ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX A

NOTICE OF EIR PREPARATION

Mono County
Community Development Department

P.O. Box 347
Mammoth Lakes, CA 93546
(760) 924-1800, fax 924-1801
commdev@mono.ca.gov

Planning Division

P.O. Box 8
Bridgeport, CA 93517
(760) 932-5420, fax 932-5431
www.monocounty.ca.gov

Notice of Preparation and Scoping Meeting

Date: December 29, 2003

To: State Clearinghouse, Responsible Agencies, Neighboring Landowners, Interested Parties

From: Mono County Community Development Department, Planning Division

Re: Notice of Preparation of a Draft Environmental Impact Report and Scoping Meeting – C & L Development, Paradise, Mono County, California

Mono County, as the Lead Agency, will prepare an Environmental Impact Report (EIR) for the project described below. Comments about the extent and content of the EIR are being sought. Responsible agency comments should focus on environmental information related to statutory responsibilities in connection with the project. Agencies may use the EIR prepared by Mono County when considering subsequent permit approvals for the project.

An environmental **Scoping Meeting will be held on Tuesday, January 13, 2004, at 6:30 p.m. in the Paradise Fire Hall** on Lower Rock Creek Road, Paradise. Public hearings regarding the EIR and project will be announced at a later date.

The project description, location, and the probable environmental effects are described below and in the attached materials. Due to the time limits mandated by State law, responses about the content of the EIR must be sent at the earliest possible date, but not later than 30 days after receipt of this notice. Responses may also be submitted at the Scoping Meeting.

Please send responses to **Gwen Plummer, P.O. Box 347, Mammoth Lakes, CA 93546.** Agencies are asked to provide the contact person's name.

Project Application:
General Plan Amendment #03-03
Specific Plan Application #03-02
Tentative Tract Map #37-56

Applicant:
C & L Development
Christopher Capurro and Matthew Lehman
P.O. Box 8898
Mammoth Lakes, CA 93546

Project Description:
General Plan Amendment, Specific Plan, Tentative Tract Map for a 53.4-acre parcel (APN 26-330-02) to allow development of 53 semi-clustered single-family residential lots ranging in size from 15,000 to 30,000 square feet, plus 24.7 acres of open space. The development would be served by a water/fire system and a package sewage system. The project is located on the east side of the community of Paradise on Lower Rock Creek Road. The General Plan currently designates the site as "Estate Residential," which potentially could allow up to 53 one-acre lots with individual wells and septic systems.

Additional Information: Contact Gwen Plummer, (760) 924-1802.

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SPECIFIC PLAN
APPLICATION

APPLICATION # SP03-02 FEE $ $2640
DATE RECEIVED 10/27/03 RECEIVED BY KPH
RECEIPT # 33452 CHECK # 12607 12608 (NO CASH)

APPLICANT/AGENT C & L Development

ADDRESS P.O. Box 8898 CITY/STATE/ZIP Mammoth Lakes, CA 93546

TELEPHONE (760) 934-8831

OWNER, if other than applicant R.V. & A.B. Capurro, c/o C&L Development

ADDRESS _____ CITY/STATE/ZIP _____

TELEPHONE (____) _____

PROPERTY DESCRIPTION:

Assessor's Parcel # 26-330-02 General Plan Land Use Designation ER-- Estate Residential

PROJECT DESCRIPTION: Describe the proposed project, using additional sheets if necessary.

Subdivision of property into 53 single family residential lots ranging in size from 15,000 s.f. to 30,000 s.f. with 24.7 ac. of open space. Project will include access from Lower Rock Creek Road, sewage treatment plant, & well, storage & water distribution system annexed into Lower Rock Creek Mutual Water Co. Overall density of subdivision will be 0.95 lots/ac.

NOTE: An incomplete or inadequate project description may delay project processing.

I CERTIFY UNDER PENALTY OF PERJURY THAT I am: ☐ legal owner(s) of the subject property (all individual owners must sign as their names appear on the deed to the land), ☐ corporate officer(s) empowered to sign for the corporation, or ☐ owner's legal agent having Power of Attorney for this action (a notarized "Power of Attorney" document must accompany the application form), AND THAT THE FOREGOING IS TRUE AND CORRECT.

Signature
MATTHEW T. LEHMAN

Signature FOR:
RANDALL AND ANNETTE CAPURRO

10/3/03
Date

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TENTATIVE TRACT MAP APPLICATION

APPLICATION # TM 37-56 FEE $ $1,500
DATE RECEIVED _____ RECEIVED BY KBH
RECEIPT # 33457 CHECK # 1285 (NO CASH)

APPLICANT/AGENT C & L Development, L.L.C.

ADDRESS P.O. Box 8898 CITY/STATE/ZIP Mammoth Lakes CA 93546

TELEPHONE (760) 934-8831

OWNER, if other than applicant Matthew Lehman & R.V. & A.B. Capurro, c/o C & L Development, LLC

ADDRESS P.O. Box 8898 CITY/STATE/ZIP Mammoth Lakes, CA 93546

TELEPHONE (760) 934-8831

PROPERTY DESCRIPTION: Assessor's Parcel # 26-330-02 Total Acres 54.67 ac

General Plan Land Use Designation ER - Estate Residential

Domestic Water Source and/or Supplier Private Water

Method of Sewage Disposal Private Sewage Treatment Plant

Present Use of Parcel Vacant

Proposed Use of Parcel 53 Single Family Residential Lots

APPLICATION PACKET SHALL INCLUDE: Tentative Map, Indemnification Agreement, required filing deposits listed on Development Fee Schedule, and other background materials described on Tentative Tract Map Requirements.

NOTE: An incomplete application packet may delay project processing.

I CERTIFY UNDER PENALTY OF PERJURY THAT I am: ☐ legal owner(s) of the subject property (all individual owners must sign as their names appear on the deed to the land), ☒ corporate officer(s) empowered to sign for the corporation, or ☐ owner's legal agent having Power of Attorney for this action (a notarized "Power of Attorney" document must accompany the application form), AND THAT THE FOREGOING IS TRUE AND CORRECT.

Signature _____ Signature _____ Date 11/17/03

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PROJECT INFORMATION

(To be completed by applicant or representative)

NOTE: Please answer all questions as accurately and completely as possible to avoid potential delays in processing. Attach additional sheets if necessary.

I. TYPE OF PROJECT (check any permit(s) requested):

- ☐ Director Review
- ☐ Use Permit
- ☐ Lot Line Adjustment
- ☐ Land Division (4 or fewer)
- ☑ Subdivision
- ☑ Specific Plan
- ☐ Zone Variance
- ☐ Zoning Amendment
- ☐ General Plan Amendment
- ☐ Other _____

APPLICANT C & L Development, L.L.C.

PROJECT TITLE Sierra Paradise

LOT SIZE (sq. ft./acre) 54.67 acres ASSESSOR'S PARCEL # 26-330-02

PROJECT LOCATION Lower Rock Creek Road, east of Paradise Lodge

Has your project been described in detail in the project application? Yes ☑ No ☐

Please Specify:

Number of Units N/A Building Height/# of floors N/A

Number of Buildings N/A Density (units/acre) N/A

Total lot coverage/impervious surface (sq. ft. & %) N/A

a. Buildings (first-floor lot coverage /sq. ft. & %) N/A
b. Paved parking & access (sq. ft. & %) 145,092 s.f. (6%)

Landscaping/screening and fencing:

a. Landscaping (sq. ft. & %) 207,317 s.f. (9%)
b. Undisturbed (sq. ft. & %) 2,029,016 s.f. (85%)

Total parking spaces provided:

a. Uncovered N/A
b. Covered N/A
c. Guest/Handicapped N/A

II. SITE PLAN

Are all existing and proposed improvements shown on the Plot Plan (see attached Plot Plan Requirements)? Yes ☑ No ☐

III. ENVIRONMENTAL SETTING

Use one copy of the Tentative Map or Plot Plan as needed to show any necessary information. Attach photographs of the site, if available.

More on back...

1. VICINITY MAP:
Attach a copy of assessor's parcel pages or a vicinity map showing the subject property in relation to nearby streets and lots or other significant features.

2. EXISTING DEVELOPMENT:
Vacant ☑ If the site is developed, describe all existing uses/improvements such as structures, roads, etc. Does the Plot Plan show these uses? Yes ☐ No ☐

3. ACCESS/CIRCULATION:
Name of Street Frontage(s) Lower Rock Creek Road
Paved ☑ Dirt ☐ No existing access ☐
Are there any private roads, drives or road easements on/through the property?
Yes ☑ No ☐
Has an encroachment permit been submitted to Public Works or Caltrans? Yes ☐ No ☑
Does the property have any existing driveways or access points? Yes ☑ No ☐
Are any new access points proposed? Yes ☑ No ☐
Does the Plot Plan show the driveways or access points? Yes ☑ No ☐
Describe the number and type of vehicles associated with the project That typical of 53 s.f. lots

4. ADJACENT LAND USES:
A. Describe the existing land use(s) on adjacent properties. Also note any major man-made or natural features (i.e., highways, stream channels, number and type of structures, etc.).

	LAND USE		LAND USE
North	RM/BLM-Resource Management	South	OS-Open Space
East	RM/BLM-Resource Management	West	RU-Rural Resort

B. Will the proposed project result in substantial changes in pattern, scale or character of use in the general area? Yes ☐ No ☑ If YES, how does the project propose to lessen potential adverse impacts to surrounding uses?

5. SITE TOPOGRAPHY:
Is the site on filled land? Yes ☐ No ☑ Describe the site's topography (i.e., landforms, slopes, etc.) The site slopes from the northeast to the southwest with an average slope of approximately 15%.

6. DRAINAGES:
A. Describe existing drainage ways or wetlands on or near the project site (i.e., rivers, creeks and drainage ditches 12" or deeper and/or within 30' of the property) There exists a drainage way on the NW corner of the site. No wetlands exist on the project site.

B. Are there any drainage easements on the parcel? Yes ☐ No ☑

C. Will the project require altering any streams or drainage channels? Yes ☐ No ☑ If YES, contact the Department of Fish and Game for a stream alteration permit. IF YES TO ANY OF THE ABOVE, show location on plot plan and note any alteration or work to be done within 30 feet of the stream or drainage.

7. VEGETATION:
A. Describe the site's vegetation and the percentage of the site it covers (map major areas of vegetation on the Plot Plan) The entire site is covered with scattered sagebrush.

B. How many trees will need to be removed? 0
C. Are there any unique, rare or endangered plant species on site? Yes ☐ No ☑
D. Has the site been used for the production of agricultural crops/trees or grazing/pasture land in the past or at the present time? Yes ☐ No ☑
E. Is landscaping/planting of new vegetation proposed? Yes ☑ No ☐

8. WILDLIFE:
A. Will the project impact existing fish and wildlife? Yes ☐ No ☑
Describe existing fish and wildlife on site and note any proposed measures (if any) to avoid or mitigate impacts to fish and wildlife There are no fish or wildlife that live on the project site.

B. Are there any unique, rare or endangered animal species on site? Yes ☐ No ☑

9. CULTURAL RESOURCES:
A. Are there any cemeteries, structures or other items of historical or archaeological interest on the property? Yes ☐ No ☑ Specify

10. SITE GRADING:
A. Will more than 10,000 square feet of site area be cleared and/or graded? Yes ☑ No ☐ If YES, how much? 352,409 sf
B. Will the project require any cuts greater than 4' or fills greater than 3'? Yes ☑ No ☐
C. Will the project require more than 200 cubic yards of cut or fill? Yes ☑ No ☐ If YES, how much? 284(c) If YES to A, B or C, contact the Public Works Department for a grading permit.
D. Will site grading of 10% or more occur on slopes? Yes ☑ No ☐
E. Note any measures to be taken to reduce dust, prevent soil erosion, or the discharge of earthen material off site or into surface waters Water trucks will be onsite at the time of grading to reduce dust. Erosion control measures will be in-place when grading begins.

11. AIR QUALITY:
A. Will the project have wood-burning devices? Yes ☐ No ☑ If YES, how many? _
B. What fuel sources will the proposed project use? Wood ☐ Electric ☐ Propane/Gas ☐
C. Will the proposal cause dust, ash, smoke, fumes or odors in the vicinity? Yes ☐ No ☑

12. VISUAL/AESTHETICS:
A. How does the proposed project blend with the existing surrounding land uses? The project site is designated Estate Residential & will conform with existing zoning requirements and specific plan requirements

B. How does the proposed project affect views from existing residential/commercial developments, public lands or roads? The proposed project will not affect any views of existing developments, public lands or roads.

C. If outdoor lighting is proposed, describe the number, type and location N/A

13. NATURAL HAZARDS:
A. Is the site known to be subject to geologic hazards such as earthquakes, landslides, mudslides, ground failure, flooding, avalanche or similar hazards? Yes ☑ No ☐ (Circle applicable hazard[s]).
B. Will any hazardous waste materials such as toxic substances, flammables or explosives be used or generated? Yes ☐ No ☑
C. Does the project require the disposal or release of hazardous substances? Yes ☐ No ☑
D. Will the project generate significant amounts of solid waste or litter? Yes ☐ No ☑

More on back...

E. Will there be a substantial change in existing noise or vibration levels? Yes ☑ No ☐
If YES to any of the above, please describe That associated with 53 s.f. residents

14. OTHER PERMITS REQUIRED:
List any other related permits and other public approvals required for this project, including those required by county, regional, state and federal agencies:

- ☑ Encroachment Permits from *Public Works or Caltrans.*
- ☐ Stream Alteration Permit from *Department of Fish and Game*
- ☐ 404 Wetland Permit *from Army Corps of Engineers*
- ☑ Grading Permit *from Public Works*
- ☐ Building Permit from *County Building Division*
- ☑ Well/Septic from *County Health Department*
- ☐ Timber Land Conversion from *California Department of Forestry*
- ☑ Waste Discharge Permit from *Lahontan Regional Water Quality Control Board*
- ☐ Other _____

IV. SERVICES

1. Indicate how the following services will be provided for your project and the availability of service.

Electricity Southern California Edison
Underground ☑ Overhead ☐ (Show location of existing utility lines on Plot Plan)

Road/Access Proposed Access Road adjoining Lower Rock Creek Road

Water Supply Private Water

Sewage Disposal Private Sewage Treatment Plant

Fire Protection Wheeler Crest Community Services District

School District Round Valley Joint Elementary/Bishop Union Joint High School District

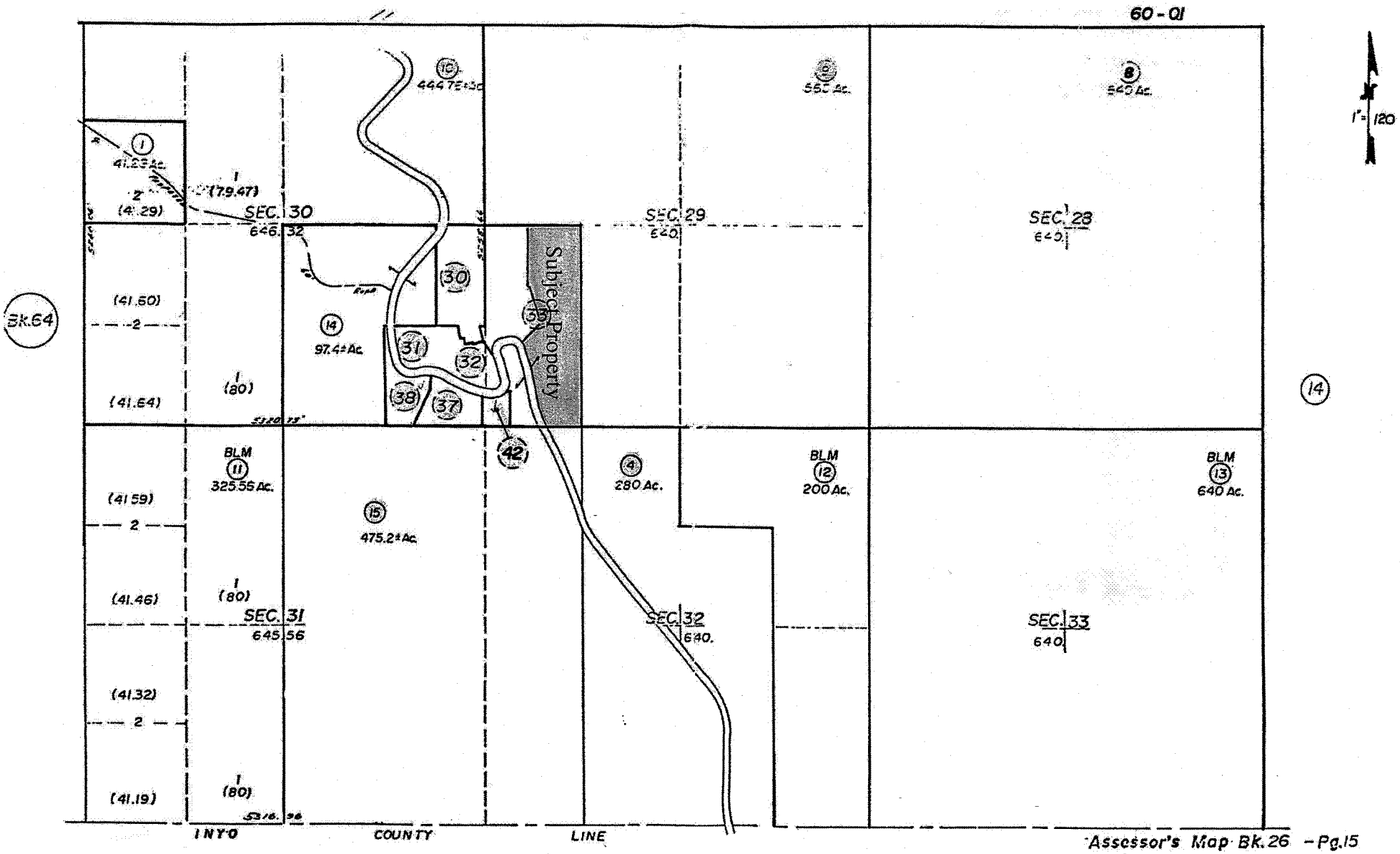
2. If an extension of any of the above is necessary, indicate which service(s), the length of the extension(s), and the infrastructure proposed Electricity will be installed in road shoulders and individual laterals will be installed.

