and/or national U.S. EPA policy: and

B. Operation of WDW No. 2 is not prohibited under the terms of this Consent Decree, or by Federal or State law.

16. Requirement to Construct a Groundwater Treatment System

A. No later than three months prior to the date set forth in the RA Work Plan for collection and disposal or treatment of contaminated groundwater, the Defendant shall commence construction of a groundwater treatment system in conformance with the approved work plan required by Paragraph 10.K hereof, unless the conditions set forth in Paragraph 15 are met, and the Defendant so certifies in writing to the Agencies. If the conditions set forth in Paragraph 15 are not met, the Defendant shall complete construction and commence operation of the treatment system by the deadline for collection of contaminated groundwater in the RA Work Plan.

B. After the Defendant commences disposal of contaminated water in WDW NO. 2 pursuant to the RA Work Plan, if any final State or Federal regulation or published National U.S. EPA policy has the effect of prohibiting disposal in WDW No. 2 of groundwater or stormwater from the Facility, the Defendant shall construct a groundwater treatment system in conformance with the approved work plan required by Subparagraph 10.K, and commence operation of said treatment system, prior to the effective date of such regulation or National policy.

C. If the Defendant voluntarily determines to cease use of WDW No. 2, and is not subject to the requirements of Subparagraph A or B above, it shall design and construct a groundwater treatment system in accordance with plans and specifications approved by the Agencies.

17. If the Defendant is required to construct a treatment system pursuant to Paragraph 16 above, it shall operate and maintain such system in accordance with the RA Work Plan and all other plans submitted and approved under this Decree. The treatment system shall be operated until the Defendant demonstrates to the Agencies that it is in compliance with the cleanup standards set forth in Paragraphs 12.1 and 12.J., in accordance with Paragraphs 13.C and 13.D, respectively.

## VIII.

AGENCIES' PERIODIC REVIEW TO ASSURE  
PROTECTION OF HUMAN HEALTH AND ENVIRONMENT

18. To the extent required by Section 121(c) of CERCLA, 42 U.S.C. Section 9621(c), and any applicable regulations, the U.S. EPA, in consultation with the State, shall review the remedial action at the Facility at least every five (5) years after the entry of this Consent Decree to assure that human health and the environment are being protected by the remedial action being implemented. If upon such review, the U.S. EPA determines that further response action is appropriate at the Facility in accordance with Section 104 or 106 of CERCLA, then the U.S. EPA may take or order the Defendant to take such action.

19. The Defendant shall be provided with an opportunity to confer with the Agencies on any response action proposed as a result of the 5-year review and to submit written comments for the record. After the period for submission of written comments is closed, the Regional Administrator of U.S. EPA, Region V, in consultation with the State, shall in writing either affirm, modify or rescind the order for further response action. The final decision of U.S. EPA shall be subject to judicial review to the extent permitted by Section 113 of CERCLA, 42 U.S.C. Section 9613.

## IX.

ADDITIONAL WORK

20. In the event that the Agencies or the Defendant determine that additional work, including additional remedial design of

remedial action, if necessary to meet the performance or cleanup standards described in Section VI above, notification of such additional work will be provided by the Agencies to the Defendant's Project Coordinator, and by Defendant to U.S. EPA's Remedial Project Manager and IEPA's Project Manager.

21. Any additional work determined to be necessary by the Defendant is subject to approval by the Agencies.

22. Any additional work determined to be necessary by the Defendant and approved by the Agencies or determined to be necessary by the Agencies to meet the performance or cleanup standards shall be completed by the Defendant in accordance with the standards, specifications, and schedules approved by the Agencies.

X.

QUALITY ASSURANCE

23. The Defendant shall use quality assurance, quality control, and chain of custody procedures in accordance with U.S. EPA's "Interim Guidelines and Specifications For Preparing Quality Assurance Project Plans" (QAM-005/80) and subsequent amendments to such guidelines upon notification to the Defendant of such amendments by U.S. EPA. Prior to the commencement of any monitoring project under this Consent Decree, the Defendant shall submit a Quality Assurance Project Plan(s) ("QAPP") to the Agencies that is consistent with the SOW. The QAPP is subject to review, and approval or disapproval in accordance with Paragraph 10.G and H hereof. Upon notification of disapproval or any need for

modifications, the Defendant shall make all required modifications in the QAPP(s) subject to the dispute resolution provisions of Section XV. Sampling data generated consistent with the QAPP(s) shall be admissible as evidence, without objection, in any proceeding under Section XV of this Decree. The Defendant shall assure that personnel or authorized representatives of the Agencies are allowed access to any laboratory utilized by the Defendant in implementing this Consent Decree, for purposes of Quality Assurance. In addition, the Defendant shall have the designated laboratory analyze samples submitted by the Agencies for purposes of quality assurance monitoring pursuant to Standard U.S. EPA Contract Laboratory Program auditing procedures.

## XI.

FACILITY ACCESS. SAMPLING. DOCUMENT AVAILABILITY

24. To the extent that the Site or other areas where Work is to be performed hereunder is presently owned by parties other than those bound by this Consent Decree, the Defendant shall use its best efforts to obtain access agreements from the present owners within thirty (30) calendar days of entry of this Consent Decree for purposes of implementing the requirements of this Decree. Such agreements shall provide access for the Agencies and authorized representatives of the Agencies and for the contractors of the Defendant. If, despite the Defendant's best efforts such access agreements are not obtained within the time specified herein, the Defendant shall so notify the Agencies, and U.S. EPA agrees, in accordance with Agency guidance in effect at the time, to exercise

its authority under Section 104(e) of CERCLA on behalf of the Defendant, to otherwise secure access to the necessary areas. The Defendant agrees to Cooperate with U.S. EPA in this regard. The Defendant shall also provide access to its property for the Agencies and authorized representatives of the Agencies at all reasonable times for purposes of overseeing the requirements of this Consent Decree. Information obtained by the Agencies or their authorized representatives during such oversight which the Defendant claims to be confidential business information in accordance with Section 104(e) of CERCLA will be afforded such protection from disclosure to third parties as specified in 40 CFR Part 2, Subpart B.

