

O.S.T. SYSTEM DESIGNS, Inc.

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February 13, 2015

Mariposa County Health Dept., Env Hlth Services

Dave Conway

PO Box 5

Mariposa CA 95338

Re: A Soils Report for Land Division Application # _____

Applicant: Metropolis Property Group

Site: 4980 Hummingbird Lane, Cathey's Valley CA

APN#: 012-160-082

Tentative Parcel Map by: Freeman & Seaman Land Surveyors

INTRODUCTION:

The proposed Land Division is located near the intersection of Hummingbird Lane and State Highway 140 in Cathey's Valley, CA. The proposal is to subdivide the existing 115.01 ± Acre Parcel into five (5) new Parcels, Parcel A (6.00 Acres), Parcel B (7.89 Acres), Parcel C (5.18 Acres), Parcel D (10.10 Acres), and the Remainder (85.84 Acres).

The purpose of the Sewage Feasibility Investigation and Soils Report is to address the feasibility of sewage dispersal using Individual On-Site Sewage Treatment Systems (OSTS) on parcels A, B, C & D. Sewage Reserve Areas meeting County Guidelines for Waste Disposal from Land Developments have been sized based on the Soils Analysis Data collected and County Policies.

SITE DESCRIPTION:

The proposed Parcels have plenty area available for building and sewage dispersal. Vegetal growth consists of Pine, Oak, and Manzanita Trees as well as native brushes, grasses and dense patches of Poison Oak. Site restrictions are limited to Mineta Gulch, ephemeral drainages and shallow soils (bedrock from 5.0 – 8.0 Ft). Please see Tentative Parcel Map by Freeman & Seaman Land Surveyors for Topography, Contours, Vicinity Map, etc., dated March 2015.

SOILS ANALYSIS:

The Soils Analysis consisted of using a medium sized excavator to excavate and analyze a minimum of two (2) soil profile test pits and conducting four percolation tests on each of the proposed Parcels. **Table A** below summarizes Parcel information and Soils Analysis data as well as the size of Sewage Reserve Areas required on each individual Parcel. The soil profile test pits and percolation test sites have been plotted on the attached Soils Report Plot Plans.

Soil Profiles

The Soil Profiles found that the top 60 inches of top soil consists of a slightly moist brown to dark brown, loose Ahwahnee-Auberry Rocky Sandy Loams (SM) followed by an underlying layer of mostly fractured rock and bedrock refusal from 5.0 to 8.0 Ft. There was no evidence of seasonal ground water in any of the soil profiles.

Percolation Tests

Percolation Tests were conducted at depths ranging from 2.5 – 3.0 Ft. Six-inch diameter Percolation holes were bored out using a Bobcat – Toolcat 5600 and a 6" auger. All percolation holes were presoaked for a period of at least 24 hours and tested at thirty-minute intervals for 3 hours.

TABLE A
Parcel & Soils Analysis Data Summary

Parcel #	Lot Size (Gross) Acres	# Perc Tests	Perc Test Depths (Ft)	Avg. Perc Rate (MPI)	Sewage Reserve Area Required	# Soil Profiles	Soil Profile Depth (Ft)
A	6.00	4	2.5– 3.5	12.79	8,000 Ft²	2	5.0 & 5.0
B	7.89	4	2.5– 3.5	19.87	8,000 Ft²	2	6.0 & 5.0
C	5.18	4	2.5– 3.5	23.57	10,000 Ft²	2	5.0 & 5.0
D	10.10	4	2.5– 3.5	28.74	10,000 Ft²	2	8.0 & 8.0
Rem.	85.84	N/A					

Note: Usable Sewage Reserve Areas were sized per Mariposa County Health Department Policy: 03-01.