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Signature _____ Date 11/17/03

For _____

NOTE: Failure to provide any of the requested information will result in an incomplete application and thereby delay processing.



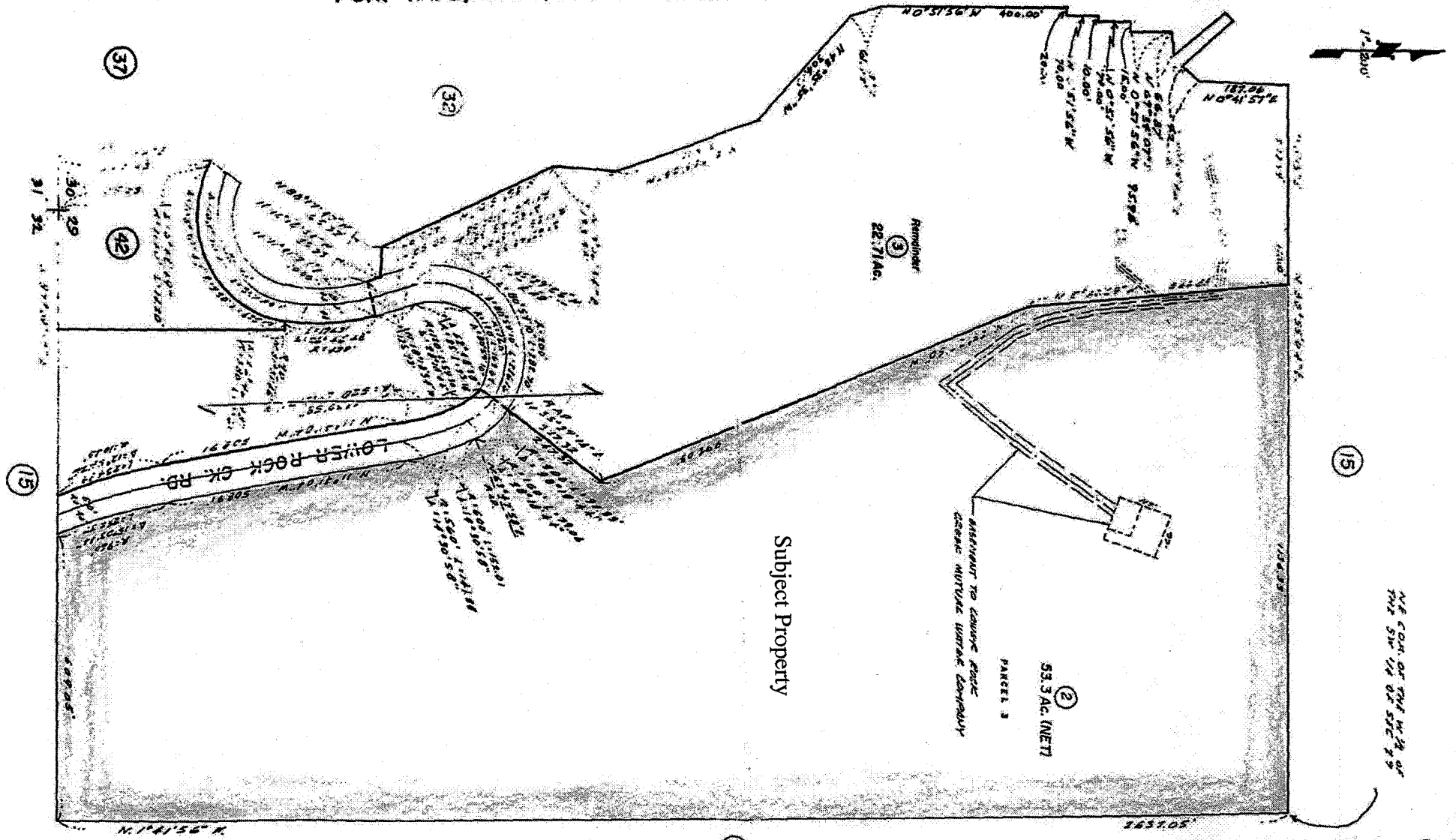
Assessor's Map Bk. 26 – Pg. 15
County of Mono, Calif.

5/95

POR. W1/2, SW1/4, SEC. 29, T.5S., R.31E., M.D.B. & M.

Tax Area Code
60-03

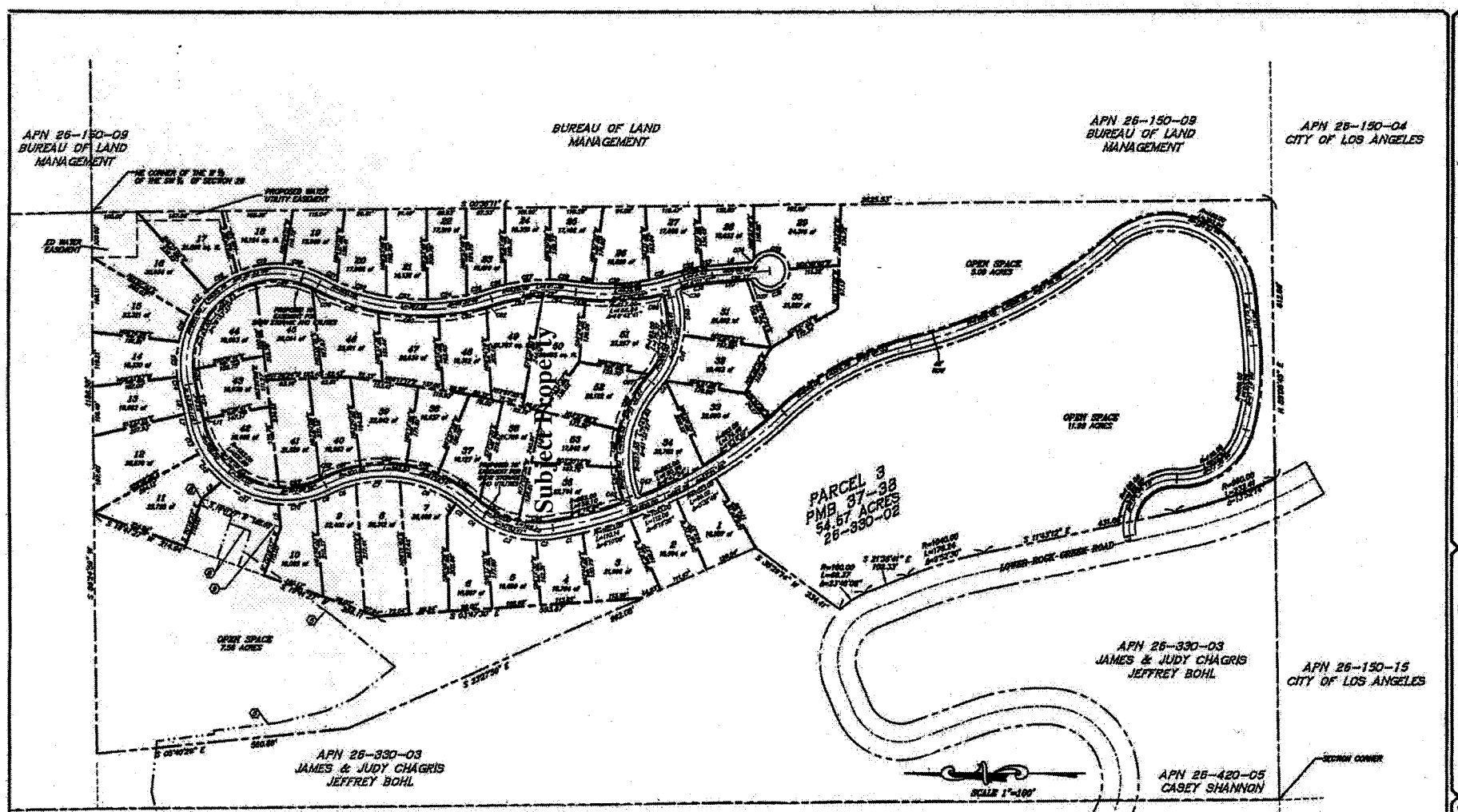
26-33



T.M. 37-41, BK. 10-34(26-330-03)

Assessor's Map Bk. 26 - Pg. 33
County of Mono, Calif.

NOTE - Assessor's Block Numbers Shown In Ellipses.



INDEX TO SHEETS

1. TENTATIVE TRACT MAP
2. CIVIL SITE PLAN-GRADING AND DRAINAGE DETAILS

DESIGN NOTES

PROJECT PROPERTY DATA

GROSS AREA	54.57 ACRES
NUMBER OF LOTS	39
DENSITY	1.04 ACRES/LOT

RECORD OWNER

PREPARED BY

LEGAL DESCRIPTION

PARCEL 3 OF PARCEL MAP 37-38.

EASEMENT NOTES

EASEMENTS ARE FROM THE PRELIMINARY TITLE REPORT FROM RTC-MONO TITLE COMPANY DATED FEBRUARY 26, 2002.

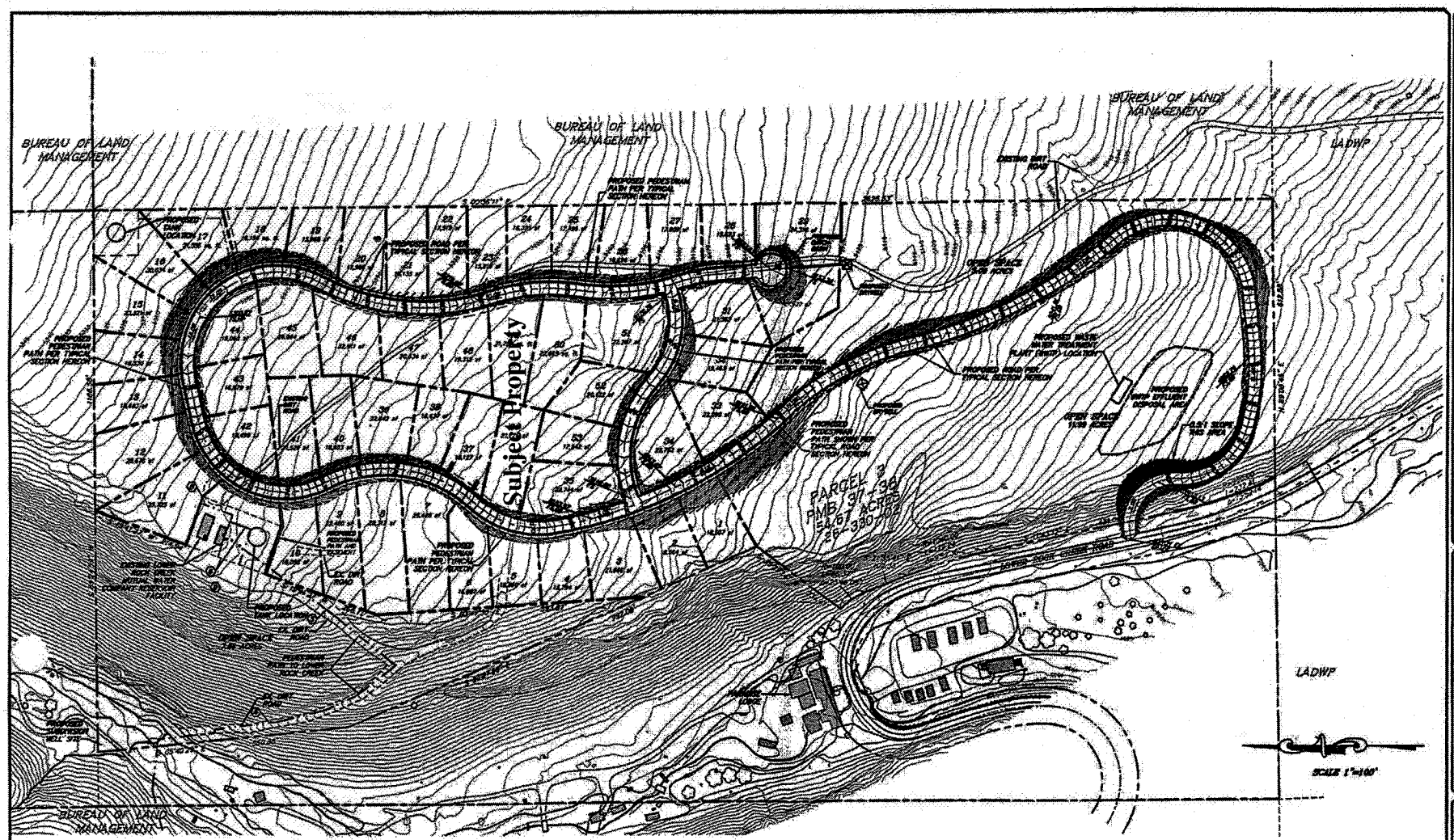
THE FOLLOWING MAY AFFECT A PORTION OR ALL OF THE PROPERTY, BUT CANNOT BE LOCATED, ARE UNKNOWN, UNRECORDED, OR OF RECORD:

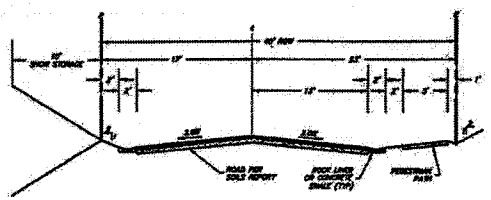
3. AN EASEMENT FOR EXISTING UNDERGROUND OR AERIAL ELECTRIC AND COMMUNICATION LINES TO SOUTHERN CALIFORNIA EDISON COMPANY PER 101/172 O.R.
4. AN EASEMENT FOR WATER PIPE LINES AND INCIDENTAL PURPOSES, RESERVOIR, AND PUMPING PLANT SYSTEM TO LOWER ROCK CREEK MUTUAL WATER COMPANY PER 107/10 O.R.
5. AN EASEMENT FOR WATER PIPE LINES, RESERVOIR, AND PUMPING PLANT SYSTEM TO LOWER ROCK CREEK MUTUAL WATER COMPANY PER 109/335 O.R.
6. AN EASEMENT FOR WATER TANK TO LOWER ROCK CREEK MUTUAL WATER COMPANY PER 285/505 O.R.
7. AN EASEMENT FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF A WATERLINE, WELL AND EQUIPMENTS, AND ACCESS THERETO, TO LOWER ROCK CREEK MUTUAL WATER COMPANY, PER 706/187 O.R.
8. AN EASEMENT FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF A WATERLINE, WELL AND EQUIPMENT, AND ACCESS THERETO, TO LOWER ROCK CREEK MUTUAL WATER COMPANY, PER 706/129 O.R.
9. AN EASEMENT FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF A WATERLINE, WELL AND EQUIPMENT, AND ACCESS THERETO, TO LOWER ROCK CREEK MUTUAL WATER COMPANY, PER INST. # 2003004318 O.R.