25. At the request of U.S. EPA or IEPA, the Defendant shall allow split or duplicate samples to be taken by the Agencies and/or their authorized representatives, of any samples collected by the Defendant pursuant to the implementation of this Consent Decree. The Defendant shall notify the Agencies not less than ten (10) days in advance of any sample collection activity unless circumstances at the site make such notice impossible. In addition, the Agencies shall have the right to take any additional samples that they deem necessary.

26. The Defendant shall make available to the Agencies the results of all sampling and/or tests or other data generated by the Defendant with respect to the implementation of this Consent Decree. The Agencies shall make available to the Defendant, upon request, to the extent allowed by law, the results of sampling and

tests or other data generated by them or their representatives, agents or contractors.

## XII.

## REPORTING REQUIREMENTS

27. The Defendant shall provide to the Agencies written monthly progress reports which: (1) describe the actions which have been taken toward achieving compliance with this Consent Decree during the previous month; (2) describe all tasks completed under the Interim Work Plan or the RA Work Plan during the previous month; (3) describe all actions, data and plans which are scheduled for the next month and provide other information relating to the progress of construction as is customary in the industry; and (4) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedules for implementation of the Interim Work Plan or the RA Work Plan, and a description of efforts made or planned to mitigate those delays or anticipated delays. These progress reports are to be submitted to the Agencies by the tenth day of every month following the effective date of this Consent Decree.

Upon the Defendant's receipt of a Certification Of Completion of Remedial Construction pursuant to Paragraph 79, reports hereunder may be submitted on an annual basis, on the tenth day following each anniversary of the Certification of Completion.

28. The date of submission or notification will be determined by the date of the postmark. If the date for submission of any item

or notification required by this Consent Decree falls upon a weekend or state or federal holiday, the time period for submission of that item or notification is extended to the next working day following the weekend or holiday.

29. Upon the occurrence of any event during performance of the work which, pursuant to Section 103 of CERCLA, requires reporting to the National Response Center, the Defendant shall promptly orally notify the U.S. EPA Remedial Project Manager and the IPA Project Manager or, in the event of their unavailability, the Emergency Response Section, Region V, United States Environmental Protection Agency, and the IEPA Emergency Response Unit in addition to the reporting required by Section 103. Within twenty (20) days of the onset of such an event, the Defendant shall furnish to Plaintiffs a written report setting forth the events which occurred and the measures taken, and to be taken, in response thereto. Within thirty (30) days of the conclusion of such an event, the Defendant shall submit a report setting forth all actions taken to respond thereto.

#### XIII.

##### PROJECT MANAGERS/PROJECT COORDINATORS

30. U.S. EPA shall designate a Remedial Project Manager (RPM) and IEPA shall designate a Project Manager (PM) for the Facility, and the Plaintiffs may designate other representatives, including U.S. EPA and State employees, and federal and state contractors and consultants, to observe and monitor the progress of any activity

undertaken pursuant to this Consent Decree. The RPM shall have the authority lawfully vested in an On-scene Coordinator by the National Contingency Plan, 40 CFR Part 300. When conditions at the Site may present an imminent and substantial endangerment to public health or welfare or the environment, the RPM/PM shall have authority to halt (after consultation with the Defendant's Project coordinator), conduct, or direct any work required by this Consent Decree and to take any necessary response action. The Defendant shall designate a Project Coordinator who shall have primary responsibility for implementation of the Work at the Facility. If the parties disagree as to any direction given by the RPM/PM, the matter shall be resolved in accordance with the dispute resolution provisions of Section XV of this Decree, but the Defendant shall comply with any work stoppage order of the RPM/PM during the dispute resolution process. In no event shall the RPM/PM have the authority to unilaterally modify the provisions of this Decree or Statement of Work, but nothing herein shall prevent the RPM/PM from taking, ordering or prohibiting action as described above.

31. To the maximum extent possible, except as specifically provided in the Consent Decree, communications between the Defendant, the State and U.S. EPA concerning the implementation of work under this Consent Decree shall be made between the Project Coordinator and the RPM/PM.

32. Within twenty (20) calendar days of the effective date of this Consent Decree, Defendant, IEPA and U.S. EPA shall notify each other, in writing, of the name, address and telephone number of the

designated Project Coordinator and an Alternate-Project-Coordinator and the RPM/PM and Alternate RPM/PM. If any of the Parties changes their designated representative, they shall notify the other Parties, in writing, within ten (10) calendar days of the name, address and telephone number of the new representative.

xxv.

FORCE MAJEURE

33. "Force Majeure" for purposes of this Consent Decree is defined as any event arising from causes beyond the control of the Defendant, including failure of the Agencies to act in timely manner pursuant to this Decree, which delays or prevents the performance of any obligation under this Consent Decree. "Force Majeure" shall not include increased costs or expenses or non-attainment of the Performance or Cleanup Standards set forth in Section VI hereof.

34. When circumstances occur which may delay the completion of any phase of the Work or delay access to the Facility or to any property on which any part of the Work is to be performed, whether or not caused by a "force majeure" event, the Defendant shall promptly notify either the RPM or the PM by telephone, or in the event of their unavailability, their alternates. Within ten (10) days of the event which the Defendant contends is responsible for the delay, the Defendant shall supply to Plaintiffs in writing the reason(s) for and anticipated duration of such delay, the measures taken and to be taken by the Defendant to prevent or minimize the

delay, and the timetable for implementation of such measures. Failure to give oral notice to the RPM or the PM and to give written explanation to plaintiffs in a timely manner shall constitute a waiver of any claim of force majeure.

35. If the Plaintiffs agree that a delay is or was attributable to a "force majeure" event, the Parties shall modify the relevant schedules to provide such additional time as may be necessary to allow the completion of the specific phase of Work and/or any succeeding phase of the Work affected by such delay.

