SALVATION ARMY DIVISION CAMP AND RETREAT CENTER

APPENDIX K

Existing & Proposed On-site Wastewater Treatment System Design & Calculations for the Salvation Army Divisional Camp & Retreat

Prepared by Vinje & Middleton Engineering, Inc.

December 18, 2009

EXISTING & PROPOSED ON-SITE WASTEWATER TREATMENT SYSTEM DESIGN & CALCULATIONS

for the

SALVATION ARMY
DIVISIONAL CAMP & RETREAT

located at

1488 MUSSEY GRADE ROAD, RAMONA CALIFORNIA

DECEMBER 18th, 2009

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Ralph M. Vinje GE #863

Depth (ft)	Observation Boring AA	12/03/09
0 - 5'	Light Brown Loamy to Silty Sand	
5 - 20'	Brownish Grey To Grey Silty Sand (D.G.)	
	End @ 20'	

Depth (ft)	Observation Boring BB	12/03/09
0 - 5'	Light Brown Loamy to Silty Sand	
5 - 15'	Brownish Grey To Grey Silty Sand (D.G.)	
	End @ 15'	

Depth (ft)	Observation Boring CC	12/03/09
0 - 5'	Light Brown Loamy to Silty Sand	
5 - 20'	Brownish Grey To Grey Silty Sand (D.G.)	
	End @ 20'	

Depth (ft)	Observation Boring DD	12/03/09
0 - 5'	Light Brown Loamy to Silty Sand	
5 - 20'	Brownish Grey To Grey Silty Sand (D.G.)	
	End @ 20'	

Depth (ft)	Observation Boring EE	12/03/09
0 - 5'	Light Brown Loamy to Silty Sand	
5 - 18.5'	Brownish Grey To Grey Silty Sand (D.G.)	
	Refusal @ 18.5'	

Depth (ft)	Observation Boring FF	12/03/09
0 - 1'	Light Brown Loamy to Silty Sand	
1 - 12.5'	Brownish Grey To Grey Silty Sand (D.G.)	
	Refusal @ 12.5'	

Depth (ft)	Observation Boring GG	12/03/09
0 - 1'	Light Brown Loamy to Silty Sand	
1 - 10'	Brownish Grey To Grey Silty Sand (D.G.)	
	Refusal @ 10'	

Piezometer #	AA		BB		CC		DD		EE		FF	
Depth/Date Drilled	20'	12/03/09	15'	12/03/09	20'	12/03/09	20'	12/03/09	18.5'	12/03/09	12.5'	12/03/09
Date of Reading	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O
12/04/09	20'	7' 9"	15'	9' 3'	20'	17' 2"	20'	17' 8"	16' 6"	DRY	12' 6"	10' 4"
12/07/09	20'	7' 8"	14'9"	9' 2"	20'	17' 3"	20'	17' 8"	16' 6"	DRY	12' 6"	9' 4"

Piezometer #	GG											
Depth/Date Drilled	10'	12/03/09										
Date of Reading	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O	Depth of Hole	Depth to H2O
12/04/09	10'	DRY										
12/07/09	9' 7"	DRY										

SEPTIC SYSTEM CALCULATIONS
for

EXISTING
LODGING & DINNING
FACILITIES #1 & #2
and
EXISTING
ON-SITE RESIDENCES

As of 12/18/2009

EXISTING HOUSING & DINNING FACILITY #1
EXPLANATION SHEET

BUILDING NAME	SEPTIC TANK SIZE	YEAR-ROUND BUILDING SEPTIC USAGE
Ranch House & Health Center	1250 gal. *	**Dinning Room & Kitchen, Main Office, Nurse's Office with Bathrooms**
		Dinning Room = 80 People @ 3 Meals/Day/Person & 80 People @ 1 Restroom Use/Day = 240 Meals/Day & 80 Restroom Uses/Day @ 8 gal./Meal/Person/Day & 5 gal. Restroom Use/Person/Day = 1,920 gal. + 400 gal. = 2,320 gal./Day ***Office*** = 2 People/Day, ***Nurse*** = 1 Person/Day, ***Kitchen*** = 2 Cooks/Day @ 15 gal./Person/Day = 5 People x 15 gal. = 75 gal./Day ***Total Flow Per Day = 2,395 gal.***
Shop & Pool Shower	5000 gal.	**Shop Restroom, Pool Shower & Bathroom Facility**
		Shop = 4 People/Day @ 15 gal./Person/Day, ***Pool*** = 2 Lifeguards/Day @ 15 gal./Person/Day = 6 People x 15 gal. = 90 gal./Day ***Shower*** = 80 People/Day @ 10 gal./Person/Day, ***Bathrooms*** = 80 People/Day @ 5 gal./Person/Day = 80 People x 15 gal. = 1,200 gal./Day ***Total Flow Per Day = 1,290 gal.***
Bunkhouses	4500 gal.	**Main Student Housing & Bathrooms w/4 Units @ 14 People max. each & 1 Unit @ 24 People max.**
		Bunkhouses = 4 Units @ 14 People/Day + 1 Unit @ 24 People/Day = 56 + 24 = 80 People/Day ***Shower*** = 80 People/Day @ 10 gal./Person/Day, ***Bathrooms*** = 80 People/Day @ 5 gal./Person/Day = 80 People x 15 gal. = 1,200 gal./Day ***Total Flow Per Day = 1,200 gal.***