PARCEL INFORMATION

Parcel A

The proposed Sewage Reserve Area on this **6.00 Acre Parcel** has gentle slopes ranging from almost flat to 6 % and natural contours which are ideal for leach line configuration, within the area tested for sewage disposal. Native grasses, Manzanita, Oak, and Pine trees are scattered throughout. The soils analysis data collected indicates that a **Special Designed On-Site Sewage Treatment System** is required in order to mitigate shallow soils due to bedrock refusal and limited soil fines below 5.0 Ft. O.S.T. System Designs, Inc. recommends using an Advanced Treatment System to treat the wastewater and a shallow, At-Grade, rock leach field for wastewater dispersal. The Special Designed OSTs should be sized based on the soils analysis, number of bedrooms, and County Policy. The attached soils analysis data collected supports this recommendation.

- **Average Percolation Rate: 12.79 MPI**
- **Minimum Usable Sewage Reserve Area Required: 8,000 Ft²**
- **Recommended Total Trench Depth for a Rock Leach Field: 2.0 Ft**
- **Site Restrictions:** Shallow Soils, and a proposed well that will be located 200 Ft away from the Sewage Reserve Area. There were no other site restrictions noted.

Parcel B

The proposed Sewage Reserve Area on this **7.89 Acre Parcel** has slopes ranging from flat - 8 % and natural contours which are ideal for leach line configuration, within the area tested for sewage disposal. Native grasses, Manzanita, Oak, and Pine trees are scattered throughout. The soils analysis data collected indicates that a **Special Designed On-Site Sewage Treatment System** is required in order to mitigate shallow soils due to bedrock refusal and limited soil fines below 5.0 Ft. O.S.T. System Designs, Inc. recommends using an Advanced Treatment System to treat the wastewater and a shallow, At-Grade, rock leach field for wastewater dispersal. The Special Designed OSTs should be sized based on the soils analysis, number of bedrooms, and County Policy. The attached soils analysis data collected supports this recommendation.

- **Average Percolation Rate: 19.87 MPI**
- **Minimum Usable Sewage Reserve Area Required: 8,000 Ft²**
- **Recommended Total Trench Depth for a Rock Leach Field: 3.0 Ft**
- **Site Restrictions:** Shallow Soils, Mineta Gulch and an ephemeral drainage/swale. There were no other site restrictions noted.

Parcel C

The proposed Sewage Reserve Area on this **5.18 Acre Parcel** has slopes ranging from 4 - 8 % and natural contours which are ideal for leach line configuration, within the area tested for sewage disposal. Native grasses, Manzanita, Oak, and Pine trees are scattered throughout. The soils analysis data collected indicates that a **Special Designed On-Site Sewage Treatment System** is required in order to mitigate shallow soils due to bedrock refusal and limited soil fines below 5.0 Ft. O.S.T. System Designs, Inc. recommends using an Advanced Treatment System to treat the wastewater and a shallow, At-Grade, rock leach field for wastewater dispersal. The Special Designed OSTs should be sized based on the soils analysis, number of bedrooms, and County Policy. The attached soils analysis data collected supports this recommendation.

- **Average Percolation Rate: 23.57 MPI**
- **Minimum Usable Sewage Reserve Area Required: 10,000 Ft²**
- **Recommended Total Trench Depth for a Rock Leach Field: 3.0 Ft**
- **Site Restrictions:** Shallow Soils, Mineta Gulch and an ephemeral drainage/swale. There were no other site restrictions noted.

Parcel D

The proposed Sewage Reserve Area on this **10.10 Acre Parcel** has slopes ranging from 2 - 6 % and natural contours which are ideal for leach line configuration, within the area tested for sewage disposal. Native grasses, Manzanita, Oak, and Pine trees are scattered throughout. The soils analysis data collected indicates that a recommendation. The soils analysis data collected indicates that a conventional OSTs designed and permitted by the Mariposa County Environmental Health Department will be used to treat and disperse residential type wastewater on this proposed Lot. The OSTs should be sized based on the soils analysis data, number of bedrooms, and County Policy. The attached soils analysis data collected supports this recommendation.