36. If the Plaintiffs and the Defendant cannot agree whether the reason for the delay was a "force majeure" event, or whether the duration of the delay is or was warranted under the circumstances, the Parties shall resolve the dispute according to Section XV hereof. The Defendant has the burden of proving force majeure as a defense to compliance with this Consent Decree.

#### XV.

##### DISPUTE RESOLUTION

37. As required by Section 121(e) (2) of CERCLA, the Parties to this Consent Decree shall attempt to resolve expeditiously and informally any disagreements concerning implementation of this Consent Decree or any Work required hereunder.

38. In the event that any dispute between the Defendant and Plaintiffs arising under this Consent Decree is not resolved expeditiously through informal means, the party desiring dispute resolution under this Section shall give written notice to the

other parties to the Decree within ten (10) days of the Party's knowledge of the dispute.

A. Within ten (10) days of the service of notice of dispute pursuant to this Paragraph, the party who gave the notice shall serve on the other parties to this Decree a written statement of the issues in dispute, the relevant facts upon which the dispute is based, and factual data, analysis or opinion supporting its position, and all supporting documentation on which such party relies (hereinafter the "Statement of Position"). Opposing parties shall serve their Statements of Position, including supporting documentation, no later than ten (10) days after receipt of the complaining party's Statement of Position. In the event that these 10-day time periods for exchange of Statements of Position may cause a delay in the Work, they shall be shortened upon and in accordance with notice by the Agencies.

B. An administrative record of any dispute under this Paragraph shall be maintained by the U.S. EPA. In the event that these include the written notification of such dispute, Statements of Position served pursuant to the preceding subparagraphs, and any other relevant information. The record shall be available for review by all parties.

C. Upon review of the administrative record, the Director of the Waste Management Division, U.S. EPA, Region V, in consultation with the State, shall issue a final decision and order resolving the dispute within thirty (30) days of receipt of the Statements of Position from both parties. This order shall be

enforceable administratively pursuant to Section 121(e) (2) of CERCLA, subject to the rights of judicial review set forth in the following Subparagraph.

D. Any decision and order of U.S. EPA pursuant to the preceding Subparagraph shall be reviewable by this Court, provided that a Notice of Judicial Appeal is filed within ten (10) days of receipt of U.S. EPA's decision and order, until the date of termination of this Consent Decree specified in Section XXVII hereof. Judicial review will be conducted on the administrative record. U.S. EPA's decisions pertaining to the selection or adequacy of response actions pursuant to Sections VI, VII, VIII and IX of this Consent Decree shall be upheld by the Court unless found to be arbitrary, capricious or otherwise not in accordance with law. The parties reserve their respective rights to make any arguments concerning what standard of review is applicable to disputes on other issues.

E. The invocation of the procedures stated in this Paragraph 38 shall not extend or postpone the Defendant's obligations under this Consent Decree with respect to the disputed issue unless and until U.S. EPA finds, or the Court orders, otherwise.

39. In the event of a dispute between Plaintiffs, the following procedures shall be implemented:

A. As required by Section 121(e)(2) of CERCLA, 42 U.S.C. Section 9621(e) (2), the Plaintiffs shall attempt to resolve expeditiously, through informal discussions, any disagreements

Concerning implementation of this Consent Decree or any Work required hereunder.

B. In the event that a dispute arising under this paragraph is not resolved expeditiously through informal means, the State shall give prompt written notice to U.S. EPA.

C. Within 15 days after service of notice of dispute under Subparagraph B of this Paragraph, the State shall serve on the U.S. EPA a written statement of the issue in dispute, the relevant facts upon which the dispute is based, the factual data, analysis or opinion supporting its position, and all supporting documentation on which the State relies (the "Statement of Position"). U.S. EPA shall serve upon the State its Statement of Position no later than fifteen days after receipt of the State's Statement of Position.

D. An administrative record of any dispute under this paragraph shall be maintained by U.S. EPA. The record shall include the written notification of such dispute, the Statements of Position served pursuant to Subparagraph C, and any other relevant non-privileged information. The record shall be available for review by all Parties.

E. Following the notification and exchange of Statements of Position, U.S. EPA shall review the administrative record. Upon such review, U.S. EPA shall set forth its position and rationale.

F. Following U.S. EPA's setting forth its position and rationale in Subparagraph E, the State shall have the right to seek judicial review of such position and rationale within 60 days of

receipt of EPA's position and rationale. State invocation of judicial proceedings following the processes established in Subparagraphs A through E above will be governed by requirements of CERCLA and other applicable law. Unless reversed by the Court pursuant to this Subparagraph, U.S. EPA's position is controlling.

## XVI.

RETENTION AND AVAILABILITY OF INFORMATION

40. A. The Defendant shall make available to the Agencies, and shall retain during the pendency of this Consent Decree and for a period of ten (10) years after the Agencies' Certification of Completion of Remedial Construction, all records and documents in Defendant's possession, custody, or control which relate to the performance of this Consent Decree, including, but not limited to, documents reflecting the results of any sampling, tests, or other data or information generated or acquired by the Defendant, or on its behalf, with respect to the Site and all documents pertaining to its own or any other person's liability for response action or costs under CERCLA. The Defendant may assert claims of privilege respecting, documentary materials to the extent authorized under Section 104(e) of CERCLA. Documentary materials other than those required to be furnished under Section 104(e) of CERCLA, which are asserted to be attorney work product or subject to privilege under law, shall not be subject to inspection and copying (except upon order of the Court) provided that the Defendant provides the Agencies with an identification of the title and subject matter of

each document for which a privilege is asserted, and an explanation as to why the privilege is applicable to the document or portion thereof. After the ten (10) year period of document retention, the Defendant shall notify U.S. DOJ, U.S. EPA, the Illinois Attorney General's Office and IEPA at least ninety (90) calendar days prior to the destruction of any such documents, and upon request by U.S. EPA or IEPA, the Defendant shall relinquish custody of the documents to IEPA or U.S. EPA as directed.

8. Upon request of the Defendant the Agencies shall make available to Defendant records pertaining to the Site to the extent permissible under Federal and State law.