** = Septic Tank Pumped Every Year*
All Others Pumped Every 3 Years And As Necessary
Per On-Site Maintenance Chart

Bathrooms = Toilets/Sinks & Showers
Restrooms = Toilets & Hand Sinks

EXISTING
FACILITY #1
DINNING ROOM & NURSES OFFICE

Ranch House & Health Center
Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30	
(80) People @ 29 gal./Person/Day =	2320	*
(1) Nurse @ 15 gal./Person/Day =	15	*
(2) Office Personel @ 15 gal./Person/Day =	30	*
(2) Cooks @ 15 gal./Person/Day =	30	*
Total Gallons/Day Flow	2395	
Saftey Factor	2	

* = See "*EXISTING HOUSING & DINNING FACILITY #1*" Explanation Sheet

Design Specifications

RESERVE Leach Line (*ft*)	3502	
Primary Leach Line (ft)	Existing	
Trench Depth (*ft*)	3	
Rock Below Pipe (*in*)	12	
Septic Tank Capacity (*gal*)	1250	Existing

Calculations

$$\left(\frac{2395\ gal/day}{\sqrt[5]{30mpi}}\right) 2626.1\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{2626.1^2}{1.5}\right)\times 2 = 3501.5\ ft\quad of\ RESERVE\ leach\ line$$

EXISTING
FACILITY #1
SHOP & SHOWER & BATHROOM
BUILDING(S)

Shop & Pool Shower & Bathroom Facility
Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30	
(80) "Shower"&"Bathroom" People @ 15 gal./Person/Day =	1200	*
(4) Shop Personel @ 15 gal./Person/Day =	60	*
(2) Lifeguards @ 15 gal./Person/Day =	30	*
Total Gallons/Day Flow	1290	
Saftey Factor	2	

* = See "*EXISTING HOUSING & DINNING FACILITY #1*" Explanation Sheet

Design Specifications

RESERVE Leach Line (*ft*)	1886	
Primary Leach Line (ft)	Existing	
Trench Depth (*ft*)	3	
Rock Below Pipe (*in*)	12	
Septic Tank Capacity (*gal*)	5000	Existing

Calculations

$$\left(\frac{1290\ gal/day}{\sqrt[5]{30mpi}}\right) 1414.5\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{1414.5^2}{1.5}\right)\times 2 = 1886\ ft \quad of\ RESERVE\ leach\ line$$

EXISTING
FACILITY #1
BUNKHOUSE(s)

Bunkhouse(s) Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30
(80) "Shower"&"Bathroom" People @ 15 gal./Person/Day =	1200 *
Total Gallons/Day Flow	1200
Saftey Factor	2

* = See "*EXISTING HOUSING & DINNING FACILITY #1*" Explanation Sheet

Design Specifications

RESERVE Leach Line (*ft*)	1755
Primary Leach Line (ft)	Existing
Trench Depth (*ft*)	3
Rock Below Pipe (*in*)	12
Septic Tank Capacity (*gal*)	4500 Existing

Calculations

$$\left(\frac{1200\ gal/day}{\sqrt[5]{30mpi}}\right) 1315.8\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{1315.8^2}{1.5}\right)\times 2 = 1755\ ft \quad of\ RESERVE\ leach\ line$$

EXISTING HOUSING & DINNING FACILITY # 2
EXPLANATION SHEET

BUILDING NAME	SEPTIC TANK SIZE	YEAR-ROUND BUILDING SEPTIC USAGE
Del Mar House & Lodge	**2500 gal.**	**1 Dorm w/Bathrooms @ 8 People max. & 1 Dinning Room & Kitchen with Restrooms**
		Del Mar House = 8 People/Day @ 10 gal./Person/Day (Shower) & 5 gal./Person/Day (Restroom) = 8 People @ 15 gal./Day = 120 gal./Day *Dinning Room* = 48 People @ 3 Meals/Day = 144 Meals/Day @ 8 gal./Meal + 5 gal. Restroom Use/Person/Day = 1,152 gal. + 240 gal. = 1,392 gal./Day *Kitchen* = 2 Cooks/Day @ 15 gal./Person/Day = 2 x 15 gal. = 30 gal./Day ***Total Flow Per Day = 1,542 gal.***
Cypress	**1000 gal.**	**1 Dorm w/Bathrooms @ 12 People max.**
		Cypress = 12 People/Day @ 10 gal./Person/Day 9Shower) & 5 gal./Person/Day (Restroom) = 12 People @ 15 gal./Day = 180 gal./Day ***Total Flow Per Day = 180 gal.***
Alder & Oak	**1000 gal.**	**2 Dorms w/Bathrooms @ 12 People max. each Dorm = 24 People Total**
		Alder = 12 People/Day @ 10 gal./Person/Day (Shower) & 5 gal./Person/Day (Restroom) = 12 People @ 15 gal./Day = 180 gal./Day *Oak* = 12 People/Day @ 10 gal./Person/Day (Shower) & 5 gal./Person/Day (Restroom) = 12 People @ 15 gal./Day = 180 gal./Day ***Total Flow Per Day = 360 gal.***
Walnut	**1000 gal.**	**1 Dorm w/Bathrooms @ 4 People max.**
		Walnut = 4 People/Day @ 10 gal./Person/Day (Shower) & 5 gal./Person/Day (Restroom) = 4 People @ 15 gal./Day = 60 gal./Day ***Total Flow Per Day = 60 gal.***
Mobile Trailer	**450 gal.**	**Hand Wash Station/ Non Habitable**
		TO BE REMOVED

