



MONTGOMERY WATSON

July 14, 2000

(Via: FedEx)

New Mexico Environmental Department (NMED)
Hazardous and Radioactive Materials Bureau
2044 Galisteo
P.O. Box 26110
Sante Fe, New Mexico 87502

Attn: Mr. Steve Pullen

Re: Final Vadose Zone Monitoring System Work Plan
Triassic Park Waste Disposal Facility
Gandy Marley, Inc.

Dear Mr. Pullen:

On behalf of Gandy Marley Incorporated (GMI), Montgomery Watson (MW) is pleased to submit three (3) copies of the above referenced document. We hope this document meets all of your expectations.

If you have any questions concerning this report, please contact us.

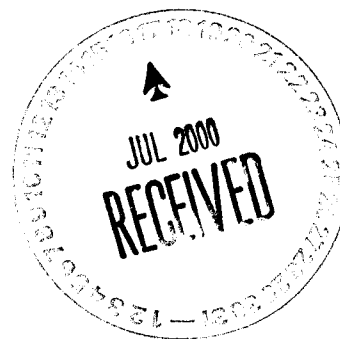
Sincerely,

Montgomery Watson

Patrick G. Corser, P.E. *for*
Principal

Enclosure

cc: Dale Gandy (1)
Ken Schultz (1)
Trey Greenwood (1)
Jim Bonner (1)
Montgomery Watson (3)



Prepared for:

TRIASSIC PARK WASTE DISPOSAL FACILITY

Gandy Marley, Inc.
Post Office Box 827
1109 East Broadway
Tatum, New Mexico 88267

Final

**Vadose Zone Monitoring System
Work Plan**

July 2000

Prepared by:

MONTGOMERY WATSON
P.O. Box 774018
Steamboat Springs, Colorado 80477
(970) 879-6260

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1.0 INTRODUCTION

1.1 BACKGROUND

The Gandy Marley Corporation (Gandy Marley) was granted a Groundwater Monitoring Waiver for its proposed Triassic Park Waste Disposal Facility by the Hazardous and Radioactive Materials Bureau (HRMB) of the New Mexico Environmental Department (NMED) on January 12, 2000. The Triassic Park Waste Disposal Facility will be located in Chaves County, New Mexico, east of Roswell (Figure 1, *Site Location Map*). The facility will be a full-service Resource Conservation and Recovery Act (RCRA) Subtitle C waste treatment, storage and disposal operation. Two treatment processes will be used at the facility. Evaporation ponds will be used for managing leachate fluids that meets landfill disposal restriction standards and a stabilization process will be used for treating fluids, sludge and solids prior to final disposal in the on-site landfill.

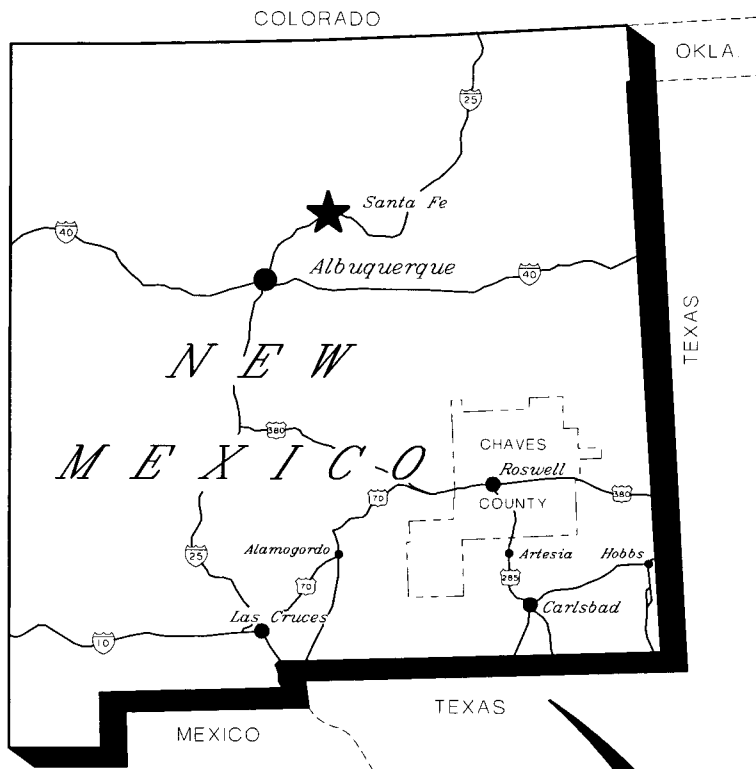
Site-specific hydrogeologic conditions and engineering safeguards for the regulated units were documented in the report titled *Groundwater Monitoring Waiver Request, Triassic Park Waste Disposal Facility* (Montgomery Watson, January 2000). The *Groundwater Monitoring Waiver Request* report indicated that hydrogeologic conditions at the site will minimize migration of potential leachate fluids from the facility to the uppermost aquifer. The conservative modeling calculations presented in the *Groundwater Monitoring Waiver Request* report estimated that the migration time for potential leaks from the disposal facility to the uppermost aquifer would be greater than 1000 years. As an alternative to conventional groundwater monitoring, the *Groundwater Monitoring Waiver Request* report recommended installation of a vadose zone monitoring system (VZMS) as a superior means for protecting human health and the environment because of its ability to detect potential leaks in a more timely manner.