- **Average Percolation Rate: 28.74 MPI**
- **Minimum Usable Sewage Reserve Area Required: 10,000 Ft²**
- **Recommended Total Trench Depth for a Rock Leach Field: 2.0 Ft**
- **Site Restrictions:** Shallow Soils, Mineta Gulch and an ephemeral drainage/swale. There were no other site restrictions noted.

CONCLUSION AND RECOMMENDATIONS

The Soils Analysis conducted indicates the soils found on-site are an excellent medium for Sewage Dispersal from residential type sewage effluent using Special Designed and standard/conventional County Designed On-Site Sewage Treatment Systems. OSTs Installers should follow the recommendations noted above for each parcel.

Septic Tank sizing shall meet current County Requirements. All County drainage, well and boundary setback requirements should be complied with.

Testing was performed per the Mariposa County Rules and Regulations Governing On-Site Sewage Disposal Systems, Land Division Applications.

Limitations:

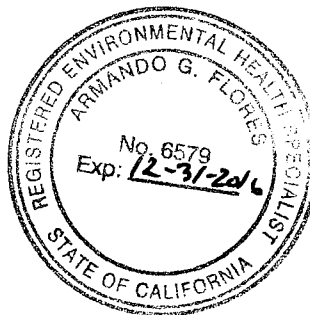
Recommended Design Criteria is based on field data collected and does not reflect variations, which may occur between weather seasons and areas tested. The extent of variation may not become evident until the property development has been commenced. The client should recognize that exposure of unexpected adverse conditions would require additional costs at the rate of \$125.00 per hour, portal-to-portal. Services performed by O.S.T. System Designs, Inc. have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty, expressed or implied, is made.

Please contact me at 559-288-8494 if you have any questions regarding this report.

Respectfully Submitted,



ARMANDO G. FLORES
Registered Environmental
Health Specialist #6579



Enclosed:

1. Percolation Test Data
2. Soil Profile Data
3. A Tentative Parcel Map by Freeman and Seaman Land Surveyors (March 2015)
4. Soils Report Site Plans indicating Test Sites, Site Restrictions, and Sewage Reserve Areas.

Parcel A

O.S.T. SYSTEM DESIGNS PERCOLATION TEST DATA SHEET

Property Owner Name: Metropolis Property Group .APN # 012-160-082

Location: 4980 Hummingbird Lane, Catheys Valley Diameter of Holes: 6"
CA 95306

Start Time	Ref. Point	Refilled Yes / No	Time Elapsed (minutes)	Water Level Difference	Drop In Inches	Drop In MPI	Comments:
PERC # 1							presoak: 1/12/15 - 12:00pm Test: 1/13/15 - 12:00pm
			Depth of Perc 3.0 - 3.5 Ft				
12:00	60"	X	30	63 3/8"	3 3/8"	9.6	
12:30	60"	✓	30	63"	3"	10	
1:00	60"	✓	30	63"	3"	10	
1:30	60"	✓	30	62 3/4"	2 3/4"	10.91	10.91 mpi
2:00	60"	✓	30	62 3/4"	2 3/4"	10.91	
2:30	60"	✓	30	62 3/4"	2 3/4"	10.91	Finish: 3:00pm
PERC # 2							
			Depth of Perc 2.5 - 3.0 Ft				
	1"	✓	30	3 1/4"	2 1/4"	13.33	
	1"	✓	30	3"	2"	15	
	1"	✓	30	3 1/8"	2 1/8"	14.12	
	1"	✓	30	3"	2"	15	16.0 mpi
	1"	✓	30	2 7/8"	1 7/8"	16	
	1"	✓	30	2 7/8"	1 7/8"	16	
PERC # 3							
			Depth of Perc 2.5 - 3.0 Ft				
	28"	✓	30	30 1/2"	2 1/2"	12	
	28"	✓	30	30 1/2"	2 1/2"	12	
	28"	✓	30	30 1/4"	2 1/4"	13.33	
	28"	✓	30	30 1/4"	2 1/4"	13.33	13.33 mpi
	28"	✓	30	30 1/4"	2 1/4"	13.33	
	28"	✓	30	30 1/4"	2 1/4"	13.33	
PERC # 4							
			Depth of Perc 2.0 - 2.5 Ft				
	6"	✓	30	9 3/8"	3 3/8"	8.89	
	6"	✓	30	9"	3"	10	
	6"	✓	30	9"	3"	10	
	6"	✓	30	8 3/4"	2 3/4"	10.91	10.91 mpi
	6"	✓	30	8 3/4"	2 3/4"	10.91	
	6"	✓	30	8 3/4"	2 3/4"	10.91	Avg Perc = 12.79 mpi