Tanks Pumped Every 3 Years And As Necessary
Per On-Site Maintenance Chart

Bathrooms = Toilets/Sinks & Showers
Restrooms = Toilets & Hand Sinks

EXISTING
FACILITY #2
DORM
BUILDING

Del Mar House Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30
Flow (*gal/person/day*)	15
Number of People	8
Saftey Factor	2

Design Specifications

RESERVE Leach Line (*ft*)	175	**USE 200' Minium**
Primary Leach Line (ft)	Existing	
Trench Depth (*ft*)	3	
Rock Below Pipe (*in*)	12	
Septic Tank Capacity (*gal*)	2500	Existing

Calculations

$$\left(\frac{8\ people \times 15\ {}^{gal}/_{person}/day}{\sqrt[5]{30mpi}}\right) 131.6\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{131.6^2}{1.5}\right) \times 2 = 175ft\quad of\ RESERVE\ leach\ line$$

EXISTING
FACILITY #2
DINNING ROOM

Lodge Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30	
Flow (*gal /person /day*)	29	@ 8 gal./Person/Meal(x3) + 5 gal./Person/Day = 1392 gal./Day
Number of People	48	
Number of Cooks @ 15 gal./Person/Day	2	= 30 gal./Day
Total Gallons/Day Flow	1422	
Saftey Factor	2	

Design Specifications

RESERVE Leach Line (*ft*)	2079	2035 + 44 = 2079
Primary Leach Line (ft)	Existing	
Trench Depth (*ft*)	3	
Rock Below Pipe (*in*)	12	
Septic Tank Capacity (*gal*)	2500	Existing

Calculations

$$\left(\frac{48\ people \times 29\ {}^{gal}/_{person}/_{day}}{\sqrt[5]{30mpi}}\right) 1526\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{1526\ ^2}{1.5}\right) \times 2 = 2035\ ft\ \ of\ RESERVE\ leach\ line$$

$$\left(\frac{2\ people \times 15\ {}^{gal}/_{person}/_{day}}{\sqrt[5]{30mpi}}\right) 32.9\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{32.9\ ft^2}{1.5}\right) \times 2 = 44\ ft\ \ \ of\ RESERVE\ leach\ line$$

EXISTING
FACILITY #2
DORM
BUILDING

Cypress Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30
Flow (*gal/person/day*)	15
Number of People	12
Saftey Factor	2

Design Specifications

RESERVE Leach Line (*ft*)	263	
Primary Leach Line (ft)	Existing	
Trench Depth (*ft*)	3	
Rock Below Pipe (*in*)	12	
Septic Tank Capacity (*gal*)	1000	Existing

Calculations

$$\left(\frac{12\ people \times 15\ {}^{gal}/_{person}/_{day}}{\sqrt[5]{30mpi}}\right) 197.4\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{197.4^2}{1.5}\right) \times 2 = 263\ ft\ \ of\ RESERVE\ leach\ line$$

EXISTING
FACILITY #2
DORM
BUILDING(S)

Alder & Oak Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30	
Flow (*gal/person/day*)	15	
Number of People	24	= 2 Dorms @ 12 People Each
Saftey Factor	2	

Design Specifications

RESERVE Leach Line (*ft*)	526	
Primary Leach Line (ft)	Existing	
Trench Depth (*ft*)	3	
Rock Below Pipe (*in*)	12	
Septic Tank Capacity (*gal*)	1000	Existing

Calculations

$$\left(\frac{24\ people \times 15\ {}^{gal}/_{person}/_{day}}{\sqrt[5]{30mpi}}\right) 394.7\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{394.7^2}{1.5}\right) \times 2 = 526\ ft\ \ of\ RESERVE\ leach\ line$$

EXISTING
FACILITY #2
DORM
BUILDING

Walnut Leach Field - Commercial

Drill Date n/a **Test Date** n/a

Lot Information

Percolation Rate (*mpi*)	30
Flow (*gal/person/day*)	15
Number of People	4
Saftey Factor	2

Design Specifications

RESERVE Leach Line (*ft*)	88	**USE 200' Minium**
Primary Leach Line (ft)	Existing	
Trench Depth (*ft*)	3	
Rock Below Pipe (*in*)	12	
Septic Tank Capacity (*gal*)	1000	Existing

Calculations

$$\left(\frac{4\ people \times 15\ {}^{gal}/_{person}/_{day}}{\sqrt[5]{30mpi}}\right) 65.8\ ft^2\ of\ required\ absorption\ area$$

$$\left(\frac{65.8\ ft^2}{1.5}\right) \times 2 = 88\ ft \quad of\ RESERVE\ leach\ line$$

EXISTING ON-SITE RESIDENCES
EXPLANATION SHEET

BUILDING NAME	SEPTIC TANK SIZE	YEAR-ROUND BUILDING SEPTIC USAGE
Cartaker	1000 gal.	3-Bdrm Full Time Residence
Director	1000 gal.	3-Bdrm Part Time Residence