* NUMBERS REPRESENT NUMBER SHOWN ON TITLE REPORT.

TENTATIVE TRACT MAP NO. 37-56
SIERRA PARADISE
PARCEL 3 OF PARCEL MAP 37-38
MONO COUNTY, CALIFORNIA

DATE	10/21/2003
SCALE	1"=100'
DRAWN BY	TP/MV/KP
JOB NO.	2215
FILE	2215TTM.dwg
SHEET	1
OF	2 SHEETS





TYPICAL ROAD SECTION

TENTATIVE TRACT MAP NO. 37-___

SIERRA PARADISE

PARCEL 3 OF PARCEL MAP 37-39

MONO COUNTY, CALIFORNIA

10/31/2003

1"=100'

TP/MV/KP

2215

2215TM.dwg

2

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX B

WRITTEN COMMENTS ON THE NOTICE OF EIR PREPARATION

Mono County
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January 21, 2004

Scoping Meeting Notes
C&L Development, Paradise Fire Station
January 13, 2004

PURPOSE OF MEETING

Identify environmental issues and concerns and not pros and cons.

PROJECT DESCRIPTION

Applicant:	C & L Development, Capurro and Lehman
Project Name:	C & L Development
Site:	East of Sierra Paradise on Lower Rock Creek Road.
Land Use:	Estate Residential

Processing:
1. Project Application
2. Project Application Acceptance
3. CEQA/ Project Application Process: Scoping / Env Doc Preparation / Public Review / Planning Commission Public Hearing(S) / Board Of Supervisors Public Hearing(S)

ENVIRONMENTAL ISSUES/CONCERNS

1. POPULATION AND HOUSING

- Verify type of home that can be built. Can manufcturd homes be built on this site?
- What development can be done with the existing zoning?
- Is there a requirement for affordable housing?
- What is affordable?
- Define affordable; Compare population statistics from both Inyo/Mono Counties.
- Restrict the size of the homes built on the lots?
- Require minimum stds on the homes? They shouldn't conflict w/ Co. stndards.
- Look at the cumulative impact of the various developments in the area such as Rovana, Mustang Mesa and C&L development.

2. GEOLOGIC PROBLEMS

- Check with USGS in Menlo Park for fault information.
- Is there a fault on the site?
- Water seepage problems. See letter from LeeRoy Johnson.
- TEAM Engineering has done a study. Locate study.
- Is there a liquefaction factor during an earthquake in the Bishop Tuff area?
- What is the permeability in the Bishop Tuff area?
- Is there a soil erosion problem anywhere on the site?

3. WATER

- How will the project be served?
- Will a well be drilled?
- Is the well site above the existing well?
- The current water system needs a second well (refer to Jim Moyer's letter).
- See the study done by TEAM Engineering.
- A third well for the dev't may be questionable as to the water availability.

- Does the development have water rights?
- Paradise now has 50 undev lots with a total of 132 lots including Paradise Lodge. Paradise Lodge has 30 water "credits."
- 70,000 + 40,000 + 140,000 equals 250,000 gallons held in water tanks.
- Intake water related to water quality and the new development.
- What are C & L water rights to the stream?
- The water co & Paradise Lodge both have stream water rights with flows of .33 cfs.
- C & L intends to drill a well.
- How much water will the new development need?
- Current water company is on meters.
- Need Fire flow reserve of 500gpm/2hrs. (500galx60minx2=60,000gal fire storage)
- What is C & L backup plan if there the well fails?
- Need clarification of water source and costs.
- Per SB 610, a water co. with >200 units must do a water study. If this dev't is merged with the current water company will SB 610 apply?
- What's effect of add'l water use on offsite users (downstream farms, Mustang Mesa, etc.?
- Where will the water tank be located? (proposed in nw corner)
- Surface water quality use "Best Management" Practices" (BMPs)
- There are potential "401" questions; Army Corps of Engineers cotact.
- How is water collected? Where does water go?
- Will runoff increase due to nonpermeable surfaces? Existing runoff vs., future dev't? Calculate "delta" – change from present (Bishop Tuff run-off v new runoff).
- How will runoff imp Rock Ck, fisheries, stream rec'n, stock watering, domestic uses?
- Beneficial uses.
- Contact Lahontan
- Intake from creek - existing water rights?
- Need a contingency plan for lack of water for current users due to the new dev't?
- Will the county enforce a contingency plan?
- What is the sustainable water budget for Sierra Paradise & C & L Dev't?
- Will sewage impact the creek?
- Where is water line easement from extg tanks to well sites – LRCMWC and C&L's?
- Visual issues?

4. AIR QUALITY

- Dust created from the development?
- Wood burners: Mono County requires Phase II EPA stoves.
- Dust from Rovana settling ponds – cumulative?
- Sewage odors.
- What is package tmt plant suggested by C&L? Sub-service tmt field 300 gpd/hh.
- Proposed leach field? Yes.
- Where dies the sewage go?
- Vegetation removed from the sites may result in dust.
- No blowing dust during construction.
- Investigate PM 10 (particulate matter 10 mirons or less)

5. TRANSPORTATION/TRAFFIC

- The average household has roughly 10 trips/day.
- One vehicle per 60 seconds added to roadway on average.
- Real question is will increase be noticeable?
- What will the cum traffic impacts be from the developments of Rimrock, Rovana, Swall Meadows, Sierra Paradise, and the C & L development?
- Bikes are popular because the main road is a designated County bike route.
- Is the project road going to be paved?
- Is the project road private are public?
- Will there be a zone of benefit or a tax for the upkeep of the road?

- If there is a zone of benefit, will an inflation factor be built in?
- Will the development cause effects (degradation) on off site roads?
- What part of the housing will be year-round/seasonal? Will this affect traffic?
- What will the edge treatment be on the project road?
- Will the 12% grade of the project road allow for fire and utility vehicles?
- Is there a need for an emergency egress and entrance?
- Will there be an evacuation plan in case of an emergency?
- The DWP has not given approval for the current access to the property.
- Proposed grade of the project road is 12% -- accident potential (e.g., icy condns)?
- Visual sight distance issue at entrance if road is cut too deep into the Bishop Tuff.
- Are there ways to reduce traffic by using existing Inyo Mono Transit service?
- Will the increased traffic impact deer and other wildlife (e.g., roadkill)?
- Is there a need for traffic control at the intersection?

6. BIOLOGICAL RESOURCES

- When will the studies be complete?
- Consider a re-vegetation plan on disturbed areas with native plants.
- Will there be fencing restrictions so wildlife can move through the properties?
- A deer study will be done.
- What safety measurements are needed due to quail hunters near res'l areas?
- At what time does Fish and Game become involved in the process?
- There have been sightings of the rare spotted bat in the canyon.
- Resident's interaction with quail hunters. Problems?
- Will there be an issue with residential animals (cats, dogs) ranging off-site?
- What will the effect be on deer and other wildlife?
- What are reltve imps re Sp Pln zoning and the Estate Res'l zoning on wildlife?
- Animals seen in area include: mtn lions, bear, fox, snakes, raccoons, quail, owl, raptors & roosting sites, rabbit, skunks, nesting migratory birds, rare spotted bat.

7. ENERGY & MINERAL RESOURCES

- Where will electrical lines be placed? Mono Co requires underground utilities.
- Where will propane tank lines be? Individual tanks versus a central tank?
- Should the homes be solar oriented?
- Could wind gen facilities be used for energy? (Co code allows it.) Note: visual impact.

8. HAZARDS

- Wildlife
- Earthquake
- Quail Hunters

9. NOISE

- Auto, trucks, motorcycles, ATVs
- Dogs
- People talking
- The nearby lodge/resort
- Construction noise
- Blasting for the road construction.
- Parties?
- Impact on the project from noise sources, lodge, camping, fishermen, etc.

10. PUBLIC SERVICES

- Need volunteers for the fire dept – project may need more volunteers.
- The current response time for the fire department is 10 minutes.
- The new dev't may have a slower response time – farther from the fire stn.
- The existing fire-flow for existing Paradise is adequate.

- Match fire-flow with hydrants.
- Will fire engine be able to navigate the 12% grade? Dept of Forestry can go up to 16%.
- The new development is in the fire district's boundaries.
- New eqpmt is needed for the fire district to accommodate the development.
- Fire dept needs new Class I truck w/ 1000 min tank – sought regardless of this proposal.
- Place higher fire proof regulations on the new development?

11. UTILITIES/SERVICE
- The developer has not proposed any street lights.
- Are there utility access roads on the property?
- Are there trails and roads on the property being used by the public?
- What impact on the refuse transfer facility located near the Inyo Co border?
- Will there be an impact on the sheriff's department?
- What is the sheriff's existing level of service for the area?
- There is a need for an expanded no-shooting zone around the area.

12. AESTHETICS
- Need a visual study.
- The development is near a scenic byway/highway.
- Dark colors shd be used on the buildings in the dev't to minimize visual imps.
- What set-backs for homes near cliffs? Should it differ from those in extg Paradise?
- Will there be Codes Covenants and Restrictions (CC&Rs)?
- Will the road cut be visually offensive?
- Will house exterior lighting be shaded downward to not interfere with night sky?

13. CULTURAL RESOURCES
- A cultural resource investigation will be conducted for the site.

14. RECREATION
- Will there be an impact on the local area's youth sports?
- Will there be an impact from senior citizens on local amenities ("old sports")?
- Off-site imps from horseback riding, quail hunting, motorcycle riding, cycling, etc.?
- Mono County bookmobile visits the area.
- A park in the development area is not part of the project.
- A park is not wanted in the area.
- How is the open space incorporated into the project?

15. OTHER
- Can a conservation easement be placed on the open space area?
- Can the open space be used as a cemetery?
- The High School bus (from Bishop) does not run through the area.
- Will there be impacts on the local schools?
- Will this development affect Bishop Area?
- Is there possibility to trade land with the DWP or BLM?
- Trespassing should be mitigated on srdg lands to avoid their use for storage, corrals, etc.
- The boundaries of the dev't should be surveyed with BLM, DWP & the lodge.
- Will there be an increased cost of enforcement to public agencies?
- Snow removal issues?
- Aside: Summit Dr in Paradise has asphalt "ridges" left over after pub wks repairs.

MAIL IN / EMAIL COMMENTS

Letters/emailed rec'd to date:
- LRCMWC Water Company (Moyer), January 13, 2004
- LeRoy Johnson email, January 8, 2004

→ Submitted 13 Jan 4 at Scoping Meeting

LOWER ROCK CREEK MUTUAL WATER COMPANY
P.O. Box 9 - Bishop, CA 93515

January 13, 2004

Gwen Plummer
P.O. Box 347
Mammoth Lakes, CA 93546

Ms. Plummer:

"The specific business in which this corporation is primarily to engage is to procure, develop, distribute, supply, and deliver water at actual cost plus necessary expenses to its shareholders for domestic use." (Lower Rock Creek Mutual Water Company - Articles of Incorporation, Article 2: Purposes and Powers, paragraph 1).

It is this boards goal to insure an adequate supply of potable water for domestic use and fire protection to all shareholders: present and future.

At the Annual Shareholders' Meeting on March 30, 1996, the shareholders voted to adopt the "Poutney Report" as the Business Plan for the LRCMWC and instructed the Board of Directors to "proceed in an orderly manner as funding and circumstances permit." The report called for a number of improvements to be in place by build-out in order to provide an adequate water supply to satisfy the community's domestic and fire protection needs: a second well and pump, a stand-by generator to provide electricity in the event of commercial power failure, the replacement of the old steel water-main along Westridge Road (completed April, 2002), a looped distribution system to supply water from both ends of the tract, and a third reservoir.

The LRCMWC Business Plan calls for a second well before we reach build-out. The purpose for a second well will be to increase our water source and provide redundancy in the event a pump or well fails. Andrew Zdon, from Team Engineering, has completed a well-location investigation for LRCMWC. Given performance details of the existing well, he has prepared an analysis of how one well may influence a second well 100ft, 200ft and 300ft apart. Mr. Zdon feels confident that if the second well equals current well performance, both wells could run simultaneously for a limited period in the event of a fire or other unexpected demand, but not continuously for extended periods. Unfortunately, there are no guarantees that the second well will equal the current well performance: it could perform better or worse; it could effect the cone of influence in such a way that the two pumps cannot run simultaneously. The only way to find out for sure is to drill the second well and conduct a longer-term aquifer test on the new well, with water levels monitored in both wells to evaluate with greater confidence well yields and potential well-interference issues. Mr. Zdon recommends locating the second well "on the northern-most extent of the existing LRCMWC property" – in other words, as far away as possible.

Furthermore, though the well is 920 feet deep, there is no evidence that our existing well source is the large aquifer lying beneath the tuff material upon which Paradise Estates is built. It is the opinion of both Mr. Zdon and Russell Kyle (owner of Maranantha Drilling who drilled our well) that our well water in is coming from fractures in the tuff material fed by Rock Creek. Their opinion is based primarily upon the amount of water level draw down when the pump is running relative to the gallons per minute production of the well. When our well was first tested, the driller used a 50hp pump producing 150gpm for a 24-hour period. The starting water level was 241feet and after 24 hours of pumping dropped to 529 feet - or 288feet of draw down. 150gpm divided by 288feet equals 0.52 gal per 1 foot of draw down. Clearly, our existing well performs poorly. Wells in and around the city of Bishop produce 30 to 50gpm per foot of draw down. It appears unlikely that our current underground water source would yield enough water to support two pumps running simultaneously - much less three (if C&L Development intends to develop a well in the same area).

According to the law office of Peter Tracy, there are no LRCMWC shares appurtenant to the property owned by C & L Development. Consequently, LRCMWC has no obligation to provide water for the project.

California Health and Safety Code, Title 22, Section 64562, Quantity of supply: a) "Sufficient water shall be available from the water sources and distribution reservoirs to supply adequately, dependably and safely the total requirements of all users under maximum demand conditions before agreement is made to permit additional service connections to a system."

It is questionable whether or not our existing water sources are sufficient to meet the future requirements of LRCMWC. There are approximately 50 undeveloped lots in Paradise Estates. The water company must provide additional source to accommodate this inevitable, increased demand: whether it is a second well or a surface water treatment plant. It is uncertain and unlikely that our current water sources will support an additional 53 homes on the eastern side of Rock Creek without implementing severe water use restrictions upon existing shareholders.

Sincerely,

Jim Moyer
President, LRCMWC
760-387-0070

TEAM
ENGINEERING & MANAGEMENT, INC.

P. O. Box 1265, Bishop, California 93515-1265
760-872-1033 fax 760-872-2131

December 5, 2002

Mr. James Moyer
Lower Rock Creek Mutual Water Company
4575 Lower Rock Creek Road
Bishop, CA 93514

Re: New Well Location and Site Conditions, Paradise, California

Dear Mr. Moyer:

TEAM Engineering & Management, Inc. (TEAM) is pleased to provide the following results of our well-location investigation for the Lower Rock Creek Mutual Water Company (LRCMWC). As part of our investigation, TEAM conducted a site visit, a review of existing data concerning the existing well, and evaluated potential well-interference issues associated with the existing well and a proposed new well.

Background

The site is in the community of Paradise (Mono County), within the northwestern-most portion of the Owens Valley, California. The dominant topographic features in the area are the Sierra Nevada (to the west), the Volcanic Tableland (to the east), and Round Valley (to the south). The site is at an elevation of approximately 5,000 feet above mean sea level in a narrow canyon drained by Rock Creek. This canyon has been eroded into the volcanic rocks of the Bishop Tuff, and the linear nature of the canyon is likely the result of the existing fault/fracture system in the area.

