



June 9, 2021

Project No. 19744-10B
Confirmation No. PR6159

Mr. Wayne Dollarhide
DIAMOND VALLEY PARTNERS, LLC
41197 Golden Gate Circle, Suite 201
Murrieta, CA 92562

Subject: Revised Onsite Wastewater Treatment System Report, Proposed Diamond Valley Storage, Assessor's Parcel Numbers 466-050-019, Southwest Corner of Winchester and Newport Roads, Winchester Area, Riverside County, California

In accordance with your request, CW Soils is pleased to present this onsite wastewater treatment system (OWTS) report for the proposed development, located on the southwest corner of Winchester and Newport Roads, in the Winchester area of Riverside County, California. The purpose of our feasibility study was to determine the onsite percolation rates and physical characteristics of the subsurface soils within the vicinity of the proposed leach lines. We have provided guidelines for the design of an onsite wastewater treatment system. This evaluation is intended to provide adequate data to satisfy the County of Riverside, Community Health Agency, Department of Environmental Health guidelines.

SITE DESCRIPTION

The subject property consists of undeveloped land with relatively flat terrain. Topographic relief at the subject property is low, with on the order of four previous buildings located in the northeast and southwest portions of the site. The previous buildings have been removed. Vegetation at the site includes moderate amounts of annual weeds/grasses, along with some scattered small to large trees.

PROPOSED DEVELOPMENT

Based on information provided by you, the proposed development includes a convenience store with car wash utilizing reclaimed water and office building, each complete with onsite wastewater treatment. It is our understanding that a second phase of the development is planned to include another office building in the area of the proposed leach fields. The proposed leach fields would be abandoned and connection to the sewer system would commence at that time.

SUBSURFACE EXPLORATION AND PERCOLATION TESTING

SUBSURFACE EXPLORATION

The subsurface exploration consisted of one (1) deep exploratory test hole to a depth of 12 feet, conducted on January 18, 2021. The deep exploratory test hole was excavated to interpret whether groundwater or impermeable soil layers were present. Soils encountered within the deep exploratory test hole were classified and logged using the guidelines of ASTM 2487. The approximate location of the deep exploratory test hole and percolation test locations are shown on Plate 1- Percolation Location Map. The exploratory log can be found in Appendix A.

PERCOLATION TESTING

A total of seven (7) percolation tests were conducted on January 18 & 19, 2021 to evaluate the feasibility of utilizing leach fields for onsite wastewater treatment. The percolation tests were performed in general accordance with the reviewing agency guidelines.

The percolation tests were performed at the bottom of 8-inch diameter test holes 2 to 3 feet deep. The percolation and deep exploratory test holes were located by property boundary measurement on the site plan and by using geographic features. The exploratory log and locations of the test holes are illustrated on the attached Exploratory Log and Plate 1 - Percolation Location Map, respectively. Prior to performing the percolation testing, each percolation test hole was cleaned of loose soils and 2 inches of $\frac{3}{4}$ -inch gravel was placed in the bottom of the test holes. A 5-gallon water container filled with clear water was then inverted and supported over each test hole. Upon percolation of all 5 gallons while the tester was present, testing was conducted on that day. If some of the initial 5 gallons remained while the tester was present, the test was conducted the day after the presoak, but not more than 26 hours after initiation of the presoak.

After the presoak, testing was performed by adjusting the water level to be roughly 6 inches over the gravel for a period of three (3) hours or two (2) hours in the case of sandy soils. The drop in water level was measured from a fixed reference point for more reliable readings, with measurements having accuracy on the order of 0.25 inches. After measurements, water may have been added to bring the water level up to approximately 6 inches over the top of the gravel. The final percolation test readings are summarized in the following table and the test data recorded in the field can be found in Appendix B.

PERCOLATION TEST SUMMARY

TEST NUMBER	TEST HOLE DIAMETER (in)	HOLE DEPTH (ft)	FINAL PERCOLATION RATE (mpi)	SOIL DESCRIPTION
P-1	8	2	12	Silty SAND
P-2	8	2.5	9	Silty SAND
P-3	8	2.5	9	Silty SAND
P-4	8	2.5	10	Silty SAND
P-5	8	2	8	Silty SAND
P-6	8	2	6	Silty SAND
P-7	8	3	10	Silty SAND

FINDINGS

SOILS

A general description of the soils observed on site is provided below:

- Quaternary Alluvium (map symbol Qal): Quaternary alluvium was encountered to a maximum depth of 8 feet. These alluvial deposits consist predominately of interlayered medium brown, silty sand and occasional sandy silt. These deposits were generally noted to be in a slightly moist, loose to medium dense state.
- Cretaceous Granodiorite to Tonalite (map symbol Kgd): The granitic rock was observed to a maximum depth of 8 feet. The granitic rock was to be light grayish brown, coarse grained and in a moderately hard to hard state.