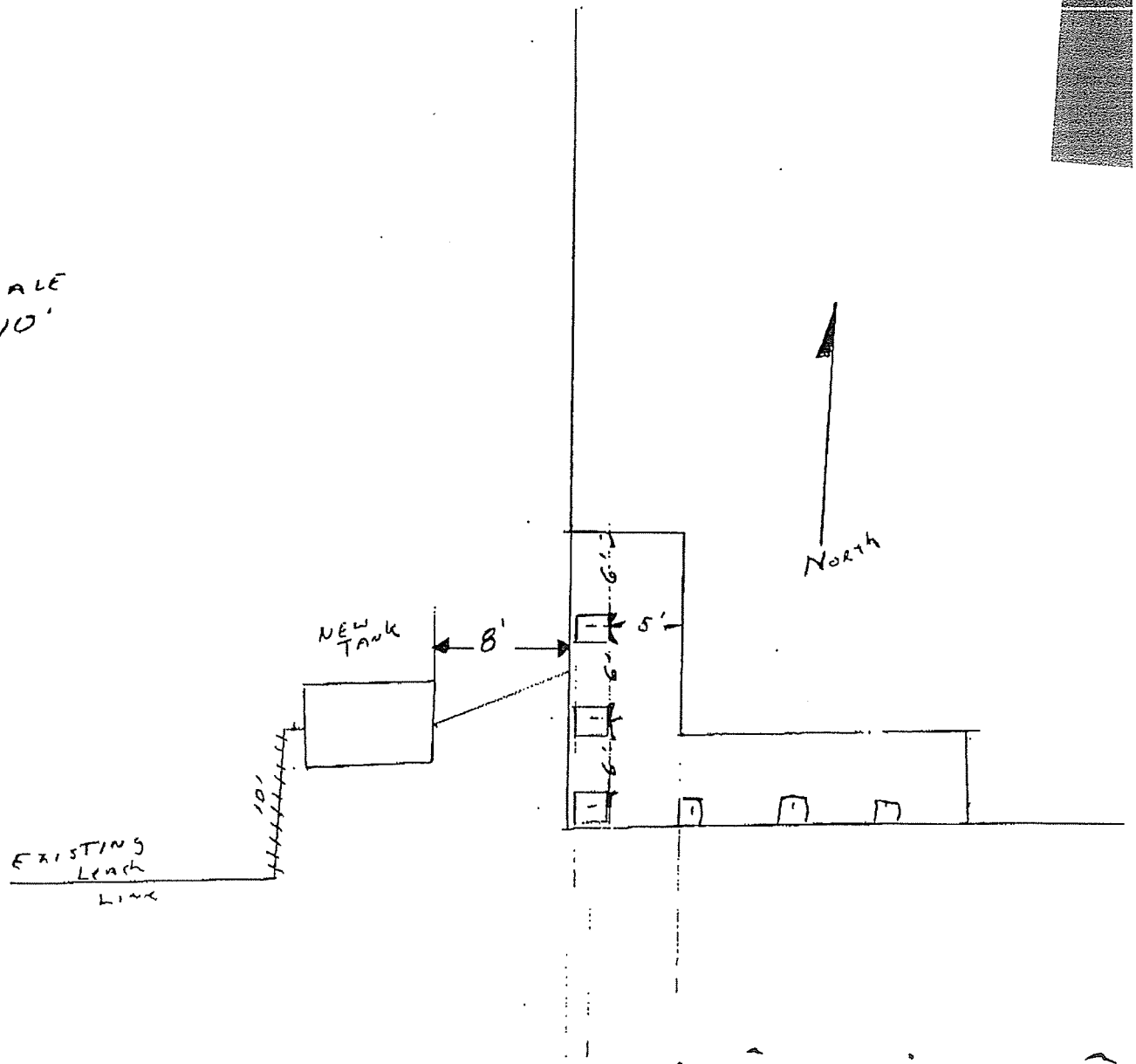
Tanks Pumped Every 3 Years And As Necessary
Per On-Site Maintenance Chart

NEW SEPTIC TANK LOCATION

AT CARETAKERS HOUSE

SALVATION ARMY CAMP RAMONA, CALIF.

SCALE
1" = 10'



AMERICAN BOBCAT AND BACKHOE INC.
1334 DESCANSO AVE.
SAN MARCOS, CA 92069

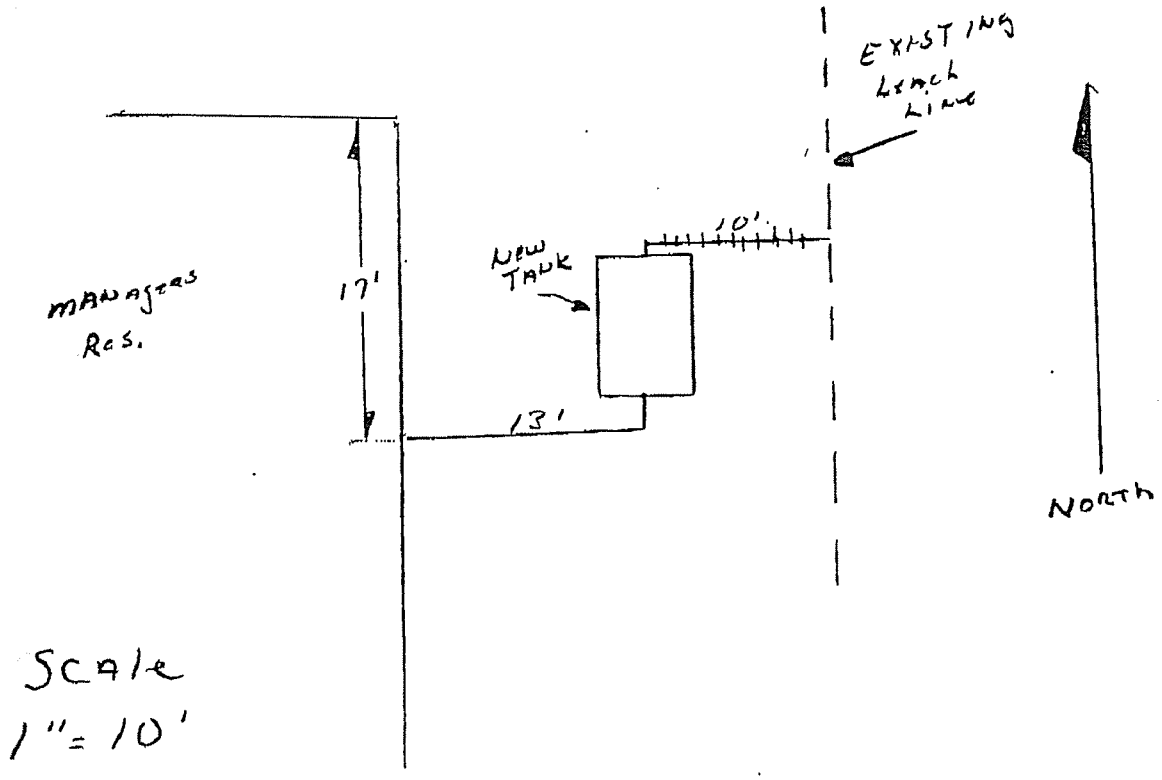
→ No documentation of inspection
As-builts received from
contractor.
S Hogerwost
7/25/05.