Rock Creek flows from north to south through the area, and stream-flow estimates in the vicinity were not available for this study (nor were they pertinent to the key issues of this report). There is an existing well at the site which was drilled to a depth of 920 feet below ground surface (bgs). During static conditions, the top of the water column in the well is generally about 300 feet above the pump assembly.

According to the logs/diagrams of the existing well, the principal aquifer materials are fractured rock of the Bishop Tuff, and an underlying "sand" unit. According to these documents, the principal water-bearing zone was this underlying "sand" unit. It is unclear if the underlying "sand" unit is an alluvial or glacial deposit, or is simply a granitic-rock unit (due to the size of cuttings from rotary drills, logging a granite as a dense sand is a common error).

Recommended Well Location

Based on our observations at the site, drilling a new well on the northern-most extent of the existing LRCMWC property, along the existing dirt road along the west side of Rock Creek is recommended. Mono County will require a 50-foot setback from Rock Creek. Additionally a pad will need to be constructed with a backhoe to accommodate drilling equipment. Given the proximity of the creek,

and the likelihood of significant purge water from the well during drilling a method of cuttings containment and purge water discharge will need to be developed with input from the Mono County Environmental Health Department.

Anticipated Well Interference

LRCMWC staff has expressed concern over potential well interference issues between the existing well and any new well drilled in its proximity. TEAM evaluated the potential for well interference using the Theis nonequilibrium equation and assumed aquifer parameters based on the results of previous short-term constant discharge tests or specific-capacity tests conducted by the driller and subsequently by the LRCMWC. Specific capacities (discharge per foot of drawdown) have ranged from approximately 0.5 to 2 gallons per minute per foot of drawdown. The higher specific capacities are from more recent tests and may indicate greater development of the well over the years since installation.

The analyses assumed that the existing well would be pumped constantly at 120 gallons per minute for a period of 24 hours before being shut off. An anticipated range of drawdown (based on the range of specific capacity previously measured) was developed for distances of 100, 200 and 300 feet from the existing well. Given the current cyclic, daily well pumping scheme, and the unlikely event that the existing well would need to be operated 24 hours a day at full Paradise build-out (not including development on the bluffs east of the creek), particularly with a second well operational, the 24-hour pumping period was assumed to be conservative for the analysis.

The results of this analysis suggest that under the conditions described above, drawdown caused by the existing well as measured in a new well located approximately 100 feet from the existing well would range from four to 28 feet. Drawdown caused by the existing well as measured in a new well located approximately 200 feet from the existing well would range from less than one foot to 19 feet. Drawdown caused by the existing well as measured in a new well located approximately 300 feet from the existing well would range from zero to 14 feet.

The results should be used with caution as the analysis was based on very short aquifer test durations (a 48-hour is typically recommended). The result is that recharge from Rock Creek might cause a flattening in water levels that suggests an equilibrium condition is reached during a test, which may be more of an aberration rather than indicative of long-term water level trends during constant pumping.

Discussion and Recommendations

Prior to hiring a driller, TEAM recommends that detailed drill specifications be developed that can be provided to multiple drillers for bid. This is particularly advantageous given the significant depths involved and associated substantial drilling costs. The key objective is to eliminate as many unknowns as possible for the driller. The result is a bid as close as possible to the final real cost as opposed to receiving low bids and incurring potentially much higher final drilling costs due to "unanticipated or different conditions" encountered by a driller or other issues resulting in unanticipated costs. The costs for TEAM to develop detailed drill specifications are provided in our

cost estimate submitted to you previously.

Additionally, after the well is installed, a longer-term aquifer test should be conducted on the new well, with water levels monitored in both the new well and the existing well to evaluate with greater confidence well yields and potential well-interference issues. This will likely be a requirement by Mono County and will also allow the LRCMWC to develop an efficient groundwater pumping scheme.

An option for consideration by LRCMWC may be to construct the proposed new well with a larger diameter than the existing well. The potential for substantially increased flow from a larger diameter well may justify the additional cost of drilling the larger diameter well. Groundwater inflow to a well is partially a function of the diameter of the well. This is a logarithmic relationship so as the diameter of the well increases, inflow can increase substantially.

TEAM appreciates the opportunity to work with the LRCMWC and looks forward to continuing to provide you with technical support on this important project. Should you have any questions or comments, please call us at 760-872-1033.

Sincerely,

Andrew Zdon, RG, CEG, CHG
Senior Hydrogeologist

c:\myfiles\lrcmwcr01

MARANATHA DRILLING & PUMP SERVICE

OWNERS, Russell & Douglas Kile
Contractors License # 417231
Route 4, Box 18-C
Bishop, CA 93514
(619) 933-2390

WATER WELL EVALUATION STUDY:

Owner: LOWER ROCK CREEK MUTUAL WATER COMPANY

Location of Well: Paradise Estates Mono County CA State

FORMATION INFORMATION: Thickness 679 FT From 24)

PUMPED WELL INFORMATION: Screen Length 660 FT FROM 2[illegible]
Screen Diameter 8 IN ~~XX~~ FROM 240 TO 900

PUMP ON : TIME 2:40pm DATE 3-24-93
PUMP OFF: TIME 2:31pm DATE 3-25-93

STATIC WATER LEVEL 241 AVERAGE DISCHARGE _____ GPM

TEST PUMP ID 175-6 DCH HP 50 DROP PIPE SIZE 4 1/2 OD Drill Pipe
DROP PIPE LENGTH _____ PUMP MOTOR VOLTAGE _____ PHASE _____

OBSERVATION WELL INFORMATION:

DIAMETER N/A IN. DEPTH _____ FT
DISTANCE _____ FT TO PUMPED WELL.

DATA FROM WELL NO. 1

OBSERVED BY Joshua, Matthew, Doug Kile
SIGNATURE: Doyle K

SHORT WELL EVALUATION WILL BE:
MAXIMUM PSI 275, PSI 60, PSI 50, PSI 40, PSI 30, PSI -0-.
@ 552 Water Level

DATE	TIME	T/T	MEASURE POINT	WTR LEVEL START	WTR LEVEL STOP	*PSI PUMP	Q GPM	REMARKS
3-24-93	2:40 pm	0 HR	Airline 575 feet	241'		200	130	Cloudy
3-25-93	2:31 pm	24 HR	Airline 575 feet		529'	50	150	Clear water
3-24-93	2:40 pm		METER: 0037,770.					
3-25-93	2:31 pm		METER: 0254,400.		TOTAL GALLONS PUMPED 232,120 GALLONS			
3-25-93	6:00 pm		Meter: 0269,890.					

LICATE
Owner's Copy
Page 1 of 1
Owner's Well No.

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 478249

STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Date Work Began 11/5/92 Ended 3/29/93
Local Permit Agency MONO COUNTY HEALTH DEPT
Permit No. 26-92-39 Permit Date

GEOLOGIC LOG

ORIENTATION (✓) — VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DEPTH TO FIRST WATER ____ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	7	D.C & BOULDERS
7 ~~ft~~	45	PURPLE B.T
45	78	BROWN B.T
78	110	FRACTURED B.T & CLAY
110	267	BROWN B.T
267	510	FRACTURED B.T
510	601	HARD GRAY B.T
601	633	BROWN B.T
633	725	BROWN & GRAY B.T, WHITE SAND
725	755	SAND
755	920	COURSE SAND

5291 - 1506 PM

TOTAL DEPTH OF BORING 920 (Feet)
TOTAL DEPTH OF COMPLETED WELL 920 (Feet)

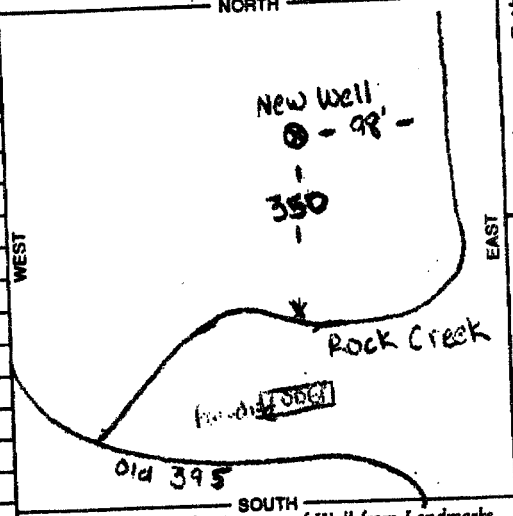
WELL OWNER

Name EMIL HAUETER ~~LOWER ROCK CREEK MUTUAL WATER CO.~~
Mailing Address ~~4986 WEST RIDGE RD.~~
City ~~BISHOP,~~ CA STATE 93514

WELL LOCATION

Address ~~LOWER ROCK CREEK RD.~~
City ~~PARADISE~~
County ~~MONO~~
APN Book 26 Page 30 Parcel
Township 5 S. Range 31 E. Section 01
Latitude DEG. MIN. SEC. NORTH Longitude DEG. MIN. SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

- ✱ NEW WELL
- MODIFICATION/REPAIR
  - ___ Deepen
  - ___ Other (Specify)
- ___ DESTROY (Describe Procedures and Material Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)

- ___ MONITORING
- WATER SUPPLY
  - ___ Domestic
  - ✱ Public
  - ___ Irrigation
  - ___ Industrial
- ___ "TEST WELL"
- ___ CATHODIC PROTECTION
- ___ OTHER (Specify)

DRILLING METHOD ROTARY FLUID MUD

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ~~XXXX~~ 241 (Ft.) & DATE MEASURED 3-25-93
ESTIMATED YIELD* 200 (GPM) & TEST TYPE PUMP
TEST LENGTH 24 (Hrs.) TOTAL DRAWDOWN 529 (Ft.)
** May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	62	14 1/2	✱				STEEL	12 3/4	188	
0	240	12 1/4	✱				STEEL	10 5/8	250	
240	920	12 1/4		✱			STEEL	8 5/8	250	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE / SIZE)
0	62	✱			
0	980			✱	3/8 gra

ATTACHMENTS (✓)

- ___ Geologic Log
- ___ Well Construction Diagram
- ___ Geophysical Log(s)
- ___ Soil/Water Chemical Analyses
- ✱ Other Pump test

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME [redacted] (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED) MARANATHA DRILLING

ADDRESS RT #4 BOX 18-C CITY BISHOP STATE CA ZIP 93514

Signed [redacted] (WELL DRILLER/AUTHORIZED REPRESENTATIVE) DATE SIGNED 6-23-93

C-57 LICENSE NUM 417231

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DWR 188 REV. 7-90

AGENDA
Scoping Meeting
C&L Development, Paradise Fire Station
January 13, 2004

PURPOSE OF MEETING

PROJECT DESCRIPTION

PROCESSING

1. PROJECT APPLICATION
2. PROJECT APPLICATION ACCEPTANCE
3. CEQA/ PROJECT APPLICATION PROCESS: SCOPING / ENVIRONMENTAL DOCUMENT PREPARATION / PUBLIC REVIEW / PLANNING COMMISSION PUBLIC HEARING(S) / BOARD OF SUPERVISORS PUBLIC HEARING(S)

ENVIRONMENTAL ISSUES/CONCERNS

1. POPULATION AND HOUSING
2. GEOLOGIC PROBLEMS
3. WATER
4. AIR QUALITY
5. TRANSPORTATION/TRAFFIC
6. BIOLOGICAL RESOURCES
   - Vegetation
   - Wildlife
7. ENERGY AND MINERAL RESOURCES
8. HAZARDS
9. NOISE
10. PUBLIC SERVICES
11. UTILITIES/SERVICE SYSTEMS
12. AESTHETICS
13. CULTURAL RESOURCES
14. RECREATION
15. OTHER

AFTER MEETING COMMENTS

MAIL IN / EMAIL COMMENTS

Environmental Scoping Meeting: Paradise

December 16, 2003

Name (please print)	Mailing Address	City/State/Zip	Phone	E-mail
DAVE SWAN	1 ATOLL	CORONA DEL MAR CA 92625	(949) 759-0337	DWHSWAN@AOL.COM
Jim Paulus	PO Box 244	Bishop CA 93515	(760) 873-8516	j-paulus@msn.com
Jim Moyer	PO Box 137 Scott Rd.	Bishop, CA 93514	760 387-0070	jmoyer@telis.org
DELORES G. WRIGHT	470 Westridge	Bishop 93514	760 387-2352	Wright@schat.com
Mary Pipersky	Box 8474	M.L., CA 93546	935-4606	mpipersky@qnet.com
Sally Kelley	POBox 7003	M.L.CA. 93546	760 934.9635	skelley@mammothmtn.com
Robert Struckman	5068 WESTRIDGE	BISHOP CA 93514	760-387-2264	paradise@qnet.com
Patricia Zappe	109 Summit Rd	" "	387-2618	PPZmtntam@aol.com
Nancy Zappe	" "	" "	" "	" "
Pat Struckman	5068 Westridge	Bishop "	387-2264	(See Robert Struckman)
Jean Johnson	9416 Westridge Rd	B " "	387-2720	Ljohnson@qnet.com
BLM LARRY PRIMOSCH	351 PACU LN SUITE	101 BISHOP 93514	760 872 5031	lprimosc@ca.blm.gov
RICHARD TEAT	105 GLEN CT.	BISHOP, 93514	387 2935	NV address
CHUCK GOEDE	101 Dennis	Bishop 93514	387 2074	BCGOEDE@JUNO.COM
Tina Bohlman	5023 Westridge	Bishop 93514	387-2346	tbillandtina@earthlink.net
Pat + Bob Brown	134 Eagle Vista	Bishop 93514	387 2005	bobpatboat@AOL.com
LOU MACK	4838 DEER PEAK TRAIL	BISHOP 93514	387-0075	DEARPEAK@AOL.COM

Name (please print)	Mailing Address	City/State/Zip	Phone	E-mail
CtL Devl.	P.O. Box 8898	Mammoth Lakes, CA 93546	760-934-8831	christophercapurro@hotmail.com Matthew.Lehman@Verizon.net
Sam Lovell	125 Summit Rd	Bishop Ca 93514	760 387 2623	Plovell@qnet.com
Paul T. Thompson	4813 Alison Lane	Bishop CA 93514	760 387-2808	RTPASSES@QNET.Com
Craig S Williams	4843 Sherwin Trail	Bishop CA. 93514	760-387-2435	PFPD3100@AOL.Com
Jeff Kelley	P.O. Box 7003 ~~ML CA~~	ML CA 93546	760 934-9635	skelley@mammoth-mtn.com
Don McGhie	300 Mandich St. Bishop	CA 93514	760-873-0248	[illegible]@[illegible].com
Mark Daniel	103 Dennis Way	Bishop CA 93514	760-387-2680	dracine@schat.com
Jeffrey Bohl	7997 CRC Road	Bishop CA 93514	387 2370	ParadiseResort@hotmail.com
Todd Ellsworth	4825 Alison Ln.	Bishop, CA. 93514	387-2081	ToddJe_65@yahoo.com
Casey Shannon	14 Sierra Vista Cir.	Bishop, CA. 93514	387-2439	cshannon@fs.fed.us
Dawn Pilsl	14 Sierra Vista Cir.	Bishop, CA. 93514	387-2439	sierrawave@hotmail.com
Gene Marten	113 Scott Rd	Bishop Ca 93514	387 1104	Gem@earthlink.Net
Darrell Wong / Pat Portal	130 Scott RD	Bishop CA 93514	387-2388	Dwong@schat.com
Ann Klinefelter	5201 Westridge Rd	Bishop CA 93514	387-2673	kevann@gte.net
Kevin Klinefelter	" "	" " "	" "	"
Debbie House	172 Summit Rd	Bishop Ca 93514		roadkill23@earthlink.net
[illegible]	4872 Alison	"	387-2125	[illegible]@aol.com
[illegible]	PO Box 5571	ML	9354844	p.hazard@gte.net
✓				

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX C

PROJECT INFORMATION AND REQUEST FOR COMMENTS

MONO COUNTY
COMMUNITY DEVELOPMENT DEPARTMENT

P. O. Box 347
Mammoth Lakes, CA 93546
(760) 924-1800 FAX 924-1801
commdev@mono.ca.gov

Planning Division

P. O. Box 8
Bridgeport, CA 93517
(760) 932-5425 FAX 932-5431
www.monocounty.ca.gov

July 15, 2008

To: Responsible Agencies and Interested Parties

From: Keith Hartstrom, Principal Planner, Bridgeport
Gwen Plummer, Associate Planner, Mammoth Lakes

RE: REQUEST FOR COMMENTS

PROJECT: Specific Plan 03-02 and Tentative Tract Map 37-56/C&L Development
The proposed project would subdivide APN 26-330-02, totaling 53.3.9 acres into 53 clustered residential lots (lots from 15,000 to 30,000 sq. ft. and 24.7 acres of open space). The project will be serviced by a water/fire system and sewage systems. The project is located southwest of the community of Sierra Paradise on Lower Rock Creek Road. The property is designated Estate Residential (ER) in the General Plan

The Mono County Planning Division is soliciting your comments and concerns regarding the attached specific plan / tentative map application. This initial project consultation is intended to assist us in determining appropriate project conditions and environmental mitigation measures for the project. Your project comments should be sent to the Planning Division no later than _____. If no comments are received, we will assume that you have no concerns regarding this project.

