

June 4, 2020

Project No. 203131-12A

Mr. Alex Hann  
**Empire Design Group, Inc.**  
24861 Washington Avenue  
Murrieta, CA 92562

Subject: **Infiltration Testing for Water Quality Treatment Areas, Proposed Commercial Development, Assessor's Parcel Number 479-631-010, Located at the Northwest Corner of Alessandro Boulevard and Lasselle Street, City of Moreno Valley, Riverside County, California**

### **INTRODUCTION**

Earth Strata Geotechnical Services is pleased to present this infiltration feasibility report for the proposed commercial development, located on the northwest corner of Alessandro Boulevard and Lasselle Street, Assessor Parcel Number 479-631-010, in the City of Moreno Valley, Riverside County, California. The purpose of our study was to determine the infiltration rates and physical characteristics of the subsurface earth materials at the approximate depth of the proposed WQMP area within the proposed development. This feasibility report provides the infiltration rates to be used for the design and the development of the water quality management plan, where applicable.

### **PROPERTY DESCRIPTION**

The subject property is located on the northwest corner of Alessandro Boulevard and Lasselle Street in the City of Moreno Valley, Riverside County, California. The approximate location of the site is shown on the Vicinity Map, Figure 1.

The subject property is comprised of an undeveloped parcel of land. The site has not been graded. Topographic relief at the subject property is relatively low with the terrain being generally flat. Elevations at the site range from approximately 1597 to 1581 feet above mean sea level (msl), for a difference of about 16± feet across the entire site. Drainage within the subject property generally flows to the south.

The site is currently bordered by residential development to the north and west, as well as Lasselle Street to the east and Alessandro Boulevard to the south. Most of the vegetation on the site consists of moderate amounts of annual weeds/grasses, along with small rock outcrops on the northern portion of the site.

## **PROPOSED CONSTRUCTION**

Based on the provided plans, the proposed development will consist of a commercial development complete with interior streets, utilities, driveways, parking and onsite water quality treatment areas.

## **SUBSURFACE EXPLORATION**

Subsurface exploration within the subject site was performed by Geoboden Inc., on December 2, 2017 for the exploratory excavations. A truck mounted hollow-stem-auger drill rig was utilized to drill eight (8) borings throughout the site to a maximum depth of 51.5 feet. The exploratory holes were excavated for geotechnical evaluation purposes with respect to the proposed developments and to interpret whether groundwater or impermeable soil layers were present. The descriptive logs are presented in Appendix A.

Earth materials encountered during exploration were classified and logged in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Upon completion of laboratory testing, exploratory logs and sample descriptions may have been reconciled to reflect laboratory test results with regard to ASTM D 2487.

### **Earth Materials**

A general description of the earth materials observed on site is provided below.

Quaternary Alluvium (Qa): Quaternary alluvium was encountered directly at the surface to the maximum depth explored, by Geoboden, of 51.5 feet. This unit consists predominately of interbedded brown to yellowish brown, fine to coarse grained silty sand and poorly graded sand with gravel.

## **INFILTRATION TESTING**

The double ring infiltrometer test method was utilized to perform a total of two (2) infiltration tests on May 18, 2020 to evaluate near surface infiltration rates in order to estimate the amount of storm water runoff that can infiltrate into the onsite water quality treatment plan areas. The infiltration tests were performed in general accordance with the requirements of double ring infiltration testing, ASTM D 3385 and Appendix A of the Riverside County Flood Control and Water Conservation District.

The infiltration tests were performed using double ring infiltrometer and Mariotte tubes at a depth of 5 feet below existing grades. The locations of the infiltration tests are indicated on the attached infiltration Location Map, Plate 1. The double ring infiltrometer tests were located by property boundary measurement on the site plan and by using geographic features. Infiltration test data recorded in the field are summarized in the following table and is included within Appendix B including the graph of Infiltration Rate versus Elapsed Time.

## Infiltration Test Summary

TEST NUMBER	INFILTRATION HOLE DEPTH (ft.)	INFILTRATION RATE (in/hr)	DESCRIPTION
DR-1	5	3.6	Silty sand with gravel
DR-2	5	1.6	Silty sand with gravel

The infiltration test rates ranged from 1.6 to 3.6 inches per hour (in/hr).

## CONCLUSIONS AND RECOMMENDATIONS

### General

From geotechnical and engineering geologic points of view, the proposed WQMP areas, where tested, is considered suitable for infiltration for the proposed development, provided the following conclusions and recommendations are incorporated into the plans and are implemented during construction.

### Groundwater

Groundwater was not observed during subsurface exploration to a total depth of 51.5 feet. Local well data indicates groundwater levels between approximately 40 to 60 feet below ground surface, which meets the minimum separation of 10 feet from the bottom of infiltration facility to the groundwater mark. Therefore, potential groundwater impact is considered very low.

### Geologic/ Geotechnical Screening

The proposed WQMP areas (see Plate 1) should be located away from and at a lower elevation than proposed structures into competent native earth materials.

The proposed structures will be supported by compacted fill and competent earth materials, with no shallow groundwater. According to the County of Riverside reports, the subject site is located in an area where liquefaction potential is considered low. As such, the potential for earthquake induced liquefaction and lateral spreading beneath the proposed structures is considered very low to remote due to the recommended compacted fill, relatively low groundwater level, and the dense nature of the deeper onsite earth materials.

The onsite earth materials exhibit an expansion potential of **VERY LOW** as classified in accordance with 2019 CBC Section 1803.5.3 and ASTM D4829.

Therefore, infiltration within the proposed WQMP areas will not encroach on any proposed structures and will not increase the risk of geologic hazards.

## **Recommended Factor of Safety/Design Rate**

In accordance with the Water Quality Management Plan Guidance Document for the Santa Ana region of Riverside County, the minimum recommended factor of safety for the infiltration design is 2.

Based on the data presented in this report and the recommendations set forth herein, it is the opinion of Earth Strata Geotechnical Services that the WQMP area utilizing a factor of safety of 2 can be designed for an infiltration rate of 1.8 inches per hour in the vicinity of DR-1 and 0.8 inches per hour in the vicinity of DR-2.

