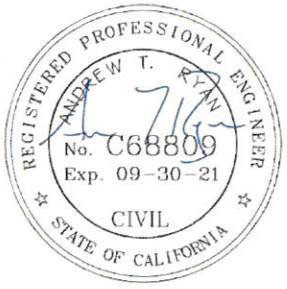
P•R DESIGN & ENGINEERING INC.
8889 North Lake Blvd, P.O. Box 1847
Kings Beach, California 96143-1847
Tel 530-546-4500 www.prdei.com

Preliminary Technical Report

Sierra Valley Preserve Public Water System

Sierra Valley Preserve
181 Austin Road
Beckwourth, CA 96122
Plumas County
APN: 025-220-025

Prepared for:
Feather River Land Trust
75 Court Street
PO Box 1826
Quincy, CA 95971



Prepared by:
PR Design & Engineering Inc.
PO Box 1847
Kings Beach, CA 96143

July 6, 2020

EXHIBIT 17

Introduction

This preliminary technical report is required by the California Health and Safety Code Section 116527 for the new public water system proposed to serve the Sierra Valley Preserve Headquarters. This report is prepared in accordance with guidance published by the California State Water Resources Control Board, entitled Preliminary Technical Report Guidance, Updated January 1, 2019.

The proposed headquarters of the Sierra Valley Preserve is located at 181 Austin Road in Beckwourth, California (Plumas County APN: 025-220-025). The proposed project will improve public access to, and enjoyment of the Sierra Valley Preserve. Existing development on the site includes a 2,600 square foot, three-bedroom residence, a 3,200 square foot barn and a 4,000 square foot storage building. The proposed project includes removal of the existing barn and storage building to construct a new 3,000 square foot 'Barn' to serve as a visitor's center; a 4,000 square foot shop/shed to serve as maintenance shop for staff and provide space for permanent exhibits pertaining to the Sierra Valley Preserve; and a 1,000 square foot pole barn to house equipment. Water will be provided by a new on-site public water system and wastewater will be treated by a new on-site wastewater treatment system In addition to the new facilities, the project will include renovation of the existing residence to improve energy efficiency and to better serve as a bunkhouse for staff and visitors.

Projected use patterns presented in the Plumas County Use Permit application are for 15-30 average daily visitors. That is expected to increase to 60-80 visitors per day during the month of May when peak aviary activity is expected to correspond to peak visitation. In addition, the use permit application provides for up to 5 large events per year which are projected to draw up to 150 visitors per day. In all cases, the average stay is expected to be about 3 hours.

Section I. Applicant General Information

Applicant: Shelton Douthit, Executive Director
Feather River Land Trust
75 Court Street
PO Box 1826
Quincy, CA 95971
T: (530) 283-5758

Engineer: PR Design & Engineering
8889 North Lake Blvd.
Kings Beach, CA 96143
T: (530) 546-4500

Owner: Feather River Land Trust
75 Court Street
PO Box 1826
Quincy, CA 95971
T: (530) 283-5758

Section II. General Information on the Proposed Water System

County of proposed public water system:	Plumas
Assessor's parcel number of proposed public water system:	025-220-025
Number of proposed connections:	1
Number of people served:	150
Number of days per year the system will serve water:	365
Proposed water source:	Public Well
Type of properties served:	Park/Recreation
Treatment Required:	Unknown

Description of proposed water system:

The Feather River Land Trust will establish a new, public water system to supply water for domestic, irrigation and fire protection purposes at the proposed Sierra Valley Preserve. The project will typically serve 15-30 visitors per day with occasional special events serving up to 150 guests. The preserve will have 1-3 fulltime employees and additional seasonal employees during spring and summer seasons. The number of projected visitors and the year-round service provided by the project mandate that the project establish a transient, non-community public water system. The water system will be owned and operated by the Feather River Land Trust. The deed for the property is included in Appendix A of this report.

Existing private development on the project site includes a single-family residence, a shop, and barn; all served by a private well that was constructed in 2010 to a depth of 220 feet and an estimated yield of 60 gpm. The existing well has a 20-foot cement-based annular seal which does not meet the requirements for a public well which require a minimum of a 50-foot annular seal.

The proposed domestic water system will require construction of a new public drinking water supply well, water storage, pressure tank and/or booster pump and distribution piping to the buildings served by the project. Water quality treatment may be required pending results from an initial water quality analysis to be performed once the new public well is constructed.

The new well will also provide water for the project fire suppression system which will include fire water storage, a high-flow pump, a distribution system, and sprinklers in each of the new buildings.

A map of the proposed water system service area is included in the appendix of this report.

Section III. Potential for Service by an Existing Water system:

There are two public water systems located within a 3-mile radius of the project:

- Caltrans_L.T. Davis Rest Stop (ID CA33200020; population: 200; connections: 1; class: non-community)
- Grizzly Ranch CSD (ID CA3205006; population: 25; connections: 24; class: community)

The Caltrans rest stop is located about 2 miles north and west of the project and would require construction of over 2 miles of new water main. Construction costs for this connection would likely exceed $1.5 million. The Grizzly Ranch CSD is located about 3.5 miles from the project. Construction costs for this connection would likely exceed $3 million. Construction costs preclude the connection to these existing water systems.

Section IV. Managerial Consolidation

The Grizzly Ranch CSD was contacted on February 12, 2020. The general manager responded on February 12, 2020 indicating that the Grizzly Ranch CSD is not able to assume responsibility outside of its boundary limits.

Section V. Cost of Proposed Water System

A preliminary 20-year cost projection is included in Appendix C of this report.

Section VI. Evaluation of Supply Capacity

The Sierra Valley Preserve is not expected to grow beyond the capacity documented in the Use Permit Application. The peak daily visitation is expected to be 80 visitors, the average daily visitation is 30 people and occasionally the preserve may host up to 150 people at special events up to 5 times per year.

A well satisfying the requirements of Section 64560 of the Water Works Standards does not exist on the site and the total capacity of the groundwater source has not yet been determined. However, the Sierra Valley is known to have reliable access to groundwater and a new public well, constructed in accordance with State requirements, should have no issue meeting the demand for the project.

Section VII.Cost Comparison

The projected costs for the proposed public water system were compared to the costs associated with providing water through connecting to an existing water system. The 20-year projected cost for the proposed transient, non-community water system is approximately $600,000. The installed costs alone for the construction of 2 miles of public water main alone would cost upwards of $1.3M (assuming $125/ft C900 PVC) and would include substantially more capital improvement costs over the life of the system. Again, connection to an existing public water system is cost prohibitive and not feasible for this project.

Appendix A

Grant Deed

2019-0001543

Recorded
Official Records
County of
Plumas
KATHY WILLIAMS
Clerk-Recorder

10:30AM 10-Apr-2019

REC FEE 21.00
TAX 660.00

SC
Page 1 of 3

RECORDING REQUESTED BY:
Cal-Sierra Title Company

WHEN RECORDED MAIL TO
AND SEND TAX STATEMENTS TO:

The Feather River Land Trust
PO Box 1826
Quincy, CA 95971

ORDER NO.
ESCROW NO. 063-56069
APN: 025-220-025; 025-220-007; 025-220-006 **HOUSING TAX EXEMPT**

SPACE ABOVE THIS LINE FOR RECORDERS USE

GRANT DEED

THE UNDERSIGNED GRANTOR(s) DECLARE(s)

DOCUMENTARY TRANSFER TAX is: $660.00 TAX PAID
(X) computed on full value of property conveyed, or
() computed on full value less value of liens or encumbrances remaining at time of sale.
(X) unincorporated area

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

Robert A. Marshall, Trustee and Kayleen Mae Marshall, Trustee of the Robert A. Marshall and Kayleen M. Marshall FamilyTrust, also known as the Marshall Family Trust dated August 31, 2010, as to parcels 3 and 4;
Robert A. Marshall and Kayleen Mae Marshall also known as Kayleen M. Marshall, husband and wife, as to parcel 2;
Robert A. Marshall, a married man, as to parcel 1

hereby GRANT(S) to The Feather River Land Trust, a California nonprofit public benefit corporation

the following described real property in an unincorporated area of the County of Plumas, State of California:

See Exhibit "A" attached hereto and made a part hereof

Date: April 02, 2019

Robert A. Marshall
Trustee

Robert A. Marshall

Kayleen M. Marshall
Trustee

Kayleen Mae Marshall

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached and not the truthfulness, accuracy, or validity of that document.

State of California
County of Plumas

On 4-2-19 before me L. Pitlock,
Notary Public personally appeared Robert A Marshall & Kayleen Mae Marshall,
who proved to me on the basis of satisfactory evidence to be the person(s), whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s) or the entity upon behalf of which the person(s) acted, executed the instrument.
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.
WITNESS my hand and official seal.

Signature L Pitlock

(Seal)

L. PITLOCK
COMM. # 2130137
NOTARY PUBLIC - CALIFORNIA
PLUMAS COUNTY
COMM. EXPIRES NOV. 9, 2019

File No.: 063-56069
CAL Grant Deed

EXHIBIT "A"
LEGAL DESCRIPTION

PARCEL ONE:
THAT CERTAIN LOT OF LAND WHICH IS NOW FENCED AND IS NOW OCCUPIED BY A BUILDING KNOWN AS THE CARPENTER BUILDING, AND BEING LOCATED ON THE BECKWITH-CALPINE ROAD, AND IN THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 35, TOWNSHIP 23 NORTH, RANGE 14 EAST, M.D.B. & M. AND BEING 140 FEET SQUARE MORE OR LESS.

PORTION APN: 025-220-006

PARCEL TWO:
PARCEL A:

THE FOLLOWING DESCRIBED PORTION OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 35, TOWNSHIP 23 NORTH, RANGE 14 EAST, M.D.B. & M., TO WIT:

COMMENCING AT THE NORTHWEST CORNER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 35 AFORESAID; THENCE RUNNING EAST ALONG THE SOUTH BOUNDARY OF LANDS OF RAMELLI AND THE NORTH BOUNDARY OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SAID SECTION 35, 140 FEET, MORE OR LESS; THENCE SOUTH 120 FEET, MORE OR LESS, TO THE LOT OWNED BY T. J. AUSTIN; THENCE WEST 140 FEET, MORE OR LESS, ALONG THE NORTH BOUNDARY OF SAID LOT OF SAID T. J. AUSTIN TO THE BECKWOURTH-CALPINE ROAD, THENCE NORTH 120 FEET, ALONG SAID BECKWOURTH-CALPINE ROAD TO THE PLACE OF BEGINNING.

PORTION APN: 025-220-006

PARCEL B:
AN EASEMENT, 60 FEET IN WIDTH, FOR INGRESS AND EGRESS AS SET FORTH IN THE DECLARATION OF ESTABLISHMENT OF EASEMENT RECORDED MARCH 13, 1991 IN BOOK 542 OF OFFICIAL RECORDS AT PAGE 3.

PARCEL THREE:
ALL THAT CERTAIN REAL PROPERTY SITUATE IN THE COUNTY OF PLUMAS, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

BEING ALL THAT PORTION OF THE SW1/4 OF THE SW1/4 OF SECTION 26 AND THE NW1/4 OF THE NW1/4 OF SECTION 35, T.23N.R.14E., M.D.M. LYING EASTERLY OF THE EASTERLY RIGHT-OF-WAY LINE OF PLUMAS COUNTY ROAD NO. 109, ALSO KNOWN AS COUNTY ROAD NO. A-23.

EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN DEED TO THE WESTERN PACIFIC RAILROAD COMPANY, A CORPORATION, RECORDED JUNE 15, 1921 IN BOOK 54 OF DEEDS AT PAGE 398, PLUMAS COUNTY RECORDS.

APN: 025-220-025

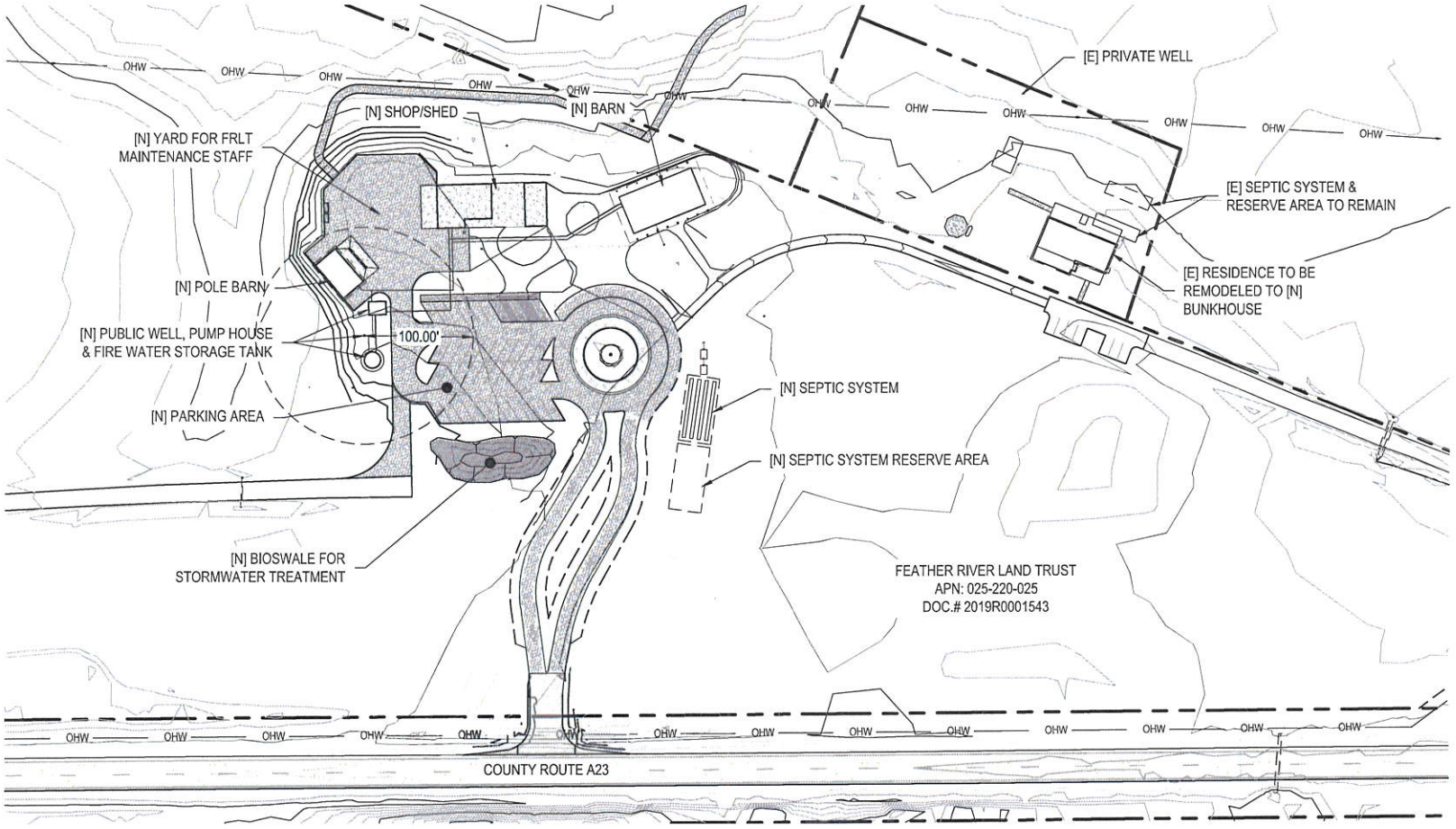
PARCEL FOUR:
THAT PORTION OF THE SW 1/4 OF THE SE 1/4 AND THAT PORTION OF THE SE 1/4 OF THE SW 1/4 IN SECTION 26, TOWNSHIP 23 NORTH, RANGE 14 EAST, MDM, ACCORDING TO THE OFFICIAL PLAT THEREOF, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTH 1/4 SECTION CORNER OF SAID SECTION; THENCE WEST 385.00 FEET; THENCE NORTH TO THE SOUTH BOUNDARY OF THE WESTERN PACIFIC RAILROAD RIGHT-OF-WAY; THENCE ALONG SAID BOUNDARY; EASTERLY 680 FEET; THENCE SOUTH TO THE SOUTH LINE OF SAID SECTION; THENCE WEST 293.30 FEET TO THE POINT OF BEGINNING.

APN: 025-220-007

Appendix B

Map of Proposed Water System



SITE EXHIBIT
1" = 100'

PRJ. ENG.:ATR | DRWN: JRL
DATE: 6/18/20
SCALE: AS NOTED
FILE: P:\SIERRA VALLEY PRESERVE

P-R DESIGN & ENGINEERING INC.
3899 North Lake Blvd. P.O. Box 607
Kings Beach, California 96143 (Mail)
Tel 530-546-4590 www.prde.com

181 AUSTIN ROAD
SIERRA VALLEY PRESERVE
WATER SYSTEM MAP
APN: 025-220-025, 006
PLUMAS COUNTY
BECKWOURTH, CA

1

Appendix C

20-Year Cost Projection

TWENTY-YEAR BUDGET PROJECTION

Transient, Noncommunity Water System

INFLATION FACTOR (%) - 3.2

System Name: Feather River Land Trust PWS

PWS I.D. Number:

*Enter information only in shaded cells

LINE	EXPENSES	Current Year	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1	OPERATIONS & MAINTENANCE										
2	Salaries and benefits		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Contract operation and maintenance		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Power and other utilities	1200.00	1238.64	1278.52	1319.69	1362.19	1406.05	1451.32	1498.06	1546.29	1596.08
5	Fees	880.00	908.34	937.58	967.77	998.94	1031.10	1064.30	1098.57	1133.95	1170.46
6	Treatment chemicals	1000.00	1032.20	1065.44	1099.74	1135.16	1171.71	1209.44	1248.38	1288.58	1330.07
7	Coliform monitoring	2500.00	2580.50	2663.59	2749.36	2837.89	2929.27	3023.59	3120.95	3221.45	3325.18
8	Chemical monitoring	1200.00	1238.64	1278.52	1319.69	1362.19	1406.05	1451.32	1498.06	1546.29	1596.08
9	Transportation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Materials, supplies, and parts	1000.00	1032.20	1065.44	1099.74	1135.16	1171.71	1209.44	1248.38	1288.58	1330.07
11	Miscellaneous	500.00	516.10	532.72	549.87	567.58	585.85	604.72	624.19	644.29	665.04
12											
13											
14	Total Operation and Maintenance	$8,280.00	$8,546.62	$8,821.82	$9,105.88	$9,399.09	$9,701.74	$10,014.14	$10,336.59	$10,669.43	$11,012.98
15											
16	GENERAL & ADMINISTRATIVE										
17	Engineering and professional services	30000.00	500.00	516.10	532.72	549.87	567.58	585.85	604.72	624.19	644.29
18	Depreciation and amortization		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	CIP Reserve (from Sheet 2, Column J Total)	5873.10	6062.21	6257.42	6458.91	6666.88	6881.56	7103.14	7331.86	7567.95	7811.64
20	Insurance	500.00	516.10	532.72	549.87	567.58	585.85	604.72	624.19	644.29	665.04
21											
22											
23	Total General and Administrative	$36,373.10	$7,078.31	$7,306.24	$7,541.50	$7,784.33	$8,034.99	$8,293.71	$8,560.77	$8,836.43	$9,120.96
24											
25	TOTAL EXPENSES	$44,653.10	$15,624.93	$16,128.05	$16,647.38	$17,183.42	$17,736.73	$18,307.85	$18,897.36	$19,505.86	$20,133.95

