

**GEOTECHNICAL ENGINEERING REPORT  
PROPOSED MONARCH MEADOWS  
RESIDENTIAL DEVELOPMENT  
13400 SOUTH 4800 WEST  
HERRIMAN, UTAH**



**Prepared For**

**Mr. Doug Young  
Herriman Land, L.L.C.  
3727 South State Street  
Salt Lake City, Utah 84115**

**Prepared By**

**PROFESSIONAL SERVICE INDUSTRIES, INC.  
2779 South 600 West Street  
Salt Lake City, Utah  
(801) 954-8442**

**PSI PROJECT 710-25083**

**August 9, 2002**

August 9, 2002

Mr. Doug Young  
Herriman Land, L.L.C.  
3727 South State Street  
Salt Lake City, Utah 84115

**Report of Geotechnical Exploration for  
Proposed Monarch Meadows  
Residential Development  
13400 South 4800 West  
Herriman, Utah  
PSI Project No. 710-25083**

Dear Mr. Young:

We are pleased to submit this report of our geotechnical engineering study for the proposed Monarch Meadows Residential Development to be constructed at approximately 13400 South 4800 West, Herriman, Utah. Details of our findings and recommendations along with the supporting field data are presented in the attached report.

A total of forty-two (42) test pits were excavated within the development area. The test pits revealed that subsurface conditions generally consists of up to 18 inches of silty topsoil underlain by stiff silt (ML) and/or clay (CL), medium dense to dense silty sand (SM), and silty gravel (GM). Collapsible soil was encountered throughout the site and extended to the depth explored in several of the test pits. Groundwater was not encountered during the field investigation.

Based upon our field and laboratory tests, the site appears to be generally suitable for the proposed development provided the recommendations of this report are properly followed. The proposed structures may be supported on conventional spread footings. For residences without basements, we recommend that collapsible soils be removed a minimum of 2 feet below foundations and be replaced with structural fill. Floor slabs may also be supported on 12 inches of properly placed and compacted structural fill below the collapsible soil. If basements are to be excavated, spread footings and floor slabs may be placed on the native soil. Footings may be designed using an allowable bearing capacity of up to **1,500 psf**. **Prior to placement of footings, we recommend**

**inspection of footing subgrades on a lot by lot basis to ensure the removal of collapsible soil to a depth of at least 2 feet below founding bearing elevation.** Additional details are provided in the attached report.

It has been a pleasure to serve you on this project. Please call us if you have any questions or need additional information.

Very truly yours,  
**PROFESSIONAL SERVICE INDUSTRIES, INC.**

  
**JASON D. CROSBY, P.E.**  
Manager, Geotechnical Services

  
**BRIAN GARRETT, E.I.T.**  
Project Engineer

Reviewed By:

  
**JAMES NIEHOFF, P.E.**  
Chief Engineer

JDC/JN/BG/ckh

Submitted in three copies.

## TABLE OF CONTENTS

<b>INTRODUCTION.....</b>	<b>1</b>
AUTHORIZATION AND PURPOSE.....	1
PROJECT INFORMATION.....	1
<b>SITE AND SUBSURFACE CONDITIONS .....</b>	<b>1</b>
SITE LOCATION AND DESCRIPTION .....	1
REGIONAL GEOLOGY .....	2
SITE ANALYSIS .....	2
<u>Field Investigation</u> .....	<u>2</u>
<u>Laboratory Testing</u> .....	<u>2</u>
SUBSURFACE CONDITIONS .....	2
<u>Soil Profile</u> .....	<u>2</u>
<u>Collapsible Soils</u> .....	<u>3</u>
<u>Groundwater Measurements</u> .....	<u>3</u>
<b>EVALUATION AND RECOMMENDATIONS .....</b>	<b>3</b>
GEOTECHNICAL DISCUSSION .....	3
SITE PREPARATION RECOMMENDATIONS .....	4
<u>General Site Grading</u> .....	<u>4</u>
<u>Structural Fill</u> .....	<u>4</u>
<u>Utility Trenches</u> .....	<u>5</u>
<u>Excavations</u> .....	<u>5</u>
FOUNDATIONS .....	5
<u>Estimated Settlement</u> .....	<u>6</u>
FLOOR SLABS .....	6
SURFACE DRAINAGE CONSIDERATIONS .....	6
LATERAL RESISTANCE AND EARTH PRESSURE .....	7
PAVEMENT RECOMMENDATIONS .....	7
<b>ADDITIONAL INSPECTION RECOMMENDED.....</b>	<b>8</b>
<b>REPORT LIMITATIONS .....</b>	<b>8</b>
<b>APPENDIX</b>	
SITE VICINITY MAP	Figure A-1
SITE PLAN AND TEST PIT LOCATIONS	Figure A-2
GRAPHICAL TEST PIT LOGS	Figures A-3 to A-44
KEY TO SYMBOLS	Figure A-45
TABLE 1: SUMMARY OF LABORATORY TESTING	Figure A-46
SUMMARY OF CONSOLIDATION TESTING	Figures A-47 to A-50

## **INTRODUCTION**

### **Authorization and Purpose**

This report presents the findings of a geotechnical study for the proposed Creek View Meadows Residential Development at approximately 13400 South 4800 West, Herriman, Utah. The services for this project were performed in general accordance with our proposal No. 710-25053 dated May 13, 2002 as authorized by Mr. Doug Young, Herriman Land, L.L.C.

The purpose of this exploration was to generally characterize subsurface conditions at the site and to provide recommendations regarding site development and parameters for foundation and floor slab design for the proposed construction.

### **Project Information**

Based upon our discussions and upon provided plans, we understand that the proposed development will consist of overlot grading and construction of streets and utilities for a 200-acre subdivision for one to two story single family residences. It is anticipated that the proposed homes will be of typical wood frame construction possibly underlain by a full basement. This report was prepared with the anticipation that the maximum column loads (if any) will be about 50 kips and the maximum wall loads will range from 2 to 4 kips per linear foot.

The geotechnical recommendations presented in this report are based on the available project information, building location, and the subsurface materials described in this document. If any of the noted information is incorrect, please inform PSI in writing so that we may amend the recommendations presented in this report if appropriate and if desired by the client. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

## **SITE AND SUBSURFACE CONDITIONS**

### **Site Location and Description**

The proposed development is located at approximately 13400 South 4800 West, Herriman, Utah. The proposed site consists of about 200 acres of open farmland, and is currently covered with planted wheat. The site is neighbored by residential developments on the south and west, 4800 West Street on the east, and 13400 South Street on the north. The general site topography is rolling with a variable downward slope to the north/northeast.

## **Regional Geology**

Based on published maps, no known faults exist on the property or within the immediate vicinity. The nearest known fault of concern is the Wasatch Fault located about 12 miles to the east. We recommend that earthquake related design parameters be obtained from the International Building Code (IBC) 2000 Edition, using a Site Class Definition = D, and spectral accelerations  $S_s = 1.15g$  and  $S_L = 0.42g$  for a 2% probability of exceedence in 50 years. No other special seismic considerations are recommended for this site.

## **Site Analysis**

### Field Investigation

Subsurface conditions at the project site were evaluated by excavating a total of forty-two test pits (TP-1 through TP-42). The test pits were excavated throughout the proposed development and were located on the site by the owner prior to our arrival. The approximate locations of these pits are shown on Figure A-2, *Site Plan and Approximate Locations of Test Pits* presented in the Appendix. The test pits were excavated using a track hoe to a depth ranging from 10 to 14 feet below the existing ground surface.

### Laboratory Testing

The soil samples collected were visually classified in accordance with the Unified Soil Classification System (USCS) in the field, placed in air-tight containers, and transported to our soil laboratory in Salt Lake City, Utah. Representative soil samples were tested to assess applicable properties of the soils, and included Atterberg Limits, mechanical sieve analysis, and collapse/swell analysis. The results of the analyses are presented in Figures A-46 to A-50 in the Appendix of this report.

## **Subsurface Conditions**

### Soil Profile

The test pits revealed that subsurface conditions generally consists of up to 18 inches of silty topsoil underlain by stiff silt (ML) and/or clay (CL), medium dense to dense silty sand (SM), and dense silty gravel (GM) extending to the maximum depth explored. For a detailed description of the conditions encountered at each test pit location, please refer to the Test Pit Logs, Figures A-3 through A-44 in Appendix A. Figure A-45 is the key to symbols and abbreviations used on the Test Pit Logs.

The above subsurface description is of a generalized nature, provided to highlight the major subsurface stratification features and material characteristics. The Test Pit Logs included in the Appendix should be reviewed for specific information as to individual test pit locations. The stratification shown on the Test Pit Logs represent the conditions only at the actual test pit locations. Variations may occur and should be expected

between test pit locations. The stratification represents the approximate boundary between subsurface materials and the transition may be gradual. The samples that were not altered by laboratory testing will be retained for 30 days from the date of this report and then will be discarded.