## **GRADING PLAN REVIEW AND CONSTRUCTION SERVICES**

This report has been prepared for the exclusive use of **Mr. Alex Hann** and their authorized representative. It likely does not contain sufficient information for other parties or other uses. Earth Strata should be engaged to review the final design plans and specifications prior to construction. This is to verify that the recommendations contained in this report have been properly incorporated into the project plans and specifications. Should Earth Strata not be accorded the opportunity to review the project plans and specifications, we are not responsible for misinterpretation of our recommendations.

Earth Strata should be retained to provide observations during construction to validate this report. In order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

Earth Strata should review any changes in the project and modify and approve in writing the conclusions and recommendations of this report. This report and the drawings contained within are intended for design input purposes only and are not intended to act as construction drawings or specifications. In the event that conditions encountered during grading or construction operations appear to be different than those indicated in this report, this office should be notified immediately, as revisions may be required.

## **REPORT LIMITATIONS**

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists, practicing at the time and location this report was prepared. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Earth materials vary in type, strength, and other geotechnical properties between points of observation and exploration. Groundwater and moisture conditions can also vary due to natural processes or the works of man on this or adjacent properties. As a result, we do not and cannot have complete knowledge of the subsurface conditions beneath the subject property. No practical study can completely eliminate uncertainty with regard to the anticipated geotechnical conditions in connection with a subject property.

The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by Earth Strata during construction. This report is considered valid for a period of one year from the time the report was issued.

This report was prepared with the understanding that it is the responsibility of the owner or their representative, to ensure that the conclusions and recommendations contained herein are brought to the attention of the other project consultants and are incorporated into the plans and specifications. The owners' contractor should properly implement the conclusions and recommendations during grading and construction, and notify the owner if they consider any of the recommendations presented herein to be unsafe or unsuitable.

Respectfully submitted,

EARTH STRATA GEOTECHNICAL SERVICES



Stephen M. Poole, PE 40219  
President  
Principal Engineer

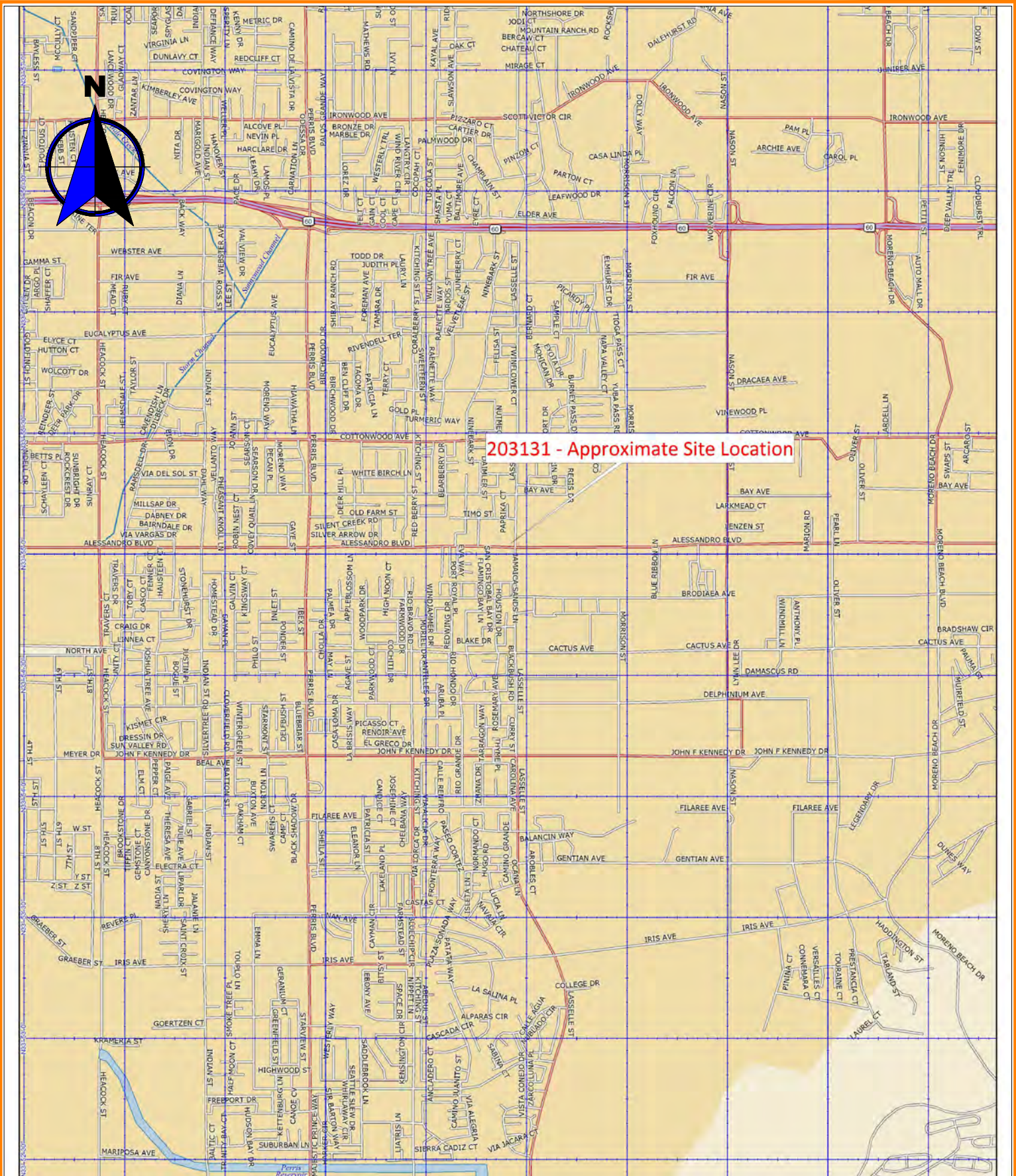


SMP/hr

Distribution: (1) Addressee

Attachments: Figure 1 – Vicinity Map (*Rear of Text*)  
Appendix A – Exploratory Logs (*Rear of Text*)  
Appendix B – Infiltration Test Sheets (*Rear of Text*)  
Plate 1 – Infiltration Location Map (*Rear of Text*)