41. The Defendant may assert business confidentiality claims covering part or all of the information provided in connection with this Consent Decree in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. Section 9604(e)(7), and pursuant to 40 CFR Section 2.203(b) and applicable State law.

42. Information determined to be confidential by U.S. EPA will be afforded the protection specified in 40 CFR Part 2, Subpart B and, if determined to be entitled to confidential treatment under State law by IEPA, afforded protection under State law by IEPA. If no such claim accompanies the information when it is submitted to the Agencies, or if a determination is made that the information is not entitled to confidential treatment, the public may be given access to such information.

43. Information acquired or generated by the Defendant in performance of the Work that is subject to the provisions of

Section 104(8)(7)(P) of CERCLA, 42 U.S.C. Section 9604(e)(t)(F), shall not be claimed as confidential by the Defendant.

## XVII.

REIMBURSEMENT

44. The Defendant shall pay One Million Two Hundred Thousand (\$1,200,000.00) dollars to the EPA Hazardous Substances Response Trust Fund, delivered to the U.S. EPA, Region V, Attention: Superfund Accounting, P.O. Box 70753, Chicago, Illinois 60673, in the form of a certified or cashier's check payable to "EPA Hazardous Substances Superfund." Payment shall be made upon the latter of: 1) Ten (10) days after the Agencies' approval of the RA Work Plan; or 2) no later than six months after the entry of this Consent Decree. A copy of such check shall be sent to the Director, Waste Management Division, U.S. EPA, Region V and to the Director of IEPA.

45. The payments made under Paragraph 44 of this Section are reimbursement of costs claimed by the United States in this action as of the date of execution of this Decree.

46. The Defendant shall pay all oversight costs of the Plaintiffs not inconsistent with the NCP that are incurred after the execution of this Consent Decree in overseeing implementation of the Work. payments shall be made on an annual basis and within thirty (30) days of the submission of itemized cost statements and supporting documentation by the Plaintiffs. The Plaintiffs shall submit their oversight cost claims as soon as practicable after

each anniversary date of this Consent Decree. If the amount of any such annual oversight cost Claims exceeds one hundred thousand dollars (\$100,000), such excess shall be carried forward without interest and shall be reimbursed to Plaintiffs as part of any subsequent annual payments to the extent that the cost claims for those subsequent years fall short of \$100,000. Interest shall accrue on any amount of such annual oversight costs, up to \$100,000, that is not paid within thirty (30) days of the submission of itemized costs statements and supporting documents by the Plaintiffs. In no event shall the cost claims sought from Defendant for oversight of this Consent Decree, exclusive of interest, exceed eight hundred thousand dollars (\$800,000). Payments of oversight costs of the United States shall be made as specified in Paragraph 44 above. Payments of oversight costs of the State shall be delivered to the IEPA Division of Administration, Fiscal Services Section, P.O. Box 19276, Springfield, Illinois 62794-9276, in the form of a certified or cashier's check payable to "Treasurer, State of Illinois for deposit in the Hazardous Waste Fund." A copy of such check shall be sent to the Director, Waste Management Division, U.S. EPA, Region V. In consideration of and upon payment of all oversight costs as required by this Paragraph, the United States and the State covenant not to sue for any oversight costs incurred in overseeing the Work.

47. If oversight costs are outstanding at the time the Plaintiffs agree to terminate this Consent Decree, the Defendant

shall, within thirty (30) days of the submission of an itemized cost statement and supporting documentation by the Plaintiffs, and before termination of this Consent Decree, pay such oversight costs.

48. The Response Costs set forth in paragraph 44 of this Section are consistent with the National Contingency Plan.

XVIII.

STIPULATED PENALTIES

49. The Defendant shall pay stipulated penalties in the amount set forth in Paragraph 50 below in equal shares to the United States and the State for each violation of this Consent Decree, within the following categories of violations, unless such failure is excused under Section XIV ("Force Majeure"):

A. Category A

Failure to complete Remedial Construction work by the date specified in the approved RA Work Plan.

B. Category B

(1) Failure to submit Design Criteria Report or required revision thereto by the date specified in Paragraph 10.B;

(2) Failure to submit final (100%) plans and specifications or required revision thereto by the date specified in the approved Design Criteria Report;

(3) Failure to submit RA Work Plan or required revisions thereto by the date specified in Paragraph 10.C; and

(4) Failure to commence remedial work required by the approved RA Work Plan in accordance with the schedule set forth therein.

C. Category C

(1) Failure to submit Mechanical Integrity Testing Reports on WDW No. 2 by the dates specified in Paragraph 10.1;

(2) Failure to submit a work plan for the groundwater treatment system by the date specified in Paragraph 10.K, or as required by Section VII; and

(3) Failure to submit any progress report by the dates specified in Paragraph 27.

Any modifications of the time for performance shall be in writing and approved by the Agencies:

50. The following stipulated penalties shall be payable per violation per day in equal shares to the United States and the State for any noncompliance identified in Paragraph 49 above.

<u>Category A</u>	<u>Category B</u>	<u>Category C</u>	<u>Period of Noncompliance</u>
\$ 700	\$ 500	\$ 100	1st thru 29th day
\$ 2,000	\$ 1,500	\$ 100	30th thru 60th day
\$ 3,000	\$ 2,500	\$ 100	61st day and beyond

51. All penalties begin to accrue on the day following the day on which complete performance is due or a violation occurs, and continue to accrue through the final day of correction of the noncompliance. herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Decree.

52. Following the U.S. EPA's or IEPA's determination that the Defendant has failed to comply with the requirements of this Consent Decree, the U.S. EPA or IEPA shall give the Defendant written notification of the same and describe the noncompliance. This notice shall also indicate the amount of penalties due.