### Collapsible Soils

Collapsible soils occur naturally and are associated with relatively dry alluvial fans, colluvium and wind-blown deposits. These soils are typically comprised of silts and sands with a small amount of clay. Collapsible soils are characterized by low density, porous structures, high shear strength when dry, and susceptibility to large settlement when wetted.

Collapsible soil was encountered at many locations within the proposed Monarch Meadows Residential Development site. The depth of collapsible soil varied throughout the site and extended to the depth explored in several of the test pits.

### Groundwater Measurements

Groundwater was not encountered during the field investigation. It should be noted that it is possible for the groundwater table to fluctuate during the year depending upon climatic and rainfall conditions. Additionally, discontinuous zones of perched water may exist within the overburden materials. The groundwater levels presented in this report are the levels that were measured at the time of our field activities. We recommend that the building contractors evaluate the groundwater levels at the site at the time of the construction activities.

## **EVALUATION AND RECOMMENDATIONS**

### **Geotechnical Discussion**

The following geotechnical related recommendations have been developed on the basis of the subsurface conditions encountered and our understanding of the proposed development. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

Due to the presence of collapsible soils, we recommend that footings and slabs on-grade should bear on a minimum of 2 feet of new, properly compacted fill. The on-site soils may be used as structural fill. If basements are to be excavated, spread footings may be placed directly on native material. Footing bearing capacities and additional geotechnical details are provided in the following paragraphs.

## **Site Preparation Recommendations**

### General Site Grading

Topsoil, man-placed fill or soft soils in the construction areas should be stripped from the site and either wasted or stockpiled for later use in landscaping. The building and roadway areas should be excavated to a depth of at least 2 feet below final grades. After stripping and excavating to the depth noted above, the building and road areas should be proof-rolled to a smooth, non-yielding surface with rubber tire equipment or a smooth-drum compactor. Soils that are observed to rut or deflect excessively under the moving load should be excavated and replaced with properly compacted structural fill. The proof-rolling and excavation activities should be witnessed by a representative of the geotechnical engineer and should be performed during a period of dry weather. If the subgrade is too soft/wet to proof-roll, we recommend that a stabilization fill be placed prior to placement of structural fill.

### Stabilization Fill

Areas of extremely soft subgrade may require stabilization prior to structural fill placement. Additional lifts of stabilization fill may be required in areas of particularly poor subgrade. The stabilization fill can be counted as part of the required structural fill section below the footings. Exposed native subgrades not requiring stabilization should be proof-rolled with a heavy truck or similar equipment to check for soft spots. Soft spots detected should be removed and replaced with either stabilization fill as defined above or structural fill as defined below.

### Structural Fill

Structural fill should consist of a well graded sand or gravel material which is free of organic or other deleterious materials, have a maximum particle size less than 4 inches, retain less than 30 percent on the  $\frac{3}{4}$  inch sieve, and contain less than 25 percent fines (materials passing the No. 200 sieve). The liquid limit of the fines should not exceed 35 percent and the plasticity index should be less than 25. Structural fill should be placed in maximum lifts of 8 inches of loose material and compacted on a horizontal plane. Moisture should be maintained at moisture content within 2 percent of the optimum moisture determined by ASTM D 1557. Structural fill should be compacted to at least 95 percent of modified proctor maximum dry density (ASTM D 1557) in structurally loaded areas. Fills placed in landscape areas not supporting structural loads should be compacted to at least 90 percent of the modified proctor maximum dry density. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Each lift of compacted-engineered fill should be tested by a representative of the geotechnical engineer prior to placement of subsequent lifts.



### Utility Trenches

Utility trenches may be backfilled with imported structural fill or the on-site soils. Backfill soils used in areas not structurally loaded should be placed in maximum 10-inch lifts and compacted to 90 percent of the modified Proctor (ASTM D 1557). The upper 2 feet of trench backfill within pavement sections or beneath footings should be compacted to 95 percent of the maximum density.

If unstable soils are encountered at invert elevations, it may be necessary to excavate an additional depth and replace the unstable soils with structural/stabilization fill. The depth of over-excavation, if necessary, should be determined by field observation.

### Excavations

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor should evaluate the soil exposed in the excavations as part of the his/her safety procedures. In no case should slope height, slope inclination, or excavation depth including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

For temporary excavations not exceeding 4 feet in height, we recommend a maximum slope of 1 to 1 (H:V). For excavations up to 10 feet in height, we recommend slopes be limited to 1.5:1. If unstable soils or groundwater conditions are encountered during excavation, bracing, benching, shoring or flatter slopes may be necessary.

We are providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's (or other parties) compliance with local, state, and federal safety or other regulations.

### **Foundations**

Provided that the sites are properly prepared as noted above and below, homes may be supported by spread footing foundations. For residences without basements, we recommend that collapsible soils be removed a minimum of 2 feet below foundations and be replaced with structural fill. If basements are to be excavated, spread footings may be placed directly on native soil. Footings constructed in this manner should be designed using an allowable bearing capacity of up to **1,500 psf**. The following design parameters are recommended for footing construction:

- Footings should bear at a minimum depth of 30 inches below final grade for frost protection. For non-frost areas, such as interior footings, a minimum embedment depth of 18 inches is recommended.
- Foundations should have minimum widths of 18 inches for continuous wall footings and 24 inches for isolated column footings.

- Structural fill should extend a minimum of  $\frac{1}{2}$  the depth of fill laterally away from the edge of the footing.
- The allowable bearing pressures presented above may be increased up to 33 percent for transient loading for such as wind and seismic load combinations.
- We recommend that the footings, foundations and below grade walls be designed in accordance with the IBC, 2000 edition.

Footings should not be installed on loose or disturbed soil or within ponded water. If unsuitable soils are encountered near the footing subgrade, they should be removed and replaced with properly compacted structural fill.

#### Estimated Settlement

If footings are design according to the recommendations described above, total estimated settlement under static conditions should not exceed one inch. Differential settlement is expected to approach 50 to 75 percent of the total settlement. Most of this settlement should occur during the construction phase.

#### **Floor Slabs**

Due to the collapsible characteristics of the on-site soils, concrete slab on grade floors should be supported on at least 24 inches of properly placed and compacted structural fill provided a minimum of 4 inches of free-draining gravel is placed immediately below the slabs and/or exterior flatwork. The free-draining gravel will enhance drainage.

The soil subgrade in the area of concrete slab-on-grade support is often disturbed during foundation and superstructure construction. We recommend that floor slab subgrades be evaluated by a representative of PSI immediately prior to beginning floor slab construction. If disturbed subgrade soils are present which cannot be adequately densified in place, such soils should be removed and replaced with additional structural/stabilization fill.

#### **Surface Drainage Considerations**

**It is absolutely critical at this site that adequate surface drainage be maintained during and after construction.** Water should not be allowed to collect near the foundations or floor slab areas of the building or in pavement areas. Undercut or excavated areas should be sloped towards one corner to facilitate removal of collected rainwater, groundwater seepage, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the buildings and beneath floor slabs. Grades should be sloped away from the building, and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill of the buildings.

## Lateral Resistance and Earth Pressure

Resistance to lateral loads on foundations may be achieved by frictional resistance between foundations and the load bearing soils, and by passive earth pressure from soils placed adjacent to the foundations. Retaining walls and below grade walls should be designed to resist pressures induced by the backfill soils. Basement walls or stem walls restrained at the top can be designed for "at rest" earth pressure conditions. Retaining walls that are free to deflect can be designed for "active" earth pressure conditions. The "passive" earth pressure state should be used for soils supporting retaining structures, such as toe backfill. Lateral earth pressures applied to walls may be computed by multiplying the vertical depth of the backfill by the appropriate equivalent fluid density. The table below presents recommended values of earth pressure coefficients using imported granular fill for the backfill materials, assuming an approximate angle of internal friction of 32 degrees, and the respective equivalent fluid densities, based on a total unit weight of 115 pcf.

Earth Pressure State	Earth Pressure Coefficient	Equivalent Fluid Density
At-Rest	0.47	54 pcf
Active	0.31	36 pcf
Passive	3.25	374 pcf

PSI recommends that only  $\frac{1}{2}$  the passive pressure be used in design due to the large movement required to mobilize this resistance. The design values and recommendations presented above assume that the backfill behind the walls will be horizontal with no surcharge loads and that a permanent drainage system will be installed behind the walls to prevent the development of hydrostatic pressures. Also, relatively free draining sands or crushed stone materials should be used as backfill behind retaining walls in place of the native clays.

For analysis of sliding resistance of the base of the retaining walls, the ultimate coefficient of friction may be taken as 0.4 between concrete and soil.