**FIGURE 1**  
VICINITY MAP



203131 - Approximate Site Location

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Earth Strata Geotechnical Services, Inc.  
Geotechnical, Environmental and Materials Testing Consultants

www.ESGSINC.com (951) 397-8315

LASSELLE STREET

203131-12A

VICINITY MAP

SCALE 1:40,625

JUNE 2020

FIGURE 1

## Groundwater Levels for Station 339347N1172408W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.

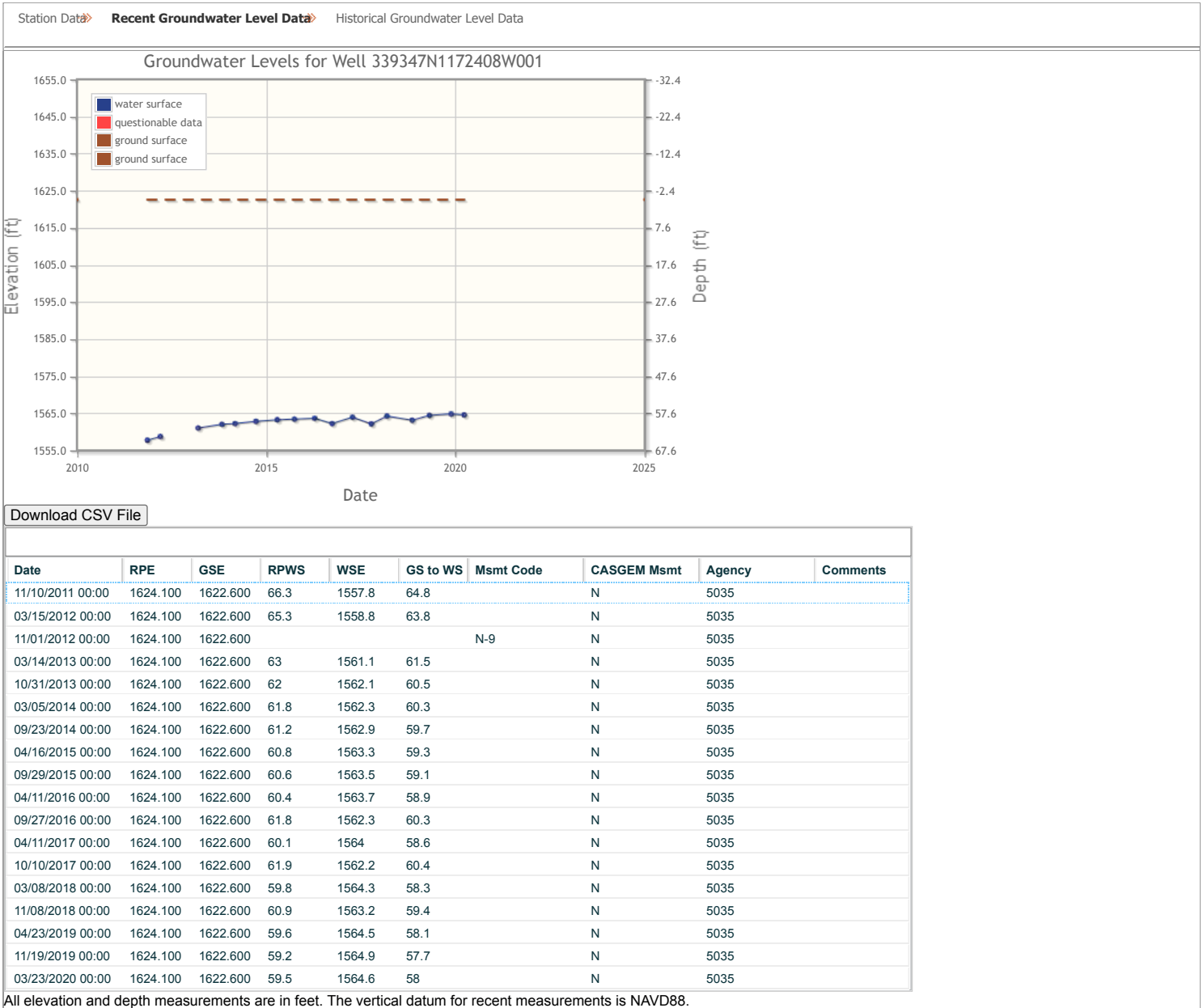
<span style="font-weight: bold;">Station Data</span> ▶ <span style="font-weight: normal;">Recent Groundwater Level Data</span> ▶ <span style="font-weight: normal;">Historical Groundwater Level Data</span>		
<p><b>State Well Number:</b>  <b>Local Well ID:</b> EMWD14350  <b>Site Code:</b> 339347N1172408W001  <b>Latitude (NAD83):</b> 33.934720  <b>Longitude (NAD83):</b> -117.240824  <b>Groundwater Basin (code):</b> San Jacinto (8-005)</p>	<p><b>Well Use:</b> Observation  <b>Well Status:</b> Active  <b>Well Completion Report Number:</b>  <b>Reference Point Elevation (NAVD88 ft):</b> 1624.100  <b>Ground Surface Elevation (NAVD88 ft):</b> 1622.600  <b>Total Depth (ft):</b> 320  <b>Perforated Interval Depths (ft):</b> 130.000 300.000</p>	

[Perform a New Well Search](#)



### Groundwater Levels for Station 339347N1172408W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.



[Perform a New Well Search](#)

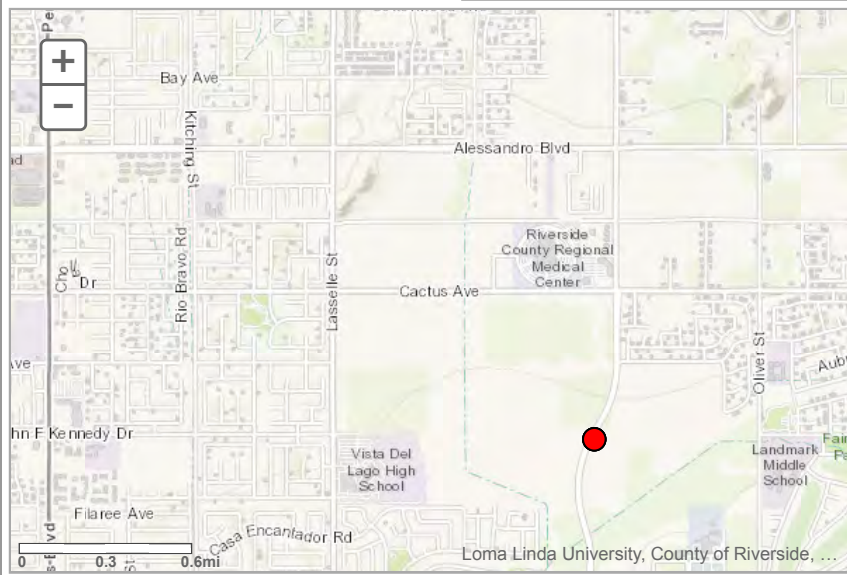
### Groundwater Levels for Station 339025N1171928W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.