GROUNDWATER

Groundwater was not observed during exploration of MW-1, excavated to a depth of 12 feet.

PERCOLATION TEST RESULTS

The final measured percolation test design rate is 12 minutes per inch (mpi).

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

Based on the data presented in this report and using the recommendations set forth, it is the judgment of this professional that there is sufficient area on each lot to support a primary and expansion OWTS that will meet the current standards of the Department of Environmental Health and the Regional Water Board. The designed system shall be located in natural undisturbed soil at the depth of the tests performed. The natural occurring body of minerals and organic matter at the proposed wastewater disposal area contains earthen materials having more than 50% of its volume composed of particles smaller than 0.08 inches (2 mm) in size.

Based on the data presented in this report and the testing information accumulated, it is the judgment of this professional that the groundwater table will not encroach within the current allowable limits set forth in Chapter 11 of LAMP.

SEWAGE DISPOSAL DESIGN RECOMMENDATIONS

The proposed sewage disposal system should consist of leach lines utilizing plastic (polyolefin) Standard Infiltrator® chambers manufactured by Infiltrator® Systems, Inc. Areas for both a primary system and a 100 percent expansion system are required. In order to provide gravity flow from the septic tank to the disposal areas, septic tanks should be located upslope from the disposal areas. The following are descriptions of the general design and construction of the wastewater treatment systems.

Septic Tank Capacity: The minimum septic tank capacity was determined in accordance with the referenced guidelines. The office septic tank capacity was based on the following: 2 employees X 20 gal./employee. 40 gal./day X 1.5 = 60 gal. say 1,000 gal. The convenience store (carwash to reclaim water) septic tank capacity was based on the following: 1,000/day X 1.5 = 1,500 gal. say 2,000 gal.

Allowable Design Percolation Rate: To determine the approximate square footage of each leaching area, the individual percolation rate test for each area that meet the requirements may be used as a guideline.

Primary System: Primary system for the office building should consist of a 1,000 gallon septic tank and leach field composed of subsurface leach lines. Primary system for the convenience store should consist of a 2,000 gallon septic tank and leach field composed of subsurface leach lines. The minimum leach field absorption area is based upon the proposed septic tank capacity and the percolation rate of the proposed leach field area. The dimensions for individual leach field absorption areas are based on the total trench bottom area only. The areas between the leach line trenches are not included in the calculations. The total linear footage may be reduced by 20 percent for designs utilizing the plastic Infiltrator® chambers, provided each line is of equal length.

Trench Width, Depth, and Minimum Soil Cover: For leach field areas with a 10 percent slope, a minimum soil cover of 1½ feet over the leach lines is required. The soil cover is required to maintain a 15 feet minimum horizontal distance from the slope face to any portion of the leach lines. In order to provide a ±1½ foot soil cover, the trenches should be excavated to a depth on the order of 3 to 3½ feet

below the surface. It should be noted that the required depth of cover is greater for those areas where the slope is steeper than 10 percent.

Individual leach line trenches should be excavated roughly parallel with the contours of the property which will maintain approximately the same elevation at the top of the trench. The leach line trench should be 36 inches wide, with a minimum center to center spacing of 7 feet. However, a minimum center to center spacing of 8 feet is required when utilizing sidewall allowances.

DESIGN RATE (mpi)	MIN FT ³ /100 GALLONS	MIN SQUARE FEET	MIN LINEAR FEET	REDUCED BY 20% (feet)	NO. OF CHAMBERS	NO. OF LINES	LENGTH OF EACH LINE (feet)	NO. OF CHAMBERS PER LINE	TOTAL LENGTH OF LINES (feet)
12	30	300	100	80	20	2	40	10	80
12	30	600	200	160	40	2	80	20	160

The Infiltrator[®] chambers are manufactured in lengths of 4 feet. The proposed location for each system shall provide sufficient areas for both primary and 100% expansion.

100 Percent Expansion System: Sufficient area must be set aside for future construction of a backup system of equal size in the event the primary system fails. The area required for the 100 percent expansion system is equal to that of the primary system area.