## Pavement Recommendations

PSI understands that a flexible pavement is desired in the road areas for the development. We have prepared a pavement design section assuming anticipated soil characteristics and light traffic loads. For design purposes, we have assumed the subgrade to consist of the firm and unyielding, proof-rolled, non-organic native soils and/or structural/stabilization fill. We have further assumed a minimum subgrade California Bearing Ratio (CBR) value of 7. For the traffic loads, we anticipate 500 cars and 2 heavy trucks per day. **Based on these assumptions, we recommend a minimum pavement section of 3 inches of bituminous concrete over 6 inches of aggregate base.** The subgrade should also be scarified to a depth of 12 inches and recompact to at least 95 percent of the maximum modified proctor dry density (ASTM D 1557). These design recommendations were based on AASHTO design procedures and the following assumptions:

- Pavement to be placed only after the subgrade has been properly prepared,
- Construction materials such as bituminous concrete and aggregate base will meet project specifications requirements,
- Aggregate base and granular fill will be compacted to at least 95 percent of the maximum modified proctor dry density (ASTM D 1557) and bituminous concrete will be compacted to at least 95 percent of the Marshal mix design density.

Subgrades should be properly prepared as recommended above for asphalt pavements. Construction of concrete flatwork should be in accordance with Portland Cement Association (PCA) guidelines. Consideration should be given to constructing exterior concrete slabs over a minimum of 4 inches of an aggregate pad/structural fill leveling coarse.

#### **ADDITIONAL INSPECTION RECOMMENDED**

Due to the variable soil conditions and the potential for collapsible soil to be encountered, we recommend additional inspection to be performed on a lot by lot basis prior to placement of footings.

#### **REPORT LIMITATIONS**

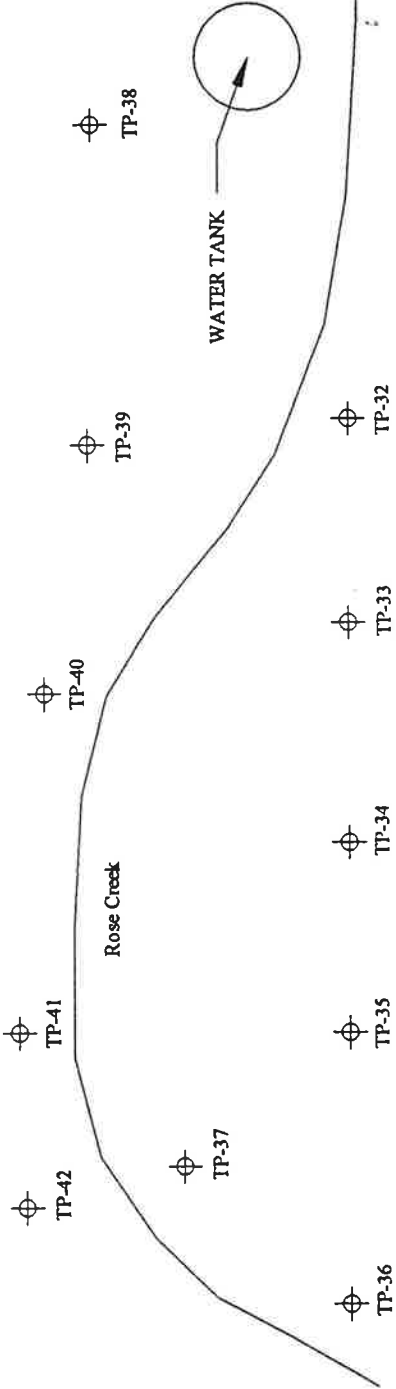
The recommendations submitted are based on the available subsurface information obtained by PSI, and information provided by Herriman Land, L.L.C. and their design consultants. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation, or other recommendations are required. If PSI is not retained to perform these functions, PSI can not be responsible for the impact of those conditions on the performance of the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

APPENDIX



13400 South Street



# LEGEND

⊕ — TEST PIT

**Information To Build On**  
 Engineering • Consulting • Testing

PROJECT NAME: MONARCH MEADOWS  
 13400 SOUTH 4800 WEST, HERRIMAN, UTAH  
 DATE: SITE PLAN & APPROXIMATE TEST PIT LOCATIONS

DESIGNED BY	SC	DATE	07/24/02	PROJECT NO.	710-25083
CHECKED BY	JC	DATE		PROJECT NO.	A-2

GEOTECHNICAL SERVICES  
 2779 South 600 West, #115  
 Salt Lake City, UT 84119  
 (801) 484-8827



2779 South 600 West  
 South Salt Lake, UT 84115  
 Telephone: (801) 954-8442  
 Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-1

Sheet 1 of 1

PSI Job No.: 710-25083		Drilling Method:		WATER LEVELS	
Project: Monarch Meadows		Sampling Method:		▽ While excavating	N/A ft
Location: 13400 South and 4800 West		Hammer Type:		▽ After excavating	N/A ft
Herriman, Utah		Latitude:		▽ 24 hours later	N/A ft
		Longitude:			

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-Inch	Moisture, %	STANDARD PENETRATION TEST DATA TEST DATA N in blows/ft X Moisture      PL LL				NOTES
						Surface Elev.:    ft				STRENGTH, tsf ▲				

Completion Depth: 13.0 ft  
 Date Boring Started: 7/15/02  
 Date Boring Completed: 7/15/02  
 Logged By: S.Greenberg  
 Drilling Contractor: -

Sample Types:

	Auger Cutting		Shelby Tube
	Split-Spoon		Grab Sample
	Rock Core		Mod. California

Remarks:

Figure A-3





2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-2

Sheet 1 of 1

PSI Job No.: 710-25083 Project: Monarch Meadows Location: 13400 South and 4800 West Herriman, Utah	Drilling Method: Sampling Method: Hammer Type: Latitude: Longitude:	WATER LEVELS	
		▽ While excavating	N/A ft
		▽ After excavating	N/A ft
		▽ 24 hours later	N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ● X Moisture      PL LL + LL				NOTES
						Surface Elev.: ft								
	0					SILT, loose to medium stiff, dry, light brown, pinholes.	ML							
				1		GRAVEL, well-graded, dense, dry, gray.	GW							
						SILT, medium stiff, dry, light brown, pinholes.	ML							
	5					SAND, silty, medium dense, dry to moist, brown.	SM							
				2										
	10													
						EOTP @ 13 feet. Groundwater was not encountered.								

Completion Depth: 13.5 ft	Sample Types:	Remarks:
Date Boring Started: 7/15/02	Auger Cutting	
Date Boring Completed: 7/15/02	Split-Spoon	
Logged By: S.Greenberg	Rock Core	
Drilling Contractor:	Shelby Tube	
	Grab Sample	
	Mod. California	

Figure A-4



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-3

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL STRENGTH, tsf Qp	NOTES
	0					Surface Elev.: ft					
				1		SILT, loose to medium stiff, dry, light brown, pinholes.	ML				
						GRAVEL, silty, with sand, dense, dry, gray.	GM				
	5					SAND, silty, medium dense, dry to moist, brown to light brown, pinholes.	SM				
				2							
	10					GRAVEL, silty, with cobbles, dense, dry, light brown to gray.	GM				
						EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/15/02  
Date Boring Completed: 7/15/02  
Logged By: S.Greenberg  
Drilling Contractor: -

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core  
Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-5



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-4

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	NOTES
						Surface Elev.: ft				X Moisture      PL LL 1                      25                      50 STRENGTH, tsf ▲                      * Qp 0                      2.0                      Qu 4.0	
	0			1		SILT, loose to medium stiff, dry, light brown, pinholes.	ML				
						SAND, silty, medium dense, dry to moist, light brown to gray, pinholes.	SM				
	5					GRAVEL, silty, with cobbles and boulders, dense, dry, gray.	GM				
	10					EOTP @ 10 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/15/02  
Date Boring Completed: 7/15/02  
Logged By: S.Greenberg  
Drilling Contractor:

Sample Types:  
☒ Auger Cutting      ☒ Shelby Tube  
☒ Split-Spoon      ☒ Grab Sample  
☒ Rock Core      ☒ Mod. California

Remarks:

Figure A-6



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-5

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	STRENGTH, tsf	NOTES
	0					Surface Elev.: ft SILT, soft, dry, light brown.	ML					
	5					GRAVEL, silty, with sand, cobbles, and boulders, dense, dry, gray.	GM					
	10					EOTP @ 10 feet. Groundwater was not encountered.						

Completion Depth: 10.0 ft  
Date Boring Started: 7/15/02  
Date Boring Completed: 7/15/02  
Logged By: S.Greenberg  
Drilling Contractor:

### Sample Types:

Auger Cutting  
 Split-Spoon  
 Rock Core

Shelby Tube  
 Grab Sample  
 Mod. California

### Remarks:

Figure A-7



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-6

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL STRENGTH, tsf ▲ Qp * Qu	NOTES
	0					Surface Elev.: ft					
						SILT, with cobbles, soft to medium stiff, dry, light brown.	ML				
	5					GRAVEL, silty, with sand, cobbles, and boulders, dense, dry, gray.	GM				
	10					EOTP @ 10 feet. Groundwater was not encountered.					