8/04

NEW Septic tank location

MANAGERS house

Salvation Army Camp RAMONA, Calif



No documentation of final inspection. See As-built from contractor.

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7/25/05.

AMERICAN BOBCAT AND BACKHOE INC.
1334 DESCANSO AVE.
SAN MARCOS, CA 92069

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8/04

SEPTIC SYSTEM CALCULATIONS

for

PROPOSED
LODGING & DINNING
FACILITY #3
MASTER PLAN

As of 12/18/2009

Septic System Calculations For Proposed Facility #3 Structures

Summary: Revised Alternate #1 and #2

PROPOSED STRUCTURES	Legend Per Master Septic Plan	PROPOSED SEPTIC AREA AS SEEN ON MASTER SEPTIC PLAN								
		A	B	CFG	DE	H	I	J	K	L
Administration, Snack Bar & Clinic	#11							Additional Overflow Area	712	
Multipurpose Facility, Mini-Theater	#19 & #20								2,132	
New Pool, Bath House	#34						6,640		563	
Main Dining Facility	#16			25,976	11,591	531 (Pit)				6,011
Staff Housing (x3)	#6	3,738								
Activities Bldg., 150-Seat Amphitheater	#22a & #22b								1,890	
Cabins (x7) & Activity Building/Restroom (x1)	#10	12,460								
New Pool Backwash	#34		1,960							
Cabins (x9) (Horizontal Pit Length)	#17					1012 (Pit)				
Conference Center	#23									19,908
Total Linear Feet Required *(ft.)*		16,198	1,960	25,976	11,591	1543 (Pit)	6,640	-	5,297	25,919
Total Available		16,198	2,146	25,976	11,591	2918 (Pit)	6,640	718	9,098	25,920
Balance		-	186	-	-	1375 (Pit)	-	718	3,801	1

Septic Area K
(Map Code #11)

Proposed Adminstration Building & Snack Bar & Clinic Same For Reduced Alternate #1 & #2

	Percolation Rate (*mpi*)	47
Administration	Flow (*gal/person/day*)	15
	Number of People	3
Snack Bar	Flow (*gal/person/day*)	50
	Number of People	1
Clinic	Flow (*gal/person/day*)	50
	Number of People	2
	Total Flow (*gal/day*)	195
	Safety Factor	2

Design Specifications

Total Leach Line (*ft*)	712
Minimum Septic Tank Capacity (*gal*)	1500
1/3 for Primary (*ft*)	237
2/3 for Reserve (*ft*)	475

Septic Area K
(Map Code #19 & 20)

Proposed Multipurpose Facility & Mini-Theater Same As Reduced Alternate #1 & #2

		Reduced Alternate #1 & 2
	Percolation Rate (*mpi*)	36
MP Facility	Flow (*gal/person/day*)	48
	Number of People	18
Mini-Theater	Flow (*gal/person/day*)	3
	Number of People	8
	Total Flow (*gal/day*)	888
	Safety Factor	1.5

Design Specifications

Total Leach Line (*ft*)	2132
Minimum Septic Tank Capacity (*gal*)	3000
1/3 for Primary (*ft*)	711
2/3 for Reserve (*ft*)	1421

Septic Area I & K
(Map Code #34)

Proposed Pool Bath House
Same As Reduced Alternate #1 & #2

Percolation Rate (*mpi*)	36
Flow (*gal/person/day*)	10
Number of People	300
Total Flow (*gal/day*)	3000
Safety Factor	1.5

Design Specifications

Total Leach Line (*ft*)	7200
Minimum Septic Tank Capacity (*gal*)	3500
1/3 for Primary (*ft*)	2400
2/3 for Reserve (*ft*)	4800

Septic Area C,D,E,F,G,H & L
(Map Code #16)

Proposed Main Dining Facility
Same As Reduced Alternate #1 & #2

Percolation Rate (*mpi*)	36
Flow (*gal/person/day*)	8
Number of People (meals)	1800
Total Flow (*gal/day*)	14400
Safety Factor	2

Design Specifications

Total Leach Line (*ft*)	46080
Minimum Septic Tank Capacity (*gal*)	12000
1/3 for Primary (*ft*)	15360
2/3 for Reserve (*ft*)	30720