53. All penalties owed to the United States and the State under this Section. shall be payable within thirty (30) days of receipt of the notification of non-compliance, Unless the Defendant invokes the dispute resolution procedures under Section XV. Penalties shall accrue from the date of violation regardless of whether the Agencies have notified the Defendant of a violation. Interest shall begin to accrue on the unpaid balance at the end of the thirty (30) day period. Such penalties owed to the United States shall be paid by certified check to the "Hazardous Substances Response Trust Fund" and shall be mailed to U.S. EPA, Region V, Attention: Superfund Accounting, P.O. Box 70753, Chicago, Illinois 60673. Such penalties owed to the State shall be paid by certified check to the "Treasurer, State of Illinois for deposit in the Hazardous Waste Fund" and shall be mailed to IEPA, Division of Administration, Fiscal Services Section, P.O. Box 19276, Springfield, Illinois 62794-9276. The checks shall contain the Defendant's complete and correct address, the site name, and the civil action number.

54. Disputes

A. The Defendant may dispute the United States' or the State's right to the stated amount of penalties by invoking the dispute resolution procedures under Section XV.

B. Penalties shall accrue but need not be paid during the dispute resolution period. If the District Court becomes involved in the resolution of the dispute, the period of dispute shall end upon the rendering of a decision by the District Court regardless Of whether any party appeals such decision. If the Defendant does not prevail upon resolution, the Plaintiffs have the right to collect all penalties plus

interest at the rate set forth in Paragraph 59 which accrue prior to and during the period of dispute. In the event of an appeal, such penalties shall be placed into an escrow account until a decision has been rendered by the final court of appeal. If the Defendant prevails upon resolution, no penalties shall be payable.

C. With respect to penalties for Consent Decree violations in Categories B and C only, the Defendant shall have the right to petition the Court for a finding that the Defendant's position regarding the dispute had substantial support in law, fact and/or expert opinion (as applicable) and reasonably could have been expected to prevail, in light of the applicable standard of judicial review, and that Defendant sought dispute resolution at the earliest practicable time and took all other appropriate steps to avoid any delay in remedial action work as a result of the dispute. If the Court so finds, the Court may reduce the stipulated penalties as appropriate, but such reduction shall be no more than fifty percent (50%).

55. Penalties for Consent Decree violations set forth in Categories B and C will be forgiven if Defendant completes Remedial Construction by the deadline set forth in the approved PA Work Plan. Any such penalties which are payable hereunder shall be paid as specified in Paragraph 53 but shall be placed by the Agencies into an interest-bearing escrow account and shall remain there until the deadline set forth above. If such deadline is missed, the balance of the escrow account shall be paid into the Hazardous Substances Response Trust Fund and the State Hazardous Waste Fund as provided in Paragraph 53. If such deadline is met the balance of the escrow account shall be paid to the Defendant.

56. Neither the filing of a petition to resolve a dispute nor the payment of penalties shall alter in any way the Defendant's obligation to complete the performance required hereunder.

57. No penalties shall accrue for violations of this Consent Decree caused by events determined to be beyond the control of the Defendant as identified in Section XIV ("Force Majeure"). The Defendant has the burden of proving force majeure or compliance with this Consent Decree.

58. This Section shall remain in full force and effect for the term of this Consent Decree.

59. Pursuant to 31 U.S.C. Section 3717, interest shall accrue on any amounts overdue at a rate established by the Department of Treasury for any period after the penalties become due and payable under Paragraph 52 above.

60. If the Defendant fails to pay stipulated penalties, the United States or the State may institute proceedings to collect the penalties. Notwithstanding the stipulated penalties provisions of this Section, U.S. EPA or the State may elect to assess civil penalties pursuant to Section 109 of CERCLA or bring an action in U.S. District Court to enforce the provisions of this Consent Decree, but they agree not to seek both stipulated penalties and Section 109 civil penalties for the same violation. Payment of stipulated penalties shall not preclude U.S. EPA or the State from electing to pursue any other remedy or sanction to enforce this Consent Decree.

COVENANT NOT TO SUE

61. In consideration of Defendant's performance of the terms and conditions of this Consent Decree, and except as otherwise specifically provided in this Decree, the United States and the State covenant not to sue the Defendant or its officers, directors, employees, or agents for Covered Matters. Covered Matters shall include: any and all claims available to Plaintiffs arising from the facts, transactions or occurrences as described in Plaintiffs' complaint against the Defendant, including such claims as could be raised under Sections 106 and 107 of CERCLA; Sections 3008(a), 3008(h) and 7003 of RCRA; Section 311 of the Clean Water Act; any and all claims available to the State under State statutory law, including Sections 21(f) and 22.2 of the Environmental Protection Act, Ill. Rev. Stat., Ch. 111-1/2, pars. 1021(f) and 1022.2; and all state and federal common law claims. With respect to Future Liability, this covenant not to sue shall take effect one year following Certification by the Agencies of the Completion of the Remedial Construction concerning the Facility.

62. "Covered Matters" does not include:

- A. Liability arising from hazardous substances removed from the Facility:
- B. Natural Resource damages:
- c. Criminal liability;

D. Claims based on a failure by the Defendant to meet the requirements of this Consent Decree; and

E. Any matters for which the United States or the State is owed indemnification under Section XX hereof:

63. Notwithstanding any other provision in this Consent Decree, (1) the United States and the State reserve the right to institute proceedings in this action or in a new action or to issue an Order seeking to compel the Defendant to perform any additional response work at the Facility; and (2) the United States and the State reserve the right to institute proceedings in this action or in a new action seeking to reimburse the United States for its response costs and to reimburse the State for its matching share of any response action undertaken by U.S. EPA or the State under CERCLA, relating to the Facility, if:

A. for proceedings prior to the Agencies' certification of completion of the remedial action concerning the Facility,

(i) conditions at the Site, previously unknown to the Agencies, are discovered after the entry of this Consent Decree, or

(ii) information is received, in whole or in part, after the entry of this Consent Decree,

and these previously unknown conditions or this information indicates that the remedial action is not protective of human health and the environment; and

B. for proceedings subsequent to the Agencies' certification of completion of the remedial action concerning the Facility,

(i) conditions at the Site, previously unknown to the Agencies, are discovered after the certification of completion by the Agencies, or

(ii) information received, in whole or in part, after the certification of completion by the Agencies,

and these previously unknown conditions or this information indicates that the remedial action is not protective of human health and the environment.