Completion Depth: 10.0 ft  
Date Boring Started: 7/15/02  
Date Boring Completed: 7/15/02  
Logged By: S.Greenberg  
Drilling Contractor: -

Sample Types:  
Auger Cutting  
Split-Spoon  
Rock Core  
Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-8



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-7

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	NOTES
	0					Surface Elev.: ft					
						SILT, with cobbles, medium stiff, dry, light brown.	ML				
	5					GRAVEL, silty, with sand, cobbles, and boulders, dense, dry, gray.	GM				
	10					EOTP @ 10 feet. Groundwater was not encountered.					

Completion Depth: 10.0 ft  
Date Boring Started: 7/15/02  
Date Boring Completed: 7/15/02  
Logged By: S.Greenberg  
Drilling Contractor:

### Sample Types:

Auger Cutting  
 Split-Spoon  
 Rock Core

Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-9



2779 South 600 West  
 South Salt Lake, UT 84115  
 Telephone: (801) 954-8442  
 Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-8

Sheet 1 of 1

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: 13400 South and 4800 West  
 Herriman, Utah

Drilling Method:  
 Sampling Method:  
 Hammer Type:  
 Latitude:  
 Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
 ▽ After excavating N/A ft  
 ▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	NOTES
	0					Surface Elev.: ft					
						SILT, with cobbles, medium stiff, dry, light brown.	ML				
	5					GRAVEL, silty, with sand and cobbles, dense, dry, gray.	GM				
	10					EOTP @ 10 feet. Groundwater was not encountered.					

Completion Depth: 10.0 ft  
 Date Boring Started: 7/15/02  
 Date Boring Completed: 7/15/02  
 Logged By: S.Greenberg  
 Drilling Contractor:

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-10



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-9

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture      PL LL				NOTES
						Surface Elev.: ft				STRENGTH, tsf ▲      * Qp Qu				
	0					SILT, soft to medium stiff, dry, light brown, pinholes.	ML							
				1		SAND, silty, loose to medium dense, dry to moist, light brown.								
	5						SM							
				2										
	10													
						EOTP @ 13 feet. Groundwater was not encountered.								

Completion Depth: 13.0 ft  
Date Boring Started: 7/15/02  
Date Boring Completed: 7/15/02  
Logged By: S.Greenberg  
Drilling Contractor: -

Sample Types:  

Auger Cutting

Split-Spoon

Rock Core

Shelby Tube

Grab Sample

Mod. California

Remarks:

Figure A-11





2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-10

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ● X Moisture      PL LL 1                      25                      50 STRENGTH, tsf ▲                      * Qp 0                      2.0                      Qu 4.0	NOTES
	0					Surface Elev.: ft					
						GRAVEL, silty, dense, dry, gray.	GM				
	5			1		SAND, silty, loose to medium dense, dry to moist, light brown to gray.	SM				
				2		SILT, with organic material, moist, light brown to gray, pinholes.	ML				
	10					EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/15/02  
Date Boring Completed: 7/15/02  
Logged By: S.Greenberg  
Drilling Contractor:

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-12



2779 South 600 West  
 South Salt Lake, UT 84115  
 Telephone: (801) 954-8442  
 Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-11

Sheet 1 of 1

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: 13400 South and 4800 West  
 Herriman, Utah

Drilling Method:  
 Sampling Method:  
 Hammer Type:  
 Latitude:  
 Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
 ▽ After excavating N/A ft  
 ▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft				NOTES
						Surface Elev.: ft				X Moisture    PL LL 1                    25                    50				
	0					SILT, loose to medium stiff, dry, light brown, pinholes.	ML							
				1		SAND, silty, medium dense, dry, light brown to gray.	SM							
	5					SILT, stiff, dry to moist, brown to light brown, iron oxide stains, pinholes.	ML							
				2										
	10													
						GRAVEL, sandy, dense, dry, reddish brown.	GP							
						EOTP @ 13 feet. Groundwater was not encountered.								

Completion Depth: 13.0 ft  
 Date Boring Started: 7/15/02  
 Date Boring Completed: 7/15/02  
 Logged By: S.Greenberg  
 Drilling Contractor: -

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-13



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-12

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	NOTES
						Surface Elev.: ft				X Moisture    PL 1                      25                      50 * LL STRENGTH, tsf 0                      2.0                      4.0 ▲                      * Qu	
	0					SILT, with sand, loose to stiff, dry, light brown to gray, pinholes.	ML				
	5					SAND, silty, loose to medium dense, dry to moist, light brown to gray.	SM				
	10					GRAVEL, silty, dense, dry, reddish brown.	GM				
						EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft

Date Boring Started: 7/15/02

Date Boring Completed: 7/15/02

Logged By: S.Greenberg

Drilling Contractor:

Sample Types:

☒ Auger Cutting  
☒ Split-Spoon  
☐ Rock Core

☐ Shelby Tube  
☐ Grab Sample  
☐ Mod. California

Remarks:

Figure A-14



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-13

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture    PL LL + LL	NOTES
	0					Surface Elev.: ft SILT, with cobbles, loose, dry, light brown.	ML			STRENGTH, tsf ▲ Qp    * Qu	
	5					GRAVEL, silty, with cobbles and boulders, dense, dry, gray.	GM				
	10					EOTP @ 10 feet. Groundwater was not encountered.					

Completion Depth: 10.0 ft

Date Boring Started: 7/15/02

Date Boring Completed: 7/15/02

Logged By: S.Greenberg

Drilling Contractor: -

### Sample Types:

☐ Auger Cutting  
☒ Split-Spoon  
☐ Rock Core

☐ Shelby Tube  
☒ Grab Sample  
☒ Mod. California

Remarks:

Figure A-15



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-14

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL	NOTES
	0					Surface Elev.: ft					
						SILT, with cobbles, loose, dry, light brown.	ML				
	5					GRAVEL, silty, with cobbles and boulders, dense, dry, gray.	GM				
	10					EOTP @ 11 feet. Groundwater was not encountered.					

Completion Depth: 11.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor:

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-16



2779 South 600 West  
 South Salt Lake, UT 84115  
 Telephone: (801) 954-8442  
 Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-15

Sheet 1 of 1

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: 13400 South and 4800 West  
 Herriman, Utah

Drilling Method:  
 Sampling Method:  
 Hammer Type:  
 Latitude:  
 Longitude:

## WATER LEVELS

▼ While excavating N/A ft  
 ▼ After excavating N/A ft  
 ▼ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-Inch	Moisture, %	STANDARD PENETRATION TEST DATA		NOTES
										N in blows/ft	PL	
	0					Surface Elev.: ft						
						SILT, with cobbles, loose, dry, light brown.	ML					
						GRAVEL, silty, with cobbles and boulders, dense, dry, gray.						
	5						GM					
	10					EOTP @ 10 feet. Groundwater was not encountered.						

Completion Depth: 10.0 ft  
 Date Boring Started: 7/16/02  
 Date Boring Completed: 7/16/02  
 Logged By: S.Greenberg  
 Drilling Contractor:

Sample Types:  
☐ Auger Cutting  
☒ Split-Spoon  
☐ Rock Core  
☐ Shelby Tube  
☒ Grab Sample  
☐ Mod. California

Remarks:

Figure A-17



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-16

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ● X Moisture □ PL + LL	STRENGTH, tsf ▲ Qp * Qu	NOTES
	0					Surface Elev.: ft						
						SILT, with cobbles, loose, dry, light brown.	ML					
	5					GRAVEL, silty, with cobbles and boulders, dense, dry, gray.	GM					
	10					EOTP @ 10 feet. Groundwater was not encountered.						

Completion Depth: 10.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor: -

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-18



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-17

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ● X Moisture PL + LL STRENGTH, tsf ▲ Qp * Qu 4.0	NOTES
	0					Surface Elev.: ft SILT, with cobbles, loose, dry, light brown.	ML				
	5					GRAVEL, silty, with cobbles and boulders, dense, dry, gray.	GM				
	10					EOTP @ 10 feet. Groundwater was not encountered.					

Completion Depth: 10.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor: -

Sample Types:  
Auger Cutting  
Split-Spoon  
Rock Core  
Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-19





2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-18

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL STRENGTH, tsf Qp	NOTES
	0					Surface Elev.: ft					
				1		SILT, gravelly, loose to stiff, dry, light brown pinholes.	ML				
	5			2		SAND, silty, medium dense, dry to moist, light brown to brown, pinholes.	SM				
						SAND, with gravel, dense, dry to moist, light brown to gray.	SP				
	10					EOTP @ 11 feet. Groundwater was not encountered.					