**Station Data** Recent Groundwater Level Data Historical Groundwater Level Data

**State Well Number:**  
**Local Well ID:** EMWD25695  
**Site Code:** 339025N1171928W001  
**Latitude (NAD83):** 33.902483  
**Longitude (NAD83):** -117.192819  
**Groundwater Basin (code):** San Jacinto (8-005)

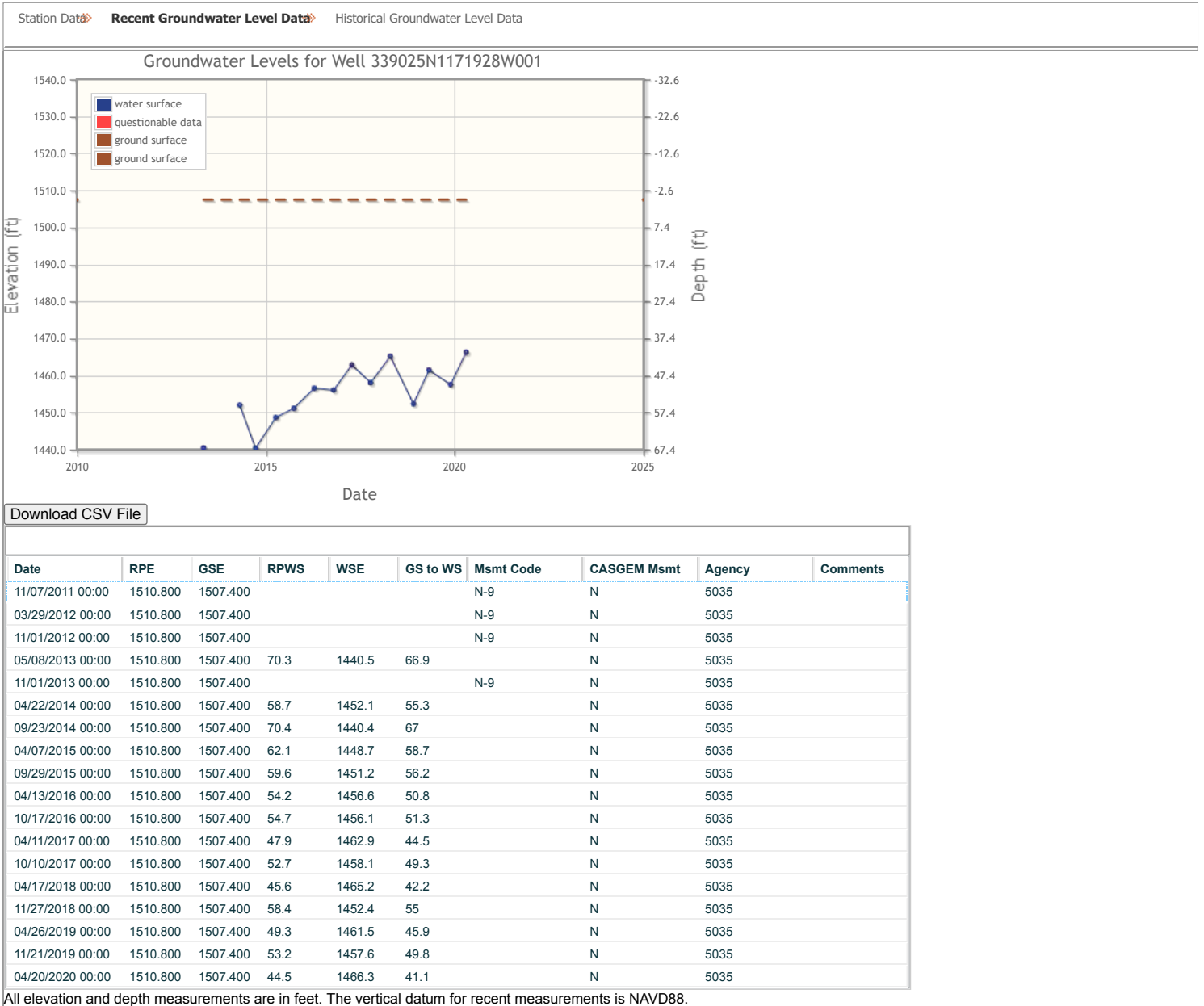
**Well Use:** Irrigation  
**Well Status:** Active  
**Well Completion Report Number:**  
**Reference Point Elevation (NAVD88 ft):** 1510.800  
**Ground Surface Elevation (NAVD88 ft):** 1507.400  
**Total Depth (ft):** 775  
**Perforated Interval Depths (ft):** 246.000 360.000  
380.000 725.000  
735.000 755.000



[Perform a New Well Search](#)

### Groundwater Levels for Station 339025N1171928W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.



[Perform a New Well Search](#)

**APPENDIX A**  
**EXPLORATORY LOGS**

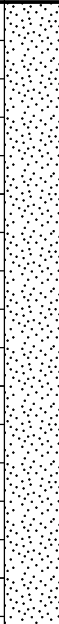
**CLIENT** Northwest Moreno Properties Inc  
**PROJECT NUMBER** Moreno Valley-1-01  
**DATE STARTED** 12/2/17 **COMPLETED** 12/2/17  
**DRILLING CONTRACTOR** GeoBoden, Inc.  
**DRILLING METHOD** HSA  
**LOGGED BY** C.R. **CHECKED BY** \_\_\_\_\_  
**NOTES** \_\_\_\_\_