64. Notwithstanding any other provision in this Consent Decree, the covenant not to sue in this Section shall not relieve the Defendant of its obligation to meet and maintain compliance with the requirements set forth in this Consent Decree, including the conditions in the ROD, which are incorporated herein, and the United States and the State reserve their rights to take response actions at the Site in the event of a breach of the terms of this Consent Decree and to seek recovery of costs incurred after entry of the Consent Decree: 1) resulting from such a breach: 2) relating to any portion of the Work funded or performed by the United States or the State: or 3) incurred by the United States or the State as a result of having to seek judicial assistance to remedy conditions at or adjacent to the Site.

65. So long as the Defendant is in compliance with this Consent Decree, Plaintiffs shall not bring an action against any other person not a signatory to this Decree for Covered Matters. Nothing in this Consent Decree shall constitute or be construed as a release or a covenant not to sue regarding any claim or cause of action against any person, firm, trust, joint venture, partnership,

corporation or other entity not a signatory to this Consent Decree for any liability it may have arising out of or relating to the Site, should the Defendant fail to maintain compliance with this Consent Decree.

## XX.

INDEMNIFICATION: OTHER CLAIMS

66. The Defendant agrees to indemnify, save and hold harmless the Plaintiffs and their representatives from any and all claims or causes of action arising solely from acts or omissions of the Defendant and its representatives in carrying out the activities pursuant to this Consent Decree. The Agencies shall notify the Defendant of any such claims or actions as soon as practicable after receiving notice that such a claim or action is anticipated or has been filed.

67. The Plaintiffs are not to be construed as parties to, and do not assume any liability for, any contract entered into by the Defendant in carrying out the activities pursuant to this Consent Decree. The proper completion of the Work under this Consent Decree is solely the responsibility of the Defendant.

68. The Defendant waives its rights to assert any claims against the Hazardous Substances Trust Fund under CERCLA or the State's Hazardous Waste Fund that are related to any past costs or costs incurred in the Work performed pursuant to this Consent Decree, and nothing in this Consent Decree shall be construed as

U.S. EPA's preauthorization of a claim against the Hazardous Substance Trust Fund or against the State's Hazardous Waste Fund.

XXI.

INSURANCE/FINANCIAL ASSURANCE

69. Within thirty (30) days of entry of this Consent Decree, the Defendant shall demonstrate financial responsibility, in accordance with 40 CFR 265.147(a) and 265.147(b), for bodily injury and property damage to third parties caused by: (1) sudden accidental occurrences arising from operation of the Facility and (2) non-sudden accidental occurrences arising from operation of the 5/6 pond. Such liability coverage shall be maintained in at least the amounts specified in the above-referenced regulations, for the period of time until the Agencies have certified completion of Remedial Construction pursuant to Paragraph 79 hereof. If Defendant is unable to obtain such coverage it shall so certify in writing to the Agencies within thirty (30) days of entry of this Consent Decree. Thereafter, on an annual basis, the Defendant shall advise the Agencies in writing as to the availability of such liability insurance in the amounts specified.

70. The Defendant shall purchase and maintain in force financial assurance in the same manner as provided at its other facilities for protection of the public against any and all liability arising out of the Defendant's and its Contractor and other agents' acts or omissions in performance of the Work at the Facility.

71. The Defendant shall provide financial security for the completion of the work excluding operation and maintenance activities, in the form of an irrevocable standby letter of credit, in the amount of the three million five hundred thousand dollars (\$3,500,000).

A. The Defendant must submit the letter of credit to the Regional Administrator, U.S. EPA, Region V no later than six (6) months after the effective date of this Decree.

B. The letter of credit shall be issued for a period of one year and provide that the expiration date shall be automatically extended for a period of one year from the expiration date and each successive expiration date unless at least 120 days before the current expiration date the issuing institution notifies the Defendant and the Regional Administrator by certified mail of a decision not to extend the expiration date.

c. The wording of the letter of credit shall be approved by U.S. EPA.

D. When the estimated cost of completion of Remedial Construction becomes less than the amount of the letter of credit, the amount of the letter of credit shall be reduced to the amount of the current cost estimate on a quarterly basis following written approval of the Regional Administrator or his delegate.

E. Within ninety (90) days of receipt of notice from the issuing institution of a decision not to extend the expiration date of the letter of credit required by this Paragraph, the Defendant

must obtain another irrevocable letter of credit in an amount at least equal to the current estimate of the cost of the remaining Remedial Construction, as approved in writing by U.S. EPA. If the Defendant does not obtain a replacement letter of credit and obtain such written approval by U.S. EPA within such 90 day period, the Regional Administrator will draw on the existing letter of credit. The funds shall be held in escrow by U.S. EPA until the Agencies certify completion of Remedial Construction pursuant to Paragraph 79 hereof, at which time they will be returned to Defendant, unless the funds are required to complete the Work in accordance with this Decree.

F. Following a determination by U.S. EPA of Defendant's

(1) Significant failure to conform with the schedules set forth in the RA Work Plan or other plans approved pursuant to this Consent Decree for completion of the Work; or

(2) Financial inability to complete the Work in accordance with such approved work plans, subject to the dispute resolution provisions set forth in Section xv, the Regional Administrator may draw on the letter of credit and U.S. EPA shall have the right to complete the remaining work required by the RA Work Plan.

72. Defendant shall provide financial assurance for operation and maintenance of the remedial action and at least thirty (30) years post-remedial construction monitoring, in the form of an

irrevocable standby letter of credit in the amount of five hundred thousand dollars (\$500,000).

A. The Defendant must submit the letter of credit to the Regional Administrator no later than two (2) years after the effective date of this Consent Decree.

B. The letter of credit shall be issued for a period of one year and provide that the expiration date shall be automatically extended for a period of one year from the expiration date and each successive expiration date unless at least 120 days before the current expiration date the issuing institution notifies the Defendant and the Regional Administrator by certified mail of a decision not to extend the expiration date.