Completion Depth: 11.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor:

Sample Types:  
Auger Cutting  
Split-Spoon  
Rock Core  
Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-20

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:




## WATER LEVELS

▽ While excavating	N/A ft
▽ After excavating	N/A ft
▽ 24 hours later	N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-Inch	STANDARD PENETRATION TEST DATA				NOTES
									Moisture, %	N in blows/ft	PL	LL	
	0					Surface Elev.: ft							
						SILT, with gravel, loose to stiff, dry, light brown, pinholes.	ML						
	5					SAND, with silt and gravel, loose to medium dense, dry to moist, light brown to gray.	SP						
	10					EOTP @ 13 feet. Groundwater was not encountered.							

Completion Depth:	13.0 ft
Date Boring Started:	7/16/02
Date Boring Completed:	7/16/02
Logged By:	S.Greenberg
Drilling Contractor:	-

**Sample Types:**

 Auger Cutting  
 Split-Spoon  
 Rock Core

**Shelby Tube  
Grab Sample  
Mod. California**

Remarks:



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-20

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture    PL + LL	STRENGTH, tsf ▲                    * Qp	NOTES
	0					Surface Elev.: ft						
				1		CLAY, soft to dense, dry, light brown, pinholes.	CL					
				2								
	5											
				3		SAND, silty, medium dense, dry to moist, light brown, iron oxide.	SM					
	10											
						GRAVEL, silty, with sand, dense, dry, reddish brown.	GM					
						EOTP @ 13 feet. Groundwater was not encountered.						

Completion Depth: 13.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor: -

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-22



2779 South 600 West  
 South Salt Lake, UT 84115  
 Telephone: (801) 954-8442  
 Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-21

Sheet 1 of 1

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: 13400 South and 4800 West  
 Herriman, Utah

Drilling Method:  
 Sampling Method:  
 Hammer Type:  
 Latitude:  
 Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
 ▽ After excavating N/A ft  
 ▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ●	NOTES
						Surface Elev.: ft				X Moisture    PL LL	
	0					SILT, soft to stiff, dry, light brown.	ML			1 25 50 STRENGTH, tsf ▲ * Qp Qu 4.0	
	5					GRAVEL, silty, with cobbles, dense, dry, light brown to gray.	GM				
	10					EOTP @ 12 feet. Groundwater was not encountered.					

Completion Depth: 12.0 ft  
 Date Boring Started: 7/16/02  
 Date Boring Completed: 7/16/02  
 Logged By: S.Greenberg  
 Drilling Contractor:

Sample Types:  
☒ Auger Cutting    ☒ Shelby Tube  
☒ Split-Spoon    ☒ Grab Sample  
☒ Rock Core    ☒ Mod. California

Remarks:

Figure A-23



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-22

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft				NOTES
						X Moisture      PL LL STRENGTH, tsf 0      2.0      4.0      Q <sub>u</sub>								
	0					Surface Elev.: ft SILT, soft to stiff, dry, light brown.	ML							
	5					GRAVEL, silty, with sand and cobbles, dense, dry, gray.	GM							
	10					EOTP @ 12 feet. Groundwater was not encountered.								

Completion Depth: 12.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor:

### Sample Types:

Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-24



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-23

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL STRENGTH, tsf Qp Qu	NOTES
	0					Surface Elev.: ft SILT, soft to stiff, dry, light brown.	ML				
	5					GRAVEL, silty, with sand and cobbles, dense, dry, gray.	GM				
	10					EOTP @ 10 feet. Groundwater was not encountered.					

Completion Depth: 10.0 ft

Date Boring Started: 7/16/02

Date Boring Completed: 7/16/02

Logged By: S.Greenberg

Drilling Contractor:

Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-25



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-24

Sheet 1 of 1

PSI Job No.: 710-25083		Drilling Method:		WATER LEVELS	
Project: Monarch Meadows		Sampling Method:		▽ While excavating	N/A ft
Location: 13400 South and 4800 West		Hammer Type:		▽ After excavating	N/A ft
Herriman, Utah		Latitude:		▽ 24 hours later	N/A ft
		Longitude:			

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft				NOTES
						Surface Elev.: ft				X Moisture	PL	LL		
	0					SILT, soft to stiff, dry, light brown.	ML							
	5					GRAVEL, silty, with sand, dense, dry, light brown to brown.	GM							
	10					EOTP @ 12 feet. Groundwater was not encountered.								

Completion Depth: 12.0 ft	Sample Types:	Remarks:
Date Boring Started: 7/16/02	Auger Cutting	
Date Boring Completed: 7/16/02	Split-Spoon	
Logged By: S.Greenberg	Rock Core	
Drilling Contractor: -	Shelby Tube	
	Grab Sample	
	Mod. California	

Figure A-26



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-25

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ● X Moisture PL + LL	NOTES
						Surface Elev.: ft				STRENGTH, tsf ▲ Q <sub>u</sub> *	
	0					CLAY, with gravel, loose to stiff, dry, light brown, pinholes.	CL				
						GRAVEL, with sand, dense, dry, reddish brown.	GW				
						SAND, silty, medium dense, dry to moist, brown.	SM				
	5					GRAVEL, silty, with sand and cobbles, dense, dry, gray.	GM				
	10					EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor:

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-27





2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-26

Sheet 1 of 1

PSI Job No.: 710-25083		Drilling Method:		WATER LEVELS	
Project: Monarch Meadows		Sampling Method:		▽ While excavating	N/A ft
Location: 13400 South and 4800 West		Hammer Type:		▽ After excavating	N/A ft
Herriman, Utah		Latitude:		▽ 24 hours later	N/A ft
		Longitude:			

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft				NOTES
						Surface Elev.: ft								
	0					SILT, soft to stiff, dry, light brown, pinholes.	ML							
	5			1		SAND, silty, dry to moist, light brown to brown, pinholes.	SM							
				2		GRAVEL, silty, dense, dry, gray.	GM							
	10					EOTP @ 12 feet. Groundwater was not encountered.								

Completion Depth: 12.0 ft	Sample Types:	Remarks:
Date Boring Started: 7/16/02	Auger Cutting	
Date Boring Completed: 7/16/02	Split-Spoon	
Logged By: S.Greenberg	Rock Core	
Drilling Contractor:	Shelby Tube	
	Grab Sample	
	Mod. California	

Figure A-28



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-27

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ● X Moisture PL + LL STRENGTH, tsf ▲ Qp * Qu	NOTES
	0					Surface Elev.: ft SILT, with gravel, loose to stiff, dry, light brown.	ML				
	5					GRAVEL, silty, with sand and cobbles, dense, dry, gray.	GM				
	10					CLAY, sandy, medium dense, dry to moist, light brown.	CL				
						EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor:

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-29



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-28

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-Inch	Moisture, %	STANDARD PENETRATION TEST DATA				NOTES
										N in blows/ft	Moisture	PL	LL	
	0					Surface Elev.: ft								
						SILT, loose to stiff, dry, light brown.	ML							
						GRAVEL, silty, with sand and cobbles, dense, dry, gray.	GM							
	5													
						SAND, silty, medium dense, dry to moist, light brown.	SM							
	10													
						EOTP @ 13 feet. Groundwater was not encountered.								

Completion Depth: 12.5 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor:

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-30



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-29

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture    PL LL	NOTES
	0					Surface Elev.: ft SILT, loose to stiff, dry, light brown.	ML			1 25 50	
						GRAVEL, silty, with sand, dense, dry, gray.	GM				
	5					SAND, clean, soft to medium dense, dry to moist, light brown to gray.	SP				
						SAND, silty, medium dense, dry to moist, light brown.	SM				
	10										
						EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 12.5 ft  
Date Boring Started: 7/16/02  
Date Boring Completed: 7/16/02  
Logged By: S.Greenberg  
Drilling Contractor:

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-31



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-30

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft				NOTES
						X Moisture      PL LL STRENGTH, tsf ▲                      * Qp 0                      2.0                      Qu                      4.0								
	0					Surface Elev.: ft								
						SILT, with gravel, loose to stiff, dry, light brown.	ML							
				1		SAND, silty, medium dense, dry to moist, gray, iron oxide stains.	SM							
	5					GRAVEL, silty, dense, dry, gray.	GM							
	10			2		SAND, silty, medium dense, moist, gray, iron oxide stains, pinholes.	SM							
						EOTP @ 13 feet. Groundwater was not encountered.								