You are also encouraged to attend the project review meeting before the Mono County Land Development Technical Advisory Committee scheduled on_____.

The meeting will be held in the Public Works Conference Room Court House Annex I, second floor, Bridgeport. The Committee will be reviewing project conditions and mitigation measures to recommend to the Mono County Planning Commission. Should you wish to attend the meeting, please contact the Bridgeport Office to confirm the date, time and location.

If you wish to be notified of the Planning Commission hearing on the project or if you would like additional information, please contact Keith Hartstrom or Gwen Plummer.

Your attention to this matter is appreciated.

cc. Engineer
Applicant

Enclosures:
_____Application
_____Pro. Information Form
_____Land Use Designation Map
_____Site Plan/Parcel Map
_____Other:
_____

Mono County
Community Development Department

P.O. Box 347
Mammoth Lakes, CA 93546
(760) 924-1800, fax 924-1801
commdev@mono.ca.gov

Planning Division

P.O. Box 8
Bridgeport, CA 93517
(760) 932-5420, fax 932-5431
www.monocounty.ca.gov

SPECIFIC PLAN
APPLICATION

APPLICATION # SP 03-02 FEE $ $2,640
DATE RECEIVED 10/27/03 RECEIVED BY KPH
RECEIPT # 33452 CHECK # 1207 12608 (NO CASH)

APPLICANT/AGENT C & L Development

ADDRESS P.O. Box 8898 CITY/STATE/ZIP Mammoth Lakes, CA 93546

TELEPHONE (760) 934-8831

OWNER, if other than applicant R.V. & A.B. Capurro, c/o C&L Development

ADDRESS _____ CITY/STATE/ZIP _____

TELEPHONE (____) _____

PROPERTY DESCRIPTION:

Assessor's Parcel # 26-330-02 General Plan Land Use Designation ER-- Estate Residential

PROJECT DESCRIPTION: Describe the proposed project, using additional sheets if necessary.

Subdivision of property into 53 single family residential lots ranging in size from 15,000 s.f. to 30,000 s.f. with 24.7 ac. of open space. Project will include access from Lower Rock Creek Road, sewage treatment plant, & well, storage & water distribution system annexed into Lower Rock Creek Mutual Water Co. Overall density of subdivision will be 0.95 lots/ac.

NOTE: An incomplete or inadequate project description may delay project processing.

I CERTIFY UNDER PENALTY OF PERJURY THAT I am: ☐ legal owner(s) of the subject property (all individual owners must sign as their names appear on the deed to the land), ☐ corporate officer(s) empowered to sign for the corporation, or ☐ owner's legal agent having Power of Attorney for this action (a notarized "Power of Attorney" document must accompany the application form), AND THAT THE FOREGOING IS TRUE AND CORRECT.

Signature
MATTHEW T. LEHMAN

Signature FOR:
RANDALL AND ANNETTE CAPURRO

Date 10/3/03

Mono County
Community Development Department

P.O. Box 347
Mammoth Lakes, CA 93546
(760) 924-1800, fax 924-1801
commdev@mono.ca.gov

Planning Division

P.O. Box 8
Bridgeport, CA 93517
(760) 932-5420, fax 932-5431
www.monocounty.ca.gov

TENTATIVE TRACT MAP APPLICATION

APPLICATION # TM 37-56 FEE $ $1,500
DATE RECEIVED _____ RECEIVED BY KBH
RECEIPT # 33451 CHECK # 1285 (NO CASH)

APPLICANT/AGENT C & L Development, L.L.C.

ADDRESS P.O. Box 8898 CITY/STATE/ZIP Mammoth Lakes CA 93546

TELEPHONE (760) 934-8831

OWNER, if other than applicant Matthew Lehman & R.V. & A.B. Capurro, c/o C & L Development, LLC

ADDRESS P.O. Box 8898 CITY/STATE/ZIP Mammoth Lakes, CA 93546

TELEPHONE (760) 934-8831

PROPERTY DESCRIPTION: Assessor's Parcel # 26-330-02 Total Acres 54.67 ac

General Plan Land Use Designation ER - Estate Residential

Domestic Water Source and/or Supplier Private Water

Method of Sewage Disposal Private Sewage Treatment Plant

Present Use of Parcel Vacant

Proposed Use of Parcel 53 Single Family Residential Lots

APPLICATION PACKET SHALL INCLUDE: Tentative Map, Indemnification Agreement, required filing deposits listed on Development Fee Schedule, and other background materials described on Tentative Tract Map Requirements.

NOTE: An incomplete application packet may delay project processing.

I CERTIFY UNDER PENALTY OF PERJURY THAT I am: ☐ legal owner(s) of the subject property (all individual owners must sign as their names appear on the deed to the land), ☒ corporate officer(s) empowered to sign for the corporation, or ☐ owner's legal agent having Power of Attorney for this action (a notarized "Power of Attorney" document must accompany the application form), AND THAT THE FOREGOING IS TRUE AND CORRECT.

Signature _____ Signature _____ Date 11/11/03

Mono County
Community Development Department

P.O. Box 347
Mammoth Lakes, CA 93546
(760) 924-1800, fax 924-1801
commdev@mono.ca.gov

Planning Division

P.O. Box 8
Bridgeport, CA 93517
(760) 932-5420, fax 932-5431
www.monocounty.ca.gov

PROJECT INFORMATION

(To be completed by applicant or representative)

NOTE: Please answer all questions as accurately and completely as possible to avoid potential delays in processing. Attach additional sheets if necessary.

I. TYPE OF PROJECT (check any permit(s) requested):

- ☐ Director Review ☐ Use Permit ☐ Lot Line Adjustment ☐ Land Division (4 or fewer)
- ☑ Subdivision ☑ Specific Plan ☐ Zone Variance ☐ Zoning Amendment
- ☐ General Plan Amendment ☐ Other _____

APPLICANT C & L Development, L.L.C.

PROJECT TITLE Sierra Paradise

LOT SIZE (sq. ft./acre) 54.67 acres ASSESSOR'S PARCEL # 26-330-02

PROJECT LOCATION Lower Rock Creek Road, east of Paradise Lodge

Has your project been described in detail in the project application? Yes ☑ No ☐

Please Specify:

Number of Units N/A Building Height/# of floors N/A

Number of Buildings N/A Density (units/acre) N/A

Total lot coverage/impervious surface (sq. ft. & %) N/A

a. Buildings (first-floor lot coverage /sq. ft. & %) N/A
b. Paved parking & access (sq. ft. & %) 145,092 s.f. (6%)

Landscaping/screening and fencing:

a. Landscaping (sq. ft. & %) 207,317 s.f. (9%)
b. Undisturbed (sq. ft. & %) 2,029,016 s.f. (85%)

Total parking spaces provided:

a. Uncovered N/A
b. Covered N/A
c. Guest/Handicapped N/A

II. SITE PLAN

Are all existing and proposed improvements shown on the Plot Plan (see attached Plot Plan Requirements)? Yes ☑ No ☐

III. ENVIRONMENTAL SETTING

Use one copy of the Tentative Map or Plot Plan as needed to show any necessary information. Attach photographs of the site, if available.

More on back...

1. VICINITY MAP:
   Attach a copy of assessor's parcel pages or a vicinity map showing the subject property in relation to nearby streets and lots or other significant features.

2. EXISTING DEVELOPMENT:
   Vacant ☑ If the site is developed, describe all existing uses/improvements such as structures, roads, etc. Does the Plot Plan show these uses? Yes ☐ No ☐

3. ACCESS/CIRCULATION:
   Name of Street Frontage(s) Lower Rock Creek Road
   Paved ☑ Dirt ☐ No existing access ☐
   Are there any private roads, drives or road easements on/through the property?
   Yes ☑ No ☐
   Has an encroachment permit been submitted to Public Works or Caltrans? Yes ☐ No ☑
   Does the property have any existing driveways or access points? Yes ☑ No ☐
   Are any new access points proposed? Yes ☑ No ☐
   Does the Plot Plan show the driveways or access points? Yes ☑ No ☐
   Describe the number and type of vehicles associated with the project That typical of 53 s.f. lots

4. ADJACENT LAND USES:
   A. Describe the existing land use(s) on adjacent properties. Also note any major man-made or natural features (i.e., highways, stream channels, number and type of structures, etc.).

	LAND USE		LAND USE
North	RM/BLM-Resource Management	South	OS-Open Space
East	RM/BLM-Resource Management	West	RU-Rural Resort

   B. Will the proposed project result in substantial changes in pattern, scale or character of use in the general area? Yes ☐ No ☑ If YES, how does the project propose to lessen potential adverse impacts to surrounding uses?

5. SITE TOPOGRAPHY:
   Is the site on filled land? Yes ☐ No ☑ Describe the site's topography (i.e., landforms, slopes, etc.) The site slopes from the northeast to the southwest with an average slope of approximately 15%.

6. DRAINAGES:
   A. Describe existing drainage ways or wetlands on or near the project site (i.e., rivers, creeks and drainage ditches 12" or deeper and/or within 30' of the property) There exists a drainage way on the NW corner of the site. No wetlands exist on the project site.

   B. Are there any drainage easements on the parcel? Yes ☐ No ☑

   C. Will the project require altering any streams or drainage channels? Yes ☐ No ☑ If YES, contact the Department of Fish and Game for a stream alteration permit. IF YES TO ANY OF THE ABOVE, show location on plot plan and note any alteration or work to be done within 30 feet of the stream or drainage.

7. VEGETATION:
   A. Describe the site's vegetation and the percentage of the site it covers (map major areas of vegetation on the Plot Plan) The entire site is covered with scattered sagebrush.

B. How many trees will need to be removed? 0
C. Are there any unique, rare or endangered plant species on site? Yes ☐ No ☑
D. Has the site been used for the production of agricultural crops/trees or grazing/pasture land in the past or at the present time? Yes ☐ No ☑
E. Is landscaping/planting of new vegetation proposed? Yes ☑ No ☐

8. WILDLIFE:
A. Will the project impact existing fish and wildlife? Yes ☐ No ☑
Describe existing fish and wildlife on site and note any proposed measures (if any) to avoid or mitigate impacts to fish and wildlife There are no fish or wildlife that live on the project site.

B. Are there any unique, rare or endangered animal species on site? Yes ☐ No ☑

9. CULTURAL RESOURCES:
A. Are there any cemeteries, structures or other items of historical or archaeological interest on the property? Yes ☐ No ☑ Specify

10. SITE GRADING:
A. Will more than 10,000 square feet of site area be cleared and/or graded? Yes ☑ No ☐ If YES, how much? 352,409 sf
B. Will the project require any cuts greater than 4' or fills greater than 3'? Yes ☑ No ☐
C. Will the project require more than 200 cubic yards of cut or fill? Yes ☑ No ☐ If YES, how much? 284(c) If YES to A, B or C, contact the Public Works Department for a grading permit.
D. Will site grading of 10% or more occur on slopes? Yes ☑ No ☐
E. Note any measures to be taken to reduce dust, prevent soil erosion, or the discharge of earthen material off site or into surface waters Water trucks will be onsite at the time of grading to reduce dust. Erosion control measures will be in-place when grading begins.

11. AIR QUALITY:
A. Will the project have wood-burning devices? Yes ☐ No ☑ If YES, how many? _
B. What fuel sources will the proposed project use? Wood ☐ Electric ☐ Propane/Gas ☐
C. Will the proposal cause dust, ash, smoke, fumes or odors in the vicinity? Yes ☐ No ☑

12. VISUAL/AESTHETICS:
A. How does the proposed project blend with the existing surrounding land uses? The project site is designated Estate Residential & will conform with existing zoning requirements and specific plan requirements

B. How does the proposed project affect views from existing residential/commercial developments, public lands or roads? The proposed project will not affect any views of existing developments, public lands or roads.

C. If outdoor lighting is proposed, describe the number, type and location N/A

13. NATURAL HAZARDS:
A. Is the site known to be subject to geologic hazards such as earthquakes, landslides, mudslides, ground failure, flooding, avalanche or similar hazards? Yes ☑ No ☐ (Circle applicable hazard[s]).
B. Will any hazardous waste materials such as toxic substances, flammables or explosives be used or generated? Yes ☐ No ☑
C. Does the project require the disposal or release of hazardous substances? Yes ☐ No ☑
D. Will the project generate significant amounts of solid waste or litter? Yes ☐ No ☑

More on back...

E. Will there be a substantial change in existing noise or vibration levels? Yes ☑ No ☐
If YES to any of the above, please describe That associated with 53 s.f. residents

14. OTHER PERMITS REQUIRED:
List any other related permits and other public approvals required for this project, including those required by county, regional, state and federal agencies:
- ☑ Encroachment Permits from *Public Works or Caltrans.*
- ☐ Stream Alteration Permit from *Department of Fish and Game*
- ☐ 404 Wetland Permit *from Army Corps of Engineers*
- ☑ Grading Permit *from Public Works*
- ☐ Building Permit from *County Building Division*
- ☑ Well/Septic from *County Health Department*
- ☐ Timber Land Conversion from *California Department of Forestry*
- ☑ Waste Discharge Permit from *Lahontan Regional Water Quality Control Board*
- ☐ Other _____

IV. SERVICES

1. Indicate how the following services will be provided for your project and the availability of service.
Electricity Southern California Edison
Underground ☑ Overhead ☐ (Show location of existing utility lines on Plot Plan)

Road/Access Proposed Access Road adjoining Lower Rock Creek Road

Water Supply Private Water

Sewage Disposal Private Sewage Treatment Plant

Fire Protection Wheeler Crest Community Services District

School District Round Valley Joint Elementary/Bishop Union Joint High School District

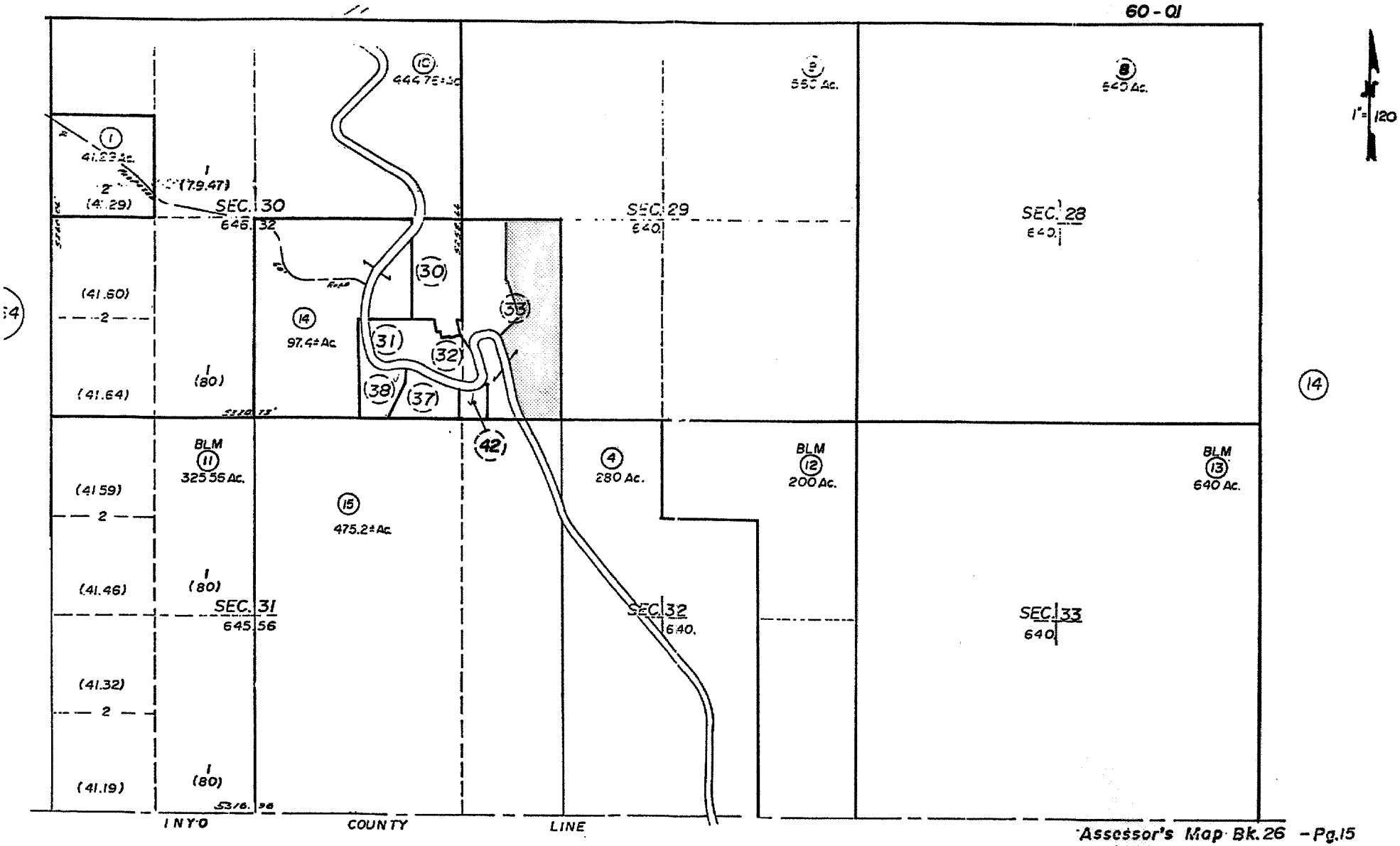
2. If an extension of any of the above is necessary, indicate which service(s), the length of the extension(s), and the infrastructure proposed Electricity will be installed in road shoulders and individual laterals will be installed.