**PROJECT NAME** Proposed 76 Gas Station  
**PROJECT LOCATION** Alessandro Boulevard/Laselle Street, Moreno Valley  
**GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 8 inches  
**GROUND WATER LEVELS:**  
**AT TIME OF DRILLING** ---  
**AT END OF DRILLING** ---  
**AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		SILTY SAND (SM): light brown, dry, ~70% sand, ~20% fines, ~10% gravel										
5		POORLY-GRADED SAND w. SILT & GRAVEL (SP-SM): yellowish brown, moist, ~15% fine subrounded gravel up to 1/2 inch, medium to coarse sand, ~10% fines	MC R-1		30		110	5				
10			SS S-2		22							
15		POORLY-GRADED SAND (SP): yellowish brown, moist, ~10% fine to coarse gravel, ~5% fines, ~85% medium to coarse sand	MC R-3		55							
20		POORLY-GRADED SAND w. GRAVEL (SP): yellowish brown, moist, ~15% fine to coarse gravel, ~5% fines, ~80% medium to coarse sand	SS S-4		58							
25		~30% fine to coarse gravel up to 1 inch, ~5% fines, ~65% medium to coarse sand	SS R-5		60							
30		POORLY-GRADED SAND w. GRAVEL (SP): brown, moist, ~15% fine gravel, ~5% fines, ~80% medium to coarse sand	SS S-6		60							
35												

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**CLIENT** Northwest Moreno Properties Inc **PROJECT NAME** Proposed 76 Gas Station  
**PROJECT NUMBER** Moreno Valley-1-01 **PROJECT LOCATION** Alessandro Boulevard/Laselle Street, Moreno Valley

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)	
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
35		POORLY-GRADED SAND w. GRAVEL (SP): brown, moist, ~15% fine gravel, ~5% fines, ~80% medium to coarse sand ( <i>continued</i> )											
40													
45													
50													

Bottom of borehole at 51.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 51.5 feet.

**CLIENT** Northwest Moreno Properties Inc  
**PROJECT NUMBER** Moreno Valley-1-01  
**DATE STARTED** 12/2/17 **COMPLETED** 12/2/17  
**DRILLING CONTRACTOR** GeoBoden, Inc.  
**DRILLING METHOD** HSA  
**LOGGED BY** C.R. **CHECKED BY** \_\_\_\_\_  
**NOTES** \_\_\_\_\_

**PROJECT NAME** Proposed 76 Gas Station  
**PROJECT LOCATION** Alessandro Boulevard/Laselle Street, Moreno Valley  
**GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 8 inches  
**GROUND WATER LEVELS:**  
**AT TIME OF DRILLING** ---  
**AT END OF DRILLING** ---  
**AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
5		SILTY SAND w. GRAVEL (SM): brown, dry, ~15% fine to coarse gravel, ~55% fine sand, ~30% fines	MC R-1		50		103	4				51
10		POORLY-GRADED SAND w. SILT & GRAVEL (SP-SM): brown, moist, ~15% fine gravel, ~10% fines, ~75% medium to coarse sand	SS S-2		36			3				
15		POORLY-GRADED SAND w. GRAVEL (SP): brown, moist, ~30% fine subrounded gravel up to 1/2 inch, ~5% fines, ~65% medium to coarse sand	MC R-3		50		111	2				

Bottom of borehole at 16.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 16.5 feet.

# GEOBODEN, INC.

# BORING NUMBER B-3

**CLIENT** Northwest Moreno Properties Inc  
**PROJECT NUMBER** Moreno Valley-1-01  
**DATE STARTED** 12/2/17 **COMPLETED** 12/2/17  
**DRILLING CONTRACTOR** GeoBoden, Inc.  
**DRILLING METHOD** HSA  
**LOGGED BY** C.R. **CHECKED BY** \_\_\_\_\_  
**NOTES** \_\_\_\_\_

**PROJECT NAME** Proposed 76 Gas Station  
**PROJECT LOCATION** Alessandro Boulevard/Laselle Street, Moreno Valley  
**GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 8 inches  
**GROUND WATER LEVELS:**  
**AT TIME OF DRILLING** ---  
**AT END OF DRILLING** ---  
**AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
5		SILTY SAND (SM): brown, dry, ~70% sand, ~30% fines	MC R-1		50		108	3				52
10		POORLY-GRADED SAND w. SILT & GRAVEL (SP-SM): light yellowish brown, moist, ~15% fine subrounded gravel, ~10% fines, ~75% medium to coarse sand	SS S-2		43			2				
15			MC R-3		45		111	3				

Bottom of borehole at 16.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 16.5 feet.



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 PROJECT NUMBER Moreno Valley-1-01  
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 DRILLING CONTRACTOR GeoBoden, Inc.  
 DRILLING METHOD HSA  
 LOGGED BY C.R. CHECKED BY \_\_\_\_\_  
 NOTES \_\_\_\_\_

PROJECT NAME Proposed 76 Gas Station  
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 AT TIME OF DRILLING ---  
 AT END OF DRILLING ---  
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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
		SILTY SAND (SM): yellowish brown, dry, ~70% sand, ~30% fines	MC R-1		45		107	4				
5		POORLY-GRADED SAND w. SILT & GRAVEL (SP-SM): brown, moist, ~15% fine gravel, ~75% medium sand, ~10% fines	MC R-2		38		109	6				
10			MC R-3		43		111	4				
15		POORLY-GRADED SAND (SP): yellowish light brown, moist, ~5% fines, ~95% sand	MC R-4		41		110	5				

Bottom of borehole at 16.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 16.5 feet.

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**AFTER DRILLING** ---

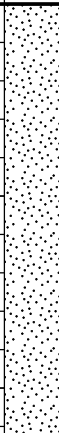
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
5		SILTY SAND w. GRAVEL (SM): brown, moist, ~15% fine gravel, ~30% fines, ~55% medium to coarse sand	MC R-1		39							
			MC R-2		43							
10		SAND w. GRAVEL (SP): light brown, moist, ~15% fine to coarse gravel, ~80% fine sand, ~5% fines	MC R-3		46							

Bottom of borehole at 11.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 11.5 feet.

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 DATE STARTED 12/2/17 COMPLETED 12/2/17  
 DRILLING CONTRACTOR GeoBoden, Inc.  
 DRILLING METHOD HSA  
 LOGGED BY C.R. CHECKED BY \_\_\_\_\_  
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PROJECT NAME Proposed 76 Gas Station  
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 GROUND WATER LEVELS:  
 AT TIME OF DRILLING ---  
 AT END OF DRILLING ---  
 AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		SAND w. GRAVEL (SP): light brown, moist, ~20% gravel										
5			MC R-1		43							
			MC R-2		45		108	2				
10			MC R-3		46							

Bottom of borehole at 11.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 11.5 feet.