ADDITIONAL DESIGN CONSIDERATIONS AND RECOMMENDATIONS

In order to encourage the maximum loss of sewage effluent through evaporation and transpiration, the leach lines should be installed at the recommended depth and as close to the ground surface as possible. As noted above, leach lines should also be installed within trenches excavated roughly parallel with the ground contours of equal elevation to maintain a relatively consistent trench depth. The minimum center to center spacing between the leach line trenches is 7 feet for 36-inch wide trenches. However, a minimum center to center spacing of 8 feet is required when utilizing sidewall allowances.

Backfill materials placed over the leach lines should not be compacted but slightly mounded to allow for future settlement and to minimize infiltration of surface water. Cobbles and boulders should be removed from the backfill soils over the plastic Infiltrator[®] chambers, to prevent the collapse or crushing of the chambers.

A minimum horizontal setback of 5 feet is required between the leach lines and property lines. A minimum horizontal setback of 5 feet is also required between the septic tank and proposed structures. A minimum horizontal setback of 8 feet is required between the leach lines and proposed structures.

In the event that future access to the 100 percent expansion area is compromised by development (i.e., garden walls, etc.), consideration should be given to constructing the expansion system at the same time as the primary system. If the systems are not constructed concurrently, consideration should be given to accessibility of the 100 percent expansion area after all site improvements are constructed.

The excavations should be observed by the soils engineering consultant during the excavation and prior to construction of the wastewater treatment system. The site observations are to verify the design assumptions and the suitability of the exposed soils. Revisions or modifications may be required if unforeseen conditions are exposed during construction, such as any relatively impermeable layers. Revisions may consist of adding additional lines or a redesign of the system that better conforms to the site conditions.

The leach field areas should not be used for horse corrals or other similar uses that would compact the soils. The ground surface over the disposal areas should be seeded or sod placed to reduce the potential for erosion.

Property owners should be aware that the proper use and maintenance are vital to extending the effective life of sewage disposal systems. The use of excessive water, introduction of detergents or chemicals, and solid food waste from garbage disposals can cause premature system failures. Properly maintained sewage disposal systems can function for many years. However, a rest period of roughly 10 to 15 years is generally needed to promote bacterial decay and provide the area a chance to dry out. After being provided a resting period, the primary system can often be reactivated and alternated with the 100 percent expansion system.

PLAN REVIEW AND CONSTRUCTION SERVICES

This report has been prepared for the exclusive use of **DIAMOND VALLEY PARTNERS, LLC** and their authorized representative. It is unlikely to contain sufficient information for other parties or other uses. CW Soils should be provided the opportunity to review the final design plans and specifications prior to construction, in order to verify that the recommendations have been properly incorporated into the project plans and specifications. If CW Soils is not accorded the opportunity to review the project plans and specifications, we are not responsible for misinterpretation of our recommendations.

We recommend that CW Soils be retained to provide soils engineering and engineering geologic services during the grading and foundation excavation phases of work, in order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

CW Soils should review any changes in the project and modify the conclusions and recommendations of this report in writing. This report along with 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 during grading or construction operations appear to differ from those indicated in this report, our office should be notified immediately, as appropriate 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.

Soils vary in type, strength, and other engineering 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 proposed project. No practical study can completely eliminate uncertainty with regard to the anticipated geologic and soils engineering conditions in connection with a proposed project. The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by CW Soils based on the conditions revealed during grading and construction operations.

This report was prepared with the understanding that it is the responsibility of the owner, 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 implement the recommendations in this report and notify the owner as well as our office if they consider any of the recommendations presented herein to be unsafe or unsuitable.

Respectfully submitted,

CW Soils


Chad E. Welke, CEG 2378
President



I, Chad E. Welke, am duly registered in the State of California and hereby attest that I have personally prepared this report, assume full professional responsibility for its validity, and for any errors or omissions herein.