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Signature _____ Date 11/17/03

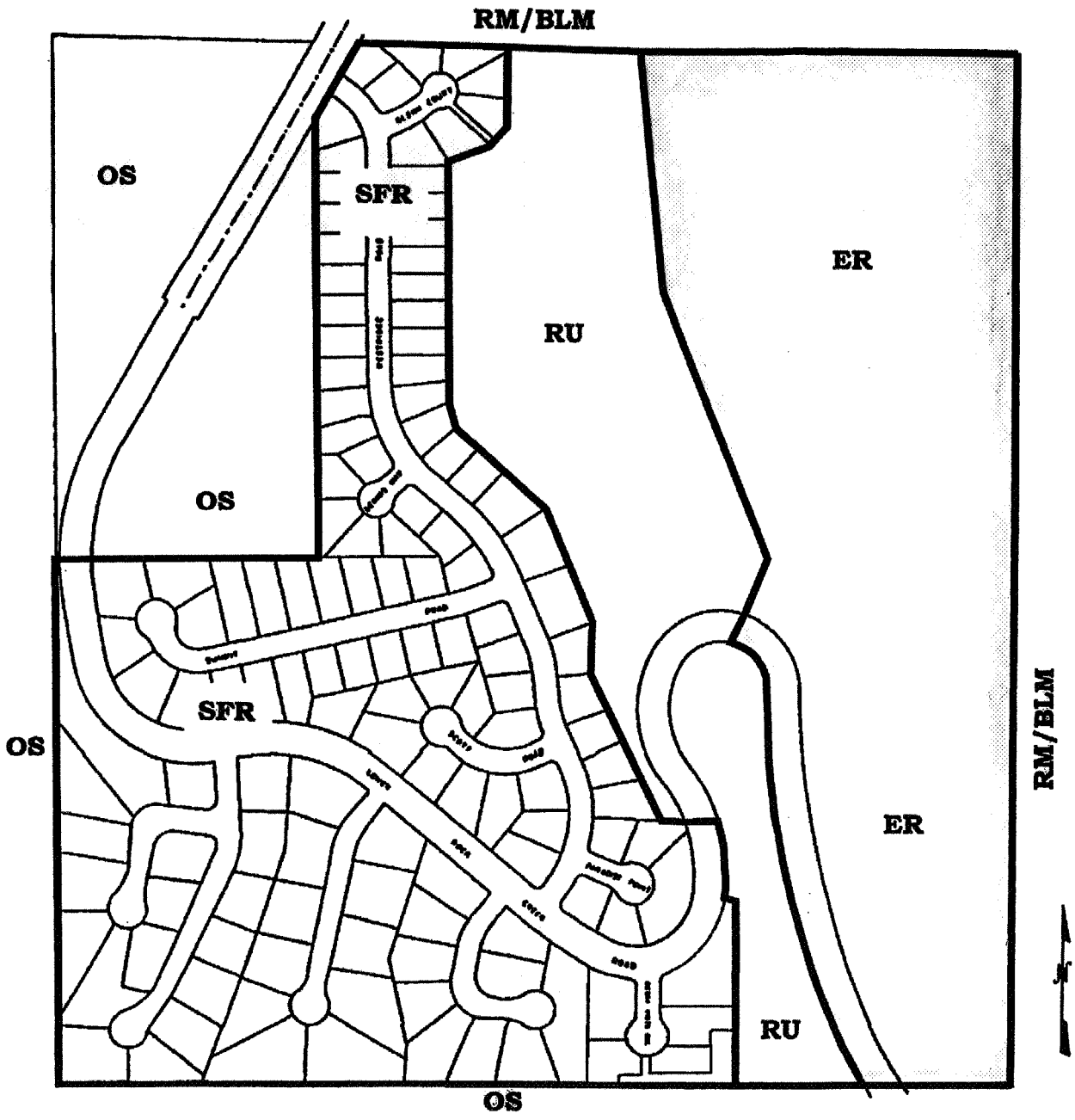
For _____

NOTE: Failure to provide any of the requested information will result in an incomplete application and thereby delay processing.



Assessor's Map Bk. 26 – Pg. 15
County of Mono, Calif.

5/95



Paradise

LEGEND

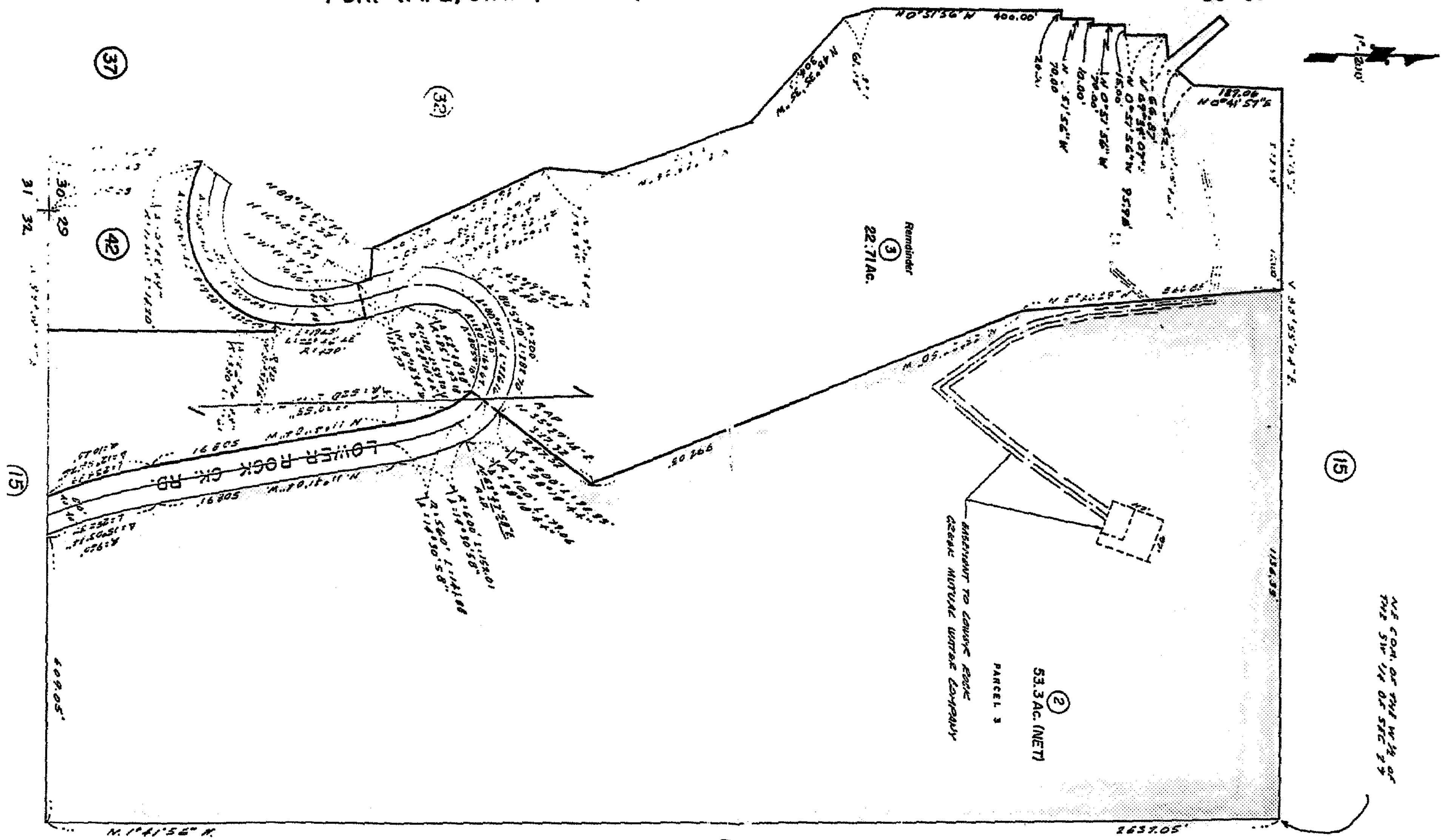
Land Use Designations:

ER	Estate Residential
SFR	Single Family Residential
RM	Resource Management
RU	Rural Resort
OS	Open Space

POR. W1/2, SW1/4, SEC. 29, T.5S., R.31E., M.D.B. & M.

Tax Area Code
60-03

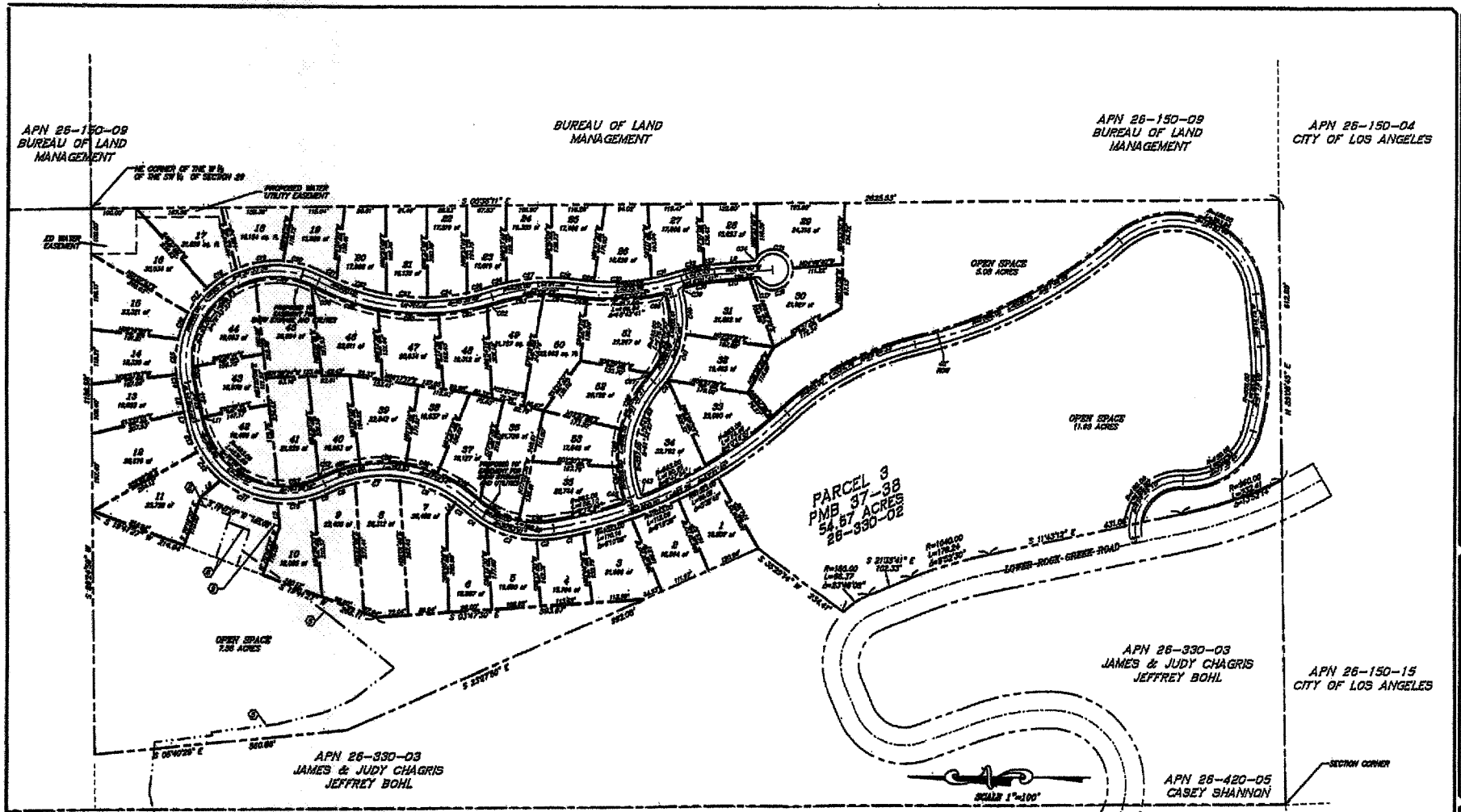
26-33



T.M. 37-41, BK. 10-34(26-330-03)

Assessor's Map Bk. 26 - Pg. 33
County of Mono, Calif.

NOTE - Assessor's Block Numbers Shown in Ellipses.



INDEX TO SHEETS

1. TENTATIVE TRACT MAP
2. CIVIL SITE PLAN-GRADING AND DRAINAGE DETAILS

DESIGN NOTES

PROJECT PROPERTY DATA

RECORD OWNER

PREPARED BY

EASEMENT NOTES

EASEMENTS ARE FROM THE PRELIMINARY TITLE REPORT FROM INYO-MONO TITLE COMPANY DATED FEBRUARY 26, 2002.

LEGAL DESCRIPTION

PARCEL 3 OF PARCEL MAP 37-38.

THE FOLLOWING MAY AFFECT A PORTION OR ALL OF THE PROPERTY. THE EXACT LOCATIONS ARE SHOWN HEREON OR ARE NOT DISCLOSED AS OF RECORD:

(2) AN EASEMENT FOR EXISTING UNDERGROUND OR AERIAL ELECTRIC AND COMMUNICATION LINES TO SOUTHERN CALIFORNIA EDISON COMPANY PER 101/172 O.R.

(4) AN EASEMENT FOR WATER PIPE LINES AND INCIDENTAL PURPOSES, RESERVOIR, AND PUMPING PLANT SYSTEM TO LOWER ROCK CREEK MUTUAL WATER COMPANY PER 107/78 O.R.

(5) AN EASEMENT FOR WATER PIPE LINES, RESERVOIR, AND PUMPING PLANT SYSTEM TO LOWER ROCK CREEK MUTUAL WATER COMPANY PER 196/325 O.R.

(6) AN EASEMENT FOR WATER TANK TO LOWER ROCK CREEK MUTUAL WATER COMPANY PER 265/595 O.R.

(7) AN EASEMENT FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF A WATERLINE, WELL AND EQUIPMENT, AND ACCESS THERETO, TO LOWER ROCK CREEK MUTUAL WATER COMPANY, PER 706/127 O.R.