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									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
		SILTY SAND (SM): brown, dry, ~70% sand, ~30% fines	MC R-1		35							
5		POORLY-GRADED SAND w. SILT & GRAVEL (SP-SM): light brown, moist, ~15% gravel, ~10% fines, ~75% medium sand	MC R-2		41		109	4				
10			MC R-3		39							

Bottom of borehole at 11.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 11.5 feet.

**CLIENT** Northwest Moreno Properties Inc  
**PROJECT NUMBER** Moreno Valley-1-01  
**DATE STARTED** 12/2/17 **COMPLETED** 12/2/17  
**DRILLING CONTRACTOR** GeoBoden, Inc.  
**DRILLING METHOD** HSA  
**LOGGED BY** C.R. **CHECKED BY** \_\_\_\_\_  
**NOTES** \_\_\_\_\_

**PROJECT NAME** Proposed 76 Gas Station  
**PROJECT LOCATION** Alessandro Boulevard/Laselle Street, Moreno Valley  
**GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 8 inches  
**GROUND WATER LEVELS:**  
**AT TIME OF DRILLING** ---  
**AT END OF DRILLING** ---  
**AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
		SILTY SAND w. GRAVEL (SM): brown, moist, ~20% fines, ~75% sand, ~5% gravel	MC R-1		34							
5			MC R-2		41		115	2				
10			MC R-3		45							

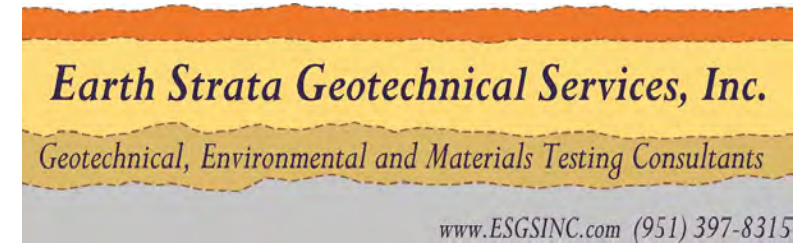
Bottom of borehole at 11.5 feet below ground surface. Boring was backfilled with cuttings. No groundwater was encountered at the time of drilling.

Bottom of borehole at 11.5 feet.

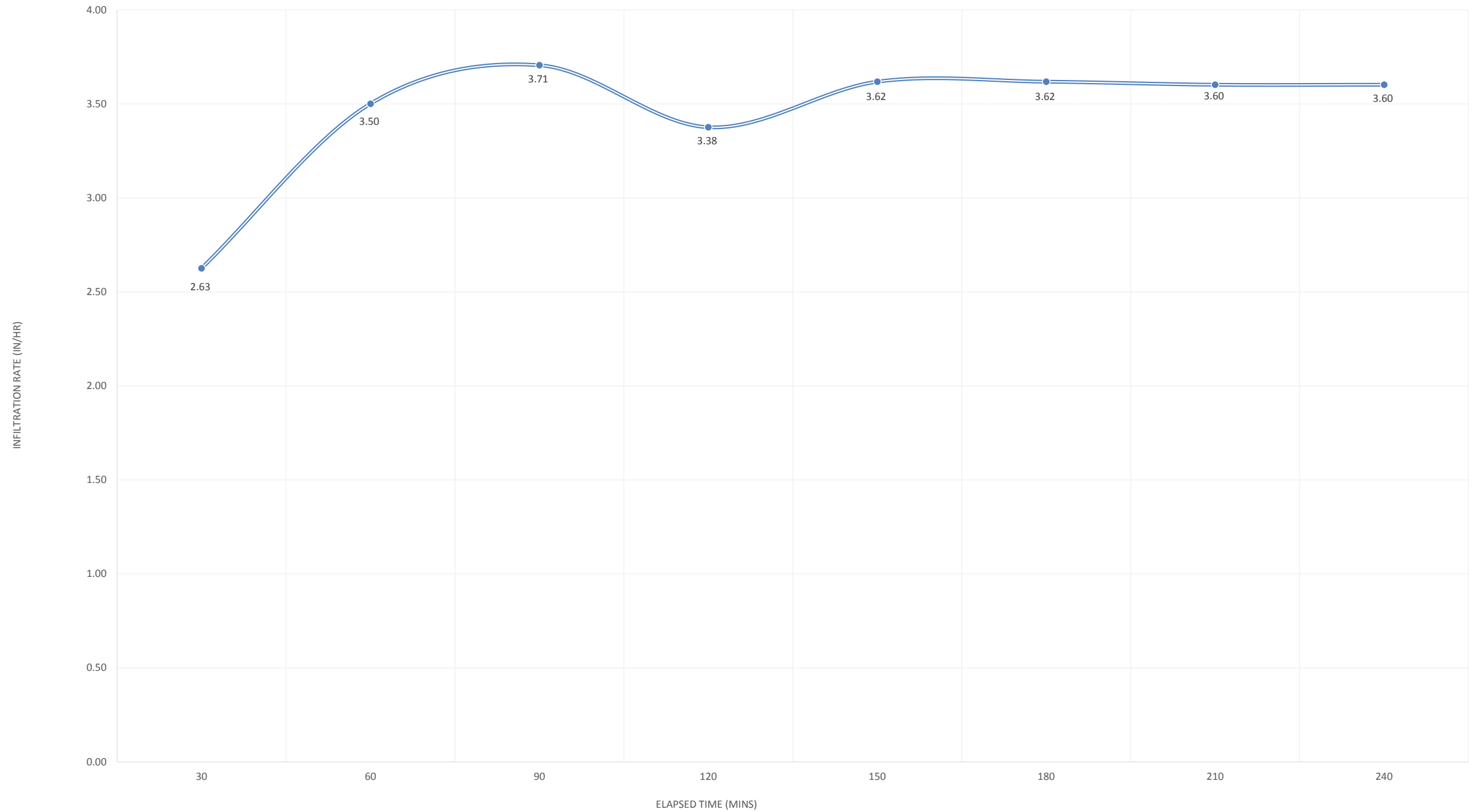
**APPENDIX B**  
**INFILTRATION TEST SHEETS**



<b>Project Identification:</b>	203131-12A		
<b>Test Location:</b>	DR-1		
<b>Liquid Used:</b>	TAP WATER	<b>pH:</b>	8.0
<b>Tested By:</b>	0		
<b>Depth to water table:</b>	0		