Report Prepared by: Jason Lynn

Date: 7/6/20

Title: Engineer

Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1647.48	1700.53	1755.28	1811.80	1870.14	1930.36	1992.52	2056.68	2122.91	2191.26
1208.15	1247.05	1287.21	1328.66	1371.44	1415.60	1461.18	1508.23	1556.80	1606.93
1372.90	1417.11	1462.74	1509.84	1558.45	1608.64	1660.43	1713.90	1769.09	1826.05
3432.25	3542.77	3656.84	3774.59	3896.13	4021.59	4151.09	4284.75	4422.72	4565.13
1647.48	1700.53	1755.28	1811.80	1870.14	1930.36	1992.52	2056.68	2122.91	2191.26
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1372.90	1417.11	1462.74	1509.84	1558.45	1608.64	1660.43	1713.90	1769.09	1826.05
686.45	708.55	731.37	754.92	779.23	804.32	830.22	856.95	884.54	913.03
$11,367.60	$11,733.64	$12,111.46	$12,501.45	$12,904.00	$13,319.51	$13,748.40	$14,191.09	$14,648.05	$15,119.71
665.04	686.45	708.55	731.37	754.92	779.23	804.32	830.22	856.95	884.54
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8063.17	8322.81	8590.80	8867.42	9152.96	9447.68	9751.90	10065.91	10390.03	10724.59
686.45	708.55	731.37	754.92	779.23	804.32	830.22	856.95	884.54	913.03
$9,414.66	$9,717.81	$10,030.72	$10,353.71	$10,687.10	$11,031.23	$11,386.43	$11,753.07	$12,131.52	$12,522.16
$20,782.26	$21,451.45	$22,142.19	$22,855.16	$23,591.10	$24,350.73	$25,134.83	$25,944.17	$26,779.57	$27,641.87

SIMPLIFIED CAPITAL IMPROVEMENT PLAN

Date: 6/17/2020
System ID No.: N/A
System Name: Feather River Land Trust PWS
Service Connections: 1

*Enter information only in shaded cells

QTY	COMPONENT				UNIT COST	INSTALLED COST	AVG LIFE, YEARS	ANNUAL RESERVE	MONTHLY RESERVE	MONTHLY RESERVE PER CUSTOMER
	Drilled Well, 6", steel casing		Depth:		80	0	25	0.00	0.00	0.00
1	Drilled Well, 8", steel casing		Depth:	220	130	28600	25	1144.00	95.33	95.33
	Drilled Well, 12", steel casing		Depth:		200	0	25	0.00	0.00	0.00
1	Wellhead Electrical Controls				700	700	25	28.00	2.33	2.33
	Submersible Pump, 20 HP (1 standby spare)				9000	0	7	0.00	0.00	0.00
	Submersible Pump, 3 HP				2000	0	7	0.00	0.00	0.00
1	Submersible Pump, 5 HP				3500	3500	7	500.00	41.67	41.67
1	Booster Pump Station, 25 HP, complete				14000	14000	5	2800.00	233.33	233.33
	Booster Pump Station Electrical Controls				900	0	5	0.00	0.00	0.00
1	Pressure Tank		Gallons:	10	1.5	15	10	1.50	0.13	0.13
	Pressure Tank		Gallons:		1.5	0	10	0.00	0.00	0.00
	Storage Tank, Plastic		Gallons:		0.5	0	10	0.00	0.00	0.00
	Storage Tank, Redwood		Gallons:		1.3	0	40	0.00	0.00	0.00
	Storage Tank, Redwood		Gallons:		1.3	0	40	0.00	0.00	0.00
1	Storage Tank, Steel		Gallons:	200	1.2	240	50	4.80	0.40	0.40
	Storage Tank, Steel		Gallons:		1.2	0	50	0.00	0.00	0.00
	Storage Tank, Steel		Gallons:		1.2	0	50	0.00	0.00	0.00
	Storage Tank, Concrete		Gallons:		1.5	0	80	0.00	0.00	0.00
1	Master Meter, 2"				450	450	10	45.00	3.75	3.75
	Master Meter, 3"				800	0	10	0.00	0.00	0.00
	Master Meter, 4"				2500	0	10	0.00	0.00	0.00
1	Hypochlorinator w/ Tank & Pump, Complete				800	800	10	80.00	6.67	6.67
320	Pipe w/ sand bedding, 1" (Enter linear feet for quantity)				30	9600	50	192.00	16.00	16.00
50	Pipe w/ sand bedding, 2" (Enter linear feet for quantity)				35	1750	50	35.00	2.92	2.92
	Pipe w/ sand bedding, 3" (Enter linear feet for quantity)				40	0	50	0.00	0.00	0.00
	Pipe w/ sand bedding, 4" (Enter linear feet for quantity)				45	0	50	0.00	0.00	0.00
350	Pipe w/ sand bedding, 6" (Enter linear feet for quantity)				60	21000	50	420.00	35.00	35.00
	Standpipe Hydrant, 1-1/2"				700	0	20	0.00	0.00	0.00
	Standpipe Hydrant, 2-1/2"				900	0	20	0.00	0.00	0.00
3	Customer Meter w/ Box & Shutoff, Complete				250	750	20	37.50	3.13	3.13
4	Distribution Valve, 2"				150	600	10	60.00	5.00	5.00
	Distribution Valve, 3"				250	0	10	0.00	0.00	0.00
	Distribution Valve, 4"				375	0	20	0.00	0.00	0.00
4	Distribution Valve, 6"				600	2400	20	120.00	10.00	10.00
1	Air & Vacuum Relief Valve, Typical				375	375	20	18.75	1.56	1.56
	TOTALS:					$84,780.00		$5,467.80	$455.65	$455.65

Report Prepared by (Title): Jason Lynn Date: 7/6/20

NOTE: Installed costs are averages, and include all materials and contracted labor and equipment.

P•R DESIGN & ENGINEERING INC.
8889 North Lake Blvd, P.O. Box 1847
Kings Beach, California 96143-1847
Tel 530-546-4500 www.prdei.com

Preliminary Fire Water Storage Requirements
Sierra Valley Preserve Headquarters
181 Austin Road
July 7, 2020

Basis of Design: NFPA 1142

Exposure Hazard: A structure within 50 ft of another building and 100 SF or larger in area.

For structures without exposure hazards:

$$WS_{MIN} = \frac{VS_{tot}}{OHC}(CC)$$

For structures with exposure hazards:

$$WS_{MIN} = \frac{VS_{tot}}{OHC}(CC) \times 1.5$$

Where:

WS_{min} = Minimum water supply (gal) (2,000 gal min.);
VS_{tot} = total volume of structure (ft^3)
OHC = Occupancy hazard classification number
CC = construction classification number, Table 6.2.1.

Occupancy Hazard Classification 5:

Moderate hazard occupancies in which the quantity of combustibility of contents is expected to develop moderate rates of spread and heat release. For example, farm storage buildings such as equipment sheds.

Occupancy Hazard Classification 7:

Light hazard occupancies in which the quantity of combustibility of contents is expected to develop relatively light rates of spread and heat release. For example, apartments, clubs, dwellings, museums, theatres, schools, etc. This OHC applies to the Shed, Barn & Bunk House.

Construction Classification Number V:

Exterior walls, bearing walls, columns, beams, girders, trusses, arches, floors, and roofs are entirely or partially of wood or other approved combustible material smaller than material required in Type IV

EXHIBIT 18

construction. Structural members shall have fire resistance ratings not less than those specified in Table 6.3.1. All of the proposed buildings will be Construction Type V with a construction classification number of 1.5 except for the bunk house whose maximum classification number is 1 (NFPA 1142 6.2.2).

The minimum fire water storage volume was calculated for of the proposed buildings:

	Building Volume (CF)	Occupancy Hazard Classification	Construction Classification Number	Exposure Hazard	Volume Required (Gal.)
Shop	30043	5	1.5	1.5	13519
Shed	12013	7	1.5	1.5	3861
Barn	64800	7	1.5	1	13886
Bunk House	34527	7	1	1	4932
*For dwellings, max. classification number is 1 (NFPA 1142 6.2.2)					

The maximum required storage is found for the Barn:

$$WS_{MIN} = \frac{VS_{tot}}{OHC}(CC) = \frac{64{,}800}{7}(1.5) = 13{,}886\ gal$$

The AHJ is permitted to reduce the water supply required by NFPA 1142 for manual fire-fighting purposes when a structure is protected by an automatic sprinkler system that fully meets the requirements of NFPA 13, 13D, or 13R.

Water Delivery for 10,000 gal – 19,999 gal: 750 GPM

P·R DESIGN & ENGINEERING INC.
8889 North Lake Blvd, P.O. Box 1847
Kings Beach, California 96143-1847
Tel 530-546-4500 www.prdei.com

July 28, 2020

Brett Russell, Chief
Beckwourth Fire
180 Main Street
Beckwourth, CA 96129

RE: Feather River Land Trust
Sierra Valley Preserve
Special Use Permit U 2-19/20-04

Mr. Russell:

Thank you for your review of the special use permit application referenced above. Please see responses to your comments below in italics.

Per email to Becky Herrin on Monday, May 04, 2020:

...On planning sheet there is no means of water (water tank/sprinkler system) for fire protection. This was discussed at the first meeting we had about the project...Please call me if you have any question...

The preliminary size and location of the proposed fire storage reservoir and pump house are shown on the plans. The justification for the proposed water storage volume is based on NFPA 1142 and is described more specifically in the Preliminary Fire Water Storage Requirements document dated July 7, 2020, included with this submittal.

As a friendly reminder, the NFPA 1142 calculations and preliminary plans dated July 2, 2020 were sent to you by email on July 7, 2020 and we have not received a response to date. Thank you again for your review of the project.

Sincerely,

Andrew Ryan

Herrin, Becky

From: Chief Russell <chiefrussell@beckwourthfire.com>
Sent: Monday, May 04, 2020 12:00 PM
To: Herrin, Becky
Subject: Re: Preliminary review period for Feather River Land Trust special use permit (Sierra Valley Preserve)

Hello Becky,

Just wanted to follow up with you via email per our conversation on Friday.. On planning sheet there is no means of water (water tank/sprinkler system) for fire protection. This was discussed at the first meeting we had about the project. I spoke to Jeff from the Feather River Trust and he is looking into it as well.. Please call me if you have any question..

-Bret

On 4/20/2020 1:25 PM, Herrin, Becky wrote:

> *The Spring Valley Ranch people have not submitted any application yet, but have been talking to us. It definitely seems more major.*
>
> **From:** Chief Russell [mailto:chiefrussell@beckwourthfire.com]
> **Sent:** Monday, April 20, 2020 1:22 PM
> **To:** Herrin, Becky <BeckyHerrin@countyofplumas.com>
> **Subject:** Re: Preliminary review period for Feather River Land Trust special use permit (Sierra Valley Preserve)
>
> Hi Becky,
>
> Thank you for your time on the phone and I appreciate the extension. We will get it dialed in on my end. Do you have any information Spring Valley Ranch? It is another project (seems much more major) off of Carmen Valley Road..
>
> -Bret
>
> On 4/20/2020 11:57 AM, Herrin, Becky wrote:
>
> Chief Russell,
> As per our phone conversation, your District may respond to the preliminary review request until May 1st. Any proposed conditions

EXHIBIT 19

of approval that your District needs in order to provide fire protection would be appreciated.
Thanks very much.

Rebecca Herrin
Assistant Planning Director
Plumas County Planning and Building Services
555 Main Street
Quincy, CA 95971
(530) 283-6213

--
Bret Russell
Fire Chief
180 Main St.
Beckwourth CA 96129
530-832-1008

--
Bret Russell
Fire Chief
180 Main St.
Beckwourth CA 96129
530-832-1008

P·R DESIGN & ENGINEERING INC.
8889 North Lake Blvd, P.O. Box 1847
Kings Beach, California 96143-1847
Tel 530-546-4500 www.prdei.com

Preliminary Design

Onsite Wastewater Treatment System

Sierra Valley Preserve
181 Austin Road
Beckwourth, CA 96122
Plumas County
APN: 025-220-025

Prepared for:
Feather River Land Trust
75 Court Street
PO Box 1826
Quincy, CA 95971

Prepared by:
PR Design & Engineering Inc.
PO Box 1847
Kings Beach, CA 96143

July 6, 2020

EXHIBIT 20

I. Project Description

This preliminary design report has been prepared for review by Plumas County Environmental Health for the proposed onsite wastewater treatment system at the Sierra Valley Preserve Headquarters.

The proposed headquarters of the Sierra Valley Preserve is located at 181 Austin Road in Beckwourth, California (Plumas County APN: 025-220-025). The proposed project will improve public access to, and enjoyment of the Sierra Valley Preserve. Existing development on the site includes a 2,600 square foot, three-bedroom residence, a 3,200 square foot barn and a 4,000 square foot storage building. The proposed project includes removal of the existing barn and storage building to construct a new 3,000 square foot 'Barn' to serve as a visitor's center; a 4,000 square foot shop/shed to serve as maintenance shop for staff and provide space for permanent exhibits pertaining to the Sierra Valley Preserve; and a 1,000 square foot pole barn to house equipment. Water will be provided by a new on-site public water system and wastewater will be treated by a new on-site wastewater treatment system. In addition to the new facilities, the project will include renovation of the existing residence to improve energy efficiency and to better serve as a bunkhouse for staff and visitors.

Projected use patterns presented in the Plumas County Use Permit application are for 15-30 average daily visitors. Visitation is expected to increase to 60-80 visitors per day during the month of May when peak aviary activity is expected to correspond to peak visitation. In addition, the use permit application provides for up to 5 large events per year which are projected to draw up to 150 visitors per day. In all cases, the average stay is expected to be about 3 hours.

II. Existing On-Site Wastewater Treatment Systems

The existing residence is served by an on-site septic tank and leach field that was installed in 1991. The septic permit filed at Plumas County indicates that a 1,200-gallon septic tank was installed and that the leach field measures 43 feet in length and 12 feet in width. Final inspections were performed, and the system was approved by Plumas County on April 22, 1991.

A second septic system was installed without a permit to provide onsite wastewater treatment for the 4,000-sf metal storage building. The exact location and dimension of this system is unknown but is understood to be located north of the existing storage building. This system will need to be field located will require removal and/or abandonment in accordance with county and state requirements.

III. Proposed On-Site Wastewater Treatment Systems

The proposed project includes construction of a new on-site wastewater treatment system (OWTS) to serve the new commercial components of the project. A soil evaluation was performed by NV5 to understand the percolation rates of the soil and to document the existence of seasonal groundwater within the project area. The existing septic tank and leach field will remain to serve the bunkhouse.

A. Proposed OWTS - Residential

Proposed improvements to the existing residence include a modest remodel to effectively split the residence into two units while retaining the same number of bedrooms. The California Plumbing Code

stipulates that for a 2-unit residential building that the minimum septic tank capacity is 1,200 gallons.[1] The existing septic tank meets the current code requirements for capacity and the leach area was designed and installed in accordance with Plumas County requirements. The existing septic system will remain without modifications to serve the proposed bunk house.

B. Proposed OWTS – Commercial

The proposed OWTS for the new commercial components of the project were designed in accordance with the Plumas County Code and the California Plumbing Code.

B.1. Subsurface Suitability Analysis

The proposed project was evaluated for suitability in accordance with Title 6, Chapter 6, Section 6-6.11 of the Plumas County Code. A soil evaluation report was prepared by NV5 in June of 2020 and is the basis for design of the on-site wastewater treatment system

Percolation Testing

Percolation testing was performed by NV5 in the spring of 2020. The results, procedural documentation, and a test location map are included in the soil evaluation report included in the appendix of this report. The percolation rates throughout the project area range from 10 MPI to 50 MPI. Near the proposed location of the on-site wastewater system, PT 5, the percolation was measured to be 12 minutes per inch (MPI).

Soil Depth Evaluation

A soil depth evaluation was performed by NV5 to identify separation to groundwater and to characterize the soil throughout the project area. Several test pits were excavated throughout the project area. Test Pit 5 was excavated nearest to the proposed location of the onsite wastewater treatment system. Silty sand (sm) and lean clay with sand (cl) were found to a depth of about 4 feet bgs. These soil classifications are considered semi pervious to impervious. Below 4 feet bgs, soil is classified as poorly graded sand (sp) and is considered pervious. [2]

Groundwater Level Testing

The depth to groundwater was measured using piezometers installed by NV5. Measurements were taken monthly beginning in February 2020 and extending through May of 2020. Piezometer P3 was installed near the proposed dispersal area and groundwater was observed at about 6.4 feet below ground surface at an elevation of 4872.79. The soil evaluation prepared by NV5 states that the groundwater may be up to two feet higher during wet water years. The groundwater elevation used for design purposes is 4874.79.

B.2. Minimum Septic Tank Capacity

The minimum septic tank capacity was determined in accordance with Section 6-6.13(b) of Title 6, Plumas County Code which provides reference to the California Plumbing Code. The maximum projected visitation of 150 visitors per day was used to determine the design criteria for septic system flow rates. Table H201.1(2) of the 2019 California Plumbing Code does not specifically list Visitor Centers as type of

[1] Table H 201.1(1). Capacity of Septic Tanks. 2019 California Plumbing Code.
[2] Engineering Classification of Earth Metals. Chapter 3. Figure 3-10. USDA/NRCS National Engineering Handbook. January 2012.

occupancy, however, given the relatively short periods of visitation, the lack of meal preparation and kitchen wastewater generation, a church (sanctuary) presents a comparably occupancy for estimating waste/sewer flow rates. Five (5) gallons per day per visitor was used to estimate the waste/sewage flow rate.

As a secondary method of confirmation, the estimation of wastewater generated by the project, the Nevada County Land Use and Development Code, Chapter VI, Section T112, Table 2 was consulted for estimated quantities of sewage flow. Table 2 lists parks and public picnic areas (toilet waste only) as a use and defines five (5) gallons per day per person as the recommended sewage flow rate.

The projected sewage demand is:

$$V = 5\frac{GPD}{VISITOR} \times 150\ VISITORS = 750\ GPD$$

Note 1, Table H 201.1(2) of the 2019 California Plumbing Code requires that septic tanks be sized as follows:

$$Septic\ Tank\ Size\ = Flow\ \times 1.5 = 1{,}125 GAL$$

The project proposes to use a 1,200-gallon septic tank to meet the requirements of Title 6 of the Plumas County Code and the California Building Code.

B.3. Minimum Dispersal Area

Title 6 of the Plumas County Code does not provide requirements for determining the rate of sewage application. In the absence of guidance provided by Plumas County, the standards provided in the Nevada County Land Use and Development Code, Chapter VI, Section T052, Part (4)(B)(2) was used to determine an appropriate sewage application rate.

For gravity trenches: $R = \frac{3.5}{\sqrt{t}} = \frac{3.5}{\sqrt{12}} = 1.0 gpd/ft^2$

For pressure distribution trenches: $R = \frac{5}{\sqrt{t}} = \frac{5}{\sqrt{12}} = 1.4 gpd/ft^2$

Where t = percolation rate in minutes per inch (MPI), defined above.

The required dispersal area is then calculated by dividing the project flow by the application rate:

$$A = \frac{V}{R} = \frac{750\ GPD}{1.4\ GPD/FT^2} = 536\ ft^2$$

The project proposes to install an OWTS that will provide a minimum of 536 square feet of dispersal area to treat wastewater generated by the commercial components of the project.