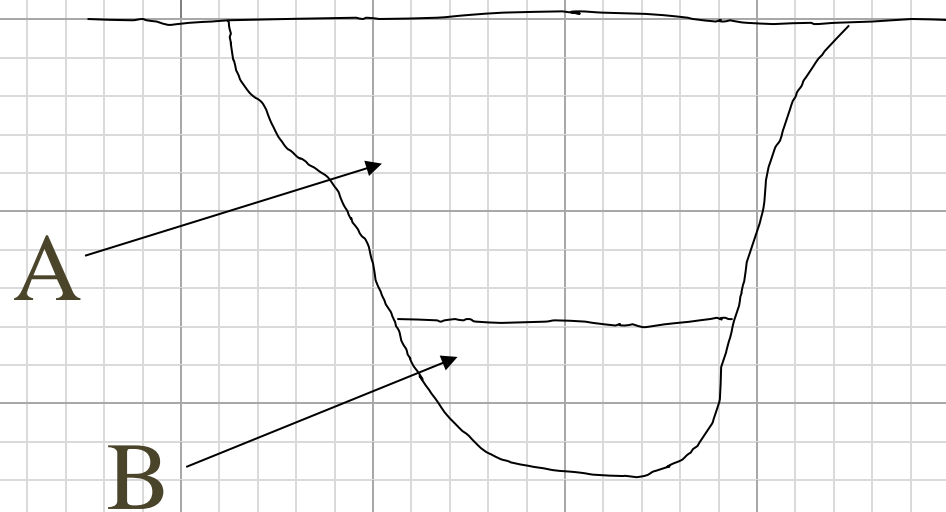
Distribution: (1) Addressee (email)

Attachments: Appendix A – Exploratory Log (*Rear of Text*)
Appendix B – Percolation Test Results (*Rear of Text*)
Plate 1 – Percolation Location Map (*Rear of Text*)

APPENDIX A

EXPLORATORY LOG

Project: Diamond Valley Storage Facility					Project No.: 19744-10B	Equip.: Cat 460		Logged by: CEW	Date: 1-18-21
Sample No.	Depth (ft)	Classification	Dry Density (pcf)	Moisture (%)	Graphic Log: Northerly	Scale: 1” = 5’	Orientation: Westerly	Elevation (ft): See Plate 1	
-	0 - 8	-	-	-	A - Quaternary Alluvium (Qal): Silty SAND; medium brown, moist, loose				
-	8 - 12	-	-	-	B - Cretaceous Granodiorite to Tonalite (map symbol Kgd): Granodiorite, light grayish brown, slightly moist, moderately hard to hard				
-	-	-	-	-					
					Total Depth (feet): 12				
					No Groundwater				



MW-1

APPENDIX B

PERCOLATION TEST RESULTS

PERCOLATION DATA SHEET

Job Number: 19744-10B
 Project: Diamond Valley Storage
 Test Number: P-1
 Soil Classification: Silty SAND
 Depth of Test Hole (ft): 2

Tested By: CW
 Test Hole Diameter (inches): 8
 Date of Presoak: 1/18/2021
 Date Tested: 1/18/2021

NORMAL OR SANDY SOIL CRITERIA TEST

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	▲ in Water Level (inches)	Percolation Rate (min/inch)
1:35	15	15	4.5	7	2.5	6
1:50						
1:50	15	30	4.75	5	1.25	12
2:05						
2:05	15	45	3.5	5	1.5	10
2:20						
2:20	15	60	3.75	5	1.25	12
2:35						
2:35	15	75	4	5.25	1.25	12
2:50						
2:50	15	90	4.25	5.5	1.25	12
3:05						
3:05	15	105	4.5	5.75	1.25	12
3:20						
3:20	15	120	4.75	6	1.25	12
3:35						



PERCOLATION DATA SHEET

Job Number: 19744-10B
 Project: Diamond Valley Storage
 Test Number: P-2
 Soil Classification: Silty SAND
 Depth of Test Hole (ft): 2.5

Tested By: CW
 Test Hole Diameter (inches): 8
 Date of Presoak: 1/18/2021
 Date Tested: 1/18/2021

NORMAL OR SANDY SOIL CRITERIA TEST

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	▲ in Water Level (inches)	Percolation Rate (min/inch)
1:37	15	15	3.75	7	3.25	5
1:52						
1:52	15	30	3.5	6	2.5	6
2:07						
2:07	15	45	3.75	6.5	2.75	5
2:22						
2:22	15	60	4.25	6.5	1.75	9
2:37						
2:37	15	75	4	6.5	2.25	7
2:52						
2:52	15	90	4.25	6	1.75	9
3:07						
3:07	15	105	4.25	6	1.75	9
3:22						
3:22	15	120	4.25	6	1.75	9
3:37						



PERCOLATION DATA SHEET

Job Number: 19744-10B
 Project: Diamond Valley Storage
 Test Number: P-3
 Soil Classification: Silty SAND
 Depth of Test Hole (ft): 2.5

Tested By: CW
 Test Hole Diameter (inches): 8
 Date of Presoak: 1/18/2021
 Date Tested: 1/18/2021