Complete System Area Limits Require 2504' of Leach Line Be Converted to Horizontal Pit

Pit Width (*ft*)	6
Pit Depth (*ft*)	7
Cap Depth (*ft*)	3
Equivalent Commercial Leach Line Length (ft)	2504
Total Horizontal Pit Length (*ft*)	531
1/3 for Primary (*ft*)	177
2/3 for Reserve (*ft*)	354

Septic Area A
(Map Code #6)

Proposed Staff Housing (x3)
Same As Reduced Alternate #1 & #2

Percolation Rate (*mpi*)	55	
Flow (*gal/person/day*)	30	
Number of People	42	= 14 People/Cabin
Total Flow (*gal/day*)	1260	
Safety Factor	1.5	

Design Specifications

Total Leach Line (*ft*)	3738
Minimum Septic Tank Capacity (*gal*)	2000
1/3 for Primary (*ft*)	1246
2/3 for Reserve (*ft*)	2492

Septic Area K
(Map Code #22a & #22b)

Proposed Activities Building (#22b) & 150-Seat Amphitheater (#22a) Same As Reduced Alternate #1 & #2

	Percolation Rate (*mpi*)	27
Activities Bldg.	Flow (*gal/person/day*)	5.39
	Number of People	198
150-Seat Thtr.	Flow (*gal/person/day*)	5
	Number of People	150
	Total Flow (*gal/day*)	1817.22
	Safety Factor	1.5

Design Specifications

Total Leach Line (*ft*)	1890
Minimum Septic Tank Capacity (*gal*)	1500
1/3 for Primary (*ft*)	630
2/3 for Reserve (*ft*)	1260

Septic Area A
(Map Code #10)

Proposed Cabins (x7)
Same As Reduced Alternate #1 & #2

Percolation Rate (*mpi*)	55	
Flow (*gal/person/day*)	30	
Number of People	140	= 20 People/Cabin
Total Flow (*gal/day*)	4200	
Safety Factor	1.5	

Design Specifications

Total Leach Line (*ft*)	12460
Minimum Septic Tank Capacity (*gal*)	4500
1/3 for Primary (*ft*)	4154
2/3 for Reserve (*ft*)	8306

Septic Area B
(Map Code #34)

Proposed New Swimming Pool Backwash Same As Reduced Alternate #1 & #2

Percolation Rate (*mpi*)	24
Flow (*gal/event/day*)	100
Minutes per Event	10
Total Flow (*gal/day*)	1000
Safety Factor	1.5

Design Specifications

Total Leach Line (*ft*)	1960
Minimum Septic Tank Capacity (*gal*)	1500
1/3 for Primary (*ft*)	654
2/3 for Reserve (*ft*)	1306

Septic Area H
(Map Code #17)

Proposed Cabins (x9)

	Reduced Alternate #1		Reduced Alternate #2
Percolation Rate (*mpi*)	16		16
Flow (*gal/person/day*)	30		30
Number of People	198	= 22 People/Cabin	120
Total Flow (*gal/day*)	5940		3600
Safety Factor	1.5		1.5

Design Specifications

	Reduced Alternate #1	Reduced Alternate #2
Pit Width (*ft*)	6	6
Pit Depth (*ft*)	7	7
Cap Depth (*ft*)	3	3
Equivalent Primary Commercial Leach Line Length (ft)	4752	2880
Total Horizontal Pit Length (*ft*)	1012	611
Minimum Septic Tank Capacity (*gal*)	6000	4000
1/3 for Primary (*ft*)	337	204
2/3 for Reserve (*ft*)	675	407

Septic Area L
(Map Code #23)