B.4. System Design

Seasonally high groundwater precludes the project from implementing a standard onsite wastewater treatment system which requires a minimum of five (5) feet of vertical separation. The proposed project

will implement an engineered, pressurized distribution system which allows for a reduction in vertical separation to groundwater to a minimum of four (4) feet.[3]

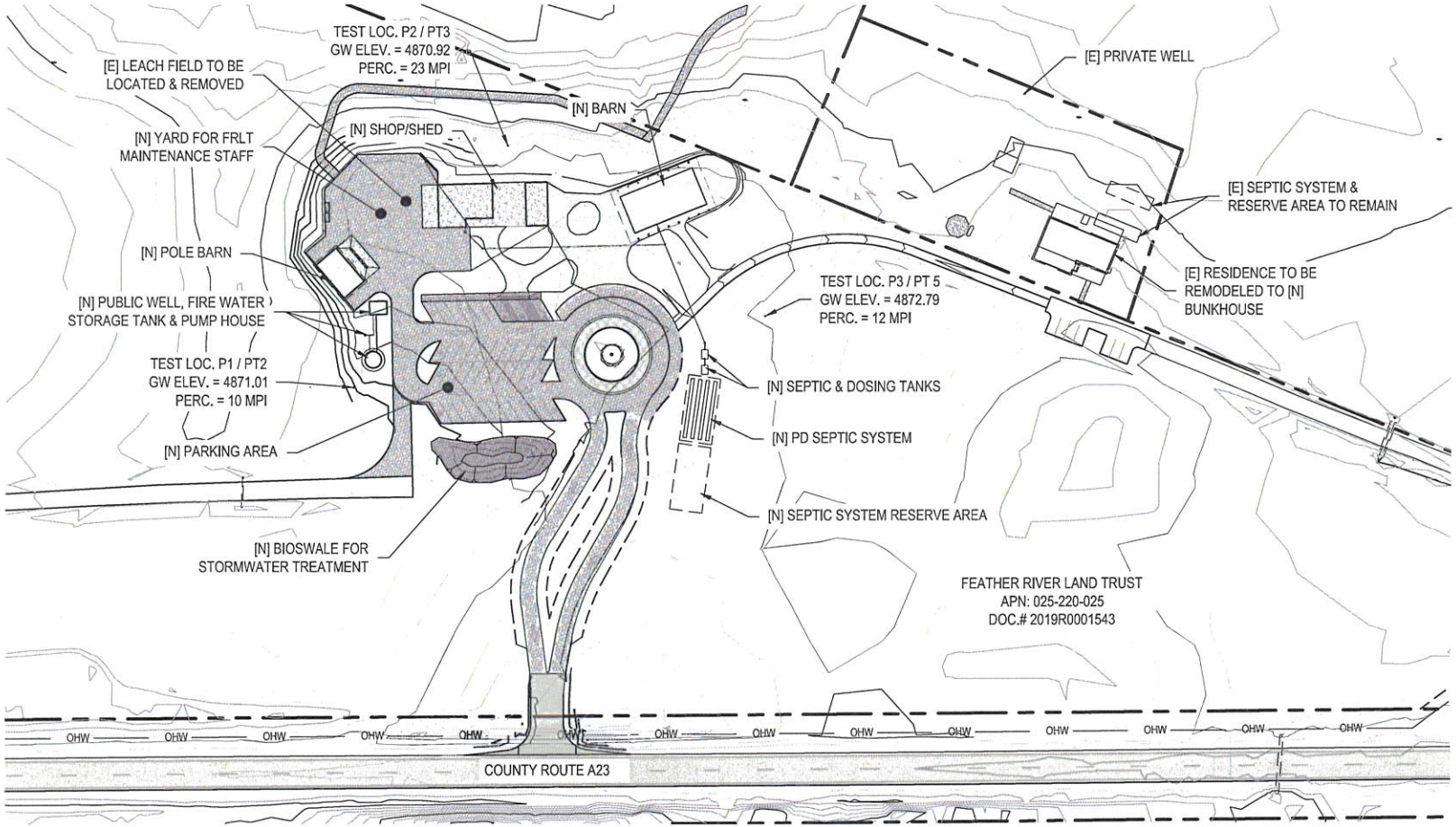
The proposed drainage field will be comprised of a series of trenches providing a minimum of 536 square feet of dispersal area. The distribution trench will be a minimum of 12 inches in depth and a maximum of 36" in width. The pressure distribution laterals will be pressure-rated pipe. The distribution pump and lateral piping will be designed such that no more than 10 percent of head loss is achieved through the length of the lateral. The dispersal trench will be capped with filter fabric and backfilled to a minimum depth of 12 inches.

Additional specifications and construction details will be provided during the development of construction drawings.

[3] Table No. 3. Title 6, Chapter 6, Sewage Disposal. Plumas County Code.

Appendix A

Septic System Map



SITE EXHIBIT
1" = 100'

PRJ. ENG.:ATR | DRWN: JRL
DATE: 7/6/20
SCALE: AS NOTED
FILE: P:\SIERRA VALLEY PRESERVE

P-R DESIGN & ENGINEERING INC.
8689 North Lake Blvd, P.O. Box 1847
Kings Beach, California 96143-1847
Tel 530-546-4500 www.prdei.com

181 AUSTIN ROAD
SIERRA VALLEY PRESERVE
SEPTIC SYSTEM MAP
APN: 025-220-025, 006
PLUMAS COUNTY
BECKWOURTH, CA

1

Appendix B

NV5 Soil Evaluation Report

SOIL EVALUATION REPORT FOR ON-SITE WASTE WATER DISPOSAL SYSTEM SIERRA VALLEY PRESERVE VISITOR CENTER

181 AUSTIN ROAD
APN 025-220-025
BECKWOURTH, PLUMAS COUNTY, CALIFORNIA

JUNE 23, 2020

PREPARED FOR:

ARKIN TILT ARCHITECTS
DAVID ARKIN, AIA
1101 8TH STREET, SUITE 180
BERKELEY, CALIFORNIA 94710

NV5
10775 PIONEER TRAIL, SUITE 213
TRUCKEE, CALIFORNIA 96161

PROJECT NO. 42686.00

Project No. 42686.00
June 23, 2020

Arkin Tilt Architects
David Arkin, AIA
1101 8th Street, Suite 180
Berkeley, California 94710

Reference: **Sierra Valley Preserve Visitor Center**
181 Austin Road
APN 025-220-025
Beckwourth, Plumas County, California

Subject: **Soil Evaluation Report**

This report presents the results of our soil evaluation for on-site sewage disposal at the proposed Sierra Valley Preserve Visitor Center to be constructed at 181 Austin Road in Beckwourth, Plumas County, California. NV5 previously prepared a geotechnical engineering report for the project dated February 13, 2020. Our scope of services for the sewage disposal involved soil profile characterization and performing percolation tests at the site. The groundwater level was measured in on-site piezometers by Feather River Land Trust personnel. PR Design & Engineering, Inc. will design the disposal system.

PROJECT DESCRIPTION

The project will involve construction of a new visitor center near the northwest corner of the preserve. The visitor center will consist of a single-story structure with detached bathroom facilities. Other project elements will include removal of an existing metal structure and replacement with two small wood-frame structures on an existing foundation with a slab-on-grade floor. Appurtenant construction will include a new entry roadway with a roundabout, a parking lot, bus parking and drop off zone, underground utilities, a wildlife viewing platform, picnic area, outdoor education circles, and a new on-site wastewater disposal system.

FIELD EXPLORATION

Our field exploration included excavating six exploratory test pits, installing three piezometers, and completion of six percolation tests, as described below.

Test Pits

We explored subsurface conditions at the site on January 15, 2020 by excavating six exploratory test pits to depths ranging from 8 to 10.5 feet below the ground surface (bgs). Test pits were excavated with a Volvo RX3W86 track-mounted mini-excavator equipped with

a 36-inch bucket. Test pit locations were selected based on locations of proposed improvements and site access.

An engineer from our firm logged the soil conditions exposed in the test pits, visually classified soil, and collected bulk soil samples for laboratory testing. Soil samples were packaged and sealed in the field to reduce moisture loss and were returned to our laboratory for testing. Upon completion, test pits were backfilled with the excavated soil. Figure 1 presents a Test Pit, Piezometer and Percolation Test Location Plan.

Test Pits TP-1 and TP-6 were located within proposed parking and driveway areas. Test Pits TP-2, TP-3B, and TP-5 were located in proposed leach field area for sewage disposal system design.

Near-surface soil encountered in our test pits and piezometers consisted of 2 to 6 inches of loose silty sand (SM) containing organic material (topsoil). Underlying the silty sand topsoil, our test pits encountered medium dense to very dense silty Sand (SM), clayey Sand (SC), and poorly graded Sand (SP) to the maximum depth explored of approximately 10.5 feet below the ground surface (bgs). Hard, lean Clay with sand (CL) was encountered in Test Pits TP-4 and TP-5 at depths of 4.5 to 10.5 feet bgs and 1.5 to 4 feet bgs, respectively. More detailed descriptions of the subsurface conditions observed are presented in our Soil Profile Logs attached to this letter report.

Based on the Natural Resource Conservation Service Web Soil Survey (2016), the site is underlain by Delleker sandy loam on 2 to 15 percent slopes, eroded surface. Our test pits encountered a soil profile that included sandy clay to clay in TP-4 and TP-5. Our test pits and percolation holes primarily encountered USDA soil classification of loamy sand, sandy loam and silt loam that exhibited moderate to moderately rapid percolation rates. However, in Percolation Test Hole PT-6, we encountered sandy clay to clay loam similar to the profile encountered in TP-5 that exhibited a moderately low percolation rate.

We performed laboratory tests on bulk soil samples collected from our exploratory test pits to evaluate their engineering properties. Sieve analysis and Atterberg limits data resulted in Unified Soil Classification System (USCS) classifications of clayey Sand (SC) and lean Clay with sand (CL). USCS classifications and Atterberg indices are summarized below. Laboratory test results are attached at the end of this report.

Summary of Laboratory Test Results

Test Pit Number	Depth (feet)	USCS Classification	Percent Passing #200 Sieve	Liquid Limit	Plasticity Index
TP-1	4.5 – 5	Clayey Sand (SC)	15	–	–
TP-2	1 – 1.5	Clayey Sand (SC)	25	–	–
TP-4	4.5 – 5	Lean Clay with Sand (CL)	–	29	13
TP-5	2 – 2.5	Lean Clay with Sand (CL)	81	39	22

Groundwater and Piezometers

At the request of the Plumas County Environmental Health Department (PCEHD), we installed three piezometers (P-1 through P-3) extending to depths of approximately 8 to 8.5 feet bgs. The piezometers consisted of 4-inch diameter, perforated, PVC pipe with a bottom cap and removable top cap. Each PVC pipe was wrapped with filter fabric and placed inside the ends of Test Pits TP-2, TP-3B, and TP-5. Excavated soil was then backfilled around each pipe. The ground surface around each piezometer was mounded to reduce the potential for surface water infiltration.

Groundwater was not encountered in our test pits, with the exception of Test Pit TP-4 which encountered groundwater at a depth of approximately 10 feet bgs. The depth to groundwater was measured by the Feather River Land Trust in piezometers on a monthly, and later, on a weekly interval. The attached Table 1 presents the Piezometer readings. Cross-sections were developed to show groundwater conditions underlying the site. A Topographic Cross Section Location Plan is shown on Figure 2. The depth to groundwater measured from on-site piezometers is shown on Figure 3, Topographic Sections and Groundwater Level.

The winter of 2020 was below average precipitation within the Feather River watershed. Based on data from the California Department of Water Resources (DWR Bulletin 120), water year 2020 started out dry until the last week in November when a major Pacific storm brought decent amounts of rain to California with moisture continuing through most of December, then January and February were dry. March and April were a vast improvement from a water standpoint in California, resulting in 55 percent of annual normal water conditions in the Feather River watershed.

The groundwater level was measured this spring at an elevation of approximately 4,870 to 4,873 feet above mean sea level (MSL). Based on our experience in the Sierra Valley, the groundwater level may be 1 to 2 feet higher during a wetter year than the 2020 water year. Based on the topographic cross-sections and groundwater elevation data shown on Figure 3, the site is located on a topographic knoll that provides a minimum effective soil depth above groundwater of at least 4 feet.

Dense granular soil was encountered beneath topsoil throughout most of the site (approximately 6 inches bgs). In addition, hard fine-grained soil was encountered in Test Pits TP-4 and TP-5 at depths ranging from approximately 1.5 to 4.5 feet bgs. Depending on final site grades, rainfall, irrigation practices, and other factors, perched groundwater will likely seasonally develop above onsite dense and fine-grained soil.

Percolation Tests

We completed six percolation tests (PT-1 through PT-6) on April 29, and May 16, 2020, at depths ranging from 26 to 32 inches bgs. The percolation rate tests were located in possible primary and repair wastewater disposal areas and advanced using hand excavating equipment. All test holes were pre-soaked 24 hours prior to completing rate tests. The tests were performed by installing a 6-inch diameter slotted pipe with approximately 2 inches of 3/8-inch gravel on the bottom and in the annular space between the pipe and soil. Successive

readings of the drop in water level were made over several 30-minute periods until a stabilized drop was recorded. Measurements were referenced from the top of the pipe. A correction factor of 1.14 was applied to the measured percolation rate similar to Nevada County regulations to account for the relation of the hole diameter and gravel filled annular space.

Percolation rate test results varied across the site with a stabilized range from 10 to 50 minutes per inch (mpi). Percolation Test Report Forms are attached to this letter. The soil underlying the area of Percolation Test PT-6 generally consists of clayey Sand (SC) from about 1 ½ feet to 4 feet below the ground surface. Otherwise, no confining layers were observed in the soil profile exposed in our test pits in this area. The approximate location of our field exploration and percolation rates are shown on Figure 1, Test Pit, Piezometer, and Percolation Test Location Plan.

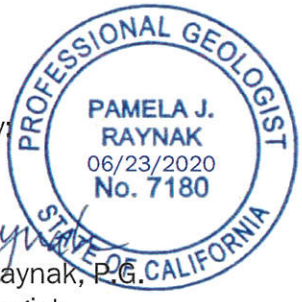
CLOSING

The findings presented in this report are based on our subsurface exploration, laboratory test results, percolation tests, and experience in the project area. We recommend retaining our firm to provide construction monitoring services during wastewater disposal system excavation to observe subsurface conditions encountered with respect to our recommendations provided in this report. As plans develop, we should be consulted concerning the need for additional services.

Please contact us if you have any questions regarding this report or if we can be of additional service.

Sincerely,
NV5

Prepared by:



Pamela J. Raynak, P.G.
Senior Geologist

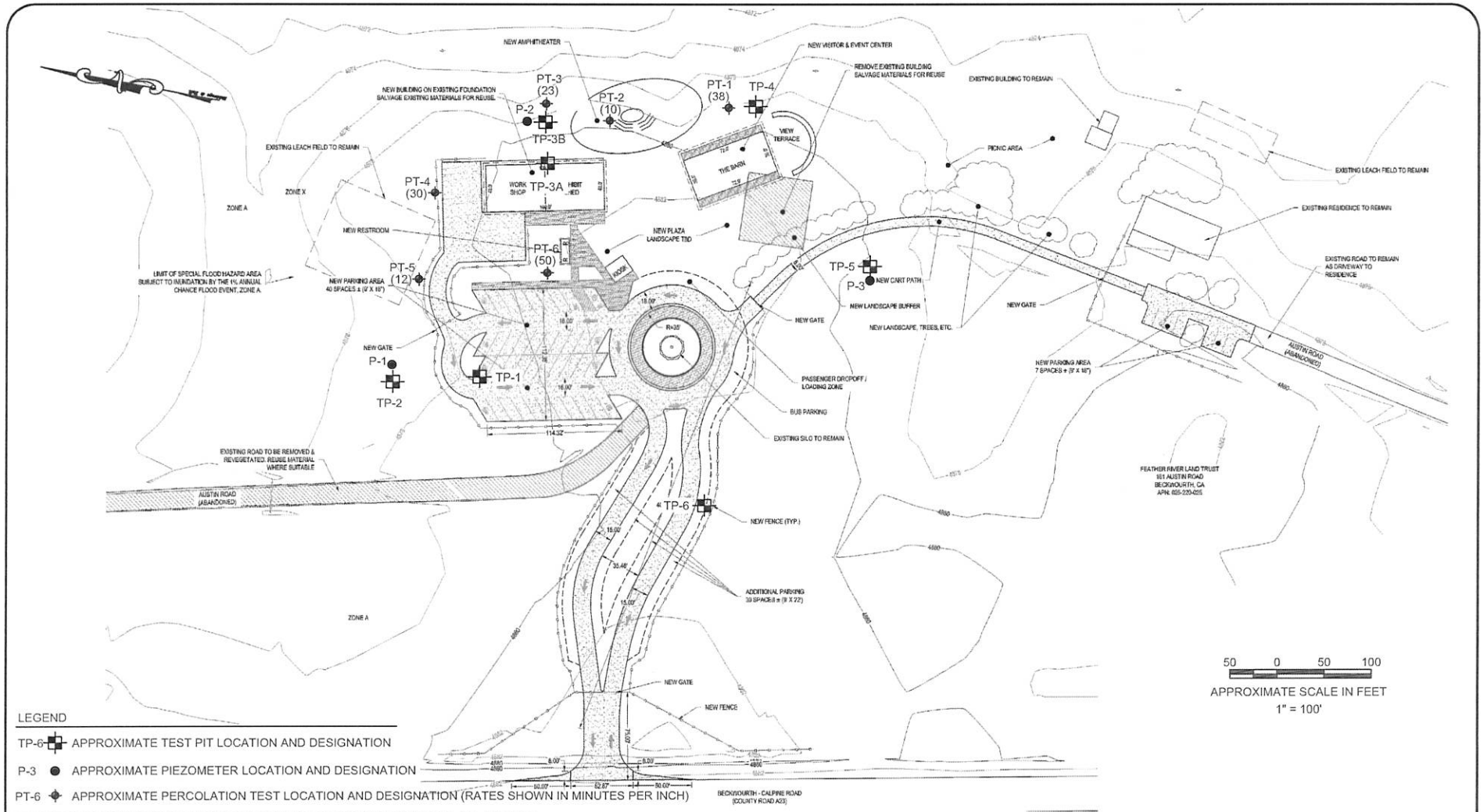
Reviewed by:

John K. Hudson, P.E., C.E.G.
Associate Engineer

copies: Jason Pignolet, Arkin Tilt Architects
Andrew Ryan, PR Design & Engineering, Inc.
Jason Lynn, PR Design & Engineering, Inc.