C. The wording of the letter of credit shall be approved by U.S. EPA.

D. So long as the Defendant is in compliance with the operation, maintenance and monitoring provisions of the approved RA Work Plan and other plans approved under this Decree, the amount of the letter of credit shall be reduced at each annual expiration date in the amount of fifty two thousand six hundred and fifty four dollars (\$52,654), following written approval of the Regional Administrator or his delegate. Such amount shall be adjusted if the Agencies determine that the operation, maintenance and monitoring activities must continue beyond thirty (30) years after completion of Remedial Construction.

E. Within ninety (90) days of receipt of notice from the issuing institution of a decision not to extend the expiration date

of the letter of credit required by this Paragraph, the Defendant must obtain another irrevocable letter of credit in an amount at least equal to the amount of the existing letter of credit. If the Defendant does not obtain a replacement letter of credit and obtain written approval thereof by U.S. EPA within such 90 day period, the Regional Administrator will draw on the existing letter of credit. The funds shall be held in escrow by U.S. EPA until the Agencies certify Completion of Remedial Action pursuant to Paragraph 80 hereof, at which time they will be returned to Defendant, unless the funds are required to complete the operation, maintenance and monitoring provisions of this Consent Decree.

F. Following a determination by U.S. EPA of Defendant's

- (1) failure to perform the operation, maintenance or monitoring activities in accordance with the RA Work Plan, or
- (2) financial inability to perform such activities in accordance with the RA Work Plan,

subject to the dispute resolution provisions set forth in Section xv, the Regional Administrator may draw on the letter of credit and U.S. EPA shall have the right thereafter to perform the operation, maintenance and monitoring activities required by the RA Work Plan.

XXII.

**NOTICES**

73. A. Whenever, under the terms of this Consent Decree, notice is required to be given or a report or other document is

required to be forwarded by one party to another, such correspondence shall be directed to the following individuals at the addresses specified below:

As' to the United States or  
U.S. EPA;

Director, Waste Management  
Division  
Attn: Velsicol Chemical  
Corporation, Marshall  
Illinois, Remedial  
Project Manager (5HE)  
U.S. Environmental Protection  
Agency  
230 S. Dearborn Street  
Chicago, Illinois 60604

As to the State of  
Illinois:

Illinois Environmental  
Protection Agency  
Velsicol Chemical Corp.,  
Marshall, Illinois  
Project Manager  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois  
62794-9276

Attorney General, State of  
Illinois  
Attn: Joseph Madonia  
Environmental Control  
Division  
500 South Second St.  
Springfield, Il. 62706

As to Defendant:

Charles R. Hanson  
Vice President  
Environmental Management  
Velsicol Chemical Corporation  
2603 Corporate Avenue  
Suite 100  
Memphis, Tennessee 38132

B. Whenever service of any papers or process is necessitated by the dispute resolution provisions of Section XV hereof, such correspondence shall be directed to the following individuals, in addition to the individuals listed above. The following individuals shall' also receive copies of the letters of transmittal for submittals under Subparagraph A, above:

As to the United States or  
U.S. EPA.

Regional Counsel  
Attn: Velsicol Chemical Corp.  
Coordinator  
Marshall, Illinois  
U.S. Environmental Protection  
230 S. Dearborn Street  
Chicago, Illinois 60604

Assistant Attorney General  
Land & Natural Resources  
Division  
U.S. Department of Justice  
10th & Pennsylvania Avenue, N.W.  
Washington, D.C. 20530

As to the State of  
Illinois:

Illinois Environmental  
Protection Agency  
Enforcement Programs  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois  
6279409276

XXIII.

CONSISTENCY WITH  
NATIONAL CONTINGENCY PLAN

74. The Court finds and the Parties agree that the Work, if properly performed as set forth in this Consent Decree, is consistent with the provisions of the National Contingency Plan pursuant to 42 U.S.C. Section 9605.

XXIV.

RESPONSE AUTHORITY

75. Nothing in this Consent Decree shall be deemed to limit the response authority of the United States under 42 U.S.C. Section 9604.

XXV.

COMMUNITY RELATIONS

76. The Defendant shall cooperate with the Agencies in providing information regarding the progress of remedial design and remedial action at the Site to the public, as required by CERCLA. As requested by the Agencies, the Defendant shall participate in the preparation of all appropriate information disseminated to the public and in public meetings which may be held or sponsored by the Agencies to explain activities at or concerning the Site.

XXVI.

EFFECT OF CONSENT DECREE

77. The execution of this Consent Decree is not an admission of any fact or liability on any issue dealt with in this Consent Decree. Accordingly, it is the intention of the Parties that, with the exception of this proceeding or any other proceeding to enforce this Consent Decree, this Consent Decree shall not be admissible in any judicial or administrative proceeding (except that it may be admissible in a judicial or administrative proceeding between the Defendant and its insurance company).

XXVII.

EFFECTIVE AND TERMINATION DATES

78. This Consent Decree shall be effective upon the date of its entry by the Court.

79. Certification of Completion of Remedial Construction

A. When Defendant believes that Remedial Construction is complete, it shall submit to the Plaintiffs a Notice of Completion of Remedial Construction; and a final report which summarizes the work done, any modification made to the final (100%) design plans and specifications, the RA Work Plan and other plans incorporated into this Consent Decree, and a Certification/demonstration of the Performance/Cleanup Standards achieved. The report shall include or reference any supporting documentation.

B. Upon receipt of the Notice of Completion of Remedial construction, the Agencies shall review the final report and supporting documentation, and all work undertaken under Section VI of this Consent Decree up to the date that the Notice of Completion was submitted. The Agencies shall issue a Certification of Completion of Remedial Construction upon their determination that:

(1) Up to the date that the Notice was submitted, the work has been performed in accordance with the final (100%) design. plans and specifications, the RA Work Plan and any other plans incorporated into this Consent Decree, and all performance standards set forth in Paragraph 12, except Subparagraph 12.J, have been achieved and maintained: and

(2) all costs and stipulated penalties required to be paid under Section XVII and XVIII have been paid in full by the Defendant.