This Work Plan presents the design of a VZMS at the site and will be an appendix to the Permit Application. It includes a discussion of the location and design of the vadose zone monitoring wells and methodologies for characterizing fluids that may accumulate in vadose zone wells and sumps from various sources. This Work Plan also discusses how data will be collected to select chemical parameters indicative of fluids (waste or non-waste) that may occur at the site. A summary of monitoring frequency, sampling procedures, laboratory analyses and data reporting associated with the monitoring system are also provided. Figure 2, *Location of Sumps and Monitoring Wells*, presents a map of the proposed facility showing significant site features including the locations of the waste management units, vadose zone monitoring wells and sumps.

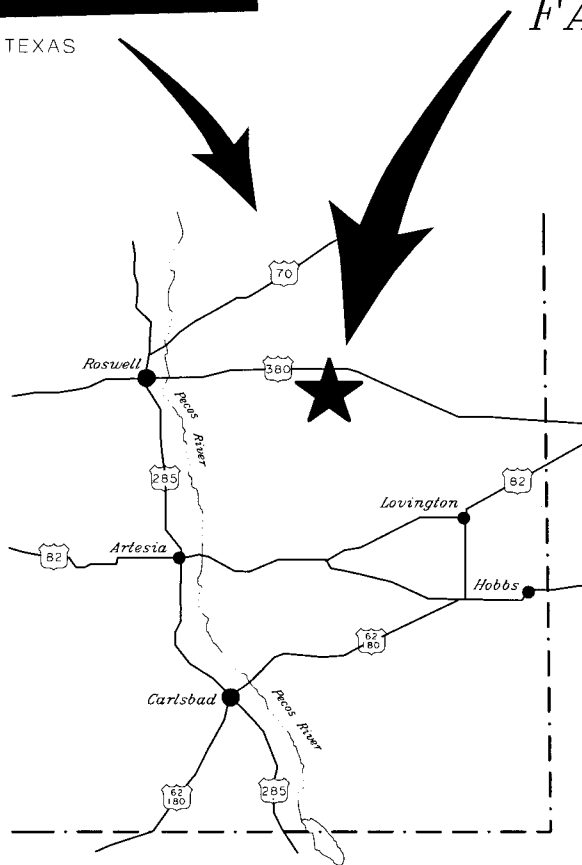
1.2 PROJECT SCOPE AND OBJECTIVES

This Work Plan presents recommendations for a VZMS at the site. The vadose zone monitoring program for the facility allows collection of fluids beneath or downgradient of the facility and identification of the potential source(s) associated with these fluids. The following items are included as part of this Work Plan.

- A description of the methodology for installing a VZMS capable of detecting fluids migrating from the waste management units;
- A description of the methodology for developing baseline data characterizing the chemical characteristics of non-leachate fluids that may accumulate in sumps or vadose zone wells ;
- A methodology for selection of appropriate indicator parameters that could be used to identify leachate fluids during future monitoring at the site;