ATTACHMENTS

Figure 1 Test Pit, Piezometer, and Percolation Test Location Plan
Figure 2 Topographic Cross Section Location Plan
Figure 3 Topographic Section and Groundwater Level
Table 1 Table 1 Piezometer Readings
Soil Profile Logs (7 Sheets)
Laboratory Test Results (6 Sheets)
Percolation Test Report Forms (6 Sheets)

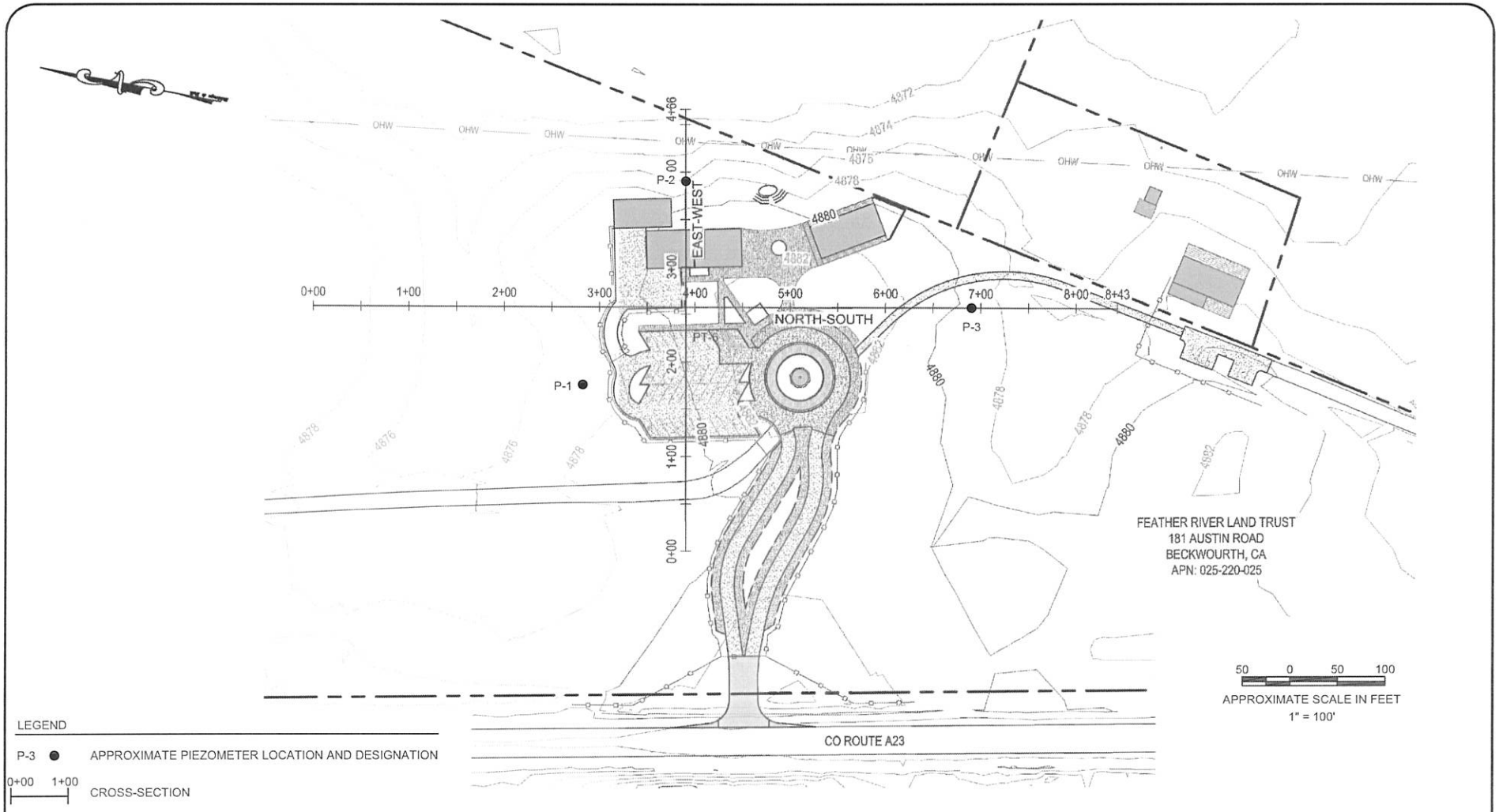


MODIFIED FROM PRELIMINARY SITE PLAN PREPARED BY PR DESIGN & ENGINEERING, INC. UNDATED.

NV5

TEST PIT, PIEZOMETER, AND PERCOLATION TEST LOCATION PLAN
SIERRA VALLEY PRESERVE VISITOR CENTER
BECKWOURTH, PLUMAS COUNTY, CALIFORNIA

DRAWN BY: PJR	CHECKED BY: JKH
PROJECT NO.: 42686.00	
DATE: JUNE 2020	
FIGURE NO.: 1	



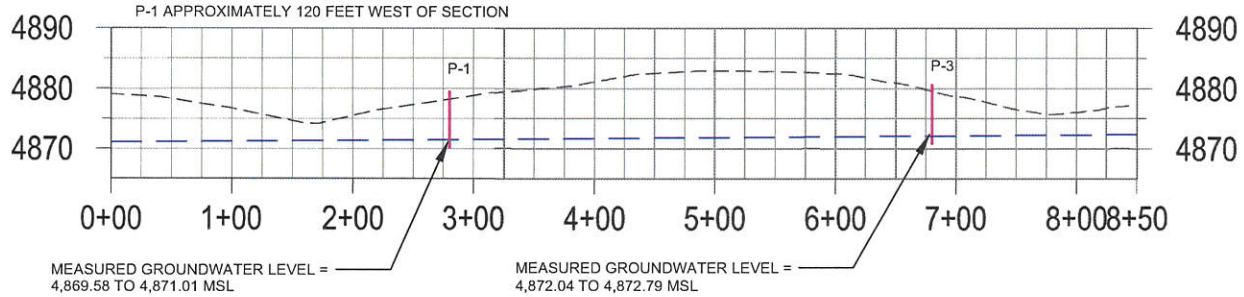
MODIFIED FROM SITE EXHIBIT, FIGURE 1, PREPARED BY PR DESIGN & ENGINEERING, INC., DATED MAY 13, 2020.

NV5

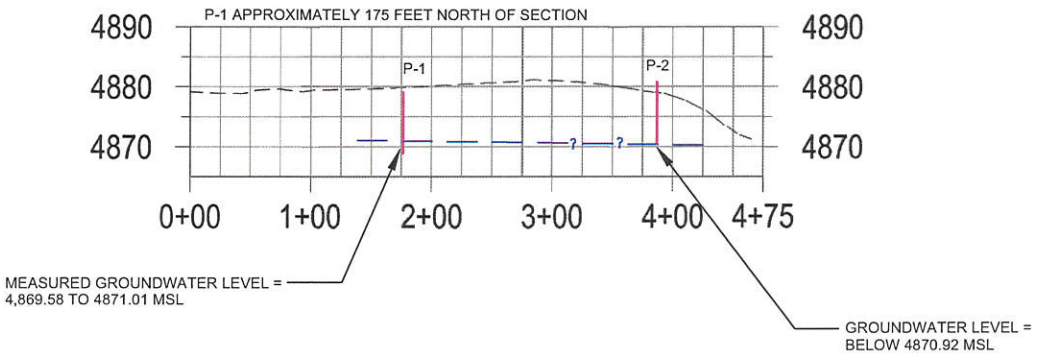
TOPOGRAPHIC CROSS-SECTION LOCATION PLAN
SIERRA VALLEY PRESERVE VISITOR CENTER
BECKWOURTH, PLUMAS COUNTY, CALIFORNIA

DRAWN BY: PJR	CHECKED BY: JKH
PROJECT NO.: 42686.00	
DATE: JUNE 2020	
FIGURE NO.: 2	

NORTH-SOUTH SECTION



EAST-WEST SECTION



LEGEND

P-3 APPROXIMATE PIEZOMETER LOCATION AND DESIGNATION
MSL FEET ABOVE MEAN SEA LEVEL

SITE SECTIONS
H: 1" = 100' / V: 1" = 20'

MODIFIED FROM SITE EXHIBIT, FIGURE 2, PREPARED BY PR DESIGN & ENGINEERING, INC., DATED MAY 13, 2020.

NV5

TOPOGRAPHIC CROSS-SECTIONS AND GROUNDWATER LEVEL
SIERRA VALLEY PRESERVE VISITOR CENTER
BECKWOURTH, PLUMAS COUNTY, CALIFORNIA

DRAWN BY: PJR	CHECKED BY: JKH
PROJECT NO.: 42686.00	
DATE: JUNE 2020	
FIGURE NO.: 3	

Table 1 - Sierra Valley Preserve Piezometer Readings, Plumas County, California

Piezometer No.	Ground Surface Elevation (Feet Above Mean Sea Level)	Surveyed Top of Casing (Feet Above Mean Sea Level)	Date Installed	Date of Water Level Measurement	Water Surface (feet below top of casing)	Water Surface (feet below ground surface)	Approximate Water Surface Elevation (feet above mean sea level)
P-1	4876.79	4878.94	1/15/2020				
				2/7/2020	9.6	7.45 (Dry Well)	Below 4,869.34
				3/9/2020	9.6	7.45 (Dry Well)	Below 4,869.34
				4/13/2020	7.93	5.78	4,871.01
				5/8/2020	8.1	5.95	4,870.84
				5/26/2020	8.5	6.35	4,870.44
				6/2/2020	8.6	6.45	4,870.34
				6/10/2020	8.75	6.6	4,870.19
				6/16/2020	8.96	7.21	4,869.58
Top of casing approximately 2.15 feet above ground surface.							
*Note - Casing length = 9.60 feet.							
P-2	4878.47	4880.57	1/15/2020				
				2/7/2020	9.65	7.55 (Dry Well)	Below 4,870.92
				3/9/2020	9.65	7.55 (Dry Well)	Below 4,870.92
				4/13/2020	9.65	7.55 (Dry Well)	Below 4,870.92
				5/8/2020	9.65	7.55 (Dry Well)	Below 4,870.92
				5/26/2020	9.65	7.55 (Dry Well)	Below 4,870.92
				6/2/2020	9.65	7.55 (Dry Well)	Below 4,870.92
				6/10/2020	9.65	7.55 (Dry Well)	Below 4,870.92
				6/16/2020	9.65	7.45 (Dry Well)	Below 4,870.92
Top of casing approximately 2.1 feet above ground surface.							
*Note - Casing length = 9.65 feet.							
P-3	4879.29	4881.04	1/15/2020				
				2/7/2020	8.25	6.5	4872.79
				3/9/2020	8.4	6.65	4872.64
				4/13/2020	8.3	6.55	4872.74
				5/8/2020	8.3	6.55	4872.74
				5/26/2020	8.5	6.75	4872.54
				6/2/2020	8.84	7.09	4872.20
				6/10/2020	8.54	6.79	4872.50
				6/16/2020	9.0	7.25	4872.04
Top of casing approximately 1.75 feet above ground surface.							
*Note - Casing length = 9.06 feet.							
**Notes from 6/2/2020 monitoring indicate plant decomposition and probable organic odor at bottom of piezometer.							

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

COARSE GRAINED SOIL More than 50% of the soil is retained on the No. 200 sieve	GRAVEL More than 50% coarse fraction is larger than the No. 4 sieve size	Clean Gravel with less than 5% fines*	GW		WELL GRADED GRAVEL, GRAVEL SAND MIXTURES
			GP		POORLY GRADED GRAVEL, GRAVEL SAND MIXTURES
		Gravel with more than 12% fines*	GM		SILTY GRAVEL, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVEL, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
	SAND More than 50% coarse fraction is smaller than the No. 4 sieve size	Clean Sand with less than 5% fines*	SW		WELL GRADED SAND, GRAVELY SAND
			SP		POORLY GRADED SAND, GRAVELY SAND
		Sand with more than 12% fines*	SM		SILTY SAND, POORLY GRADED SAND-SILT MIXTURE
			SC		CLAYEY SAND, POORLY GRADED SAND-SILT MIXTURE
FINE GRAINED SOIL More than 50% of the soil passes the No. 200 sieve	SILT AND CLAY Liquid limit less than 50		ML		INORGANIC SILT & VERY FINE SAND, ROCK FLOUR, SILTY OR CLAYEY FINE SAND, OR CLAYEY SILT WITH SLIGHT PLASTICITY
			CL		INORGANIC CLAY OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAY, SANDY CLAY, SILTY CLAY, LEAN CLAY
			OL		ORGANIC CLAY AND ORGANIC SILTY CLAY OF LOW PLASTICITY
	SILT AND CLAY Liquid limit greater than 50		MH		INORGANIC SILT, MIMCACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOIL, ELASTIC SILT
			CH		INORGANIC CLAY OF HIGH PLASTICITY, FAT CLAY
			OH		ORGANIC CLAY OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILT
HIGHLY ORGANIC SOIL			Pt		PEAT AND OTHER HIGHLY ORGANIC SOIL
ROCK			RX		ROCK

* Hybrid classifications are used when the fines content is between 5% and 12% (e.g, SP-SM, GP-GM, SW-SC, GW-GC, etc.)

SAMPLE DESIGNATION

- MODIFIED CALIFORNIA SAMPLER (3" OUTSIDE DIAMETER)
- MODIFIED CALIFORNIA SAMPLER (2-1/2" OUTSIDE DIAMETER)
- STANDARD PENETRATION SPLIT SPOON SAMPLER (2" OUTSIDE DIAMETER)
- BULK OR CLASSIFICATION SAMPLE
- SHELBY TUBE (3" OUTSIDE DIAMETER)

KEY TO SYMBOLS

▽	OBSERVED GROUNDWATER
▼	STABILIZED GROUNDWATER LEVEL
LL	LIQUID LIMIT
PL	PLASTIC LIMIT
PI	PLASTICITY INDEX
Gs	SPECIFIC GRAVITY
PERM	PERMEABILITY
CONSOL	CONSOLIDATION
SA	SIEVE ANALYSIS
-200	PERCENT PASSING NO. 200 SIEVE

NON-COHESIVE (GRANULAR) SOIL

RELATIVE DENSITY	SPT BLOWS PER FOOT (N)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	51 +

BLOW COUNTS

BLOW COUNTS REPRESENT THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER EVERY 6 INCHES OF AN 18-INCH DRIVE OR FRACTION INDICATED. BLOW COUNTS PRESENTED ON LOGS HAVE NOT BEEN ADJUSTED.

COHESIVE (CLAYEY) SOIL

COMPARATIVE CONSISTENCY	SPT BLOWS PER FOOT (N)	UNCONFINED COMPRESSIVE STRENGTH (TSF)
VERY SOFT	0 - 2	0 - 0.25
SOFT	3 - 4	0.25 - 0.50
MEDIUM STIFF	5 - 8	0.50 - 1.00
STIFF	9 - 15	1.00 - 2.00
VERY STIFF	16 - 30	2.00 - 4.00
HARD	31 +	4.00 +

SOIL CONTACTS

- SOLID - WELL-DEFINED CHANGE
- DASHED - GRADATIONAL OR APPROXIMATE CHANGE

MOISTURE CONTENT

CLASSIFICATION	DESCRIPTION
DRY	FREE OF MOISTURE, DUSTY, DRY TO THE TOUCH
SLIGHTLY MOIST	BELOW THE SOIL'S OPTIMUM MOISTURE CONTENT, BUT NOT DRY
MOIST	NEAR THE SOIL'S OPTIMUM MOISTURE CONTENT
VERY MOIST	ABOVE THE SOIL'S OPTIMUM MOISTURE CONTENT, BUT NOT WET
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

CEMENTATION

CLASSIFICATION	DESCRIPTION
WEAK	CRUMBLES OR BREAKS WITH HANDLING OR SLIGHT FINGER PRESSURE
MODERATE	CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE
STRONG	WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE

MINOR CONSTITUENT QUANTITIES

QUALIFIER	DESCRIPTION
TRACE	PARTICLES ARE PRESENT, BUT ESTIMATED TO BE LESS THAN 5%
SOME	5 to 12%
WITH	12 to 30%

NV5

SOIL CLASSIFICATION KEY

SIERRA VALLEY PRESERVE VISITOR CENTER

BECKWOURTH, PLUMAS COUNTY, CALIFORNIA

PROJECT NO.: 42686.00

DATE: JUNE 2020

FIGURE NO.:

TEST PIT NO. TP-1

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42686.00	SIERRA VALLEY PRESERVE VISITOR CENTER	~4,878 FT MSL	01/15/2020	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
JOY ENGINEERING	JIM	VOLVO RX3W86 MINI-EXCAVATOR W/36" BKT

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
NCM	BULK	NO	NO

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
					SM	3 TO 4 INCHES BROWN SILTY SAND (SM); MOIST, LOOSE, WITH ORGANICS (TOPSOIL)
			1		SM	BROWN SILTY SAND (SM); MOIST, DENSE, FINE SAND, EST. 15% FINES USDA CLASSIFICATION: LOAMY SAND
			2			
1-1	--	--			SM	REDDISH BROWN SILTY SAND (SM); MOIST, DENSE, FINE SAND, EST. 25% TO 30% FINES USDA CLASSIFICATION: SANDY LOAM
			3			
			4		SC	DARK GRAYISH BROWN CLAYEY SAND (SC); SLIGHTLY MOIST, DENSE
1-2	--	15	5			USDA CLASSIFICATION: LOAMY SAND SAND 85% SILT 8% CLAY 7%
			6			
			7			INCREASING GRAVEL WITH DEPTH
			8			
			9			
			10			TEST PIT TERMINATED AT 10 FEET BGS
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

TEST PIT NO. TP-2

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42686.00	SIERRA VALLEY PRESERVE VISITOR CENTER	~4,878 FT MSL	01/15/2020	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
JOY ENGINEERING	JIM	VOLVO RX3W86 MINI-EXCAVATOR W/36" BKT

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
NCM	BULK	NO	NO

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
					SM	2 TO 3 INCHES BROWN SILTY SAND (SM); MOIST, LOOSE, WITH ORGANICS (TOPSOIL)
2-1	--	25	1		SC	BROWN CLAYEY SAND (SC); MOIST, MEDIUM DENSE TO DENSE, FINE SAND, OCCASIONAL FINE ROOTS USDA CLASS.: SANDY CLAY LOAM
			2		SM	BROWN SILTY SAND (SM); MOIST, DENSE, FINE SAND, EST. 20% TO 25% FINES USDA CLASSIFICATION: SANDY LOAM
			3			
			4		SP	LIGHT BROWN POORLY GRADED SAND (SP); MOIST, DENSE, FINE TO COARSE SAND USDA CLASSIFICATION: LOAMY SAND SAND 85% SILT 8% CLAY 7%
			5			
			6			
			7			
			8			TEST PIT TERMINATED AT 8 FEET BGS INSTALLED PIEZOMETER P-1
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

TEST PIT NO. TP-3B

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42686.00	SIERRA VALLEY PRESERVE VISITOR CENTER	~4,878 FT MSL	01/15/2020	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
JOY ENGINEERING	JIM	VOLVO RX3W86 MINI-EXCAVATOR W/36" BKT

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
NCM	BULK	NO	NO

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
			0		SM	4 TO 6 INCHES BROWN SILTY SAND (SM); MOIST, LOOSE, WITH ORGANICS (TOPSOIL)
			1		SM	DARK BROWN SILTY SAND (SM); MOIST, MEDIUM DENSE TO DENSE, FREQUENT VERY FINE ROOTS, EST. 30% FINES SANDY LOAM
			2		SM	LIGHT BROWN SILTY SAND (SM); MOIST, DENSE TO VERY DENSE, FINE TO SOME COARSE SAND, EST. 25% TO 30% FINES
3-1	--	--	3			USDA CLASSIFICATION: SANDY LOAM
			4		SP	LIGHT BROWN POORLY GRADED SAND (SP); MOIST, DENSE TO VERY DENSE, FINE SAND, OCCASIONAL COARSE SAND, EST. LESS THAN 10% FINES
3-2	--	--	5			USDA CLASSIFICATION: SAND
			6			
			7			
			8			TEST PIT TERMINATED AT 8 FEET BGS INSTALLED PIEZOMETER P-2
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

TEST PIT NO. TP-4

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42686.00	SIERRA VALLEY PRESERVE VISITOR CENTER	~4,878 FT MSL	01/15/2020	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
JOY ENGINEERING	JIM	VOLVO RX3W86 MINI-EXCAVATOR W/36" BKT

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
NCM	BULK	YES @ 10 FEET BGS	NO

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
					SM	6 TO 8 INCHES DARK BROWN SILTY SAND (SM); MOIST, LOOSE, WITH ORGANICS (TOPSOIL)
			1		SM	DARK BROWN SILTY SAND (SM); MOIST, DENSE, FINE SAND, OCCASIONAL FINE ROOTS, EST. 30% TO 35% FINES USDA CLASSIFICATION: SANDY LOAM
			2			
			3			
4-1	--	--	4		SM	BROWN SILTY SAND (SM); MOIST, DENSE TO VERY DENSE, FINE SAND, TRACE FINE ROOTS, EST. 20% TO 25% FINES USDA CLASSIFICATION: SANDY LOAM
4-2	+4.5	>50	5		CL	DARK GRAYISH BROWN LEAN CLAY WITH SAND (CL); MOIST TO WET, HARD, FINE SAND USDA CLASSIFICATION: CLAY
			6			
			7			
			8			
			9			
			10		▽	
			11			TEST PIT TERMINATED AT 10.5 FEET BGS
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