(8) AN EASEMENT FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF A WATERLINE, WELL AND EQUIPMENT, AND ACCESS THERETO, TO LOWER ROCK CREEK MUTUAL WATER COMPANY, PER 706/128 O.R.

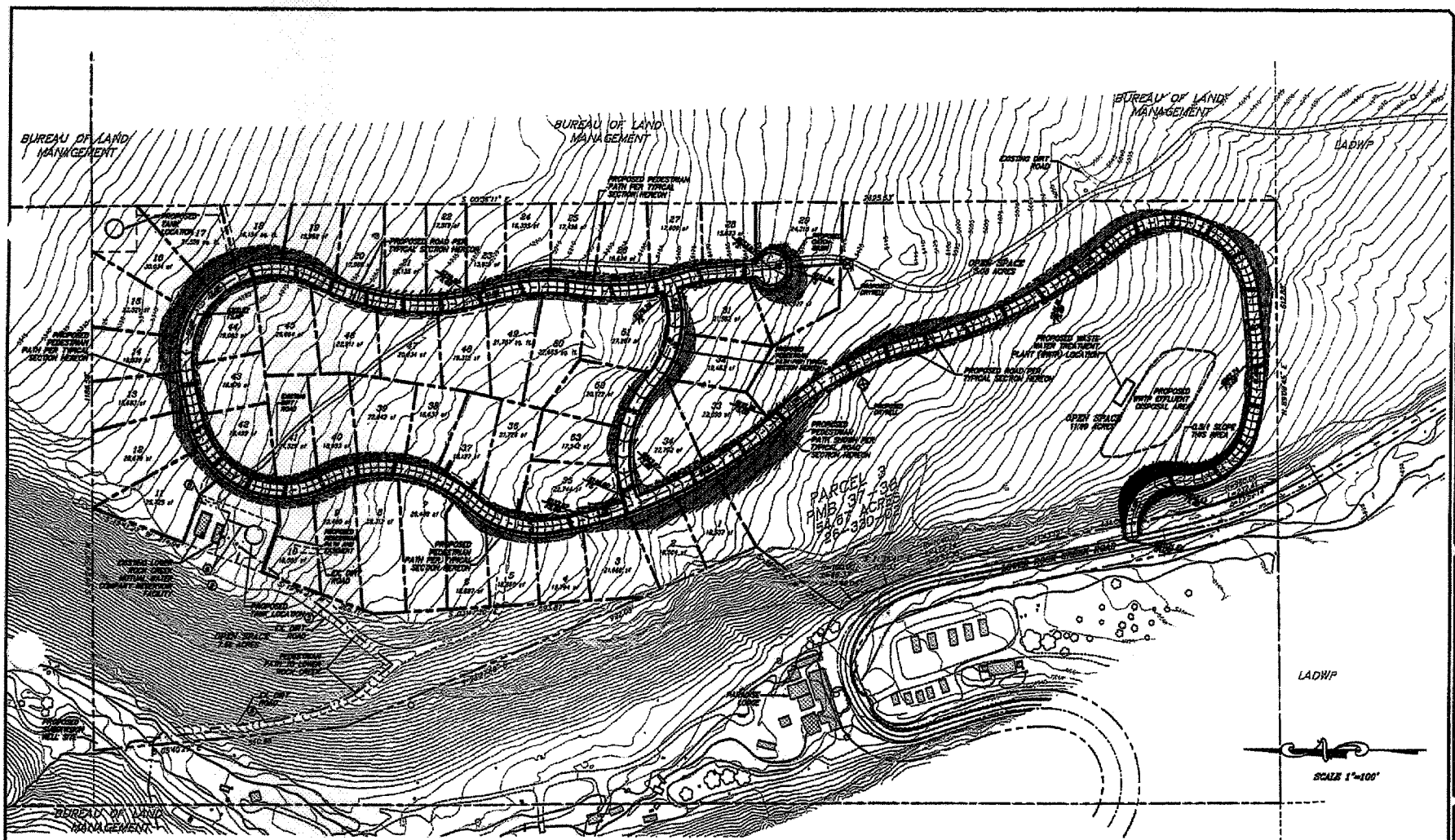
(9) AN EASEMENT FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF A WATERLINE, WELL AND EQUIPMENT, AND ACCESS THERETO, TO LOWER ROCK CREEK MUTUAL WATER COMPANY, PER INST. # 2002004316 O.R.

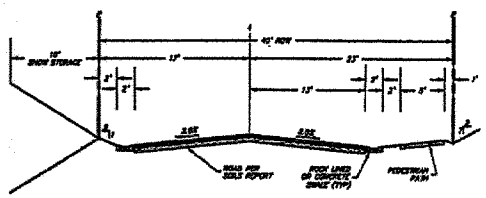
* NUMBERS REPRESENT NUMBER SHOWN ON TITLE REPORT.

TENTATIVE TRACT MAP NO. 37-
SIERRA PARADISE
PARCEL 3 OF PARCEL MAP 37-38
MONO COUNTY, CALIFORNIA

37-39

10/21/2003
1"=100'
TP/MV/RD
2215
2215TTM.dwg
1





TYPICAL ROAD SECTION
N.T.S.

TENTATIVE TRACT MAP NO. 37-___

SIERRA PARADISE

PARCEL 3 OF PARCEL MAP 37-38

MONO COUNTY, CALIFORNIA

DATE	10/21/2003
SCALE	1"=100'
DRAWN BY	TP/AV/KP
JOB NO.	2215
FILE NAME	2215TM.dwg
SHEET	2
OF SHEETS	2

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX D

GEOTECHNICAL ANALYSIS

SIERRA GEOTECHNICAL SERVICES INC.

ENVIRONMENTAL • GEOTECHNICAL • GEOLOGY • HYDROGEOLOGY • MATERIALS

October 10, 2007 Project No. 3.02215

Matthew Lehman
1949 Sierra park Road
Mammoth Lakes, CA 93546

Subject: **SITE CONDITIONS**
Specific Plan 03-02 and Tentative Tract Map 37-56 (Sierra Paradise)
Paradise, Mono County, California

Reference: **PRELIMINARY GEOTECHNICAL INVESTIGATION**
Specific Plan 03-02 and Tentative Tract Map 37-56 (Sierra Paradise)
Paradise, Mono County, California
SGSI Project No. 3.0225; Dated May 21, 2004

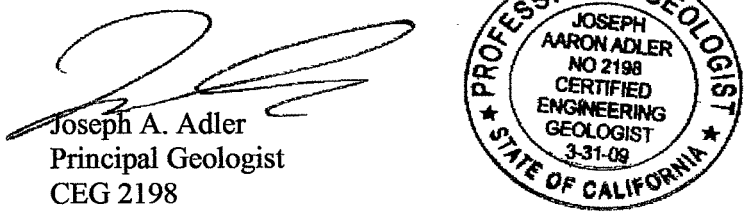
Dear Mr. Lehman:

In response to your request for information, conditions related to the geotechnical environment at the site have not adversely changed since the above referenced report was issued.

We appreciate the opportunity to be of service to you. Should you have any questions regarding this letter, please do not hesitate to contact us.

Respectfully,

SIERRA GEOTECHNICAL SERVICES INC.



Joseph A. Adler
Principal Geologist
CEG 2198

(1) Addressee

May 21, 2004 Project No. 3.02215

C & L Development, LLC
P.O. Box 8898
Mammoth Lakes, CA 93546

Attention: Christopher Capurro

Subject: **PRELIMINARY GEOTECHNICAL INVESTIGATION**
Specific Plan 03-02 and Tentative Tract Map 37-56 (Sierra Paradise)
Paradise, Mono County, California

Dear Mr. Capurro:

In accordance with your authorization of our proposal dated February 6, 2004 we herein submit the results of our preliminary geotechnical investigation for the proposed 53-lot residential development project to be located on the subject site. The purpose of this study was to assess the geotechnical constraints to development (if any) and provide geotechnical recommendations relative to the future development of the proposed project.

As part of this study, a *Tentative Tract Plan* prepared by Triad/Holmes Associates, dated 10/21/03 was reviewed. This investigation however, is considered preliminary as final detailed plans for construction and grading are currently not available. SGSI should review grading and foundation plans prior to construction in order to assure that they will be in conformance with our recommendations.

We appreciate the opportunity to be of service to you. Should you have any questions regarding this report, please do not hesitate to contact us.

Respectfully,

SIERRA GEOTECHNICAL SERVICES, INC.

Thomas A. Platz
President
PE C41039

Joseph A. Adler
Senior Geologist
CEG 2198

jaa:tap

(3) addressee

PRELIMINARY GEOTECHNICAL INVESTIGATION

FOR

SPECIFIC PLAN 03-02 AND
TENTATIVE TRACT MAP 37-56
SIERRA PARADISE
PARADISE, MONO COUNTY, CALIFORNIA

MAY 21, 2004
PROJECT NO. 3.02215

Prepared By:

SIERRA GEOTECHNICAL SERVICES, INC.
P.O. Box 5024
Mammoth Lakes, California 93546
(760) 934-3992

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF ATTACHMENTS

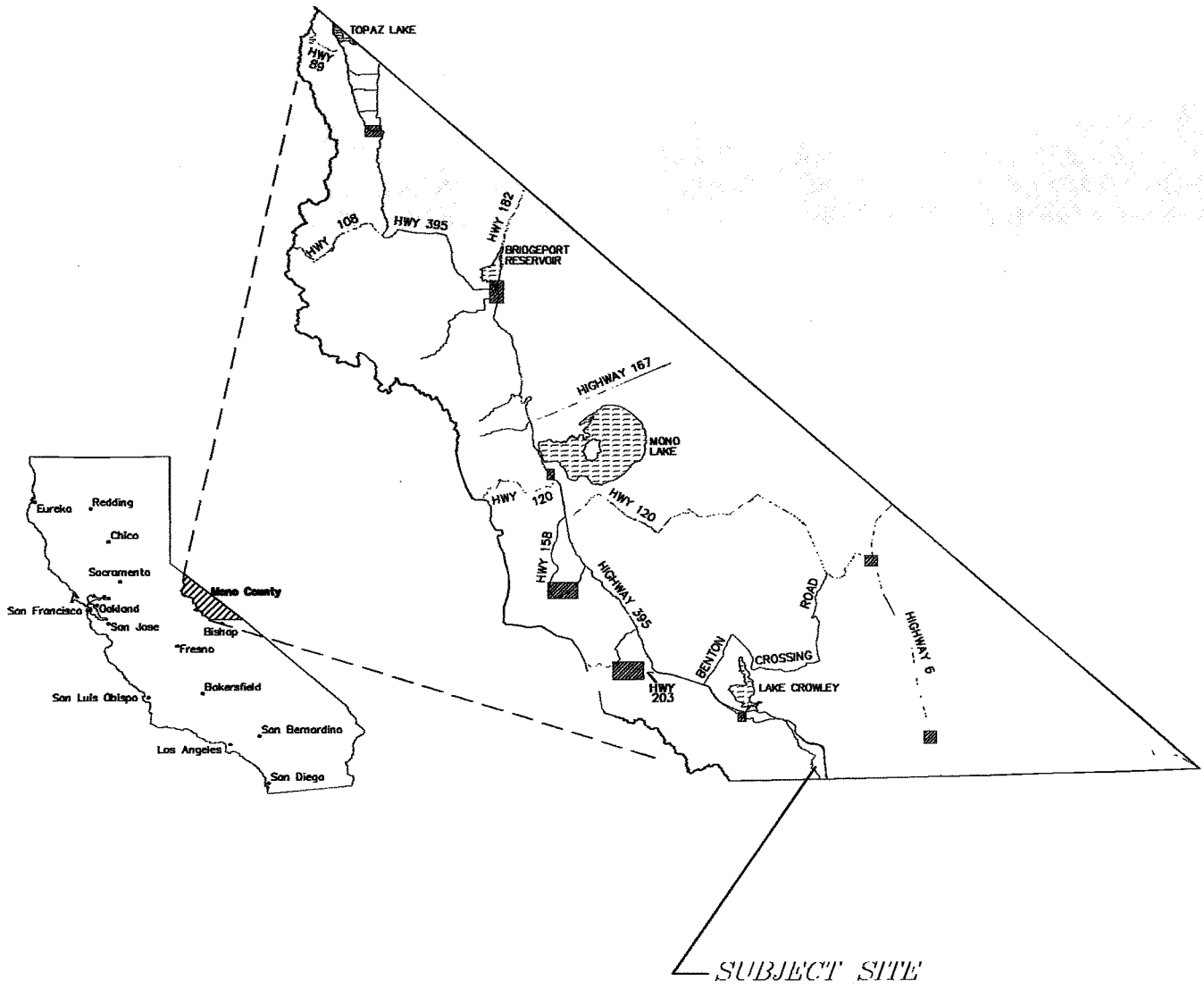
1. PURPOSE AND SCOPE

This report presents the results of a preliminary geotechnical investigation for the proposed 53-lot residential subdivision to be located along the east side of Lower Rock Creek, to the east of the existing communities of Paradise, and Sierra Paradise Estates (Figures 1 and 2). The purpose of this study was to assess the geotechnical constraints to development (if any), and provide geotechnical recommendations relative to the future development of the proposed project.

The scope of this investigation included a review of stereoscopic aerial photographs, readily available published and unpublished geologic literature, a subsurface field investigation that included the excavation of fourteen exploratory test pits in the proposed construction areas, laboratory testing of representative soil samples obtained during our field investigation, geologic and geotechnical evaluation and analysis of the collected field and laboratory data, and preparation of this report presenting the results of our findings, conclusions, geotechnical recommendations for earthwork and construction considerations for the proposed development.

The field investigation was performed on March 18, 2004. A geologist from our office logged the excavations as they were advanced. Bulk samples of the soils encountered were obtained during the field investigation for laboratory testing. Approximate locations of the exploratory test pits are shown on the Geologic Map (Figure 3). Details of the laboratory testing are presented in Appendix B.

After the test pits were excavated and logged, they were loosely backfilled with the excavated soil and not compacted to the requirements typically specified for engineered fill. The test pit backfill material should be removed and compacted in accordance with the earthwork recommendations contained within this report, prior to construction in theses areas. If the backfill materials are left "as-is" structures located over these areas may experience some degree of settlement.



PROJECT: REGIONAL MAP SIERRA PARADISE	
SCALE: NTS	DATE: 5/2004
DRAWING: FIG1.DWG	DRAWN BY: JAA
JOB NO.: 3.02215	FIGURE: FIGURE 1

Sierra Geotechnical Services

2. SITE DESCRIPTION

The irregularly shaped subject property encompasses approximately 78-acres, of which approximately 53-acres will be subdivided into 53 single family lots, and the remainder will be designated open space (Figure 3). In general, the project site slopes moderately from northeast to southwest and surface topography ranges from 5345' MSL in the northeast to approximately 4905' MSL near the southwest property boundary. The site is bounded by the Lower Rock Creek drainage to the west and undeveloped land to the north, south, and east. No structures are present on the property and vegetation includes indigenous brush.