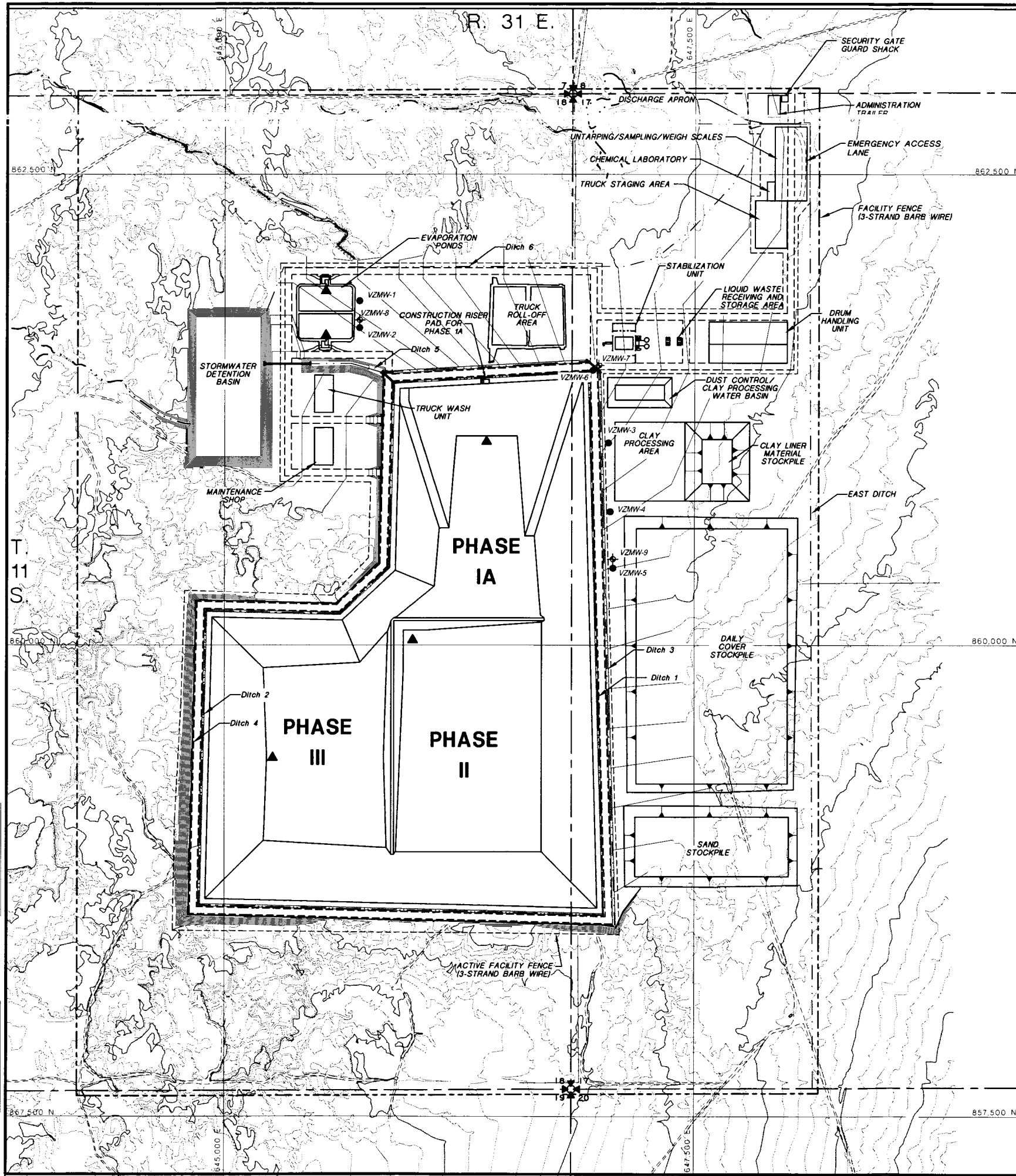
**TRIASSIC
PARK
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MONTGOMERY WATSON			PROJECT No. 1342602 02190200 AutoCAD FILE: SITELOC.DWG SCALE: N/A FIGURE No. 1		