Parcel B

O.S.T. SYSTEM DESIGNS PERCOLATION TEST DATA SHEET

Property Owner Name: Metropolis Property Group .APN # 012-160-082

Location: 4980 Hammingbird Lane, Cathey Valley, CA 95306 Diameter of Holes: 6"

Start Time	Ref. Point	Refilled Yes / No	Time Elapsed (minutes)	Water Level Difference	Drop In Inches	Drop In MPI	Comments:
PERC #1							Pre-soak: 1/12/15 - 12:00pm Test: 1/13/15 - 12:00pm
			Depth of Perc		2.5 - 3.0	Ft	
12:10	30"	X	30	31 3/4"	1 3/4"	17.14	
12:40	30"	V	30	31 1/2"	1 1/2"	20	
1:10	30"	V	30	31 1/2"	1 1/2"	20	21.82 mpi
1:40	30"	V	30	31 1/2"	1 1/2"	20	
2:10	30"	V	30	31 3/4"	1 3/4"	21.42	
2:40	30"	V	30	31 3/4"	1 3/4"	21.92	Finish: 3:10pm
PERC #2							
			Depth of Perc		2.5 - 3.0	Ft	
	10"	V	30	11 1/2"	1 1/2"	20	
	10"	V	30	11 1/2"	1 1/2"	20	
	10"	V	30	11 3/8"	1 3/8"	21.82	
	10"	V	30	11 7/8"	1 7/8"	26.67	26.67 mpi
	10"	V	30	11 7/8"	1 7/8"	26.67	
	10"	V	30	11 7/8"	1 7/8"	26.67	
PERC #3							
			Depth of Perc		3.0 - 3.5	Ft	
	44"	V	30	45 7/8"	1 7/8"	16	
	44"	V	30	46"	2"	15	
	44"	V	30	45 5/8"	1 5/8"	18.41	
	44"	V	30	45 1/2"	1 1/2"	20	20 mpi
	44"	V	30	45 1/2"	1 1/2"	20	
	44"	V	30	45 1/2"	1 1/2"	20	
PERC #4							
			Depth of Perc		2.0 - 2.5	Ft	
	80"	V	30	83 1/2"	3 1/2"		
	80"	V	30	83"	3"	10	
	80"	V	30	83"	3"	10	
	80"	V	30	82 3/4"	2 3/4"	10.91	10.91 mpi
	80"	V	30	82 3/4"	2 3/4"	10.91	
	80"	V	30	82 3/4"	2 3/4"	10.91	Aug Perc = 19.87 mpi