TEST PIT NO. TP-5

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42686.00	SIERRA VALLEY PRESERVE VISITOR CENTER	~4,880 FT MSL	01/15/2020	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
JOY ENGINEERING	JIM	VOLVO RX3W86 MINI-EXCAVATOR W/36" BKT

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
NCM	BULK	NO	NO

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
			0		SM	6 INCHES DARK BROWN SILTY SAND (SM); MOIST, LOOSE, WITH ORGANICS (TOPSOIL)
			1		SM	MOTTLED DARK BROWN AND BLACK SILTY SAND (SM); MOIST, MEDIUM DENSE TO DENSE, FINE ROOTS, EST. 30% TO 35% FINES USDA CLASSIFICATION: SANDY LOAM
5-1	+4.5	81	2		CL	DARK GRAYISH BROWN LEAN CLAY WITH SAND (CL); MOIST, HARD, TRACE FINE ROOTS USDA CLASSIFICATION: CLAY
			3			
			4		SP	LIGHT BROWN POORLY GRADED SAND (SP); MOIST, DENSE, FINE SAND, EST. LESS THAN 10% FINES USDA CLASSIFICATION: SAND
			5			
			6			
			7			
			8			
			9			TEST PIT TERMINATED AT 8.5 FEET BGS INSTALLED PIEZOMETER P-3
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

TEST PIT NO. TP-6

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE
42686.00	SIERRA VALLEY PRESERVE VISITOR CENTER	~4,880 FT MSL	01/15/2020	1 OF 1

EXCAVATING CONTRACTOR	OPERATOR	EXCAVATING METHOD AND BUCKET SIZE
JOY ENGINEERING	JIM	VOLVO RX3W86 MINI-EXCAVATOR W/36" BKT

LOGGED BY	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
NCM	BULK	NO	NO

SAMPLE NO.	POCKET PEN. (TSF)	PERCENT PASSING #200 SIEVE	DEPTH (FEET)	GRAPHIC LOG	USCS	DESCRIPTIONS/REMARKS
			0		SM	6 INCHES VERY DARK BROWN SILTY SAND (SM); MOIST, LOOSE, WITH ORGANICS (TOPSOIL)
			1		SM	BROWN SILTY SAND (SM); MOIST, MEDIUM DENSE TO DENSE, FINE SAND, EST. 25% TO 30% FINES USDA CLASSIFICATION: SANDY LOAM
			2		SM	BROWN SILTY SAND WITH GRAVEL (SM); SLIGHTLY MOIST, VERY DENSE, FINE SAND, EST. 30% TO 35% FINES USDA CLASSIFICATION: SANDY LOAM
6-1	--	--	3			
			4		SP	LIGHT BROWN POORLY GRADED SAND (SP); MOIST, DENSE, FINE SAND, EST. LESS THAN 10% FINES USDA CLASSIFICATION: SAND
			5			
			6			
			7			
			8			
			9			
			10			TEST PIT TERMINATED AT 10 FEET BGS
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

NV5

PARTICLE SIZE DISTRIBUTION

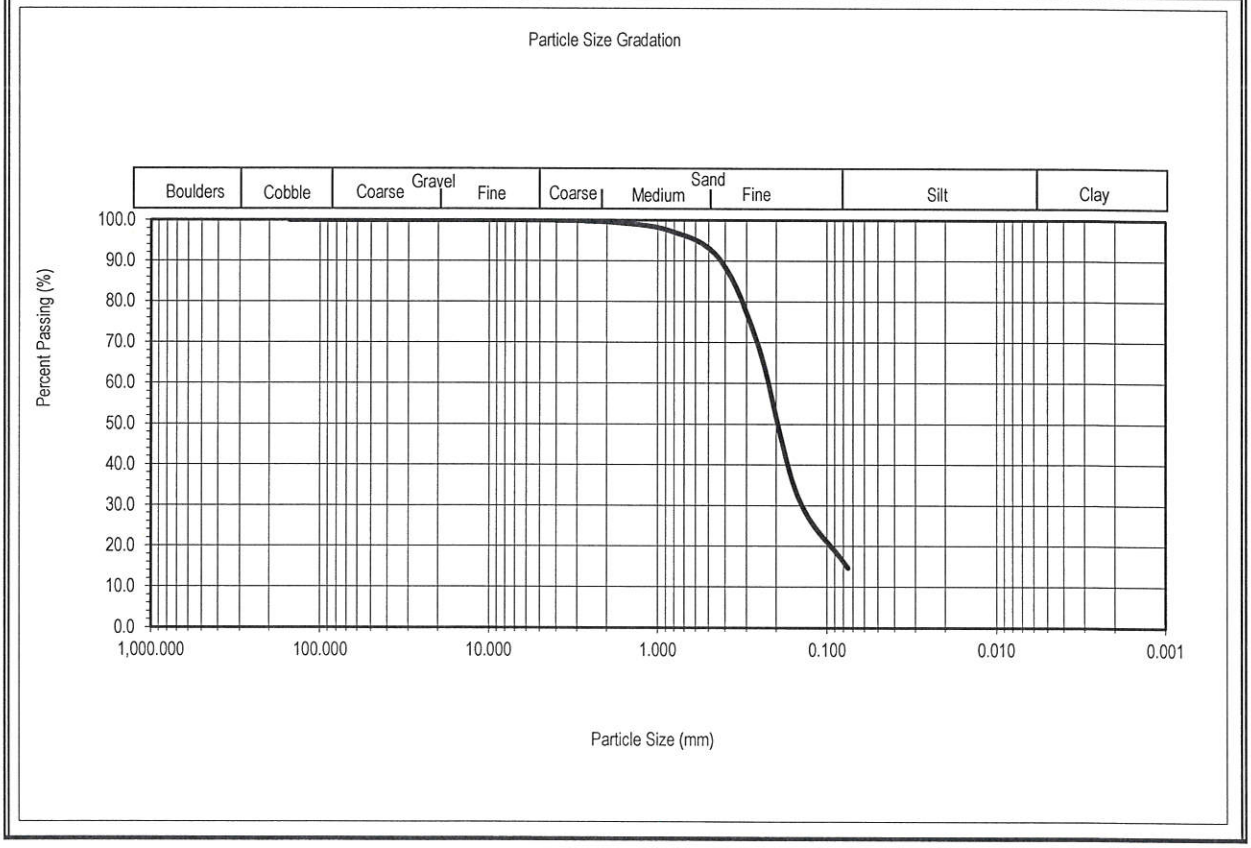
ASTM D422

DSA File #:

DSA Appl #:

Project No.:	42686.00	Project Name:	Sierra Valley Preserve	Date:	1/21/2020
Sample No.:	1-2	Boring/Trench:	TP-1	Depth, (ft.): 4.5-5	Tested By: SJS/SLN
Description:	Dark Grayish Brown (10YR 4/2) Clayey Sand (SC)			Checked By:	MLH
Sample Location:				Lab. No.:	15-20-015

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent Passing
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	2,191.0	**100.0**
3 Inch	3.0000	76.2	0.00	0.0	2,191.0	**100.0**
2 Inch	2.0000	50.8	0.00	0.0	2,191.0	**100.0**
1.5 Inch	1.5000	38.1	0.00	0.0	2,191.0	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	2,191.0	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	2,191.0	**100.0**
1/2 Inch	0.5000	12.7	0.00	0.0	2,191.0	**100.0**
3/8 Inch	0.3750	9.5	0.00	0.0	2,191.0	**100.0**
#4	0.1870	4.7500	0.00	0.0	2,191.0	**100.0**
#10	0.0787	2.0000	10.07	10.1	2,180.9	**99.5**
#20	0.0335	0.8500	46.41	56.5	2,134.5	**97.4**
#40	0.0167	0.4250	160.48	217.0	1,974.0	**90.1**
#60	0.0098	0.2500	482.57	699.5	1,491.4	**68.1**
#100	0.0059	0.1500	773.89	1,473.4	717.5	**32.7**
#200	0.0030	0.0750	395.34	1,868.8	322.2	**14.7**



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CQA – INFRASTRUCTURE – ENERGY – PROGRAM MANAGEMENT – ENVIRONMENTAL

PARTICLE SIZE DISTRIBUTION

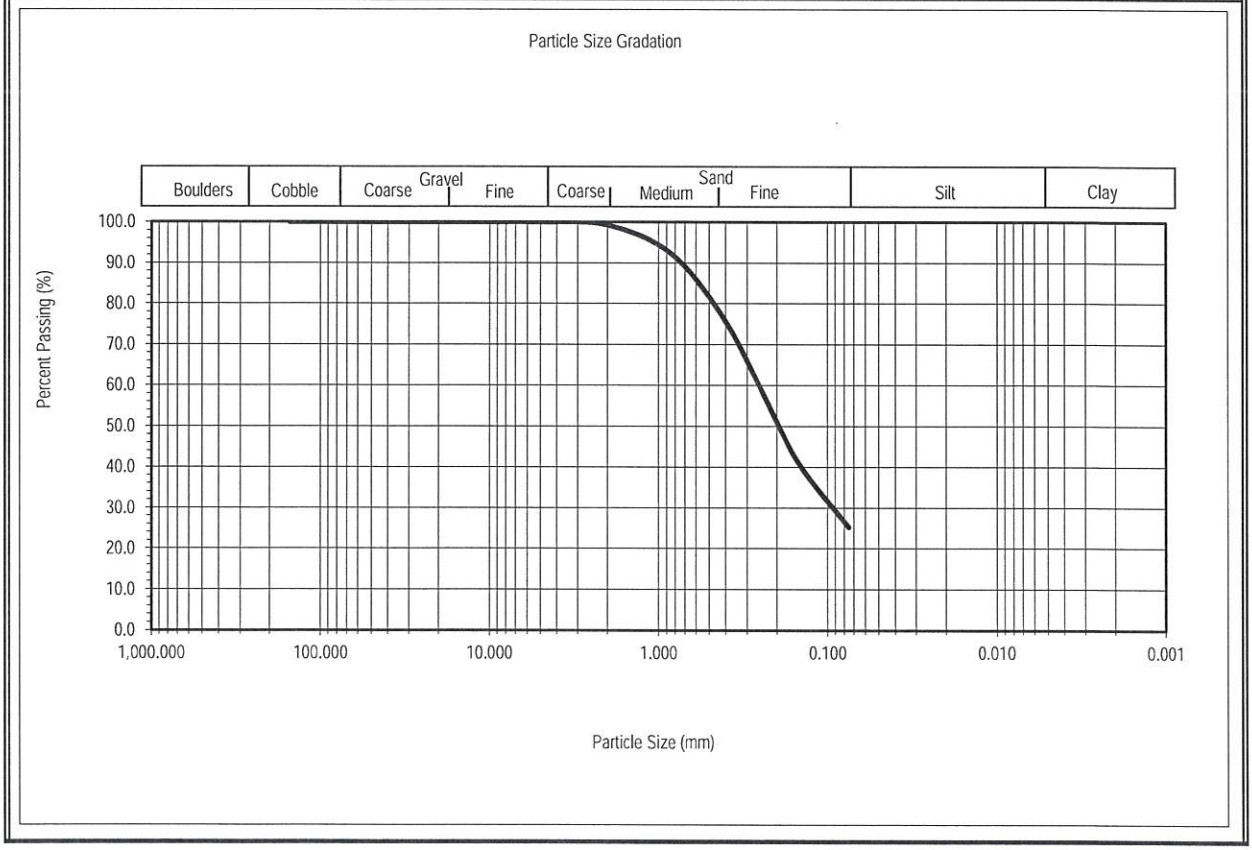
ASTM D422

DSA File #:

DSA Appl #:

Project No.:	42686.00	Project Name:	Sierra Valley Preserve	Date:	1/21/2020
Sample No.:	2-1	Boring/Trench:	TP-2	Depth, (ft.): 1-1.5	Tested By: SJS/SLN
Description:	Brown (10YR 4/3) Clayey Sand (SC)				Checked By: MLH
Sample Location:					Lab. No.: 15-20-015

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	2,294.8	100.0
3 Inch	3.0000	76.2	0.00	0.0	2,294.8	100.0
2 Inch	2.0000	50.8	0.00	0.0	2,294.8	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	2,294.8	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	2,294.8	100.0
3/4 Inch	0.7500	19.1	0.00	0.0	2,294.8	100.0
1/2 Inch	0.5000	12.7	0.00	0.0	2,294.8	100.0
3/8 Inch	0.3750	9.5	0.00	0.0	2,294.8	100.0
#4	0.1870	4.7500	0.00	0.0	2,294.8	100.0
#10	0.0787	2.0000	17.25	17.2	2,277.5	99.2
#20	0.0335	0.8500	156.51	173.8	2,121.0	92.4
#40	0.0167	0.4250	344.93	518.7	1,776.1	77.4
#60	0.0098	0.2500	410.47	929.2	1,365.6	59.5
#100	0.0059	0.1500	418.23	1,347.4	947.4	41.3
#200	0.0030	0.0750	367.78	1,715.2	579.6	25.3



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CQA – INFRASTRUCTURE – ENERGY – PROGRAM MANAGEMENT – ENVIRONMENTAL

ATTERBERG INDICES

ASTM D4318

DSA File #:

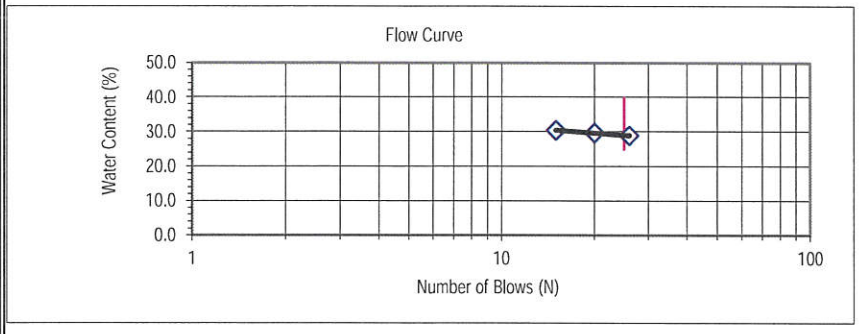
DSA Appl #:

Project No.:	42686.00	Project Name:	Sierra Valley Preserve	Date:	1/21/2020
Sample No.:	4-2	Boring/Trench:	TP-4	Depth, (ft.): 4.5-5	Tested By: SLN
Description:	Dark Grayish Brown (10YR 4/2) Lean Clay with Sand (SC)			Checked By:	MLH
Sample Location:				Lab. No.:	15-20-015

Estimated % of Sample Retained on No. 40 Sieve: 10 Sample Air Dried: yes

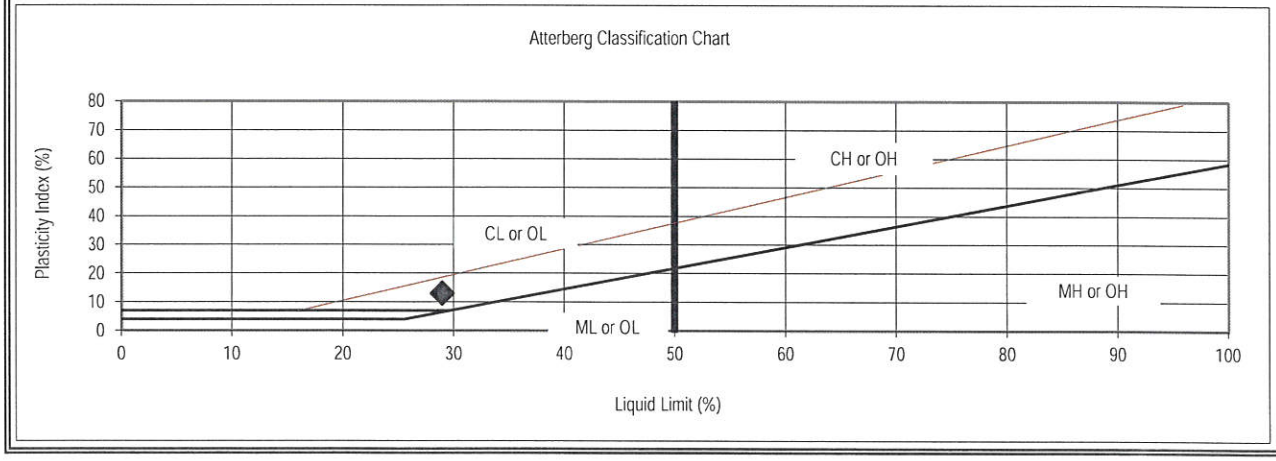
Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	2	T	13			5	G	
Wt. Pan (gr)	15.24	15.02	15.18			15.44	15.41	
Wt. Wet Soil + Pan (gr)	33.50	31.63	26.25			21.82	22.13	
Wt. Dry Soil + Pan (gr)	29.41	27.83	23.67			20.91	21.22	
Wt. Water (gr)	4.09	3.80	2.58			0.91	0.91	
Wt. Dry Soil (gr)	14.17	12.81	8.49			5.47	5.81	
Water Content (%)	28.9	29.7	30.4			16.6	15.7	
Number of Blows, N	26	20	15					
				LIQUID LIMIT =	29		PLASTIC LIMIT =	16



Plasticity Index = 13

Group Symbol = CL



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EXPANSION INDEX/SWELL

ASTM D4829

DSA File #:

DSA Appl #:

Project No.:	42686.00	Project Name:	Sierra Valley Preserve		Date: 1/21/2020
Sample No.:	4-2	Boring/Trench No.:	TP-4	Depth (ft.) 4.5-5	Tested By: MLH
Soil Description:	Dark Grayish Brown (10YR 4/2) Lean Clay with Sand (CL)				Checked By: MLH
Estimated % of sample retained on #4:		Notes:			Lab. No.: 15-20-015

Specimen Type:	Undisturbed:	Disturbed:	Remolded to:	ASTM Guidelines
Tube Dia. (Inch) =		Ring Dia. (Inch) = 4	Ring Height (Inch) = 1.00	

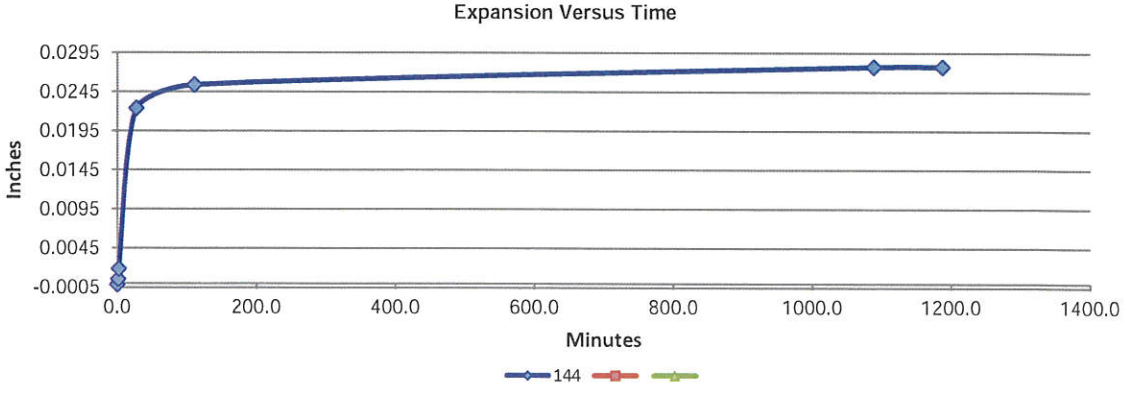
FIELD DATA Tube Sample Moisture & Density			LAB DATA	Test wt. Initial	144 Final	Test wt. Initial	Final	Test wt. Initial	Final
Tare Tube Number			Tare Number	B-40					
Tare Weight	(gr)		Tare Ring Weight (gr)	369.60	369.60				
Wet Soil + Tare	(gr)		Tare Pan Weight (gr)	0.00	267.27				
Dry Soil + Tare	(gr)		Wet Soil + Tare (gr)	737.36	1047.25				
Weight of Water	(gr)	0.00	Dry Soil + Tare (gr)	695.19	962.46	0.00		0.00	
Dry Soil Weight	(gr)	0.00	Weight of Water (gr)	42.17	84.79	0.00	0.00	0.00	0.00
Moisture Content	(%)	0.00	Dry Soil Weight (gr)	325.59	325.59	0.00	0.00	0.00	0.00
Soil Height	(In.)		Moisture Content (%)	12.95	26.04	0.00	0.00	0.00	0.00
Wet Unit Weight	(pcf)		Wet Unit Weight (pcf)	111.50	121.06				
Dry Unit Weight	(pcf)		Dry Unit Weight (pcf)	98.72	96.05				
			Sample Height (Inches)	1.00	1.028				
Specific Gravity		2.7	Percent Saturation	49.48	93.23				

Expansion Index Number

Surcharge (psf)	Uncorrected	Corrected to 50% Saturation
Test wt. 144	28	28
Test wt.		
Test wt.		