**TRIASSIC PARK
WASTE DISPOSAL FACILITY**

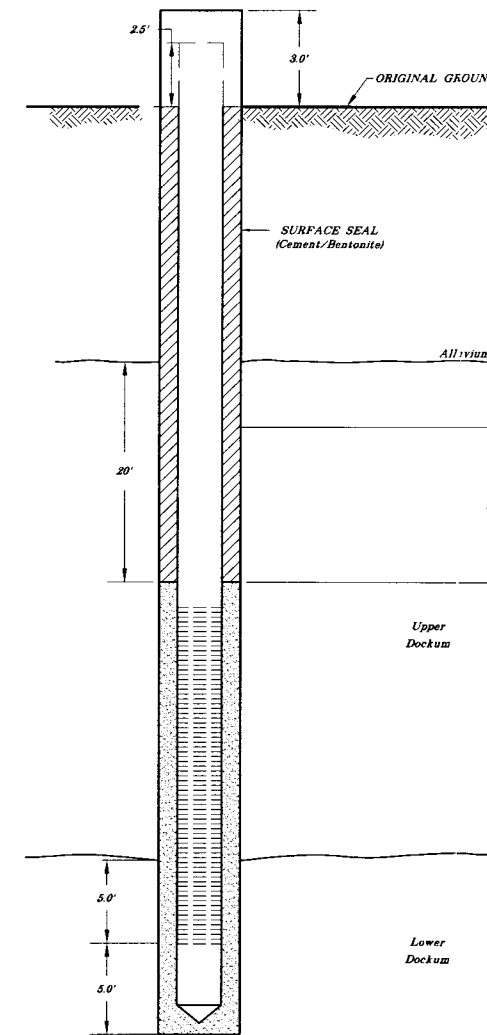
SITE LOCATION



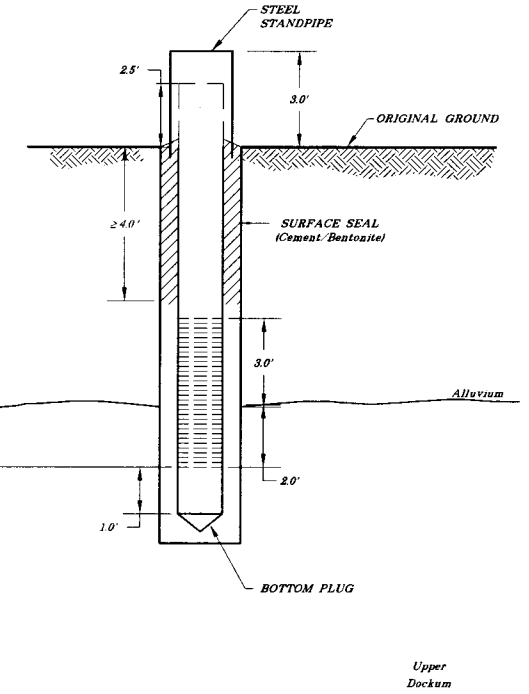
LEGEND

- EXISTING CONTOUR
- REGRADED CONTOUR
- VZMW2 DEEP MONITORING WELL
- ⊕ NESTED SHALLOW MONITORING WELL
- ▲ VADOSE ZONE SUMP
- - - FACILITY AND ACTIVE FACILITY FENCES (3-STRAND BARB WIRE)

DEEP MONITORING WELL INSTALLATION DETAIL



SHALLOW MONITORING WELL INSTALLATION DETAIL



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1	Revisions	5/9/00	T.Leeson	K.Comrath	T.Leeson
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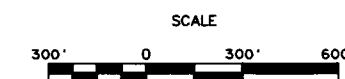
TRIASSIC PARK WASTE DISPOSAL FACILITY

PROJECT:
VADOSE ZONE MONITORING SYSTEM WORK PLAN

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LOCATION OF SUMPS AND MONITORING WELLS