Parcel C

O.S.T. SYSTEM DESIGNS PERCOLATION TEST DATA SHEET

Property Owner Name: Metropolis Property Group .APN # 012-160-082

Location: 4980 Hummingbird Lane, Catheys Valley Diameter of Holes: 6"
CA 95306

Start Time	Ref. Point	Refilled Yes / No	Time Elapsed (minutes)	Water Level Difference	Drop In Inches	Drop In MPI	Comments:
PERC #1							presoak: 1/12/15 - 12:00pm Test: 1/13/15 - 12:00pm
Depth of Perc 2.5 - 3.0 Ft							
1:00	120"	x	30	122 1/4"	2 1/4"	13.33	
1:30	120"	v	30	122"	2"	15	
2:00	120"	v	30	121 7/8"	1 7/8"	16	
2:30	120"	v	30	121 3/4"	1 3/4"	17.14	17.14 mpi
3:00	120"	v	30	121 3/4"	1 3/4"	17.14	
3:30	120"	v	30	121 3/4"	1 3/4"	17.14	Finish 4:00 pm
PERC #2							
Depth of Perc 3.0 - 3.5 Ft							
	128"	v	30	129"	1"	30	
	129"	v	30	128 7/8"	7/8"	34.29	
	129"	v	30	128 3/4"	3/4"	40	
	128"	v	30	128 3/4"	3/4"	40	40 mpi
	128"	v	30	128 3/4"	3/4"	40	
	128"	v	30	128 3/4"	3/4"	40	
PERC #3							
Depth of Perc 2.0 - 2.5 Ft							
	18"	v	30	19 5/8"	1 5/8"	18.46	
	18"	v	30	19 1/2"	1 1/2"	20	
	18"	v	30	19 1/2"	1 1/2"	20	
	18"	v	30	19 1/2"	1 1/2"	20	20 mpi
	18"	v	30	19 1/2"	1 1/2"	20	
	18"	v	30	19 1/2"	1 1/2"	20	
PERC #4							
Depth of Perc 2.5 - 3.0 Ft							
	50"	v	30	52 1/4"	2 1/4"	13.33	
	50"	v	30	52"	2"	15	
	50"	v	30	52"	2"	15	
	50"	v	30	51 3/4"	1 3/4"	17.14	17.14 mpi
	50"	v	30	51 3/4"	1 3/4"	17.14	
	50"	v	30	51 3/4"	1 3/4"	17.14	Avg perc: 23.57 mpi

Parcel D

O.S.T. SYSTEM DESIGNS PERCOLATION TEST DATA SHEET

Property Owner Name: Metropolis Property Group .APN # 012-160-082

Location: 4980 Hummingbird Lane, Lathrop Valley Diameter of Holes: 6"
CA 95306

Start Time	Ref. Point	Refilled Yes / No	Time Elapsed (minutes)	Water Level Difference	Drop In Inches	Drop In MPI	Comments:
PERC #1							pre-soak: 1/12/15 - 12:00 pm Test: 1/13/15 - 12:00 pm
Depth of Perc 2.5 - 3.0 Ft							
1:15 pm	55"	X	30	56 1/4"	1 1/4"	24	
1:45	55"	V	30	56"	1"	30	
2:15	55"	V	30	56"	1"	30	
2:45	55"	V	30	56"	1"	30	34.29 mpi
3:15	55"	V	30	56 7/8"	7/8"	34.29	
3:45	55"	V	30	56 7/8"	7/8"	34.29	Finish 4:15 pm
PERC #2							
Depth of Perc 2.5 - 3.0 Ft							
	110"	V	30	111 5/8"	15/8"	18.46	
	110"	V	30	111 5/8"	15/8"	18.46	
	110"	V	30	111 1/4"	1 1/4"	24	
	110"	V	30	111 1/4"	1 1/4"	24	24 mpi
	110"	V	30	111 1/4"	1 1/4"	24	
	110"	V	30	111 1/4"	1 1/4"	24	
PERC #3							
Depth of Perc 3.0 - 3.5 Ft							
	45"	V	30	46 1/4"	1 1/4"	24	
	45"	V	30	46 1/8"	1 1/8"	26.67	
	45"	V	30	46 1/8"	1 1/8"	26.67	
	45"	V	30	46"	1"	30	30 mpi
	45"	V	30	46"	1"	30	
	45"	V	30	46"	1"	30	
PERC #4							
Depth of Perc 2.0 - 2.5 Ft							
	100"	V	30	101 1/2"	1 1/2"	20	
	100"	V	30	101 1/2"	1 1/2"	20	
	100"	V	30	101 1/4"	1 1/4"	20	
	100"	V	30	101 1/8"	1 1/8"	26.67	26.67 mpi
	100"	V	30	101 1/8"	1 1/8"	26.67	
	100"	V	30	101 1/8"	1 1/8"	26.67	Avg perc: 28.74 mpi