Elapsed Time (m:s)	Change in Height (Inches)	Elapsed Time (m:s)	Change in Height (Inches)	Elapsed Time (m:s)	Change in Height (Inches)
0.0	-0.0001				
1.0	0.0006				
2.0	0.0019				
27.0	0.0224				
110.0	0.0254				
1089.0	0.0278				
1188.0	0.0278				

Expansion Index Values and Descriptions	
Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High



PARTICLE SIZE DISTRIBUTION

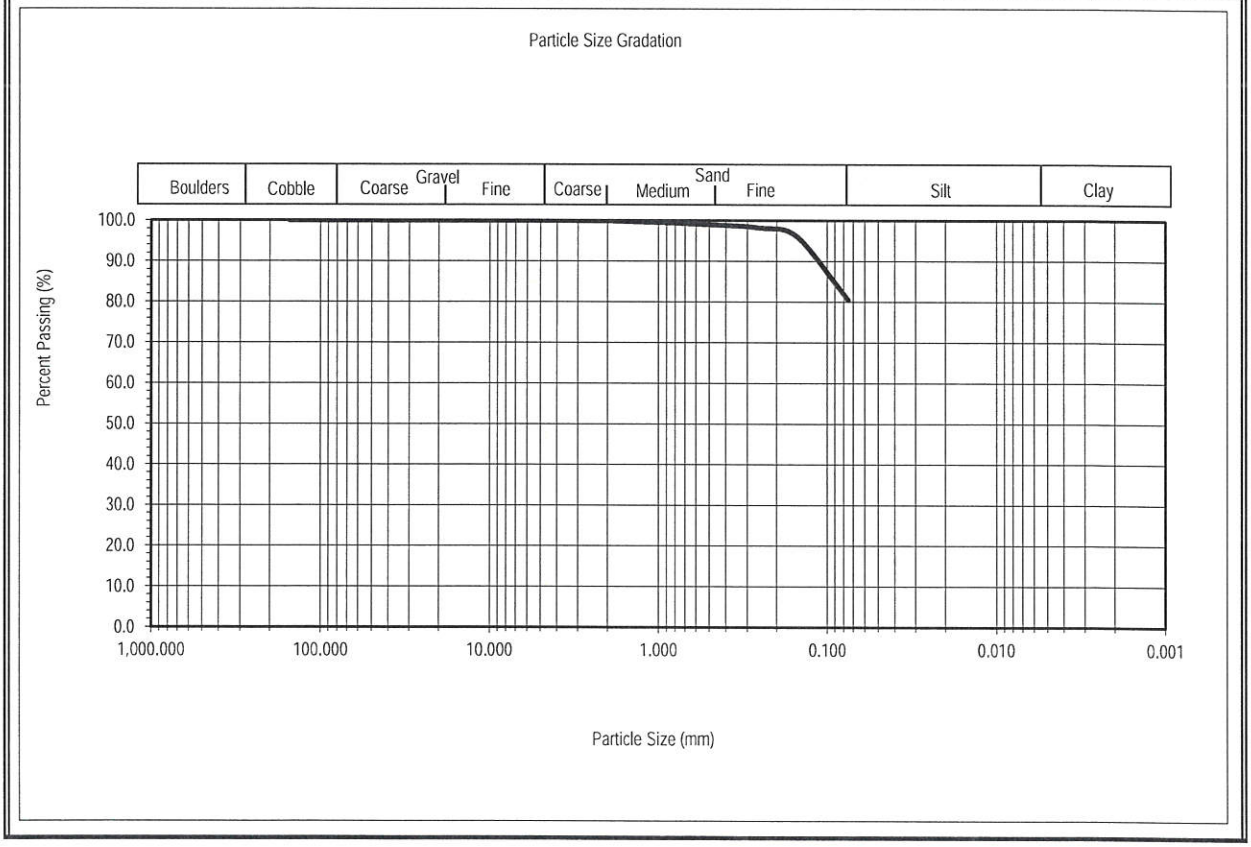
ASTM D422

DSA File #:

DSA Appl #:

Project No.:	42686.00	Project Name:	Sierra Valley Preserve	Date:	1/21/2020
Sample No.:	5-1	Boring/Trench:	TP-5	Depth, (ft.): 2-2.5	Tested By: SJS/SLN
Description:	Dark Grayish Brown (10YR 4/2) Lean Clay with Sand (CL)				Checked By: MLH
Sample Location:					Lab. No.: 15-20-015

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	1,557.6	100.0
3 Inch	3.0000	76.2	0.00	0.0	1,557.6	100.0
2 Inch	2.0000	50.8	0.00	0.0	1,557.6	100.0
1.5 Inch	1.5000	38.1	0.00	0.0	1,557.6	100.0
1.0 Inch	1.0000	25.4	0.00	0.0	1,557.6	100.0
3/4 Inch	0.7500	19.1	0.00	0.0	1,557.6	100.0
1/2 Inch	0.5000	12.7	0.00	0.0	1,557.6	100.0
3/8 Inch	0.3750	9.5	0.00	0.0	1,557.6	100.0
#4	0.1870	4.7500	0.00	0.0	1,557.6	100.0
#10	0.0787	2.0000	1.70	1.7	1,555.9	99.9
#20	0.0335	0.8500	7.05	8.8	1,548.9	99.4
#40	0.0167	0.4250	8.27	17.0	1,540.6	98.9
#60	0.0098	0.2500	9.73	26.7	1,530.9	98.3
#100	0.0059	0.1500	36.48	63.2	1,494.4	95.9
#200	0.0030	0.0750	240.98	304.2	1,253.4	80.5



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CQA – INFRASTRUCTURE – ENERGY – PROGRAM MANAGEMENT – ENVIRONMENTAL

ATTERBERG INDICES

ASTM D4318

DSA File #:

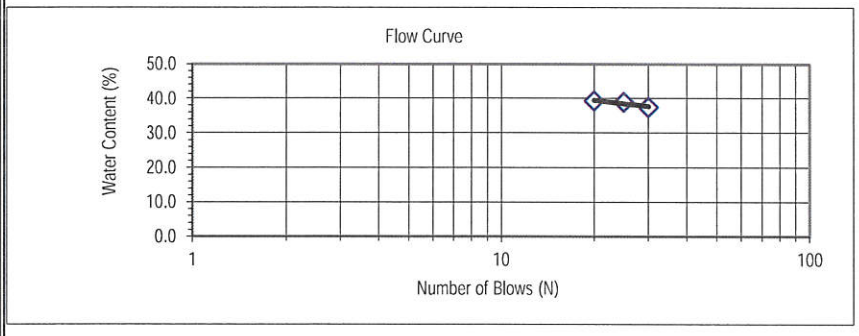
DSA Appl #:

Project No.:	**42686.00**	Project Name:	**Sierra Valley Preserve**	Date:	**1/21/2020**
Sample No.:	**5-1**	Boring/Trench:	**TP-5** Depth, (ft.): **2-2.5**	Tested By:	**SLN**
Description:	**Dark Grayish Brown (10YR 4/2) Lean Clay with Sand (CL)**			Checked By:	**MLH**
Sample Location:				Lab. No.:	**15-20-015**

Estimated % of Sample Retained on No. 40 Sieve: 10 Sample Air Dried: yes

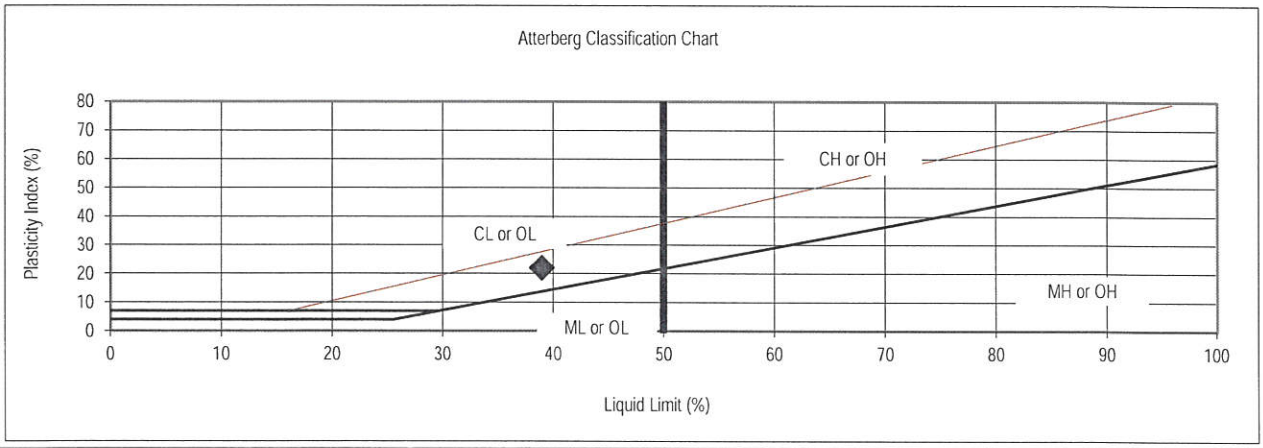
Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	G	TT	E			LO	S	
Wt. Pan (gr)	15.39	15.53	13.90			15.07	15.46	
Wt. Wet Soil + Pan (gr)	29.63	28.84	30.81			21.30	21.72	
Wt. Dry Soil + Pan (gr)	25.75	25.11	26.04			20.42	20.82	
Wt. Water (gr)	3.88	3.73	4.77			0.88	0.90	
Wt. Dry Soil (gr)	10.36	9.58	12.14			5.35	5.36	
Water Content (%)	37.5	38.9	39.3			16.4	16.8	
Number of Blows, N	30	25	20					
				LIQUID LIMIT =	39	PLASTIC LIMIT =		17



Plasticity Index = 22

Group Symbol = CL



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PLUMAS COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH
PERCOLATION TEST REPORT FORM

I. IDENTIFICATION

Assesor's Parcel No: 025-220-025

Owner's Name: THE FEATHER RIVER LAND TRUST

Mailing Address: PO BOX 1926, QUINCY CA 95971

II. PERCOLATION REPORT

Parcel Location/Address:
SIERRA VALLEY PRESERVE VISITOR CENTER

Sub Division: N/A 181 Austin Road

Hole Location (Attach plot plan with Hole Location indicated)

1. Average diameter of hole: 7 3/4"
2. Depth of hole before sand and gravel: 26"
3. Date and Time presoaked: 4/28/2020 6:15 pm
4. Water Measurements: Date: 4/29/2020

	Hole # P1	Hole #	Hole #	Hole #
Avg Perc Rate (min per inch)	38			
Required Sq Ft per Bdrm				

Hole # 1	Run # 1	Hole # 1	Run # 1	Hole #	Run #	Hole #	Run #
TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)
14:30	16.9"	15:30	19.2"				
14:40	17.3"	15:40	19.5"				
14:50	17.7"	15:50	19.8"				
15:00	18.2"	16:00	20.1"				
15:10	18.5"		$\frac{30 \text{ min}}{0.9 \text{ in}} = 33 \times 1.14 =$		$38 \frac{\text{min}}{\text{in}}$		
15:20	18.9"						

III. CERTIFICATION

I hereby certify that the above information is the result of a percolation test I performed in accordance with Plumas County Standard Percolation Test Procedures.

Signed: Noah McCoy License No: C 88882 Tel No: 530-587-5156

FOR OFFICE USE ONLY

Comments: $\frac{10 \text{ min}}{6.3"} = 33 \frac{\text{min}}{\text{in}} \times 1.14 = 38 \frac{\text{min}}{\text{in}}$

Reviewed By: _____ Date: _____

PERCFRM

PLUMAS COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH
PERCOLATION TEST REPORT FORM

I. IDENTIFICATION

Assesor's Parcel No: 025-220-025

Owner's Name: THE FEATHER RIVER LAND TRUST

Mailing Address: PO BOX 1826, QUINCY CA 95971

II. PERCOLATION REPORT

Parcel Location/Address:
SIERRA VALLEY PRESERVE VISITOR CENTER

Sub Division: N/A 181 Austin Road

Hole Location (Attach plot plan with Hole Location indicated)

1. Average diameter of hole: 8 1/4"
2. Depth of hole before sand and gravel: 28"
3. Date and Time presoaked: 4/28/2020 6:15 pm
4. Water Measurements: Date: 4/29/2020

	Hole # PT-2	Hole #	Hole #	Hole #
Avg Perc Rate (min per inch)	10			
Required Sq Ft per Bdrm				

Hole # 2	Run # 1	Hole # 2	Run # 2	Hole # 2	Run # 3	Hole #	Run #
TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)
16:52	12.1"	17:04	17.5"	17:16	19.6"	17:28	20.9"
16:54	13.7"	17:06	18.0"	17:18	19.8"		
16:56	14.9"	17:08	18.4"	17:20	20.0"		
16:58	15.8"	17:10	18.8"	17:22	20.3"		
17:00	16.3"	17:12	19.0"	17:24	20.5"		
17:02	16.9"	17:14	19.3"	17:26	20.7"		

$\frac{10 \text{ min}}{1.1 \text{ in}} = 9 \frac{\text{min}}{\text{in}} \times 1.14 = 10 \frac{\text{min}}{\text{in}}$

III. CERTIFICATION

I hereby certify that the above information is the result of a percolation test I performed in accordance with Plumas County Standard Percolation Test Procedures.

Signed: Mark McCoy License No: C88882 Tel No: 530-587-5156

FOR OFFICE USE ONLY

Comments: _____

Reviewed By: _____ Date: _____

PERCFRM

PLUMAS COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH
PERCOLATION TEST REPORT FORM

I. IDENTIFICATION

Assesor's Parcel No: 025-220-025

Owner's Name: THE FEATHER RIVER LAND TRUST

Mailing Address: PO BOX 1826, QUINCY CA 95971

II. PERCOLATION REPORT

Parcel Location/Address: SIERRA VALLEY PRESERVE VISITOR CENTER

Sub Division: N/A 181 Austin Road

Hole Location (Attach plot plan with Hole Location indicated)

1. Average diameter of hole: 8"
2. Depth of hole before sand and gravel: 28"
3. Date and Time presoaked: 4/28/2020 6:15 pm
4. Water Measurements: Date: 4/29/2020

	Hole # PT-3	Hole #	Hole #	Hole #
Avg Perc Rate (min per inch)	23			
Required Sq Ft per Bdrm				

Hole # 3	Run # 1	Hole # 3	Run # 2	Hole # 3	Run # 3	Hole #	Run #
TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)
16:53	21.7"	17:05	28.7"	17:17	30.0"		
16:55	24.0"	17:07	29.0"	17:19	30.1"		
16:57	25.7"	17:09	29.3"	17:21	30.2"		
16:59	26.8"	17:11	29.5"	17:23	30.3"		
17:01	27.6"	17:13	29.7"	17:25	30.4"		
17:03	28.2"	17:15	29.9"	17:27	30.5"		

III. CERTIFICATION

$\frac{10 \text{ min}}{0.5 \text{ in}} = 20 \frac{\text{min}}{\text{in}} \times 1.14 = 23 \frac{\text{min}}{\text{in}}$

I hereby certify that the above information is the result of a percolation test I performed in accordance with Plumas County Standard Percolation Test Procedures.

Signed: Mark McCann License No: C 88882 Tel No: 530-587-5156

FOR OFFICE USE ONLY

Comments: _____

Reviewed By: _____ Date: _____

PERCFRM

PLUMAS COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH
PERCOLATION TEST REPORT FORM

I. IDENTIFICATION

Assesor's Parcel No: 025-220-025

Owner's Name: The Feather River Land Trust

Mailing Address: P.O. Box 1826, Quincy CA 95971

II. PERCOLATION REPORT

Parcel Location/Address: Sierra Valley Preserve Visitor Center

Sub Division: N/A 151 Austin Road

Hole Location (Attach plot plan with Hole Location indicated)

1. Average diameter of hole: 8"
2. Depth of hole before sand and gravel: 32"
3. Date and Time presoaked: May 15, 2020 5pm
4. Water Measurements: 2pm-5pm Date: May 16, 2020

	Hole # P-4	Hole #	Hole #	Hole #
Avg Perc Rate (min per inch)	30 min/in			
Required Sq Ft per Bdrm				

Hole # P-4 Run # 1		Hole # P-4 Run # 2		Hole # P-4 Run # 3		Hole # P-4 Run # 4	
TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)
3:02	19.25	4:02	17 11/16 17.875	4:33	19.125	5:03	20.313
3:12	19.56	4:33	15 2/16 19.125	5:03	20.313	5:33	21.25
3:22	20.0	30/1.25	= 24 x 1.14 = 27	30/1.19	= 25 x 1.14 = 29 min/in	30/0.94 =	32 x 1.14 = 36
3:42	20.69						
3:52	21.19						
4:02	21.50 LD 2.25	= 27 x 1.14 =	30 min/in				

III. CERTIFICATION

I hereby certify that the above information is the result of a percolation test I performed in accordance with Plumas County Standard Percolation Test Procedures.

Signed: John K Hudson License No: C50923 Tel No: (530) 587-5156

FOR OFFICE USE ONLY

Comments: _____

Reviewed By: _____ Date: _____

PERCFRM

PLUMAS COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH
PERCOLATION TEST REPORT FORM

I. IDENTIFICATION

Assesor's Parcel No: 025-220-025

Owner's Name: The Feather River Land Trust

Mailing Address: P.O Box 1826, Quincy CA 95971

II. PERCOLATION REPORT

Parcel Location/Address: Sierra Valley Preserve Visitor Center

Sub Division: N/A 181 Ruston Road

Hole Location (Attach plot plan with Hole Location indicated)

1. Average diameter of hole: 8"
2. Depth of hole before sand and gravel: 29"
3. Date and Time presoaked: may 15, 2020 5pm
4. Water Measurements: 2-5pm Date: may 16, 2020

	Hole # P-5	Hole #	Hole #	Hole #
Avg Perc Rate (min per inch)	12 min/in			
Required Sq Ft per Bdrm				

Hole # P-5 Run # 1		Hole # P-5 Run # 2		Hole # P-5 Run # 3		Hole # P-5 Run # 4	
TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)
2:41	$18\frac{13}{16} = 18.813$	3:27	$14\frac{3}{16} = 14.438$	4:01	16"	5:01	22.188
2:51	20"	3:41	$17\frac{3}{16}$	4:31	$19\frac{5}{16}$	5:31	$24\frac{6}{16} = 24.375$
3:01	$21\frac{1}{16}$	3:51	$18\frac{8}{16} = 18.5$	5:01	$22\frac{3}{16} = 22.188$	$\frac{30}{2.187}$	$= 14 \times 1.14 = 16$
3:11	$22\frac{2}{16} = 22.125$	4:01	$19\frac{8}{16} = 19.5$				
	$30/3.3 = 9$ min/in		$40/19.5-14.4 = 8$ min/in		$60/6.188 = 10$ min/in $\times 1.14 =$ min/in		
	$9 \times 1.14 = 10$ min/in		$8 \times 1.14 = 9$ min/in				

III. CERTIFICATION

I hereby certify that the above information is the result of a percolation test I performed in accordance with Plumas County Standard Percolation Test Procedures.