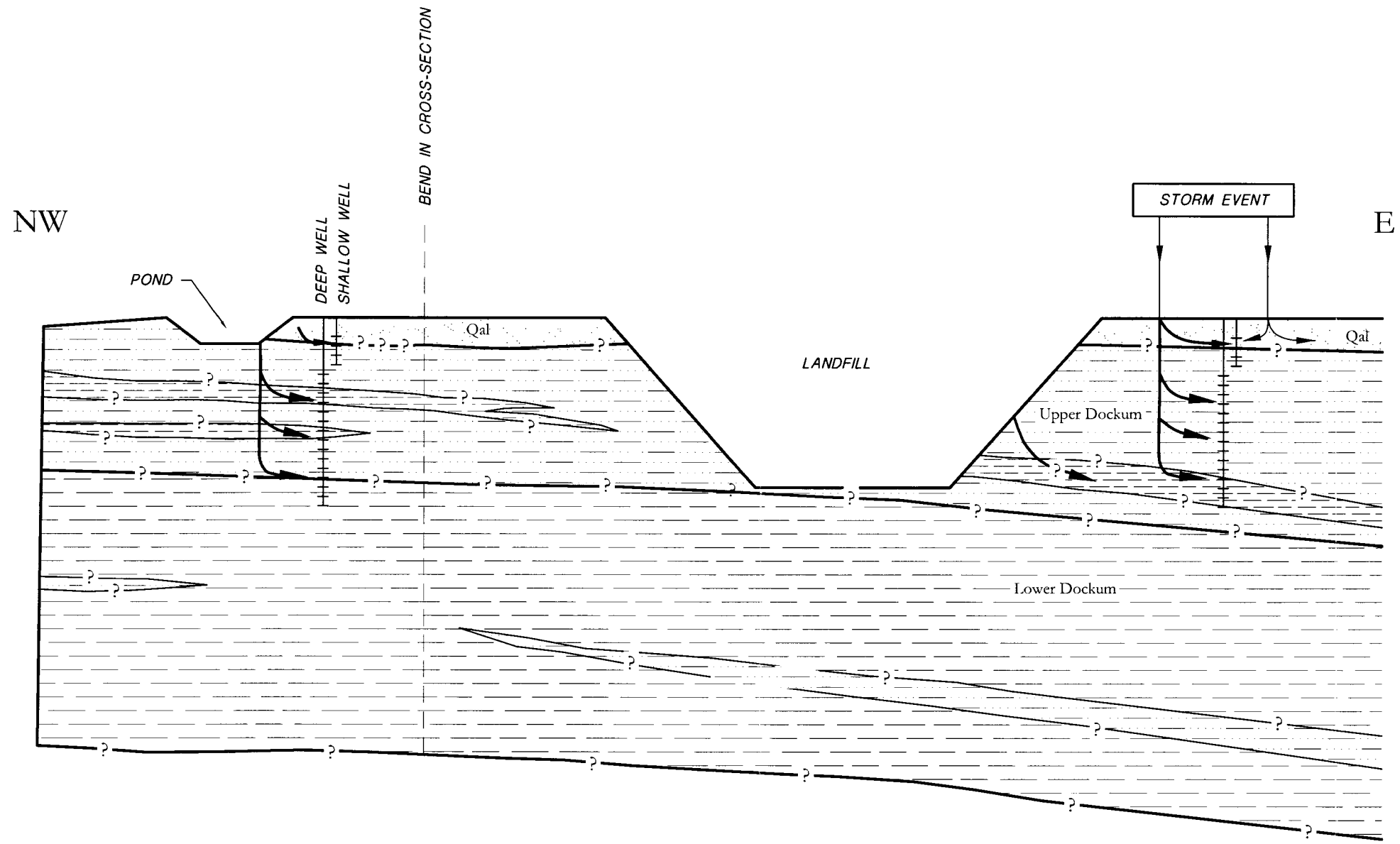


Sheet 1 of 7 Sheets
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FIGURE No. 2



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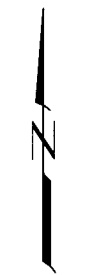
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Average $k = 5.7 \times 10^{-8}$ cm/s

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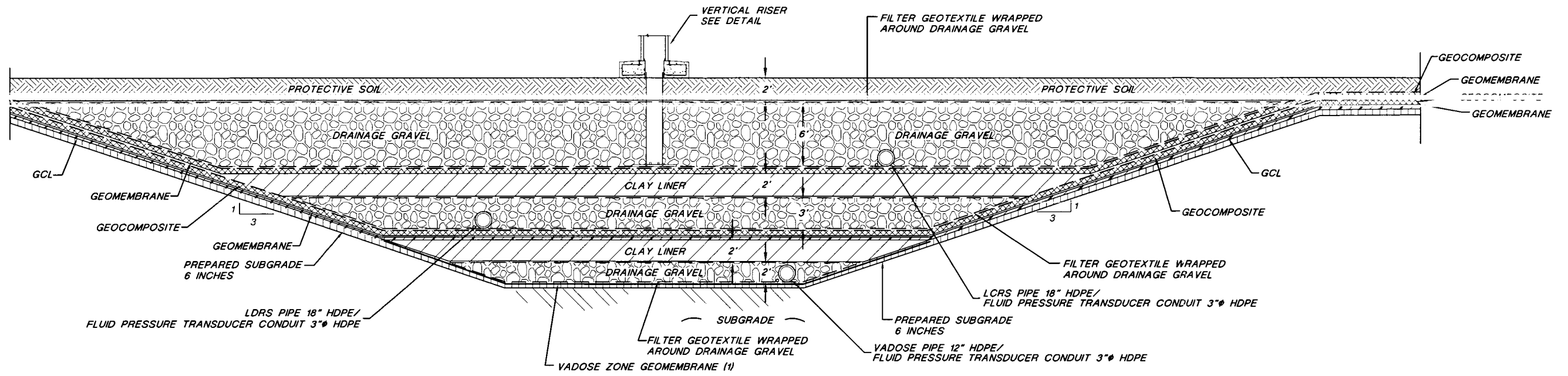
- POTENTIAL CONTAMINANT TRANSPORT PATHWAY
- MONITORING WELL
- Screened Interval

NOTE:
THIS FIGURE IS STRICTLY SCHEMATIC, NOT TO SCALE, AND NOT MEANT TO PRESENT THE ACTUAL STRATIGRAPHY OR CONSTRUCTION OF TRUE REGULATED UNITS.