**ELAPSED TIME VS. INFILTRATION RATE**





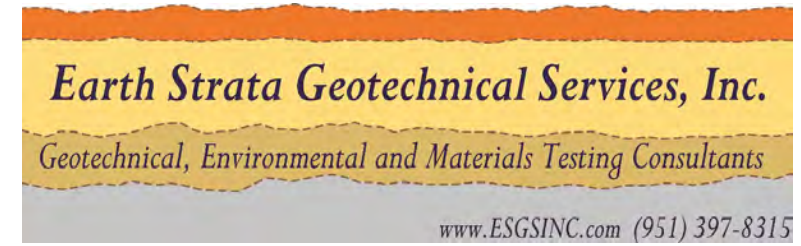
Test No. DR-2 Location See Map **Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)**

<b>Project Identification:</b>	203131-12A					<b>Constants</b>	<b>Area cm2</b>	<b>Depth of Liquid (cm)</b>	<b>Liquid Container Number</b>		<b>Marriotte Tube Volume</b>	<i>Earth Strata Geotechnical Services, Inc.</i> Geotechnical, Environmental and Materials Testing Consultants www.ESGSINC.com (951) 397-8315
<b>Test Location:</b>	DR-1					<b>Inner Ring</b>	729	10.0	1		3000	
<b>Liquid Used:</b>	TAP WATER	<b>pH:</b>	8.0			<b>Annular Ring</b>	2189	10.0	2		10000	
<b>Tested By:</b>		<b>Date</b>	5/18/2020			Liquid level maintained ( <input checked="" type="checkbox"/> Flow Valve <input type="checkbox"/> Float Valve <input type="checkbox"/> Mariotte Tubes						
<b>Depth to water table:</b>		<b>Depth of Test</b>	4.5'			<b>Penetration Depth of Outer Ring:</b>			9 cm	<b>Other</b>		

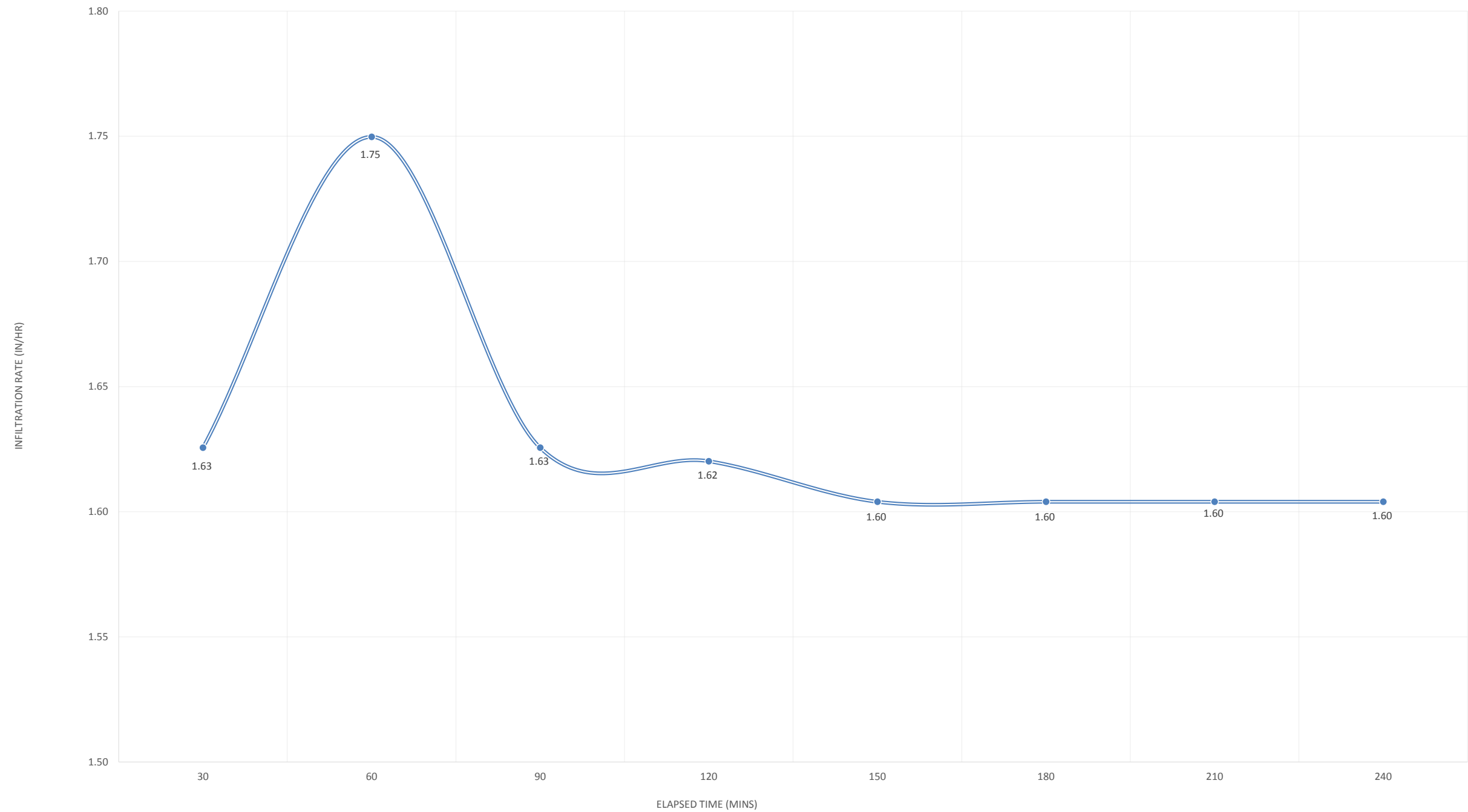
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment / (Total)	Elapsed Time (Min)	Flow Readings				Liquid Temp °F	Infiltration Rates				Ground Temperature		Remarks Weather conditions Etc...
						Inner Ring Reading cm	Inner Mariotte Tube Flow (ml)	Annular Space Reading cm	Annular Space Mariotte Tube Flow (ml)		Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	
1	Start Test	5/18/2020	12:40	0:30	30												
	End Test	5/18/2020	13:10	0:30		6.00	1505	6.00	4167.8		4.13	1.63	3.81	1.50			
2	Start Test	5/18/2020	13:15	0:30	60												
	End Test	5/18/2020	13:45	1:00		6.00	1620	6.00	2315.45		4.44	1.75	2.12	0.83			
3	Start Test	5/18/2020	13:50	0:30	90												
	End Test	5/18/2020	14:20	1:30		6.00	1505	6.00	11257.4		4.13	1.63	10.29	4.05			
4	Start Test	5/18/2020	14:24	0:30	120												
	End Test	5/18/2020	14:54	2:00		6.00	1500	6.00	2778.5		4.12	1.62	2.54	1.00			
5	Start Test	5/18/2020	14:58	0:30	150												
	End Test	5/18/2020	15:28	2:30		6.00	1485	6.00	5557		4.07	1.60	5.08	2.00			
6	Start Test	5/18/2020	15:31	0:30	180												
	End Test	5/18/2020	16:01	3:00		6.00	1485	6.00	4167.8		4.07	1.60	3.81	1.50			
7	Start Test	5/18/2020	16:11	0:30	210												
	End Test	5/18/2020	16:41	3:30		6.00	1485	6.00	2315.4		4.07	1.60	2.12	0.83			
8	Start Test	5/18/2020	16:42	0:30	240												
	End Test	5/18/2020	17:12	4:00		6.00	1485	6.00	2315.4		4.07	1.60	2.12	0.83			