Signed: John K. Hudson License No: C50933 Tel No: (530) 587-5156

FOR OFFICE USE ONLY

Comments: _____

Reviewed By: _____ Date: _____

PERCFRM

PLUMAS COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH
PERCOLATION TEST REPORT FORM

I. IDENTIFICATION

Assesor's Parcel No: 025-220-025

Owner's Name: The Feather River Land Trust

Mailing Address: P.O. Box 1826
Quincy, CA 95971

II. PERCOLATION REPORT

Parcel Location/Address:
Sierra Valley Preserve Visitor Center

Sub Division: N/A 181 Austin Road

Hole Location (Attach plot plan with Hole Location indicated)

1. Average diameter of hole: 8 inch
2. Depth of hole before sand and gravel: 26"
3. Date and Time presoaked: may 15, 2020 3pm
4. Water Measurements: 2-5pm Date: may 16, 2020

	Hole # P-6	Hole #	Hole #	Hole #
Avg Perc Rate (min per inch)	50 min/in			
Required Sq Ft per Bdrm				

Hole # P-6 Run # 1		Hole # Run # 2		Hole # Run # 3		Hole # Run #	
TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)	TIME	DEPTH TO WATER SURFACE (INCHES)
2:40	$12\frac{4}{16}$ = 12.25	3:10	13.75	Refill 4:00	$12\frac{2}{16}$ = 12.125		
2:50	$12\frac{14}{16}$ = 12.875	3:20	$13\frac{13}{16}$ = 13.8125	4:30	$13\frac{5}{16}$ = 13.3125	$\frac{30}{1.1875}$ =	25 x 1.14 = 29
3:00	$13\frac{11}{16}$ 13.0625	3:40	14" = 14.4375	5:00	14"	$\frac{30}{0.6875}$ =	44 x 1.14 = 50 min/in
3:10	$13\frac{12}{16}$ 13.75	3:50	14 12 = 14.75	5:30	$14\frac{10}{16}$ = 14.625		
	$\frac{30}{1.5}$ = 20 x 1.14 =	23 4:00	15"				
				$\frac{30}{0.625}$ =	48 x 1.14 = 55 min/in		46+55+50/3 = 50 min/in

$\frac{50}{1.25}$ = 40 x 1.14 = 46

III. CERTIFICATION

I hereby certify that the above information is the result of a percolation test I performed in accordance with Plumas County Standard Percolation Test Procedures.

Signed: John K. Anderson License No: C50923 Tel No: (530) 587-5156

FOR OFFICE USE ONLY

Comments: _____

Reviewed By: _____ Date: _____

PERCFRM

Appendix C

20-Year Cost Projection

TWENTY-YEAR BUDGET PROJECTION

Sierra Valley Preserve Septic System

INFLATION FACTOR (%) - 3.2

System Name: Feather River Land Trust Septic System

LINE	EXPENSES	Current Year	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1	OPERATIONS & MAINTENANCE										
2	Salaries and benefits		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Contract operation and maintenance	100.00	103.22	106.54	109.97	113.52	117.17	120.94	124.84	128.86	133.01
4	Power and other utilities	600.00	619.32	639.26	659.85	681.09	703.02	725.66	749.03	773.15	798.04
5	Fees	200.00	206.44	213.09	219.95	227.03	234.34	241.89	249.68	257.72	266.01
10	Materials, supplies, and parts	600.00	619.32	639.26	659.85	681.09	703.02	725.66	749.03	773.15	798.04
11	Miscellaneous	500.00	516.10	532.72	549.87	567.58	585.85	604.72	624.19	644.29	665.04
12											
13											
14	Total Operation and Maintenance	$2,000.00	$2,064.40	$2,130.87	$2,199.49	$2,270.31	$2,343.42	$2,418.87	$2,496.76	$2,577.16	$2,660.14
15											
16	GENERAL & ADMINISTRATIVE										
17	Engineering and professional services	15000.00	200.00	206.44	213.09	219.95	227.03	234.34	241.89	249.68	257.72
18	Depreciation and amortization		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	CIP Reserve (from Sheet 2, Column J Total)	1138.00	1174.64	1212.47	1251.51	1291.81	1333.40	1376.34	1420.66	1466.40	1513.62
20	Insurance	100.00	103.22	106.54	109.97	113.52	117.17	120.94	124.84	128.86	133.01
21											
22											
23	Total General and Administrative	$16,238.00	$1,477.86	$1,525.45	$1,574.57	$1,625.27	$1,677.61	$1,731.62	$1,787.38	$1,844.94	$1,904.34
24											
25	TOTAL EXPENSES	$18,238.00	$3,542.26	$3,656.32	$3,774.06	$3,895.58	$4,021.02	$4,150.50	$4,284.14	$4,422.09	$4,564.48

Report Prepared by: Jason Lynn Date: 7/7/20

Title: Engineer

Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
137.29	141.71	146.27	150.98	155.85	160.86	166.04	171.39	176.91	182.61
823.74	850.26	877.64	905.90	935.07	965.18	996.26	1028.34	1061.45	1095.63
274.58	283.42	292.55	301.97	311.69	321.73	332.09	342.78	353.82	365.21
823.74	850.26	877.64	905.90	935.07	965.18	996.26	1028.34	1061.45	1095.63
686.45	708.55	731.37	754.92	779.23	804.32	830.22	856.95	884.54	913.03
$2,745.80	$2,834.21	$2,925.47	$3,019.67	$3,116.91	$3,217.27	$3,320.87	$3,427.80	$3,538.18	$3,652.10
266.01	274.58	283.42	292.55	301.97	311.69	321.73	332.09	342.78	353.82
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1562.36	1612.67	1664.59	1718.19	1773.52	1830.63	1889.57	1950.42	2013.22	2078.05
137.29	141.71	146.27	150.98	155.85	160.86	166.04	171.39	176.91	182.61
$1,965.66	$2,028.96	$2,094.29	$2,161.73	$2,231.33	$2,303.18	$2,377.34	$2,453.90	$2,532.91	$2,614.47
$4,711.46	$4,863.17	$5,019.76	$5,181.40	$5,348.24	$5,520.45	$5,698.21	$5,881.70	$6,071.09	$6,266.58

SIMPLIFIED CAPITAL IMPROVEMENT PLAN

Date: 7/7/2020

System Name: Feather River Land Trust Septic System

System ID No.: N/A

Service Connections: 1

QTY	COMPONENT			UNIT COST	INSTALLED COST	AVG LIFE, YEARS	ANNUAL RESERVE	MONTHLY RESERVE	MONTHLY RESERVE PER CUSTOMER
1	1200 Gal. Septic Tank			7500	7500	50	150.00	12.50	12.50
1	600 Gal. Dosing Tank & Pump			7500	7500	25	300.00	25.00	25.00
1	Distribution Box			200	200	50	4.00	0.33	0.33
220	Distribution Pipe, 1" Pressure Pipe			60	13200	50	264.00	22.00	22.00
350	Distribution Pipe, 6" Gravity			60	21000	50	420.00	35.00	35.00
	TOTALS:				$49,400.00		$1,138.00	$94.83	$94.83

Report Prepared by (Title): Jason Lynn Date: 7/7/20

NOTE: Installed costs are averages, and include all materials and contracted labor and equipment.

Mooretown Rancheria
#1 Alverda Drive
Oroville, CA 95966
(530) 533-3625 Office
(530) 533-3680 Fax

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FEB 26 2021
PC Planning+Building

February 23, 2021

Ms. Rebecca Herrin
Assistant Planning Director
Plumas County
555 Main Street
Quincy, CA 95971

Re: Proposed (Feather River Land Trust Special Use Permit) Project – Beckwourth, Plumas County, CA

Dear Ms. Herrin:

Thank you for your letter dated, February 5, 2021, seeking information regarding the proposed Feather River Land Trust Special Used Permit project in Plumas County, California. Based on the information provided, the Mooretown Rancheria is not aware of any known cultural resources on this site. However, as the project progresses, if any new information or human remains are found, we do have a process to protect such important and sacred artifacts (especially near rivers or streams).

Please contact the following individuals if tribal cultural items or Native American human remains are found:

THPO
Mooretown Rancheria
1 Alverda Drive
Oroville, CA 95966
(530) 533-3625 Office
(530) 533-3680 Fax
E-mail: matthew.hatcher@mooretown.org

Thank you for providing us with this notice and opportunity to comment.

Sincerely,

Matthew Hatcher
Tribal Historic Preservation Officer

"Concow - Maidu"
EXHIBIT 21

HARDY CONSERVATION
Paul Hardy, M.S., Wildlife Biologist
P.O. Box 4276
Quincy, CA 95971
530.258.6607

Memorandum

TO: Mr. Shelton Douthit, Executive Director
Mr. Gabe Miller, Stewardship Director
Feather River Land Trust
P.O. Box 1826
75 Court Street
Quincy, CA 95971

DATE: 7/21/19

SUBJECT: Wildlife and Habitat Assessments for proposed Bluff Trail, Rebecca Trail extension, Jenner Memorial, and Marshall Parcel projects on Sierra Valley Preserve

On June 11, 2019, from 0800 to 1800 (8am to 6pm), I conducted wildlife and habitat field assessments of the following proposed recreational and interpretive improvements on Feather River Land Trust's ("FRLT's") Sierra Valley Preserve ("SVP"): Bluff Trail, Rebecca (Wenk) Trail extension, Jenner Memorial, and Marshall Parcel (Interpretive Center and other potential projects). Shelton Douthit, FRLT's Executive Director, and Gabe Miller, FRLT's Associate Director, oriented me and other FRLT staff and consultants to the proposed projects, including reviewing maps and walking us along the proposed trail routes, which were marked with stakes and flagging.

My primary objectives in conducting the wildlife and habitat field assessments were: 1) to assess the potential impacts of the proposed trails, memorial, interpretive center, and other projects upon wildlife and wildlife habitat, with an emphasis on special status species (California Department of Fish and Wildlife Special Animals List, November 2018, https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline); and 2) to make recommendations for avoiding and mitigating potential impacts to wildlife and wildlife habitat, including the possibility of not implementing the proposed projects.

I focused my wildlife surveys within 100 meters of the proposed trail routes and the proposed Jenner Memorial Circle and thoroughly surveyed the entire Marshall Parcel, site of the proposed Interpretive Center and various other potential improvements. I surveyed for vertebrate wildlife species, including reptiles, amphibians, birds, and mammals. I relied upon auditory and visual detections, including the examination and identification of tracks, scat, eggshells, feathers, and other sign. I did not conduct any trapping and did not survey for rare plants.

Nesting/Denning by Special Status Species.—I observed nesting or recent denning by 3 special status species within proposed project areas (see **Table 1** below). I observed 4 recently-active (likely active in 2018) American badger dens/burrows on the northern portion of the Marshall Parcel (see **Figure 1** below). The American badger is a California Species of Special Concern. I observed nesting Brewer's Sparrows, a U.S. Fish and Wildlife Service Bird of Conservation Concern, within 100 meters of both proposed trails and the

EXHIBIT 22

proposed Jenner Memorial; however, none of these nests were located within 10 meters of the trail footprint. Finally, I observed nesting Yellow-headed Blackbirds, a California Species of Special Concern, in the bulrush within "Otter Cove" at the northern edge of the Marshall Parcel. I found no direct evidence of nesting or denning by any other special status species within the proposed project areas.

I did find evidence of nesting by Barn Owl in the wooden barn on the Marshall Parcel (pellets, white wash, downy feathers, and egg shells). This species is increasingly sensitive in Sierra Valley due to usurpation and predation by Common Ravens and Great Horned Owls.

Finally, my observations (with Kristi Jamason) of a family group of southwestern river otters in November and December of 2018 in the vicinity of "Otter Cove" at the northeastern edge of the Marshall Parcel, including 2 juveniles, indicates the possibility that river otters could breed and den on the SVP. River otters frequently use burrows dug by other species, such as muskrats and beavers, within earthen embankments. Such burrows occur on the SVP. The southwestern river otter is a California Species of Special Concern.

Foraging/Roosting by Special Status Species.—I observed White-faced Ibis and Greater Sandhill Cranes foraging within 100 meters of the proposed Bluff Trail SE of the "Port of Bulson Canal" (this year's boating launch site; see **Table 1**). White-faced Ibis is a CDFW Watch List species and Greater Sandhill Crane is a State-Threatened species.

On the Marshall Parcel, I observed foraging White-faced Ibis and Greater Sandhill Crane in the vicinity of the Middle Fork channels, and observed a foraging Swainson's Hawk in the southern edge of the Parcel just east of the southern entry gate. Swainson's Hawk is a State-Threatened species.

Suitable Nesting/Denning Habitat for Special Status Species.—I observed suitable nesting/denning habitat for American badger, Northern Harrier, Greater Sandhill Crane, Short-eared Owl, and Burrowing Owl both along (within 100 meters of) the proposed Bluff Trail and on the Marshall Parcel (see **Table 1**). Along the proposed Bluff Trail, such habitat for the Northern Harrier, Greater Sandhill Crane, and Short-eared Owl exists on the S/SW edge of the shallow wetlands closest to the trail route (N/NE of the trail); specifically, within the rushes, sedges, spike-rushes, and tall grasses within and on the edge of the wetlands.

Suitable habitat for Burrowing Owl occurs all along the proposed route of the Bluff Trail and within the American badger denning area (see **Figure 1**) on the Marshall Parcel. Burrowing Owl is a California Species of Special Concern. Suitable nesting and denning habitat for American badger and Burrowing Owl also occurs within the proposed Jenner Memorial site and all along the proposed Rebecca Trail extension.

Suitable nesting habitat for Bank Swallow, a State-Threatened species, occurs along the main channel of the Middle Fork Feather on the eastern edge of the Marshall Parcel; specifically, this species is a colonial nester that digs nest cavities into tall, vertical, earthen banks. A few such riverbanks exist on the Marshall Parcel.

Suitable nesting habitat for Swainson's Hawk, another State-Threatened species, occurs in the elm and aspen trees that have been planted around and in the vicinity of the house on the Marshall Parcel.

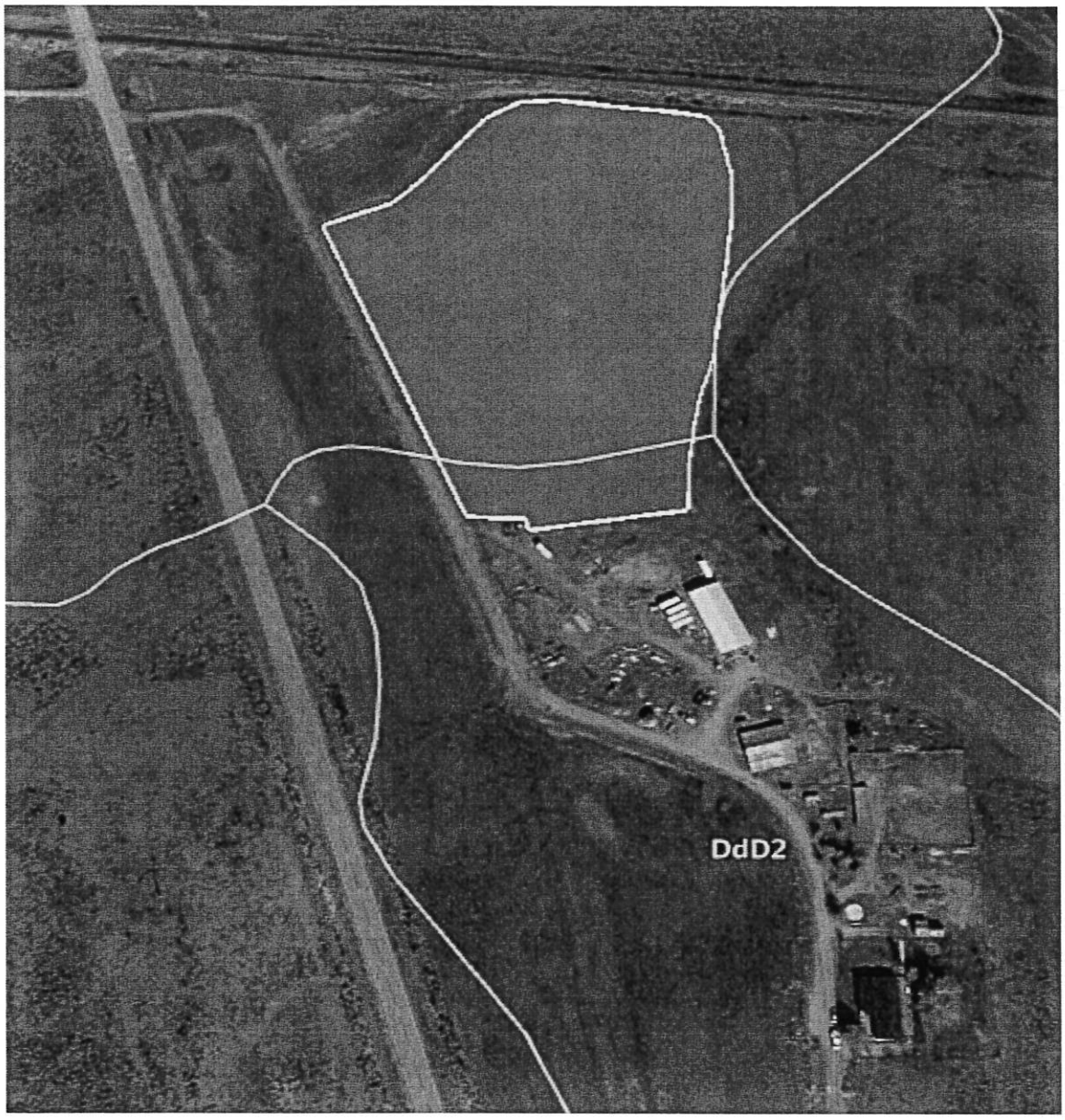
Finally, as described above in "*Nesting/Denning by Special Status Species*," the Middle Fork channels on the eastern edge of the Marshall Parcel provide suitable breeding and denning habitat for southwestern river otters; specifically, denning is most likely to occur within burrows and dens constructed by muskrats (and possibly by beavers).

Table 1. Special Status Wildlife Species Observed During Field Assessment, By Observation Category and Proposed Project Area.

	Proposed Project Area			
Category of Observation	**Bluff Trail and Wildlife Observation Area**	**Jenner Memorial**	**Rebecca Trail Extension**	**Marshall Parcel**
Nesting or Denning	Brewer's Sparrow	Brewer's Sparrow	Brewer's Sparrow	Yellow-headed Blackbird
				American badger
Foraging or Roosting	White-faced Ibis			White-faced Ibis
	Greater Sandhill Crane			Greater Sandhill Crane
				Swainson's Hawk
				Southwestern river otter*
Suitable Nesting or Denning Habitat	Northern Harrier			Northern Harrier
	Greater Sandhill Crane			Greater Sandhill Crane
	Short-eared Owl			Short-eared Owl
	Burrowing Owl	Burrowing Owl	Burrowing Owl	Burrowing Owl
	American badger	American badger	American badger	Bank Swallow
				Southwestern river otter

*Observed by Paul Hardy and Kristi Jamason in and around "Otter Cove" in November and December, 2018; group of 5+, including 2 juveniles.

Figure 1. Area within which 4 recently-active American badger dens were observed on the Marshall Parcel (see turquoise polygon below).