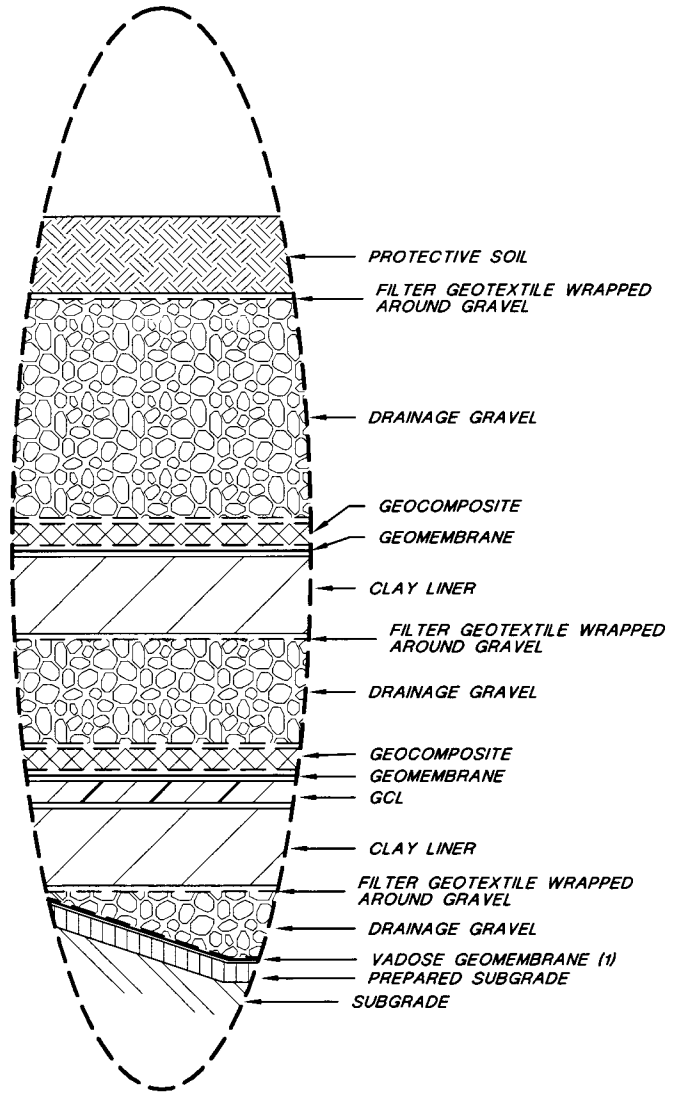
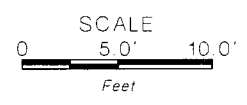


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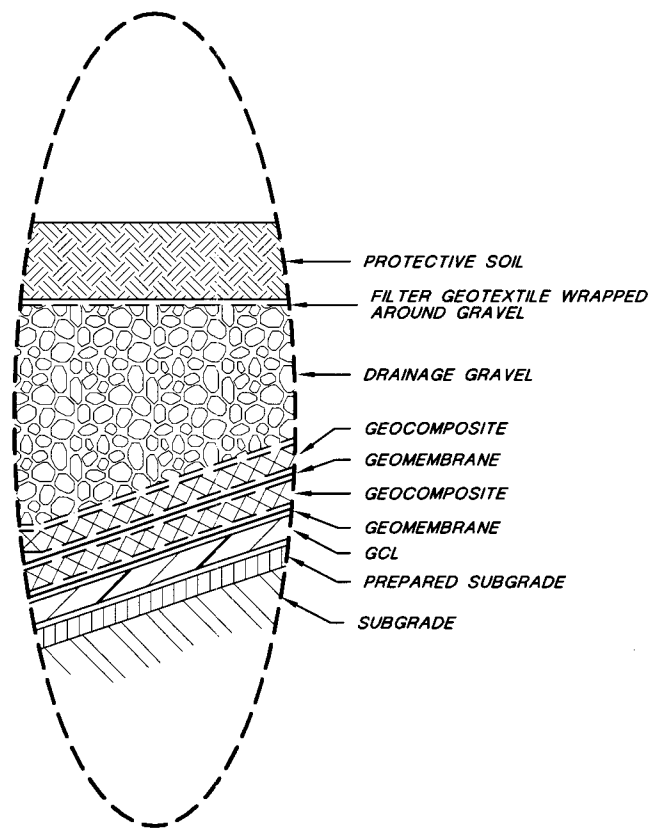
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WASTE DISPOSAL FACILITY							
PROJECT: VADOSE ZONE MONITORING SYSTEM WORK PLAN							
DRAWING TITLE: SCHEMATIC SITE MODEL							
MONTGOMERY WATSON				Sheet <u>1</u> Of <u>1</u> Sheets			
SCALE: Not to Scale				Figure No. 3			



TYPICAL SUMP DETAIL



EXAGGERATED GEOSYNTHETIC COMPONENT DETAIL
Not To Scale



EXAGGERATED GEOSYNTHETIC COMPONENT DETAIL
Not To Scale

NOTE:
THE VADOSE GEOMEMBRANE EXTENDS TO LIMITS OF THE SECONDARY CLAY LINER.