O.S.T. System Designs Inc. Soil Profile Log - **PARCEL A**

Site: 4980 Hummingbird Ln, Cathey's Valley CA Property Owner: Metropolis

APN # 012-160-082

Equipment Used: Excavator

Date: January 12, 2015

Soil Profile Data	
DEPTH	Soil Profile # 1
0	Brown to Dark Brown, slightly moist, loose easy digging Ahwahnee-Auberry Rocky Sandy Loams (SM)
2	
4	
6	
8	Bedrock Refusal Soil Fines < 30%
10	
12	
14	
16	
DEPTH	Soil Profile # 2
0	Same as # 1
2	
4	
6	
8	
10	
12	
14	
16	

O.S.T. System Designs Inc. Soil Profile Log - **PARCEL B**

Site: 4980 Hummingbird Ln, Cathey's Valley CA Property Owner: Metropolis

APN # 012-160-082

Equipment Used: Excavator

Date: January 12, 2015

Soil Profile Data	
DEPTH	Soil Profile # 1
0	Brown to Dark Brown, slightly moist, loose easy digging Ahwahnee-Auberry Rocky Sandy Loams (SM)
2	
4	
6	
8	
10	Bedrock Refusal Soil Fines < 30%
12	
14	
16	
18	
DEPTH	Soil Profile # 2
0	Same as # 1, Refusal at 5.0 Ft
2	
4	
6	
8	
10	
12	
14	
16	
18	

O.S.T. System Designs Inc. Soil Profile Log - **PARCEL C**

Site: 4980 Hummingbird Ln, Cathey's Valley CA Property Owner: Metropolis

APN # 012-160-082

Equipment Used: Excavator

Date: January 12, 2015

Soil Profile Data

DEPTH	Soil Profile # 1
0	Brown to Dark Brown, slightly moist, loose easy digging Ahwahnee-Auberry Rocky Sandy Loams (SM)
2	
4	
6	
8	
10	Bedrock Refusal Soil Fines < 30%
12	
14	
16	
18	
DEPTH	Soil Profile # 2
0	Same as # 1
2	
4	
6	
8	
10	
12	
14	
16	
18	