Completion Depth: 13.0 ft

Date Boring Started: 7/16/02

Date Boring Completed: 7/16/02

Logged By: S.Greenberg

Drilling Contractor:

Sample Types:

☐ Auger Cutting  
☒ Split-Spoon  
☐ Rock Core

☐ Shelby Tube  
☒ Grab Sample  
☒ Mod. California

Remarks:

Figure A-32



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-31

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft				NOTES
						X Moisture      PL LL 1                      25                      50 STRENGTH, tsf ▲                      * Qp Qu                      40								
	0					Surface Elev.: ft								
						SILT, with gravel, loose, dark brown, dry.	ML							
						GRAVEL, silty, dense, dry, light brown.	GM							
						SAND, clean, medium dense, dry, gray.	SP							
						SAND, silty, medium dense, dry, light brown.								
	5						SM							
				1		SILT, medium stiff, moist, light brown, iron oxide stains.	ML							
	10													
				2		SAND, silty, medium dense, dry, light brown, iron oxide stains.	SM							
						EOTH @ 12.5 feet. Groundwater was not encountered.								

Completion Depth: 12.5 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B.Garrett  
Drilling Contractor:

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-33



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-32

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL STRENGTH, tsf ▲ * Qp 0 20 Qu 40	NOTES
	0					Surface Elev.: ft					
						SILT, loose, dry, dark brown, pinholes.	ML				
						GRAVEL, silty, dense, dry, gray to brown.	GM				
	5			1		SILT, medium stiff, dry, brown, pinholes.	ML				
						GRAVEL, silty, dense, dry, light brown.	GM				
	10					SILT, medium stiff, moist, brown, small pinholes.	ML				
				2		EOTH @ 12.5 feet. Groundwater was not encountered.					

Completion Depth: 12.5 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor: -

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-34



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-33

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-Inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL	NOTES
	0					Surface Elev.: ft					
						SILT, loose, dry, dark brown.	ML				
				1		SILT, medium stiff, dry, light brown, pinholes.	ML				
	5					GRAVEL, silty, with cobbles, dense, dry, light brown.	GM				
				2		SILT, sandy, medium stiff, moist, brown, iron oxide stains.	ML				
	10										
						EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor:

## Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core  
Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-35





2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-34

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture    PL LL STRENGTH, tsf ▲ Qp    * Qu	NOTES
	0					Surface Elev.: ft					
						SILT, with gravel, loose, dry, dark brown, pinholes.	ML				
						GRAVEL, silty, dense, dry, light brown.	GM				
						SAND, silty, medium dense dry light brown.	SM				
	5					SILT, medium stiff, dry to moist, light brown.	ML				
	10										
						EOTP @ 14 feet. Groundwater was not encountered.					

Completion Depth: 14.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor:

### Sample Types:

☒ Auger Cutting  
☒ Split-Spoon  
☒ Rock Core

☒ Shelby Tube  
☒ Grab Sample  
☒ Mod. California

Remarks:

Figure A-36



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-35

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture    PL LL STRENGTH, tsf ▲                    * Qp Qu	NOTES
0						Surface Elev.: ft SILT, loose, dry, dark brown.	ML				
				1		SILT, medium stiff, dry, brown, pinholes.					
5							ML				
10				2							
						EOTH @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor:

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:

Figure A-37



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-36

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft				NOTES
										X	Moisture	PL	LL	
	0					Surface Elev.: ft								
						SILT, loose, dry, light brown.	ML							
						SILT, medium stiff, dry, light brown, pinholes.	ML							
	5													
						GRAVEL, silty, dense, dry, light brown to gray.	GM							
	10													
						EOTH @ 11.5 feet. Groundwater was not encountered.								

Completion Depth: 11.5 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor: -

### Sample Types:

☒ Auger Cutting  
☒ Split-Spoon  
☒ Rock Core

☒ Shelby Tube  
☒ Grab Sample  
☒ Mod. California

Remarks:

Figure A-38



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-37

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	NOTES
	0					Surface Elev.: ft					
						SILT, loose, dry, light brown.	ML				
						SILT, medium stiff, dry, light brown, pinholes.	ML				
	5					GRAVEL, silty, dense, dry, gray.	GM				
						SILT, sandy, medium stiff, dry, light brown.	ML				
						GRAVEL, silty, dense, dry, gray.	GM				
	10					EOTH @ 10 feet. Groundwater was not encountered.					

Completion Depth: 10.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor:

### Sample Types:

☐ Auger Cutting  
☒ Split-Spoon  
☐ Rock Core

☐ Shelby Tube  
☒ Grab Sample  
☒ Mod. California

### Remarks:

Figure A-39



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-38

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture    PL LL	NOTES
	0					Surface Elev.:    ft				STRENGTH, tsf ▲                      * Qp Qu 40	
				1		SILT, loose, moist, light brown.	ML				
						SAND, silty, medium dense, moist, brown.	SM				
	5										
				2		SILT, sandy, medium stiff, moist, brown.	ML				
	10										
						EOTP @ 13 feet. Groundwater was not encountered.					

Completion Depth: 13.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor: -

### Sample Types:

☒ Auger Cutting  
☒ Split-Spoon  
☒ Rock Core

☒ Shelby Tube  
☒ Grab Sample  
☒ Mod. California

### Remarks:

Figure A-40



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-40

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL STRENGTH, tsf Qp Qu	NOTES
	0					Surface Elev.: ft					
						SILT, loose, dry, light brown, pinholes.	ML				
						GRAVEL, silty, with sand and cobbles, dense, dry, light brown.	GM				
	5			1		SILT, medium stiff, moist, brown, pinholes.	ML				
						GRAVEL, silty, with cobbles, dense, dry, gray.	GM				
	10			2		CLAY, medium stiff, moist, brown.	CL				
						EOTP @ 14 feet. Groundwater was not encountered.					

Completion Depth: 14.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor: -

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-42



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-41

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

**WATER LEVELS**  
▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture PL LL	NOTES
	0					Surface Elev.: ft				1 25 50	
				1		SILT, loose to medium stiff, moist, light brown, pinholes.	ML				
	5					GRAVEL, silty, with cobbles, dense, moist, light brown.	GM				
	10			2		SILT, sandy, medium stiff, moist, brown, iron oxide stains.	ML				
						EOTP @ 14 feet. Groundwater was not encountered.					

Completion Depth: 14.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor:

Sample Types:  
☒ Auger Cutting  
☒ Split-Spoon  
☐ Rock Core  
☒ Shelby Tube  
☒ Grab Sample  
☒ Mod. California

Remarks:

Figure A-43



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-42

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture    PL LL * STRENGTH, tsf ▲                    * Qp Qu	NOTES
	0					Surface Elev.: ft					
				1		SILT, loose to medium stiff, moist, light brown, pinholes.	ML				
	5										
				2		GRAVEL, silty, with cobbles, dense, dry, gray.	GM				
	10					SILT, medium stiff, moist, brown, iron oxide stains.	ML				
						EOTP @ 12.5 feet. Groundwater was not encountered.					

Completion Depth: 12.5 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor: -

### Sample Types:

Auger Cutting  
Split-Spoon  
Rock Core

Shelby Tube  
Grab Sample  
Mod. California

Remarks:



# KEY TO SYMBOLS



USCS Silt



USCS Low Plasticity Clay



USCS Silty Gravel



USCS Well-graded Gravel



USCS Poorly-graded Sand



USCS Silty Sand

HSA = Hollow Stem Auger

CFA = Continuous Flight Auger

SS = Split-spoon Sampler

ST = Shelby Tube Sampler

RC = Rock Core

DD = Dry Density

LL = Liquid Limit

PL = Plastic Limit

Qu = Unconfined Compressive  
Strength

Qp = Pocket Penetrometer

RQD = Rock Quality Designation

REC'D = Rock Core Recovery Percentage

PID = Photo Ionic Detector (ppm)

MR\* = Unable to determine depth of water  
due to mud rotary drilling methods

The test pits were excavated to the desired depth using a trackhoe. Disturbed bag samples and relatively undisturbed tube and block samples were obtained at various intervals in each test pit. Each tube and bag sample was sealed and transported to the laboratory for testing.