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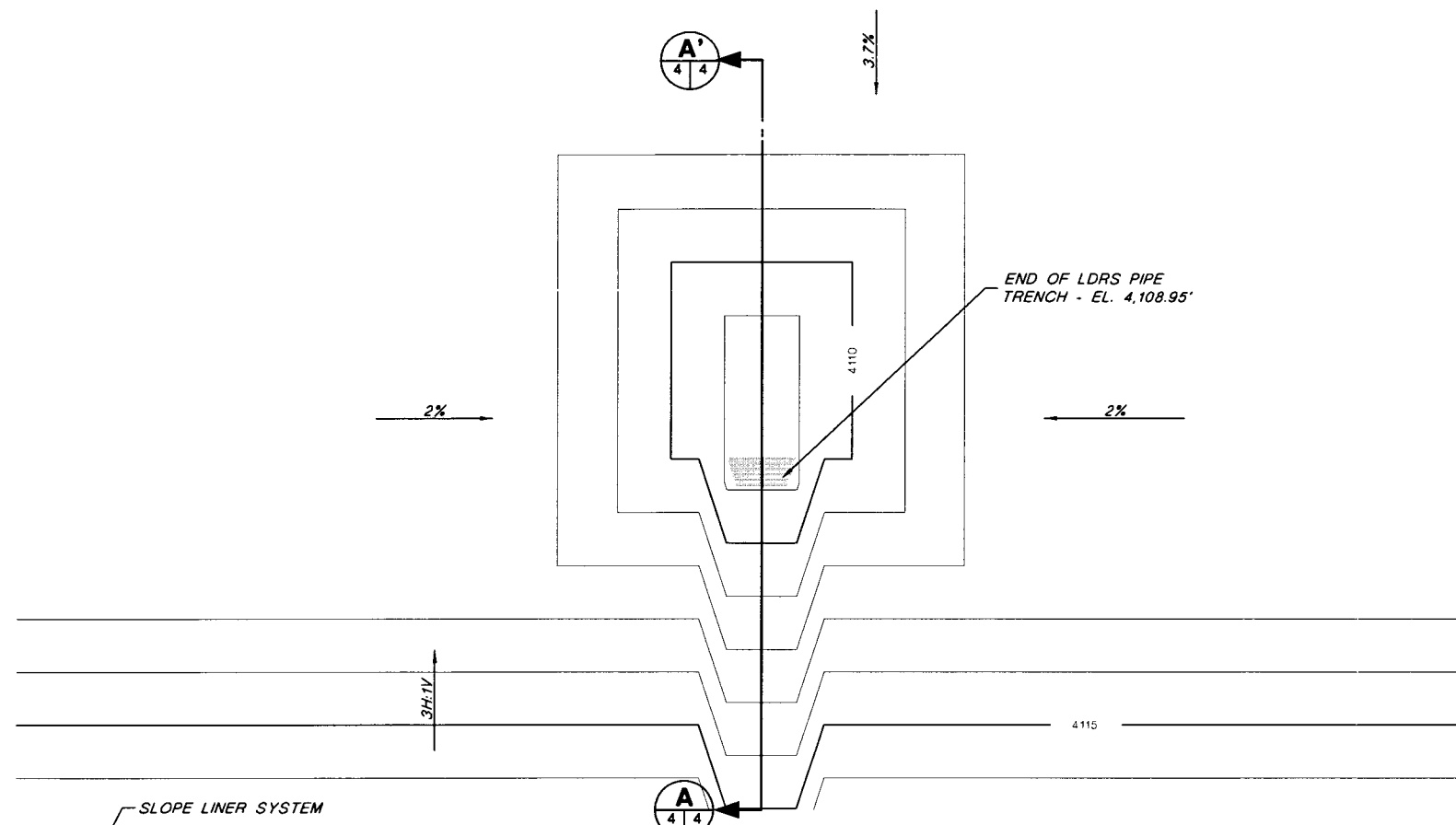
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PROJECT:
VADOSE ZONE MONITORING SYSTEM WORK PLAN