Proposed Conference Center

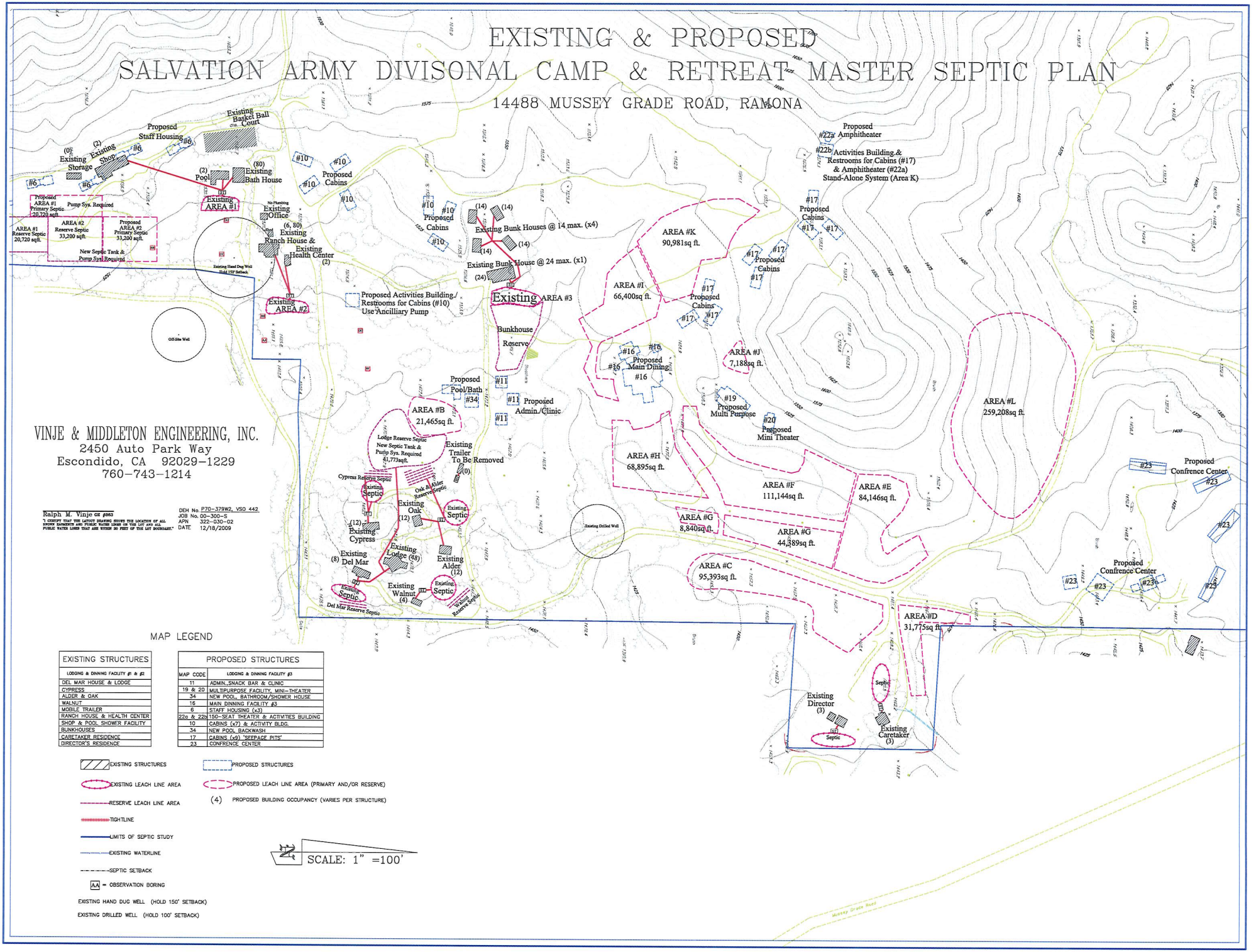
	Reduced Alternate #1	Reduced Alternate #2
Percolation Rate (*mpi*)	42	42
Flow (*gal/person/day*)	40	40
Number of People	144	108
Total Flow (*gal/day*)	5760	4320
Safety Factor	2	2

Design Specifications

	Reduced Alternate #1	Reduced Alternate #2
Total Leach Line Length (*ft*)	19908	14932
Minimum Septic Tank Capacity (*gal*)	6700	5500
1/3 for Primary (*ft*)	6635	4977
2/3 for Reserve (*ft*)	13273	9955

EXISTING & PROPOSED
SALVATION ARMY DIVISONAL CAMP & RETREAT MASTER SEPTIC PLAN

14488 MUSSEY GRADE ROAD, RAMONA



VINJE & MIDDLETON ENGINEERING, INC.
2450 Auto Park Way
Escondido, CA 92029-1229
760-743-1214

Ralph M. Vinje GE #863

"I CERTIFY THAT THE LATEST DRAWING SHOWS THE LOCATION OF ALL KNOWN EASEMENTS AND PUBLIC WATER LINES ON THE LOT AND ALL PUBLIC WATER LINES THAT ARE WITHIN 30 FEET OF THE LOT BOUNDARY."