Other Wildlife Observations of Note.—I observed mule deer tracks in the vicinity of each proposed project, the densest concentrations of which occurred along the northern edge of the Marshall Parcel. It is possible that deer are funneled by the elevated Union Pacific railroad line along the south edge of the tracks. "Otter Cove" on the west side of the main river channel provides a good drinking water source in close proximity to the excellent bitterbrush habitat on the west side of A-23 on the south side of the tracks. I also

observed many fresh deer tracks on the western edge of "Otter Cove" and along the edge of the long, rectangular pond along the northwestern edge of the Marshall Parcel.

Suitable nesting and denning habitat for several other (non-special-status) wildlife species occurs directly on and/or within 10 meters of the proposed Bluff Trail and Rebecca Trail extension routes and the Jenner Memorial site, including: Belding's ground squirrel, black-tailed jackrabbit, Brewer's Blackbird, coyote, gray fox, Horned Lark, montane vole, mountain cottontail, Sage Thrasher, Spotted Towhee, Savannah Sparrow, Vesper Sparrow, and Western Meadowlark.

In addition to the special status species locations described above, I noted 7 locations/features of particular interest and sensitivity from a native wildlife and wildlife habitat perspective: 1) the Bulson Alkali Flat Seasonal Wetland; 2) the "Powerline" Vernal Pool; 3) "Otter Cove"; 4) the Marshall Parcel Middle Fork river channels; 5) the planted trees around the Marshall House; 6) the wooden barn on the Marshall Parcel; and 7) the Marshall Pond.

1) The Bulson Alkali Flat Seasonal Wetland, located directly N/NE of the proposed Bluff Trail (the trail comes as close as 25 meters to the Wetland), provides important foraging, and in wet years, nesting habitat for a diversity of native shorebirds, wading birds, waterfowl, and other species. This seasonal wetland is used both by species nesting on the SVP and by species using the SVP in migration, including: American Avocet, American Coot, Black-necked Stilt, Black-bellied Plover (migration only), Canada Geese, Cinnamon Teal, Dunlin (migration only), Gadwall, Greater Sandhill Crane, Green-winged Teal, Least Sandpiper (migration only), Mallard, Northern Harrier, Northern Shoveler, Red-winged Blackbird, Short-eared Owl, Sora, Western Sandpiper (migration only), White-faced Ibis, Willet, Wilson's Phalarope, Wilson's Snipe, and Yellow-headed Blackbird. This alkali seasonal wetland also provides habitat for an abundance of tadpole shrimp (*Lepidurus* sp.), the species of which is mostly likely *L. cryptus*, but which is not yet known (although unlikely, the shrimp could be the federally-endangered *L. parckardi*). Finally, the ecotone between the proposed Bluff Trail and the alkali flat supports incredible botanical diversity, including camas lily, whorled penstemon, bistort, and western peony.

The area of the Bluff Trail immediately above the linear "Port of Bulson" canal (and anywhere along the trail within 30 meters SW of the canal) would be a good location for an earthen wildlife observation area with interpretive signage, due to the topographic relief of the site, appropriate distance from the wetland edge (close, but not too close), scenic vistas, ready accessibility, and the wide variety of observable breeding and migratory birdlife (and other wildlife) that uses the wetland and meadow areas to the N/NE/E of the trail.

2) The "Powerline" Vernal Pool, the edge of which the Rebecca extension trail comes within 20 meters, also supports tadpole shrimp.

3) "Otter Cove," a 3.5-acre body of water connected to and supplied by the west side of the main Middle Fork channel and located just south of the Union Pacific Railroad line, holds water year-round except in the driest of years and supports mature stands of bulrush. This perennial water and habitat supports a diversity of native wetland and riverine wildlife, as well as a variety of fishes. I observed American Bittern, American Coot, Canada Goose, Cinnamon Teal, Gadwall, Green-winged Teal, Mallard, Marsh Wren, Northern Shoveler, Osprey, Pied-billed Grebe, Red-winged Blackbird, and Yellow-headed Blackbird. The large, partially-submerged boulders and rocks at the eastern edge of the cove, at the point where it meets the main Middle Fork channel, have been used by southwestern river otters as a haul out site. I also observed carp, largemouth bass, and rainbow trout in the eastern portion of the cove during my field assessment. Unfortunately, I also observed abundant, non-native, invasive bullfrogs within the cove.

The Otter Cover area would make for an excellent wildlife observation area and a good potential boat launch site, including due to the fact that it is located just across the tracks from the official beginning of the federally-designated Wild-and-Scenic Middle Fork Feather.

4) The approximately 400-meter stretch of the Middle Fork Feather River located along the eastern edge of the Marshall Parcel is quite diverse, containing not only riverine and riparian habitat, but also supporting bulrush and cattail wetland habitat up to 50 feet in width along portions of it banks, as well as seasonal wetland habitat and mudflats on the floodplains. Within the main river channels, and in the above-described habitats within 50 meters of its western bank, I observed: American Avocet (2), American Coot, Canada Goose, Gadwall, Green-winged Teal, Mallard, Marsh Wren (2), Osprey, Red-winged Blackbird, Song Sparrow, White-faced Ibis (10), Willet (8), and muskrat. Flocks of White-faced Ibis have repeatedly been observed flying to the northern portion of the Marshall Parcel along the river channels in the evening (Shelton Douthit, personal communication), likely to forage.

5) The elm, aspen, and other trees around and in the vicinity of the Marshall House are used for nesting by a considerable number of native bird species, including Brown-headed Cowbird, Bullock's Oriole, House Finch, House Wren, Mourning Dove, Red-breasted Sapsucker, Western Kingbird, and Western Wood-Pewee. They also provide potential nest sites for the State-Threatened Swainson's Hawk and stopover habitat for migrating songbirds and raptors.

6) The wooden barn on the Marshall Parcel supports, or is highly likely to support, nesting American Kestrel, Barn Owl, Barn Swallow, House Wren, Mountain Bluebird, Mourning Dove, and Tree Swallow.

7) Finally, the long, rectangular pond along A-23 on the far NW edge of the Marshall Parcel was filled with dragonflies, damselflies, and Pacific tree frog tadpoles. I also observed Cinnamon Teal and Mallard on the pond, both likely nesting.

Conclusions and Recommendations

Potential Impacts: Bluff Trail, Rebecca Trail Extension, and Jenner Memorial.—In my professional opinion, the construction of the proposed Bluff Trail, Rebecca Trail extension, and Jenner Memorial (in 2019) would have minimal to no impact upon special status wildlife species and their habitats (depending upon the species) and would have minimal to no impact upon other native wildlife species and their habitats. Specifically, the construction of the Bluff Trail and Rebecca Trail extension has the potential to have a minimal negative impact upon Brewer's Sparrow by removing nesting habitat (sagebrush and bitterbrush) and potentially destroying nests and/or nesting shrubs. I provide recommendations for avoiding and mitigating such potential impacts below (see *Avoidance and Mitigation of Potential Impacts*).

In my professional opinion, the construction of the proposed Bluff Trail, Rebecca Trail extension, and Jenner Memorial (in 2019) would not decrease populations of special status or other wildlife species on the SVP, and would be highly unlikely to harm individual animals, if constructed at an appropriate time of year (see *Avoidance and Mitigation of Potential Impacts* below).

In my professional opinion, recreational use of the Bluff Trail, Rebecca Trail extension, and Jenner Memorial (once constructed) has the potential to cause minimal negative impacts to special status wildlife species and their habitats, including American badger, Burrowing Owl, Greater Sandhill Crane, Northern Harrier, and Short-eared Owl. Recreational use of the trails and Jenner Memorial could also have minimal negative impacts upon breeding Brewer's Sparrows, but such impacts are highly unlikely, as this species is very adaptable to people and able to move to alternate nesting shrubs. I provide recommendations for avoiding and mitigating such potential impacts below (see *Avoidance and Mitigation of Potential Impacts*).

Potential Impacts: Interpretive Center on Marshall Parcel.—In my professional opinion, construction of an Interpretive Center within the American badger burrowing/denning area shown in **Figure 1** has the potential to have moderate to significant negative impacts upon American badgers and their habitat on the SVP by

directly destroying active dens and burrows and by removing denning and burrowing habitat. Construction of an Interpretive Center within the badger burrowing/denning area also has the potential to impact Burrowing Owls and their habitat on the SVP, as Burrowing Owls often use American badger burrows and dens for nesting. I provide recommendations for avoiding and mitigating such potential impacts below (see *Avoidance and Mitigation of Potential Impacts*).

In my professional opinion, construction of an Interpretive Center on the Marshall Parcel in a manner that entails removing any of the planted elm, aspen, and other trees (>20 feet tall) on the Parcel would have a moderate negative impact upon suitable nesting habitat for Swainson's Hawk on the SVP. Removal of these trees would also have a moderate to significant impact upon the various other (non-special-status) bird species nesting within these trees (see above).

In my professional opinion, construction of an Interpretive Center on any upland (i.e., out of floodplain) portion of the Marshall Parcel other than in the badger burrowing/denning area, and in a manner that does not entail removal of the planted elm and aspen trees on the Parcel, would have minimal to no impact upon special status wildlife species and their habitats (depending upon the species) and would have minimal to no impact upon other native wildlife species and their habitats.

Potential Impacts: Other Potential Recreational/Interpretive Improvements on Marshall Parcel.—Recent discussions with Shelton Douthit, Gabe Miller, and Lucy Blake regarding other potential improvements and construction activity on the Marshall Parcel indicate the potential for: 1) a mowed trail, boardwalk, wildlife observation structure, and/or boat launch site out to and along "Otter Cove" and the Middle Fork channels; 2) removal of the old wooden barn; and 3) an interpretive, picnic, and/or gathering area in vicinity of aspen grove.

1) A mowed trail, boardwalk, wildlife observation structure, and/or boat launch site in the vicinity of "Otter Cove" and the Middle Fork channels have potential to create minimal to moderate negative impacts to special status wildlife species and their habitats (depending upon the species), including Bank Swallow, Greater Sandhill Crane, Northern Harrier, Short-eared Owl, Southwestern river otter, and Yellow-headed Blackbird. Yellow-headed Blackbird is highly unlikely to be negatively impacted, due to its adaptability to human presence. I provide recommendations for avoiding and mitigating such potential impacts below (see *Avoidance and Mitigation of Potential Impacts*).

2) Removal of the old wooden barn on the Marshall Parcel would likely have direct, moderate to significant negative impacts upon nesting American Kestrel, Barn Owl, Barn Swallow, House Wren, Mountain Bluebird, Mourning Dove, and Tree Swallow by directly removing their nests and nesting habitat. I provide recommendations for avoiding and mitigating such potential impacts below (see *Avoidance and Mitigation of Potential Impacts*).

3) In my professional opinion, the establishment of an interpretive, picnic, and/or gathering area in vicinity of aspen grove would have minimal to no negative impacts upon special status wildlife species and would have minimal to no negative impacts upon other wildlife species. The non-special-status birds currently using the aspen grove (see above) are highly adaptable to human presence and have been subject to decades of human presence by the Marshall Family.

Avoidance and Mitigation of Potential Impacts: Bluff Trail, Rebecca Trail Extension, and Jenner Memorial.—The timing of construction is key to avoiding and minimizing potential negative impacts to the above-mentioned wildlife species and their habitats. The proposed timing of trail construction (late summer/early fall of 2019) is good from a wildlife perspective, as the above wildlife species will have completed their breeding cycles (including fledging of young) by this time, minimizing disturbance to breeding, nesting, and denning wildlife. *I recommend adhering to this construction time frame. I also recommend that the construction of the Jenner Memorial be completed prior to April 15, 2020, or occur after June 15, 2020.*

A variety native birds (e.g., Brewer's blackbird, Brewer's sparrow, California quail, sage thrasher, spotted towhee, vesper sparrow, western meadowlark), nest within or at the base of sagebrush and bitterbrush plants along the proposed trail routes. Sagebrush and bitterbrush are also frequently used as singing perches and for cover and foraging by such species. *I recommend that care be taken to remove as few sagebrush and bitterbrush plants as possible during the construction of the trail, and especially to avoid removal of individual shrubs taller than 24 inches.*

Many of the potential impacts to special status and other wildlife species are related to recreational use of the trails and Jenner Memorial after their construction; specifically, potential negative impacts associated with disturbing nesting/denning wildlife in the vicinity of the trails and Memorial. Nesting special status species potentially impacted by recreational use of the **Bluff Trail** (see **Table 1**) include American badger, Burrowing Owl, Greater Sandhill Crane, Northern Harrier, and Short-eared Owl. *I recommend that potential negative impacts be avoided or mitigated for these species by conducting annual Clearance Inspection(s) within 100 meters of the trail for each species (except Sandhill Cranes, for which I recommend an inspection area of 150 meters from the trail) prior to opening the trail to the public each year.* Both Burrowing Owls and Greater Sandhill Cranes typically arrive in Sierra Valley by mid-March, establish nesting territories by late-March, and have highly mobile young by mid-June. Similarly, Northern Harriers and Short-eared Owls generally initiate nest-building by late April and have highly mobile young by June 30th. American badgers typically initiate denning in February or March, with kits emerging from the den between late April and early June. *Hence, I recommend that annual Clearance Inspections be conducted in late March for American badgers, Burrowing Owls and cranes, and in late April for harriers and Short-eared Owls. If FRLT observes nesting/denning or highly territorial pairs of any of these species within 100 meters of the trail (150 m for cranes), I recommend that FRLT enforce a seasonal closure of the trail from the date of inspection through June 30th. I would recommend a similar seasonal closure if denning coyotes or other medium to large fossorial (digging) mammals are located within 100 meters of the trail. It should be feasible for the public to use the trail (if weather and soil conditions warrant) from July 1st through February 28th with minimal to no impact upon special status species or other native wildlife.*

Nesting special status species potentially negatively impacted by recreational use of the **Rebecca Trail extension and Jenner Memorial** (see **Table 1**) include American badger and Burrowing Owl. *I recommend that potential negative impacts be avoided or mitigated for these species by conducting annual Clearance Inspection(s) within 100 meters of the trail prior to opening the trail to the public each year.* Burrowing Owls typically arrive in Sierra Valley by mid-March, establish nesting territories by late March, and have highly mobile young by mid-June. American badgers typically initiate denning in February or March, with kits emerging from the den between late April and early June. *Hence, I recommend that annual Clearance Inspection(s) be conducted in late March for American badgers and Burrowing Owls. If FRLT observes nesting/denning or highly territorial pairs of either species within 100 meters of the trail or Memorial, I recommend that FRLT enforce a seasonal closure of the trail and/or Memorial from the date of inspection through June 30th. I would recommend a similar seasonal closure if denning coyotes or other medium to large mammals are located within 100 meters of the trail or Memorial. It should be feasible for the public to use the trail and Memorial (if weather and soil conditions warrant) from July 1st through February 28th with minimal to no impact upon special status species or other native wildlife.*

Signage that directs people to "stay on trails," especially on the Bluff Trail, along the "Powerline" Vernal Pool on the Rebecca Trail extension, and along the Otter Cove and the Middle Fork channels, will help mitigate negative impacts to native wildlife and wildlife habitat within all of the proposed project areas.

*Avoidance and Mitigation of Potential Impacts: Interpretive Center on Marshall Parcel.—In order to avoid negative impacts to American badgers and badger habitat (as well as to suitable nesting habitat for Burrowing Owls), I recommend that the Interpretive Center be constructed in a location outside of the badger denning/burrowing area (see **Figure 1**). If the preferred location of the Interpretive Center is on or in the immediate vicinity of the badger denning/burrowing area, in order to mitigate potential negative impacts to badgers and burrowing owl habitat I recommend that:*

1. *A Clearance Inspection be conducted in late March in the year of the proposed construction and that if active dens, burrows, or nests are located in or within 100 meters of the proposed Interpretive Center, that initiation of site prep and construction be postponed until after June 30th.*

2. *All badger and/or Burrowing Owl burrows/dens/nests be located and mapped and taken into account in the design and placement of the Interpretive Center (I have location data for badger burrows and dens).*
3. *The Interpretive Center be located as far east as possible in the upland area of the Marshall Parcel.*

In order to avoid potential negative impacts to suitable nesting habitat for Swainson's Hawk, *I recommend that none of the elm, aspen, or other trees >20 feet tall be removed during the construction process. Removal of these trees would also have a moderate to significant negative impact upon the various other (non-special-status) bird species nesting within these trees.*

Avoidance and Mitigation of Potential Impacts: Other Potential Recreational/Interpretive Improvements on Marshall Parcel.—In order to avoid or mitigate potential negative impacts to special status wildlife created by a mowed trail, boardwalk, wildlife observation structure, and/or boat launch site in the vicinity of "Otter Cove" and the Middle Fork channels, *I recommend that:*

1. *Clearance Inspections be conducted in February and March (one inspection per month) within Otter Cove and the Middle Fork channels during the year of proposed construction to determine if and how these areas are being used by southwestern river otters and to determine if otters are denning within these areas.*
    a. *If otters are documented to be denning within the Otter Cove and/or if they are documented to be using the boulders and large rocks at the western end of Otter Cove for hauling out (resting, eating, sunning), I recommend that Otter Cove not be used for a boat launch site, and that any trail, boardwalk, or wildlife observation structure be constructed at least 50 meters from the den and/or haul out rocks. Note that it may be preferred to conduct these inspections in the year prior to planned construction in order to better incorporate the results into the design of the improvements.*
    b. *If otters are documented to be denning within the Middle Fork channels, I recommend that any boat launch, trail, boardwalk, or wildlife observation structure be constructed at least 50 meters from the den site.*
2. *Annual Clearance Inspections be conducted in February and March (one inspection per month) within Otter Cove and the Middle Fork channels to determine if southwestern river otters are using these areas and to determine if otters are denning within these areas.*
    a. *If otters are documented to be denning within the Otter Cove or Middle Fork channels, and/or if they are documented to be using the boulders and large rocks at the western end of Otter Cove for hauling out (resting, eating, sunning), I recommend a seasonal closure of all trails, boat launches, and observation structures within 50 meters of the den and/or haul out rocks from the time of inspection through May 30th.*
3. *A Clearance Inspection for Bank Swallows be conducted in early May within the Middle Fork channels during the year of proposed construction. Note that it may be preferred to conduct this inspection in the year prior to planned construction in order to better incorporate the results into the design of the improvements.*
    a. *If a Bank Swallow nesting colony is located, I recommend that any trail, boardwalk, or wildlife observation structure be constructed at least 50 meters from the site of the nesting colony.*
    b. *It is worth re-surveying for Bank Swallows every 5 years to determine they are nesting on the SVP. It is unlikely that they are or that they will, but it is worth checking.*
4. *Clearance Inspections be conducted in late March for Greater Sandhill Cranes and in late April for Northern Harriers and Short-eared Owls on the year of proposed construction. If FRLT observes nesting or highly territorial pairs of any of these species within 100 meters of any trail, boardwalk, boat launch, or wildlife observation structure (or within 150 m for cranes), I recommend that FRLT postpone construction of the trail/launch/observation structure until after June 30th.*
5. *Annual Clearance Inspections be conducted in late March for Greater Sandhill Cranes and in late April for Northern Harriers and Short-eared Owls. If FRLT observes nesting or highly territorial pairs of any of these species within 100 meters of any trail, boardwalk, boat launch, or wildlife observation structure (or within 150 m for cranes), I recommend that FRLT enforce a seasonal closure of the trail/launch/observation structure from the date of inspection through June 30th.*

In order to mitigate negative impacts to native (non-special-status) wildlife and their habitat caused by the removal of the old wooden barn on the Marshall Parcel, *I recommend that nest boxes specific to American Kestrel, Barn Owl, House Wren, Mountain Bluebird, and Tree Swallow be placed under the eves of the large metal barn (on the east side of the building), on and in other structures (including trees and wooden fence posts), and in other locations on the Marshall Parcel.*

Please don't hesitate to contact me if you have any questions regarding this memo and the observations and recommendations herein, and/or if you require any additional data or information.

Respectfully Submitted,

Paul Hardy