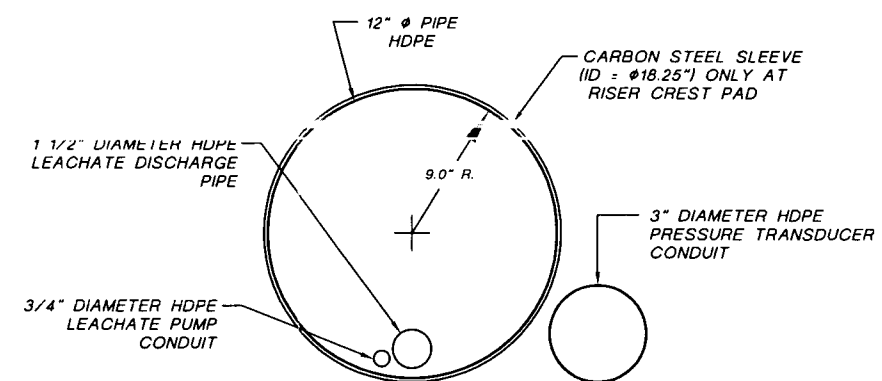
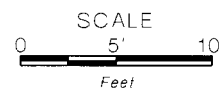
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TYPICAL LANDFILL SUMP DETAIL CROSS-SECTION

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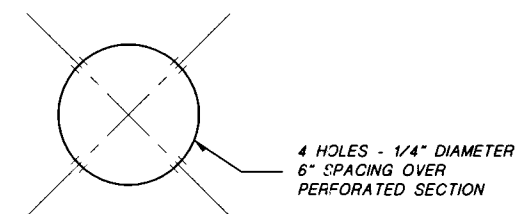
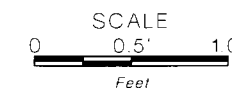
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4 EVAPORATION POND SUMP LAYOUT

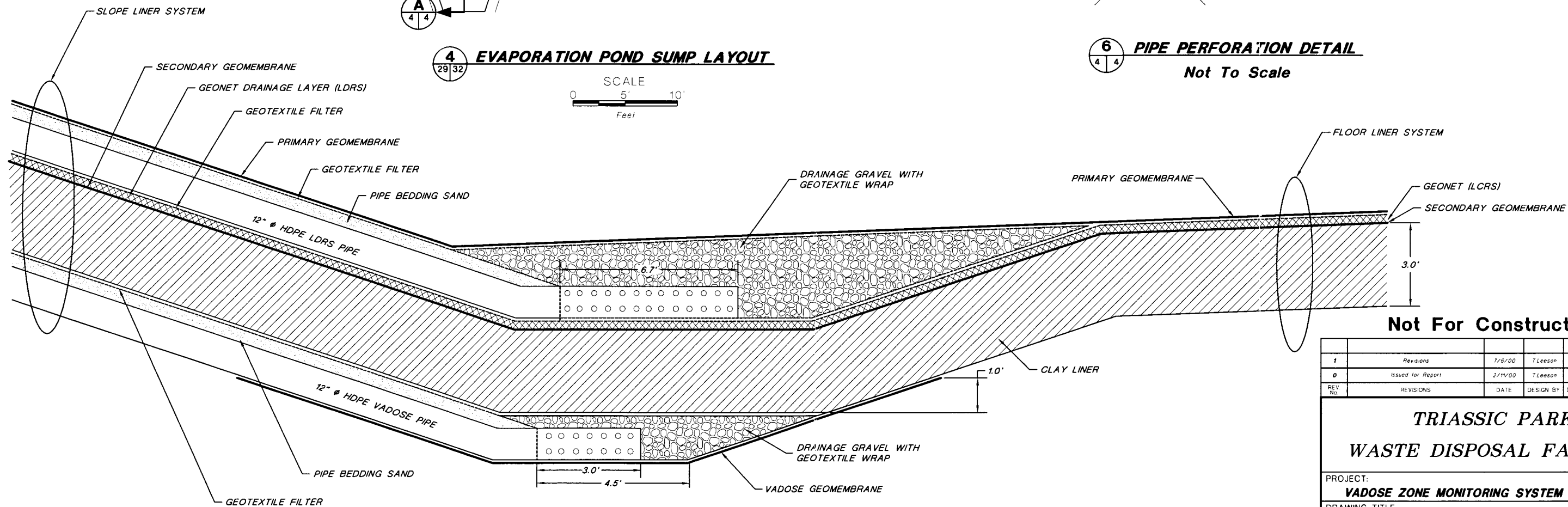


5 LDRS RISER PIPE DETAIL



6 PIPE PERFORATION DETAIL

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A EVAPORATION POND SUMP CROSS-SECTION

Not To Scale

NOTE:
FOR GENERAL NOTES AND LEGEND INFORMATION SEE DRAWING No. 2,
"INDEX, LEGEND AND GENERAL NOTES".

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**TRIASSIC PARK
WASTE DISPOSAL FACILITY**

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VADOSE ZONE MONITORING SYSTEM WORK PLAN
DRAWING TITLE:
**EVAPORATION POND LDRS AND
VADOSE PLAN AND DETAILS**

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Sheet 1 of 1 Sheets
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FIGURE No. 5