NORMAL OR SANDY SOIL CRITERIA TEST

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	▲ in Water Level (inches)	Percolation Rate (min/inch)
1:39	15	15	5	8	3	5
1:54						
1:54	15	30	4.5	7	2.5	6
2:09						
2:09	15	45	4.75	7	2.25	7
2:24						
2:24	15	60	5.25	7	1.75	9
2:39						
2:39	15	75	6	7.75	1.75	9
2:54						
2:54	15	90	5	6.75	1.75	9
3:09						
3:09	15	105	5.25	7	1.75	9
3:24						
3:24	15	120	5.5	7.25	1.75	9
3:39						



PERCOLATION DATA SHEET

Job Number: 19744-10B
 Project: Diamond Valley Storage
 Test Number: P-4
 Soil Classification: Silty SAND
 Depth of Test Hole (ft): 2.5

Tested By: CW
 Test Hole Diameter (inches): 8
 Date of Presoak: 1/18/2021
 Date Tested: 1/18/2021

NORMAL OR SANDY SOIL CRITERIA TEST

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	▲ in Water Level (inches)	Percolation Rate (min/inch)
1:41	15	15	4	6	2	8
1:56						
1:56	15	30	3.5	5.25	1.75	9
2:11						
2:11	15	45	3.75	5.5	1.75	9
2:26						
2:26	15	60	4	5.5	1.5	10
2:41						
2:41	15	75	4	5.75	1.75	9
2:56						
2:56	15	90	4.5	6	1.5	10
3:11						
3:11	15	105	4.25	5.75	1.5	10
3:26						
3:26	15	120	4.75	6.25	1.5	10
3:41						



PERCOLATION DATA SHEET

Job Number: 19744-10B
 Project: Diamond Valley Storage
 Test Number: P-5
 Soil Classification: Silty SAND
 Depth of Test Hole (ft): 2

Tested By: CW
 Test Hole Diameter (inches): 8
 Date of Presoak: 1/18/2021
 Date Tested: 1/19/2021

NORMAL OR SANDY SOIL CRITERIA TEST

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	▲ in Water Level (inches)	Percolation Rate (min/inch)
12:35	15	15	4.75	8	3.25	5
12:50						
12:50	15	30	4.75	7	2.25	7
1:05						
1:05	15	45	4.5	7	2.5	6
1:20						
1:20	15	60	5	7	2	8
1:35						
1:35	15	75	5	7	2	8
1:50						
1:50	15	90	5	7	2	8
2:05						
2:05	15	105	5	7	2	8
2:20						
2:20	15	120	5	7	2	8
2:35						



PERCOLATION DATA SHEET

Job Number: 19744-10B
 Project: Diamond Valley Storage
 Test Number: P-6
 Soil Classification: Silty SAND
 Depth of Test Hole (ft): 2

Tested By: CW
 Test Hole Diameter (inches): 8
 Date of Presoak: 1/18/2021
 Date Tested: 1/19/2021

NORMAL OR SANDY SOIL CRITERIA TEST

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	▲ in Water Level (inches)	Percolation Rate (min/inch)
12:38	15	15	4.75	10	5.25	3
12:53						
12:53	15	30	4.5	9.5	5	3
1:08						
1:08	15	45	4.5	8.5	4	4
1:23						
1:23	15	60	4.75	8.5	3.75	4
1:38						
1:38	15	75	5	8.5	3.5	4
1:53						
1:53	15	90	5	8.25	3.25	5
2:08						
2:08	15	105	5	8	3	5
2:23						
2:23	15	120	5	7.75	2.75	6
2:38						