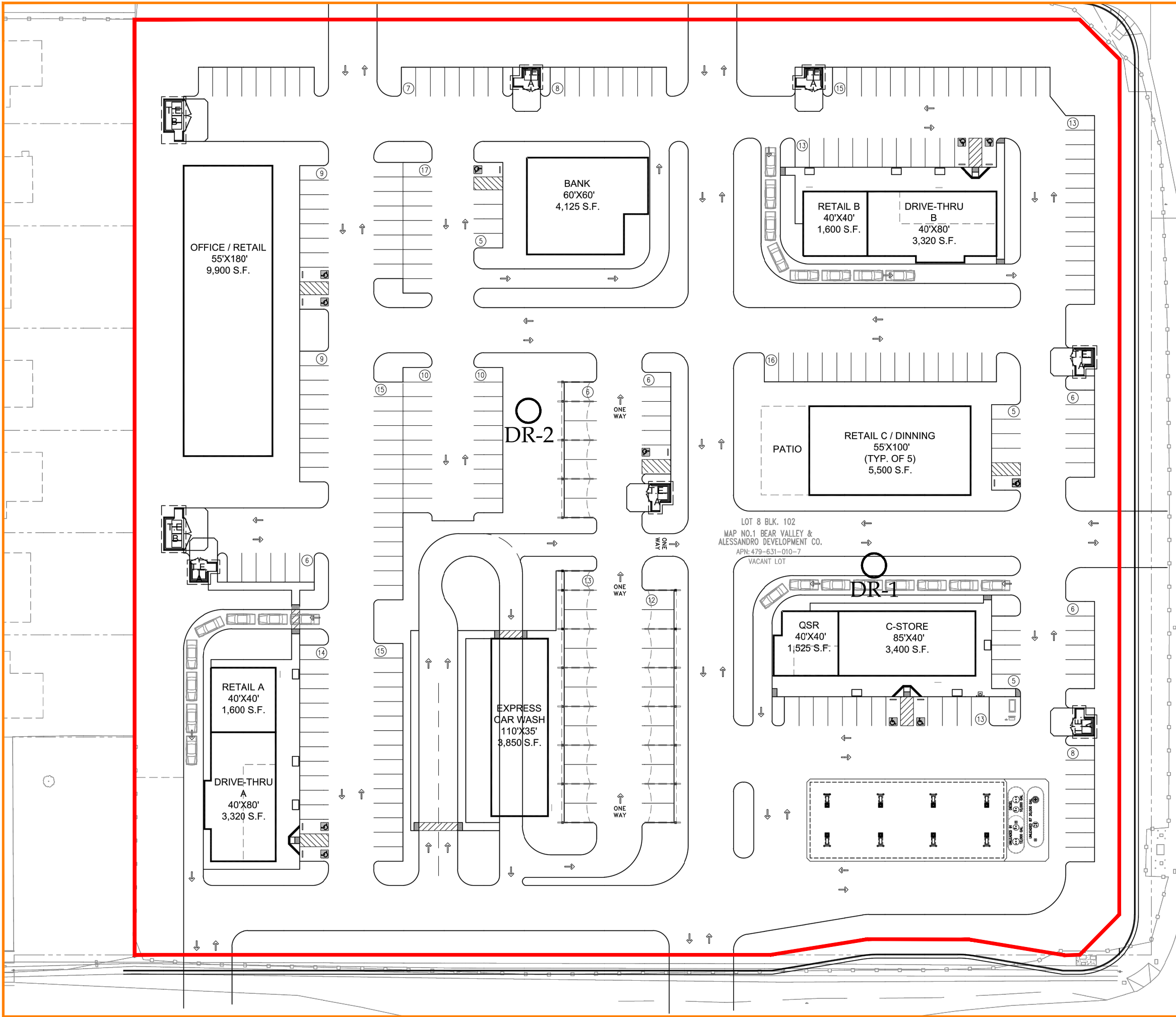


<b>Project Identification:</b>	203131-12A		
<b>Test Location:</b>	DR-1		
<b>Liquid Used:</b>	TAP WATER	<b>pH:</b>	8.0
<b>Tested By:</b>	0		
<b>Depth to water table:</b>	0		



**ELAPSED TIME VS. INFILTRATION RATE**





**LEGEND**

Locations are Approximate

**Symbols**

- - Limits of Report
- DR-2 - Double Ring Test Location

LOT 8 BLK. 102  
 MAP NO.1 BEAR VALLEY &  
 ALESSANDRO DEVELOPMENT CO.  
 APN: 479-631-010-7  
 VACANT LOT

LASELLE ST.



**INFILTRAITON MAP**

LOCATED AT THE NORTH WEST CORNER OF ALESSANDRO BOULEVARD AND LASSELLE STREET  
 CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA  
 APN 479-631-010

PROJECT	LASSELLE STREET		
CLIENT	MR. ALEX HANN		
PROJECT NO.	203131-12A		
DATE	MAY 2020		
SCALE	1:60		
DWG XREFS			
REVISION			
DRAWN BY	JDG	PLATE	1 OF 1

Earth Strata Geotechnical Services, Inc.  
 Geotechnical, Environmental and Materials Testing Consultants