O.S.T. System Designs Inc. Soil Profile Log - **PARCEL D**

Site: 4980 Hummingbird Ln, Cathey's Valley CA Property Owner: Metropolis

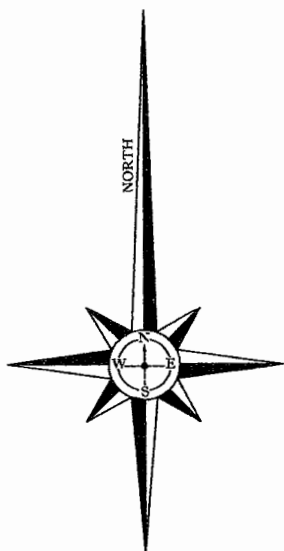
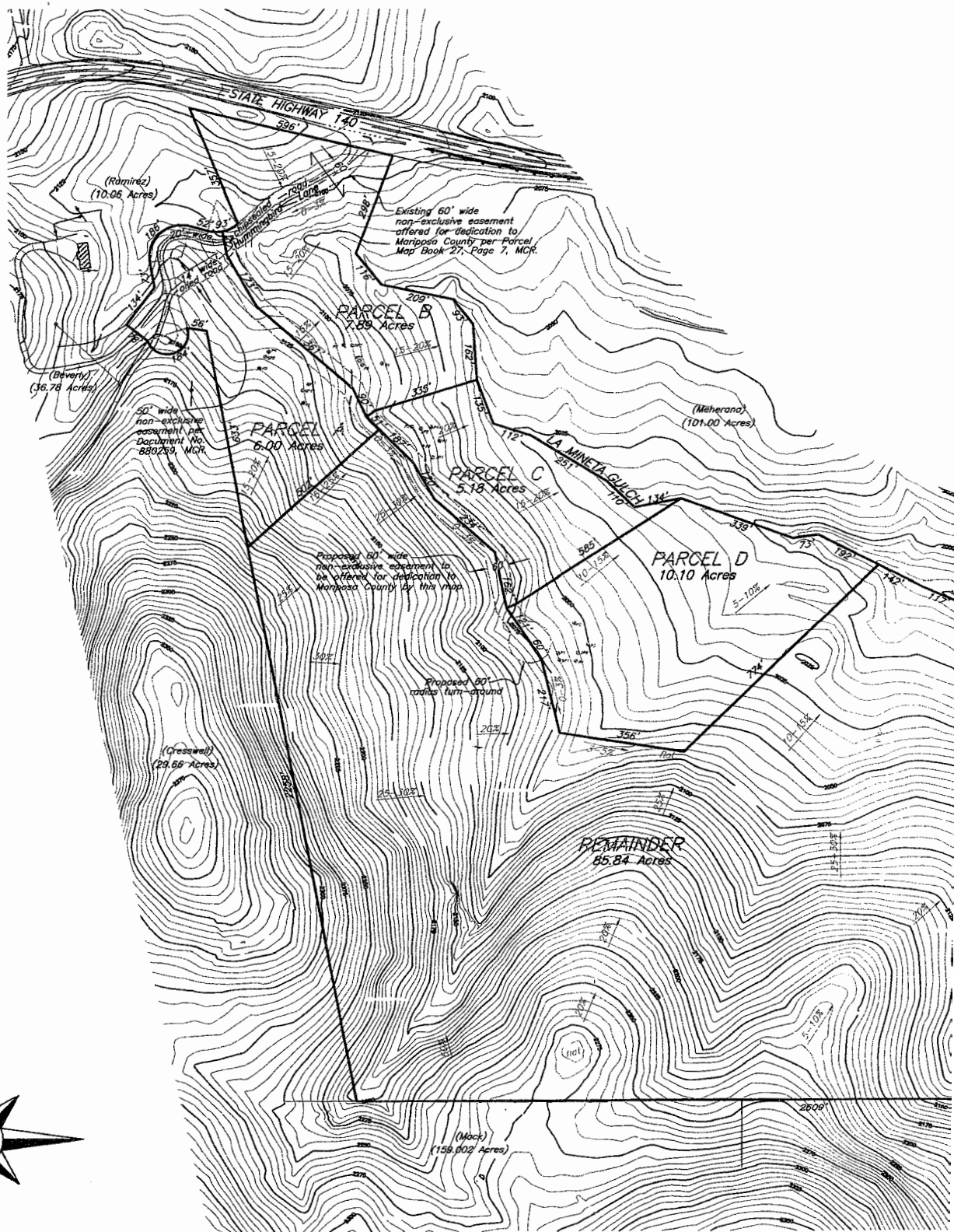
APN # 012-160-082

Equipment Used: Excavator

Date: January 12, 2015

Soil Profile Data

DEPTH	Soil Profile # 1
0_	Brown to Dark Brown, slightly moist, loose easy digging Ahwahnee-Auberry Rocky Sandy Loams (SM)
2_	
4_	
6_	
8_	
10_	Bedrock Refusal Soil Fines < 30%
12_	
14_	
16_	
18_	
DEPTH	Soil Profile # 2
0_	Same as # 1
2_	
4_	
6_	
8_	
10_	
12_	
14_	
16_	
18_	



Scale: 1" = 200'

200 0 200 400 600

GRAPHIC SCALE - FEET