DEH No. P70-379W2, VSO 442
JOB No. 00-300-S
APN 322-030-02
DATE 12/18/2009

MAP LEGEND

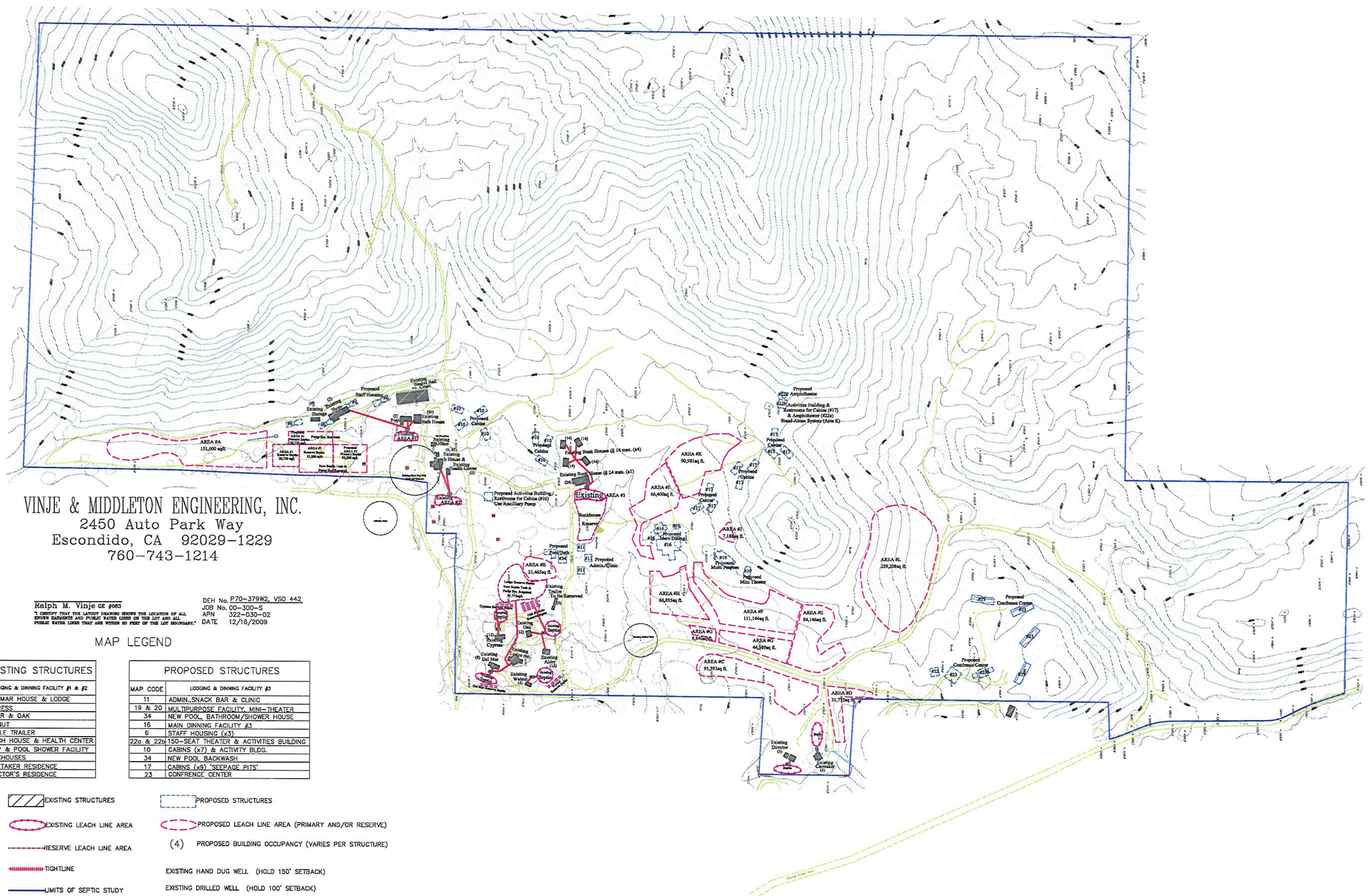
EXISTING STRUCTURES
LODGING & DINNING FACILITY #1 & #2
DEL MAR HOUSE & LODGE
CYPRESS
ALDER & OAK
WALNUT
MOBILE TRAILER
RANCH HOUSE & HEALTH CENTER
SHOP & POOL SHOWER FACILITY
BUNKHOUSES
CARETAKER RESIDENCE
DIRECTOR'S RESIDENCE

PROPOSED STRUCTURES	
MAP CODE	LODGING & DINNING FACILITY #3
11	ADMIN., SNACK BAR & CLINIC
19 & 20	MULTIPURPOSE FACILITY, MINI-THEATER
34	NEW POOL, BATHROOM/SHOWER HOUSE
16	MAIN DINNING FACILITY #3
6	STAFF HOUSING (x3)
22a & 22b	150-SEAT THEATER & ACTIVITIES BUILDING
10	CABINS (x7) & ACTIVITY BLDG.
34	NEW POOL BACKWASH
17	CABINS (x9) "SEEPAGE PITS"
23	CONFRENCE CENTER

EXISTING STRUCTURES
PROPOSED STRUCTURES
EXISTING LEACH LINE AREA
PROPOSED LEACH LINE AREA (PRIMARY AND/OR RESERVE)
RESERVE LEACH LINE AREA
(4) PROPOSED BUILDING OCCUPANCY (VARIES PER STRUCTURE)
TIGHTLINE
LIMITS OF SEPTIC STUDY
EXISTING WATERLINE
SEPTIC SETBACK
AA = OBSERVATION BORING
EXISTING HAND DUG WELL (HOLD 150' SETBACK)
EXISTING DRILLED WELL (HOLD 100' SETBACK)

SCALE: 1" =100'

EXISTING & PROPOSED
SALVATION ARMY DIVISONAL CAMP & RETREAT MASTER SEPTIC PLAN
14488 MUSSEY GRADE ROAD, RAMONA



VINJE & MIDDLETON ENGINEERING, INC.
2450 Auto Park Way
Escondido, CA 92029-1229
760-743-1214

Ralph M. Vinje CE #863
"I CERTIFY THAT THE LAYOUT DRAWING SHOWS THE LOCATION OF ALL KNOWN EASEMENTS AND PUBLIC WATER LINES ON THE LOT AND ALL PUBLIC WATER LINES THAT ARE WITHIN 50 FEET OF THE LOT BOUNDARY."

DEH No. P70-379W2, VSO 442
JOB No. 00-300-S
APN 322-030-02
DATE 12/18/2009

MAP LEGEND

EXISTING STRUCTURES
LODGING & DINNING FACILITY #1 & #2
DEL MAR HOUSE & LODGE
CYPRESS
ALDER & OAK
WALNUT
MOBILE TRAILER
RANCH HOUSE & HEALTH CENTER
SHOP & POOL SHOWER FACILITY
BUNKHOUSES
CARETAKER RESIDENCE
DIRECTOR'S RESIDENCE

PROPOSED STRUCTURES	
MAP CODE	LODGING & DINNING FACILITY #3
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EXISTING STRUCTURES
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LIMITS OF SEPTIC STUDY
EXISTING WATERLINE
SEPTIC SETBACK
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PROPOSED STRUCTURES
PROPOSED LEACH LINE AREA (PRIMARY AND/OR RESERVE)
(4) PROPOSED BUILDING OCCUPANCY (VARIES PER STRUCTURE)
EXISTING HAND DUG WELL (HOLD 150' SETBACK)
EXISTING DRILLED WELL (HOLD 100' SETBACK)

SCALE: 1" =200'