## 80. Certification of Completion of Remedial Action

A. When the Defendant believes that the demonstration of compliance with the cleanup standard set forth in Paragraph 12.J has been made, and that groundwater collection and treatment/disposal is no longer necessary to maintain compliance with said cleanup standard, the Defendant shall submit to the Plaintiffs a Notice of Completion of Remedial Action and data demonstrating (pursuant to Paragraph 13.D) that the cleanup standard in Paragraph 12.5 has been achieved.

B. Upon receipt of the Notice of Completion of Remedial Action, the Agencies shall review the work performed pursuant to Paragraph 10 since completion of Remedial Construction, and the data supporting the demonstration of compliance with Paragraph 12.5. The Agencies shall issue a Certification of Completion of Remedial Action upon a determination that the Defendant has demonstrated compliance with the cleanup standard in Paragraph 12.3 and that the Defendant is otherwise in compliance with all other clean-up standards and other requirements of this Decree and that no further remedial action is required as of the time EPA reviewed the Notice of Completion of Remedial Action.

## 81. Termination

Upon the filing of the Agencies' Certification of Completion of Remedial Action pursuant to the preceding paragraph, and a showing that the other terms of this Consent Decree including

payment of all costs and stipulated penalties due hereunder, have been compiled with, this Consent Decree shall be terminated upon motion of any party. However, the Defendant's obligation to perform long term monitoring, cap maintenance and reporting in accordance with Paragraphs 10.N and 27 shall survive the termination of this Decree and shall be enforceable by the United States by reinstatement of this action or by institution of a new judicial action. The provisions of Sections VIII (Agencies' Periodic Review), XVI (Retention and Availability of Information) and XIX (Covenant Not to Sue) shall also survive the termination of this Decree.

ENTERED this 14<sup>th</sup> day of Sept., 19 89.

EOD 9-15-89  
JLM

James L. Foreman  
U.S. District Judge

The parties whose signature appear below hereby consent to the terms of this Consent Decree. The consent of the United States is subject to the public notice and comment requirements of 28 C.P.R. 50.7.

UNITED STATES OF AMERICA

By: Ronald Carr  
DONALD A. CARR  
Acting Assistant Attorney General  
Land & Natural Resources Division  
U.S. Department of Justice  
Washington, D.C. 20530

Date: May 4, 1989

By: Franklin M. [Signature]  
Valdas V. Adamkus  
Regional Administrator  
U.S. EPA Region V

Date: 3/6/89

PEOPLE OF THE STATE OF ILLINOIS

Neil F. Hartigan  
Attorney General

By: Shawn W. Denney  
Shawn W. Denney  
First Assistant; Attorney  
General

Date: 1-23-89

ILLINOIS ENVIRONMENTAL PROTECTION  
AGENCY

By: Joseph E. Svoboda  
Joseph E. Svoboda  
Manager, Enforcement Programs

Date: 1/6/89

VELSICOL CHEMICAL CORPORATION

By: CR Hanson  
Charles R. Hanson  
Vice President  
Environmental Management

Date: 12/29/88

## **EXHIBIT I**

### DEED RESTRICTIONS

Deed Restrictions have been imposed on certain parcels of real estate, referred to collectively herein as the Velsicol Chemical Corporation property (the "Property"), in Clark County, in the State of Illinois.

The following restrictions run with the land and are imposed on the Property for the purpose of preventing interference with the performance of remedial action pursuant to the attached Consent Decree approved by the United States District court for the Southern District of Illinois on \_\_\_\_\_, 1989, styled as Civil Action Number \_\_\_\_\_, (the "Consent Decree"), and are required by Paragraph 5.C of the Consent Decree. The definitions of "Facility," "Agricultural Soils," "Unnamed Tributary" and "5/6 Pond" as used herein, are found in Paragraph 3 of the Consent Decree and have the same meanings as stated therein.

1. There shall be no use for any purpose whatsoever of that portion of the Property known as the 5/6 Pond. This restriction shall continue in perpetuity.

2. There shall be no use of that portion of the Property known as the "Agricultural Soils" except for cultivation of corn, soybeans or wheat. This restriction shall remain in full force and

effect until residual chlordane levels in the Agricultural Soils have attained background levels of chlordane in similar soils used for agricultural purposes.

3. There shall be no use of the Facility, including but not limited to the use of the land for grazing or farm production, or the construction, installation or use of any structures or buildings. This restriction shall remain in full force and effect until the U.S. Environmental Protection Agency (U.S. EPA) issues a determination in writing pursuant to Paragraph 79 of the Consent Decree, that the performance standards set forth in Paragraph 12.0 of the Consent Decree have been achieved.

4. After U.S. EPA has issued a determination that the performance standards set forth in Paragraph 12.0 of the Consent Decree have been achieved at the Facility, the Facility may be used for commercial and industrial purposes only. However, such use shall be subject to the following limitations:

a. No building or structure may be constructed with a basement or below ground facilities.

b. No excavation shall be conducted below the clean fill layer without prior approval of U.S. EPA. This restriction shall continue in perpetuity.

5. There shall be no agricultural, recreational or consumptive use of the Unnamed Tributary located on the Property, This restriction shall remain in full force and effect until U.S. EPA issues a determination in writing, pursuant to Paragraph 79 of the Consent Decree, that the Performance and Cleanup Standards set forth in Paragraph 12.A, I and K have been achieved.

6. There shall be no installation of wells or consumptive or other use of the groundwater underlying the Facility and the Agricultural Soils . The restrictions set forth in Paragraph 6 shall remain in full force and effect until U.S. EPA issues a determination in writing, pursuant to Paragraph 80 of the Consent Decree, that the Cleanup Standard set forth in Paragraph 12.J of the Consent Decree has been achieved and no further remedial action is required.

If the property owner intends to permit commercial or industrial use of the Facility after termination of the restrictions set forth in Paragraphs 3 and 4 above, the owner shall give at least sixty (60) days prior notice of the intended use of the Facility to the parties to the Consent Decree.