PERCOLATION DATA SHEET

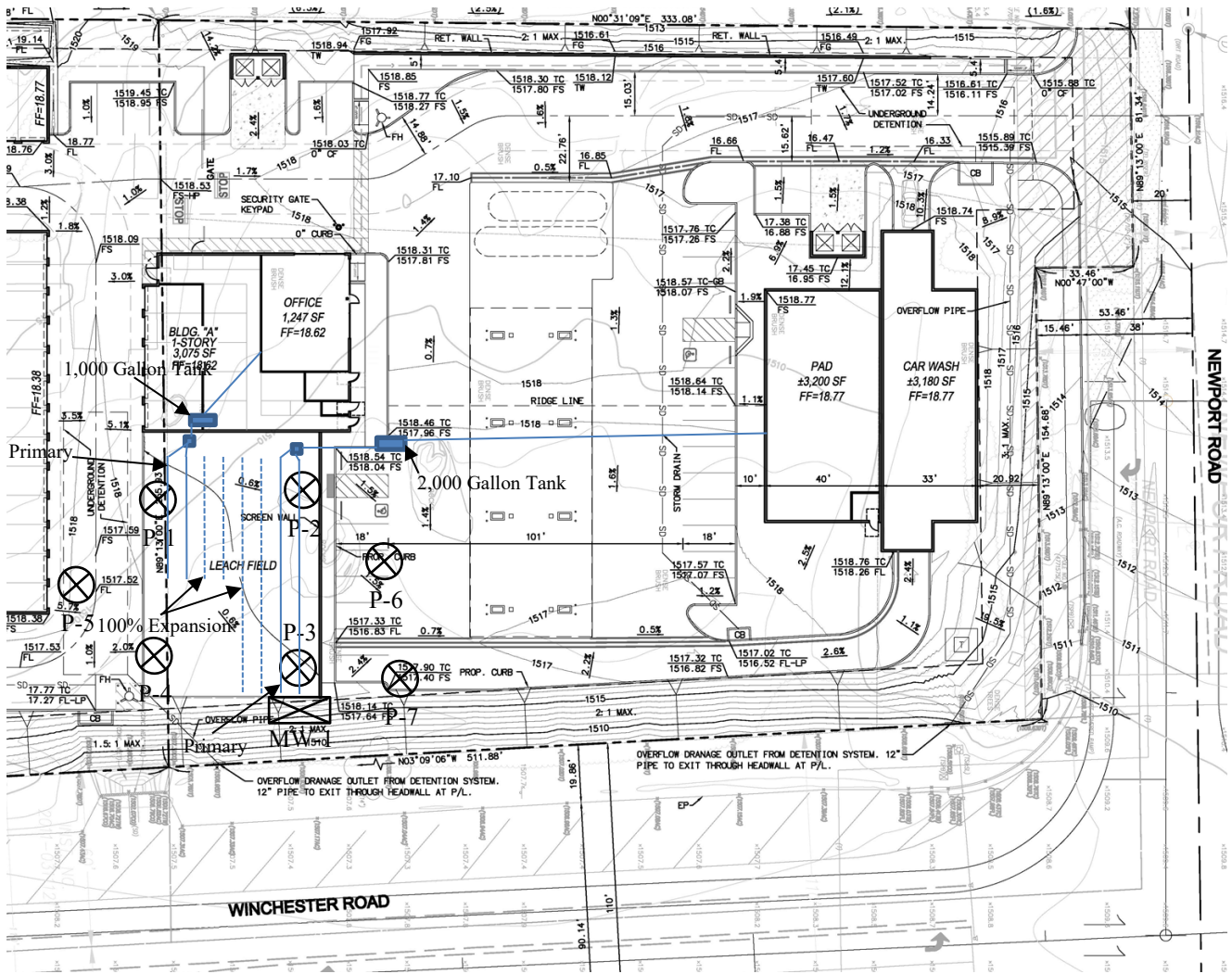
Job Number: 19744-10B
 Project: Diamond Valley Storage
 Test Number: P-7
 Soil Classification: Silty SAND
 Depth of Test Hole (ft): 3

Tested By: CW
 Test Hole Diameter (inches): 8
 Date of Presoak: 1/18/2021
 Date Tested: 1/19/2021

NORMAL OR SANDY SOIL CRITERIA TEST

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	▲ in Water Level (inches)	Percolation Rate (min/inch)
12:40	15	15	4	6.5	2.5	6
12:55						
12:55	15	30	4.25	6	1.75	9
1:10						
1:10	15	45	4	5.75	1.75	9
1:25						
1:25	15	60	4.25	5.75	1.5	10
1:40						
1:40	15	75	4	5.5	1.5	10
1:55						
1:55	15	90	4	5.5	1.5	10
2:10						
2:10	15	105	4	5.5	1.5	10
2:25						
2:25	15	120	4	5.5	1.5	10
2:40						





LEGEND

Locations are Approximate

Symbols



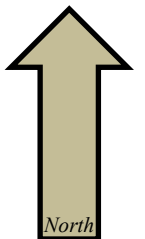
P-7

– Percolation Test



MW-1

– Exploratory Test Pit



REFERENCE: Blue Peak Engineering, Inc., 2020, *Preliminary Grading and Drainage Plan*, January 9, 2020.



Proposed Office and Convenience Store

19744-10B

PERCOLATION LOCATION MAP

1" = 60'

2021

PLATE 1