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

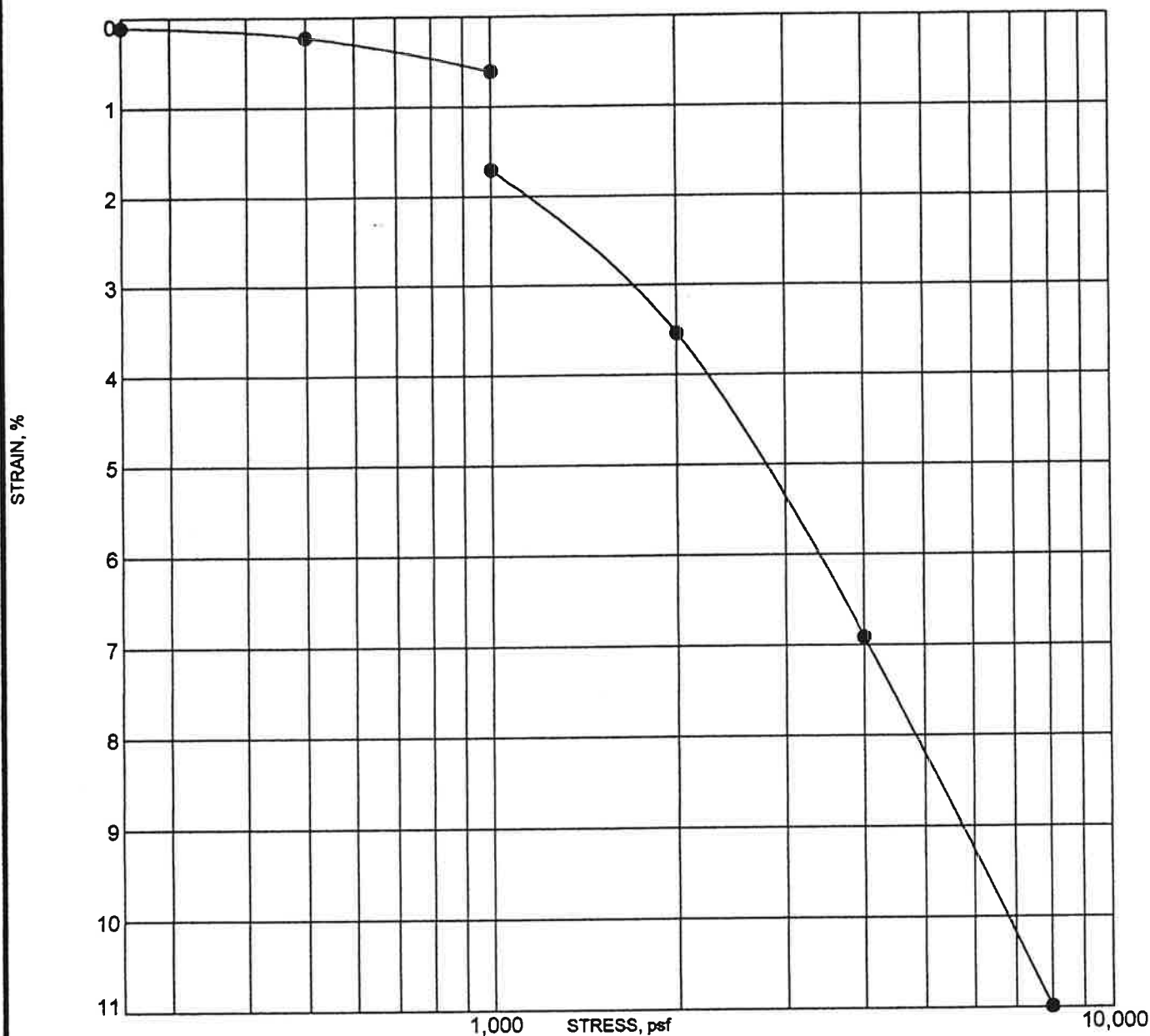
PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Figure A-45

**TABLE 1: SUMMARY OF LABORATORY TESTING**

Sample No.	Sample Depth (ft.)	Mechanical Sieve Analysis			Atterberg Limits		USCS Soil Classification
		% Gravel	% Sand	% Fines	Liquid Limit (%)	Plastic Index (%)	
TP-5	PILE	66.2	27.8	6.0	--	--	GP-GC
TP-11	4.0	0.0	61.5	38.5	--	--	SM
TP-20	2.5	--	--	--	27	13	CL
TP-25	2.5	--	--	--	32	16	CL
TP-27	8.0	0.0	7.9	92.1	28	8	CL
TP-31	12.0	0.0	14.0	86.0	26	5	ML
TP-38	4.0	0.9	57.8	41.3	--	--	SM
TP-38	11.0	0.0	33.7	66.3	NP*	NP	ML
TP-40	5.0	--	--	--	26	3	ML
TP-40	10.0	--	--	--	32	15	CL

\*NP = Non-Plastic as per ASTM D 4318 Section 11.4.



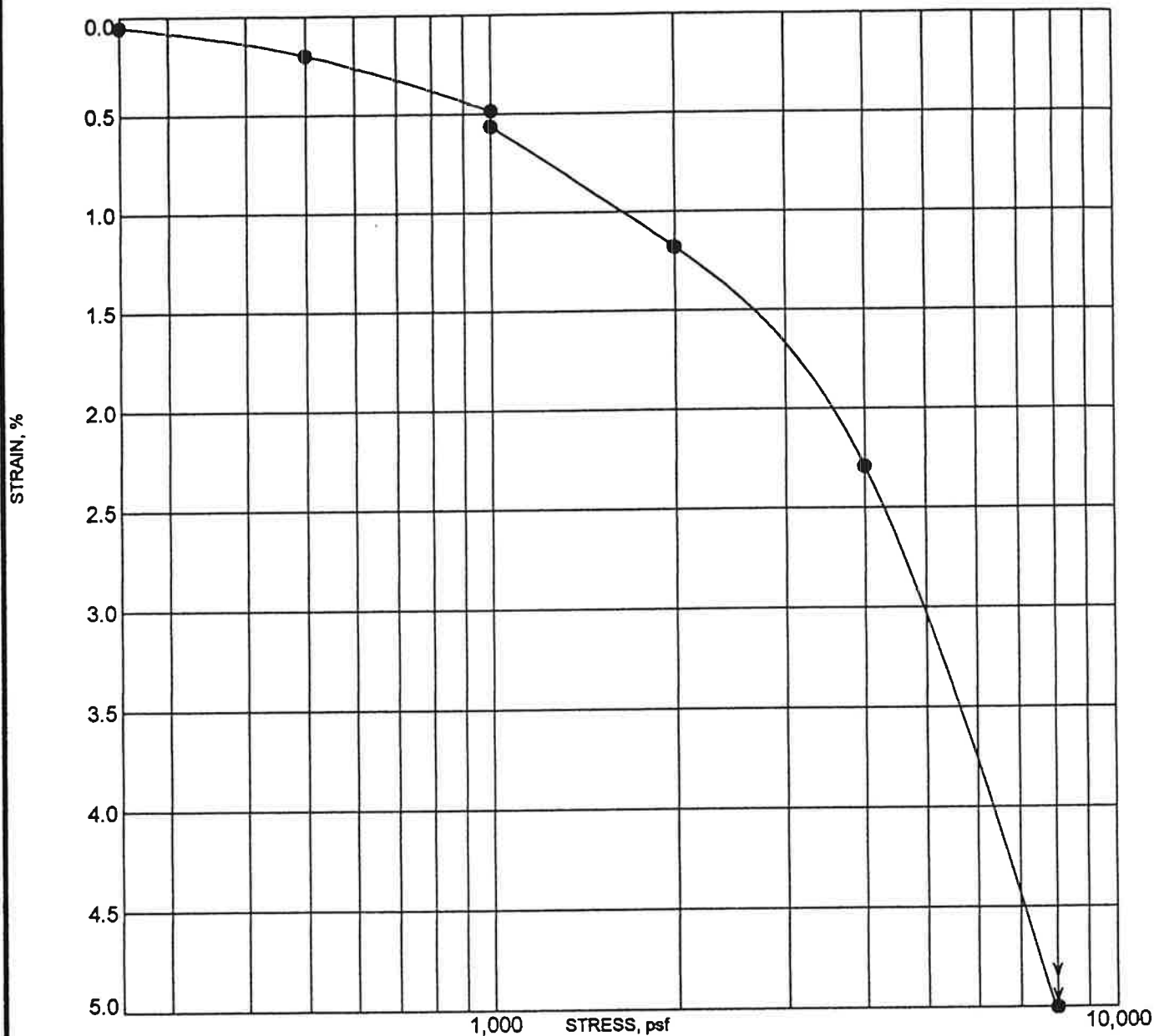
Specimen Identification		Classification	$\gamma_d$	MC%
●	TP-20	2.5		9



### CONSOLIDATION TEST

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: Herriman, Utah

Figure A-47



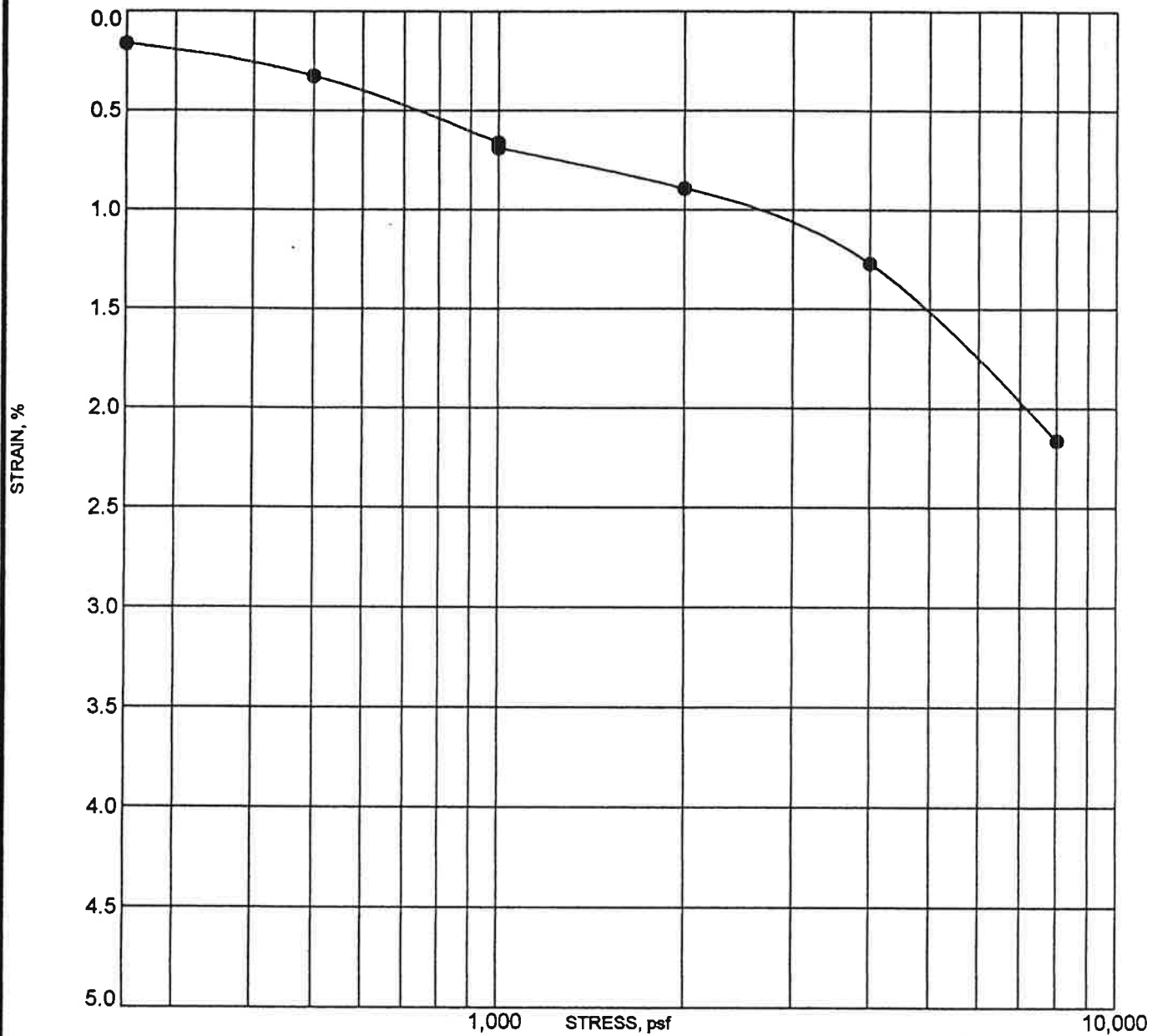
Specimen Identification		Classification	$\gamma_d$	MC%
● TP-25	2.5		93	7



### CONSOLIDATION TEST

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: Herriman, Utah

Figure A-48



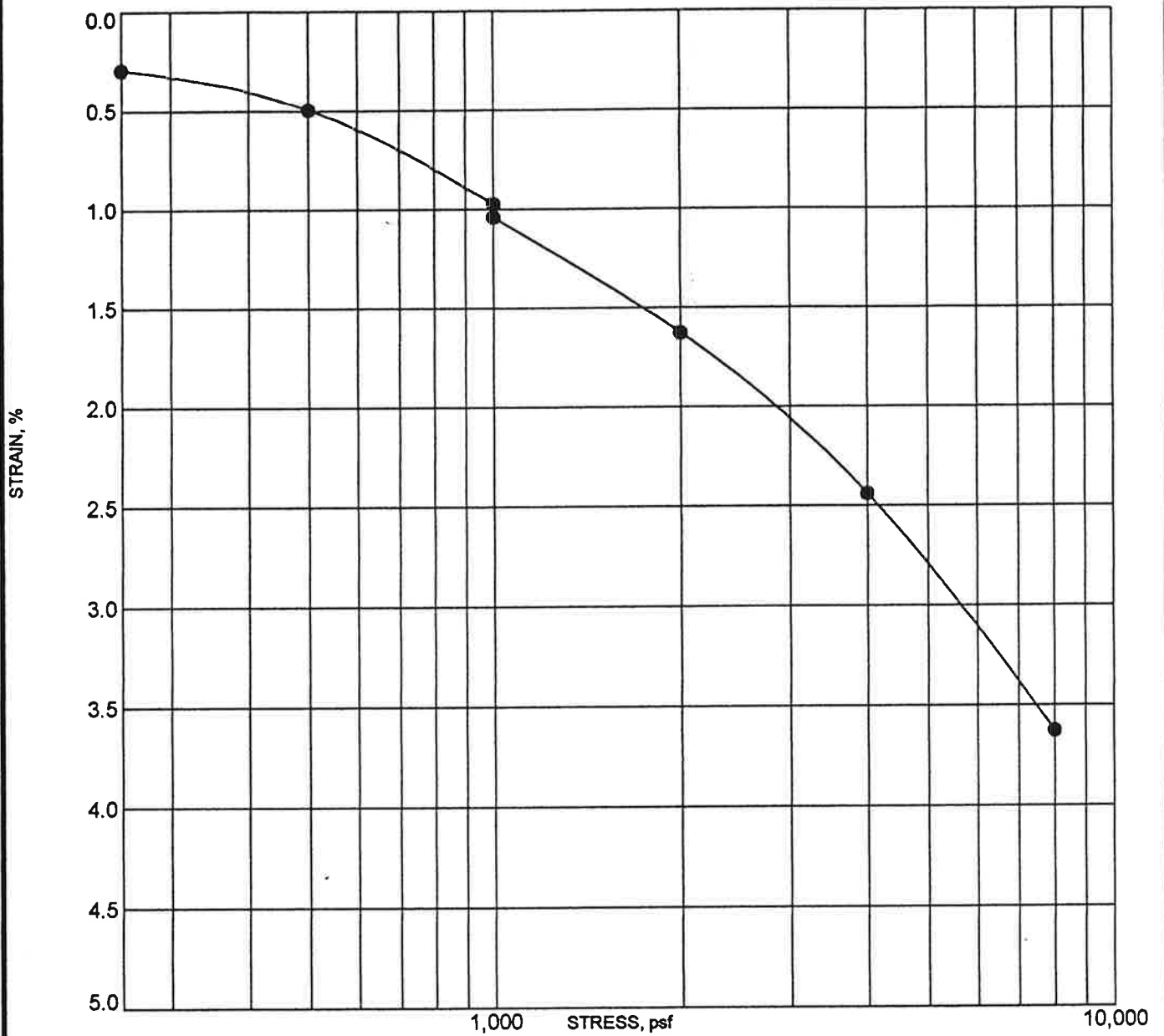
Specimen Identification	Classification	$\gamma_d$	MC%
● TP-40 5.0		90	21



### CONSOLIDATION TEST

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: Herriman, Utah

Figure A-49



Specimen Identification			Classification	$\gamma_d$	MC%
●	TP-40	10.0		86	34



### CONSOLIDATION TEST

PSI Job No.: 710-25083  
 Project: Monarch Meadows  
 Location: Herriman, Utah

Figure A-50



2779 South 600 West  
South Salt Lake, UT 84115  
Telephone: (801) 954-8442  
Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-39

Sheet 1 of 1

PSI Job No.: 710-25083  
Project: Monarch Meadows  
Location: 13400 South and 4800 West  
Herriman, Utah

Drilling Method:  
Sampling Method:  
Hammer Type:  
Latitude:  
Longitude:

## WATER LEVELS

▽ While excavating N/A ft  
▽ After excavating N/A ft  
▽ 24 hours later N/A ft

Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ● X Moisture PL LL				NOTES
	0					Surface Elev.: ft								
				1		SILT, loose, moist, light brown, pinholes.	ML							
	5					GRAVEL, silty, cobbles, dense, moist, gray.	GM							
	10			2		SILT, sandy, medium stiff, moist, light brown.	ML							
						EOTP @ 14 feet. Groundwater was not encountered.								

Completion Depth: 14.0 ft  
Date Boring Started: 7/17/02  
Date Boring Completed: 7/17/02  
Logged By: B. Garrett  
Drilling Contractor:

Sample Types:  
 Auger Cutting  
 Split-Spoon  
 Rock Core  
 Shelby Tube  
 Grab Sample  
 Mod. California

Remarks:

Figure A-41