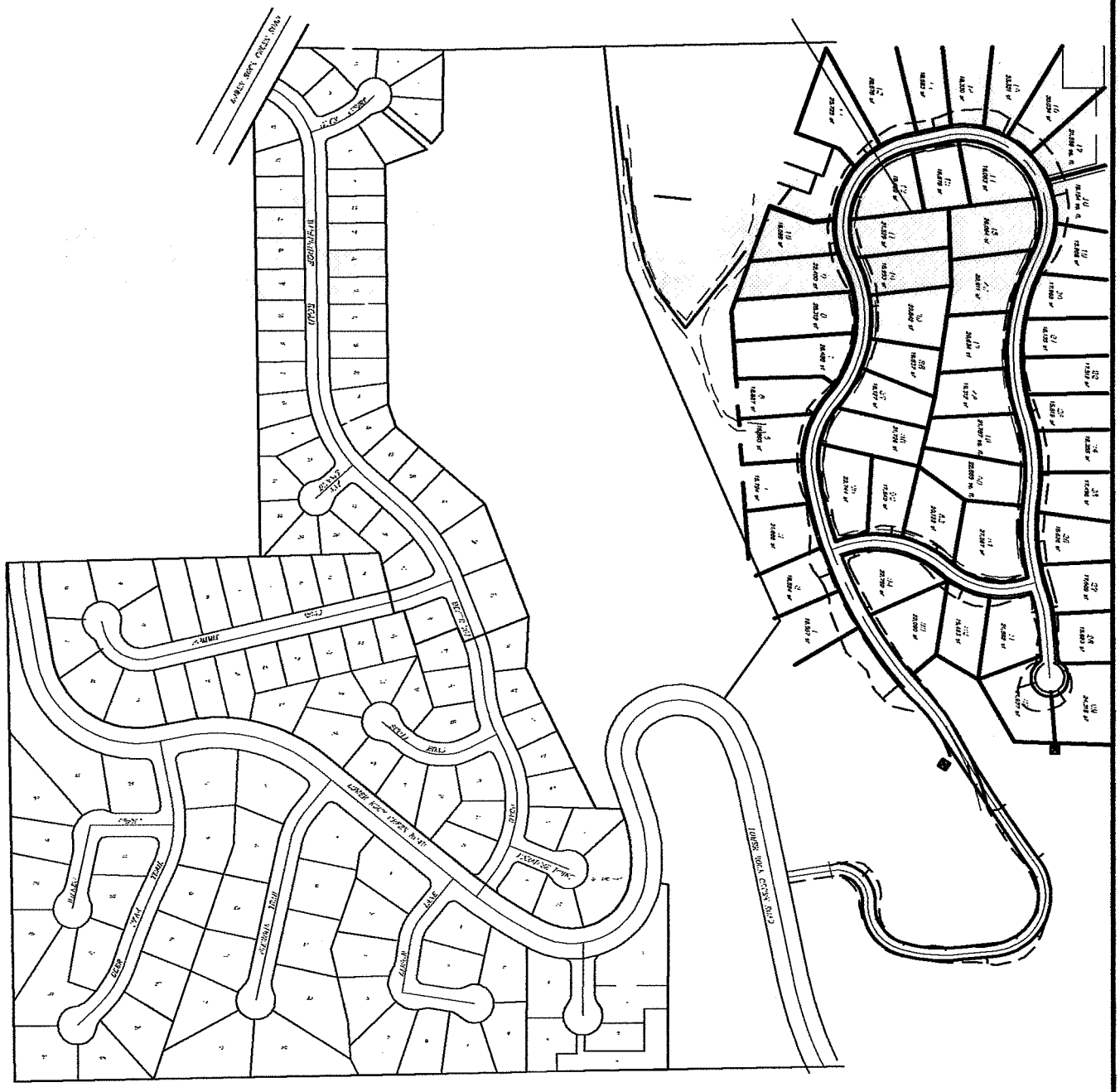
3. PROPOSED DEVELOPMENT

It is our understanding that the subject site will likely be subdivided into at least 53 "Estate Residential" single-family lots ranging in size from approximately 15,000 to 30,000 sqft. with interior roadways, access drives, in-road utilities, a water well, and a waste-water treatment plant. Recommendations for the water well and waste-treatment plant are not included herein and will be provided as separate reports by RC Slade and Associates LLC, and Triad/Holmes Associates, respectively.

Grading is expected to be minor with the structures situated at or near existing grade. However, as previously noted, detailed plans for construction and grading are currently not available. Anticipated finish grade elevations - and the amount of site grading - may be subject to change. SGSI should review grading and foundation plans prior to construction in order to assure that they are in conformance with this report; some of the geotechnical recommendations contained herein may need to be revised after reviewing. If the property is subdivided as expected, and lots are to be sold on an individual basis, SGSI should review individual grading and foundation plans prior to construction in order to assure that they are in conformance with this report.

4. AERIAL PHOTOGRAPHIC REVIEW

Prior to our field investigation, we acquired and reviewed aerial photographs to assist in our evaluation of geomorphic features that could be indicative of geologic hazards at the property. Details from the earliest available photographs (1972) did not show any evidence of lineations,



PROJECT: REGIONAL MAP SIERRA PARADISE	
SCALE: NTS	DATE: 5/2004
DRAWING: FIG2.DWG	DRAWN BY: JAA
JOB NO.: 3.02215	FIGURE: FIGURE 2

Sierra Geotechnical Services

scarps, or other ground-surface fault, landslide, or recent avalanche related features on the project site. At least one high angle normal fault (down dropped block to the west) was observed to the east of the project site but does not cross within the property boundary. This unnamed fault is shown on the Geologic Map of the Mount Tom 15-minute Quadrangle, California (Bateman and others, 1965).

5. GEOTECHNICAL AND GEOLOGIC SITE CONSTRAINTS

Geotechnical constraints to development include the potential for moderate ground shaking (M_w~6.8) along the nearby Round Valley fault (1.9 km). The above concern is addressed in the site seismicity section (see Section 8) of this report.

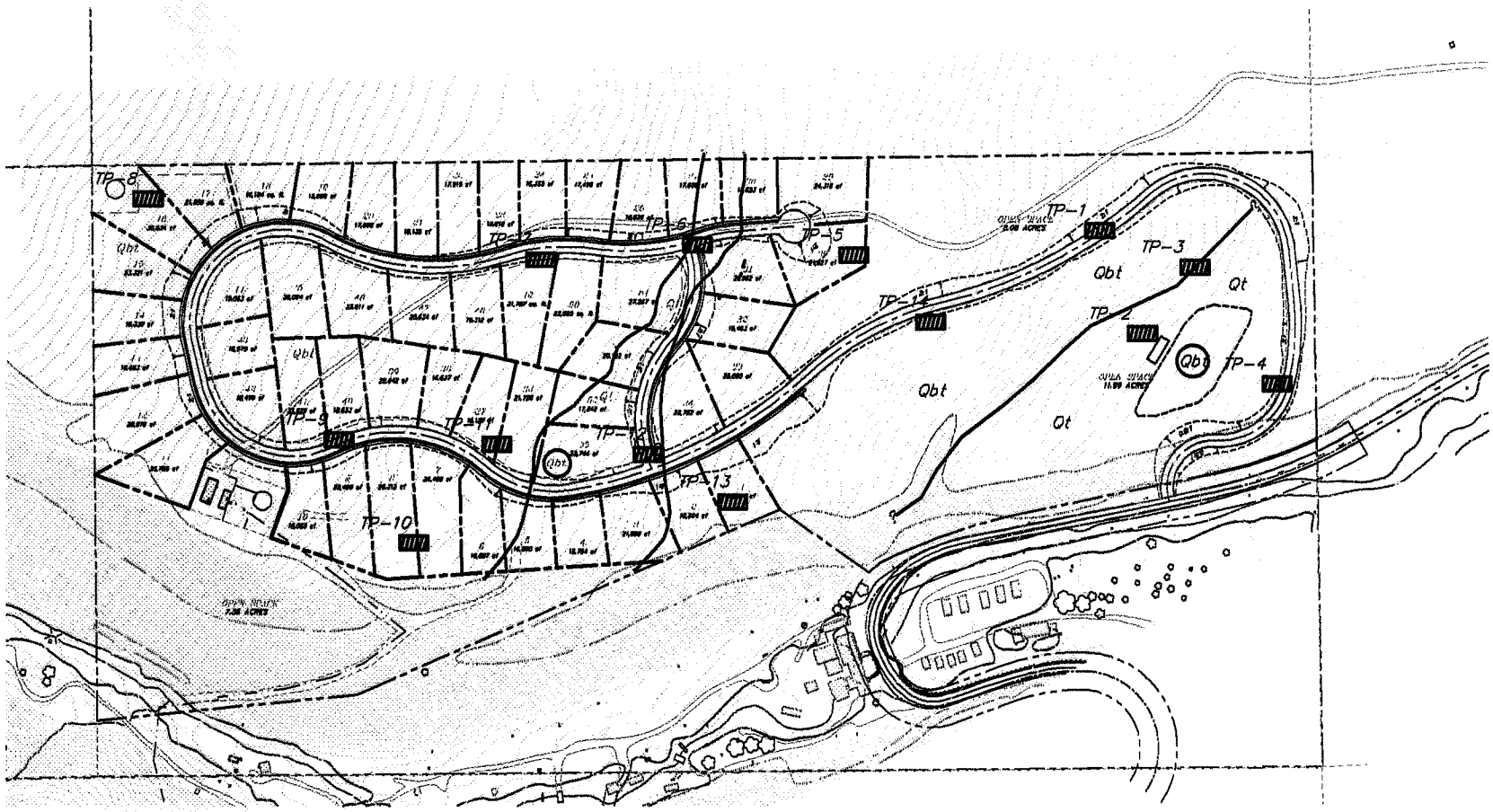
6. GEOLOGY AND SUBSURFACE CONDITIONS

The project site is located adjacent the Lower Rock Creek drainage, a moderately to deeply incised southeastward trending gorge that is cut across a broad plateau of volcanic rock known locally as the Bishop Tuff. The Tuff was extruded approximately 0.76 my ago during a cataclysmic eruptive event from the area now known as the Long Valley. Approximately 125 cu mi of flow rock and about 75 cu mi of air-fall ash were extruded during this eruption. In general, the Tuff is a rhyolitic ignimbrite consisting of welded and non-welded ash deposits. The unit is approximately 400 to 500-feet thick. The Tuff is mantled by a thin deposit of river terrace sediments, deposited during incision of the Rock Creek drainage. Unconformably overlying the terrace deposits are a thin veneer of weathered in-place and translocated Topsoil/Colluvium.

As observed during this investigation, surficial deposits consisting of Topsoil/Colluvium and Terrace Deposits, as well as Pleistocene age welded and non-welded ash deposits of the Bishop Tuff underlie the site. Logs of the subsurface conditions encountered in exploratory test pits are provided in Appendix A. Generalized descriptions of the materials encountered during this investigation follow.

6.1 Topsoil/Colluvium (unmapped)

Topsoil/Colluvium was encountered in all the test pits to an approximate depth of 2-feet below existing grades. In general, the topsoil/colluvium consisted of medium



LEGEND

TP-14 ▮	APPROXIMATE LOCATION OF EXPLORATORY TEST PIT
Qt	TERRACE DEPOSITS
Qbt	BISHOP TUFF CIRCLED WHERE BURIED
?——?	GEOLOGIC CONTACT QUERIED WHERE UNCERTAIN

Sierra Geotechnical Services

PROJECT: GEOLOGIC MAP SIERRA PARADISE	
SCALE: N.T.S	DATE: 5/2004
DRAWING: FIG 3.DWG	DRAWN BY: JAA/HDD
JOB NO.: 3.02215	FIGURE: FIGURE 3

brown to brown, loose, moist, silty, very fine to coarse-grained SAND (Unified Soil Classification Symbols: SM), with few subangular rock fragments.

6.2 Terrace Deposits (Qt)

River terrace deposits were encountered test pits TP-2 through TP-4, TP-6, TP-8, and TP-12 to an approximate depth of 4-feet below existing grades. In general, the terrace deposits consisted of a brown to reddish-brown, medium dense, moist, silty to clayey, very fine to coarse-grained SAND (Unified Soil Classification Symbols: SP-SM and SM-SC) that is massive and contains abundant subrounded cobble clasts and boulders.

6.3 Bishop Tuff (Qbt)

Bishop Tuff was encountered in all the test pits below the topsoil/colluvium and terrace deposits. In general, the Bishop Tuff consisted of a light brown to pink, dry to moist, massive, highly to moderately weathered, moderately fractured, well indurated welded to non-welded ash-fall TUFF.

6.4 Groundwater

Neither a groundwater table nor groundwater seepage was encountered during this field investigation. Based upon information provided from the existing Lower Rock Creek Mutual water company, the depth to the groundwater table (excluding the surface run-off from the creek drainage) is approximately 1,000-feet below the existing ground surface.

7. FAULTING

Our discussion of faults on the site is prefaced with a discussion of California legislation and state policies concerning the classification and land-use criteria associated with faults. By definition of the California Geological Survey, an "active fault" is a fault that has had surface displacement within Holocene time (about the last 11,000 years); hence constituting a potential hazard to structures that might be located across it. This definition is used in delineating Earthquake Fault Zones as mandated by the Alquist-Priolo Geologic Hazards Zones Act of 1972, which is detailed in the California Geological Survey Special Publication SP-42 (Hart

and Bryant, 1999). The intent of this act is to assure that unwise urban development does not occur across the traces of active faults. Based on our review, the site is not located within any "Earthquake Fault Zones" or Alquist-Priolo Hazard Zones as identified in this document.

8. SITE SEISMICITY

Site coordinates of latitude 37.48230° north and longitude 118.60221° west were estimated using the computer program **Topozone.com**. The computer programs **EQFAULT** and **EQSEARCH** (Blake, 2000) were used to estimate peak horizontal accelerations from regional faults and tabulate data from historical earthquakes.

A deterministic seismic analysis was performed within a 100 km radius of the site using the computer program **EQFAULT** (Blake, 2000). The results of the analysis indicate that the peak ground acceleration estimated for a maximum earthquake event within the specified radius is 0.51g. This acceleration represents deterministic peak ground accelerations and could occur from a magnitude 6.8 (Mw) earthquake on the Round Valley fault located approximately 1.9 km from the site. The Hilton Creek Fault, located approximately 5.4 km from the site could produce a magnitude 6.7 (Mw) earthquake resulting in a peak horizontal ground acceleration of 0.38g at the site. The tabulated results of the deterministic seismic analysis are presented in Appendix C. The Fault Location Map, which depicts active faults within a 100 km radius of the site, is also presented in Appendix C.

The computed maximum site acceleration within a 100 km radius of the site was derived from **EQSEARCH** (Blake, 2000) during the time period of 1800 to 2004. The largest estimated site acceleration based on the Boore et al. (1997) model, was 0.37g, which occurred on November 23, 1984. This earthquake was located approximately 1.4 km from the site. The Modified Mercalli Intensity and earthquake magnitude were IX and 6.2 (M_w) respectively. The largest earthquake recorded within the specified distance and time period was a magnitude 7.8 (M_w) earthquake (Modified Mercalli Intensity of VII) which occurred in The Owens Valley on March 26, 1872. A site acceleration of 0.09g was estimated from this earthquake which was located approximately 98 km from the site.

The tabulated results of the historical analysis are presented in Appendix C. The Earthquake Epicenter Map, which depicts the epicenters and magnitudes of historical earthquakes that

have affected the site, a Earthquake Recurrence Curve, and a plot depicting Earthquake Events versus Magnitude also presented in Appendix C.

The computer program **FRISKSP** (Blake, 2000) was used to perform a probabilistic analysis of seismicity at the subject site. The probabilistic analysis was used to define the Upper-Bound and Design Basis Earthquakes at the site for use in structural design. These results as well as Probability of Exceedance versus Acceleration graphs, and Return Period versus Acceleration graphs are presented in Appendix C. Based on the results of the probabilistic analysis, the Upper-Bound Earthquake (Non-Magnitude Weighted) for the site, defined as the ground motion that has a 10 percent chance of exceedance in 100 years, with a statistical return period of ~ 949 years, is 0.60g. The Design Basis Earthquake (Non-Magnitude Weighted) for the site, defined as the ground motion that has a 10 percent chance of exceedance in 50 years, with a statistical return period of ~ 475 years, is 0.47g.

8.1 Seismic Design Criteria

Table 1 presents the Seismic Parameters for use in preparing a Design Response Spectra for the site. The program used to obtain the seismic parameters is UBCSEIS which is based upon the 1997 Uniform Building Code (UBC) and 2001 California Building Code (CBC). The results of the UBC Seismic Design Parameters as well as the Design Response Spectra are presented in Appendix C.

TABLE 1

UBC-CHAPTER 16 TABLE NO.	SEISMIC PARAMETER	RECOMMENDED VALUE
16-I	Seismic Zone Factor Z	0.4
16-J	Soil Profile Type	S_B
16-Q	Seismic Coefficient C_a	0.52
16-R	Seismic Coefficient C_v	0.64
16-S	Near Source Factor N_a	1.3
16-T	Near Source Factor N_v	1.6
16-U	Seismic Source Type	B

The subject site is situated in Seismic Zone 4 (Z=0.4) based on the 1997 UBC, and the 2001 CBC. A geologic subgrade type S_B, "rock" was assumed for the site based upon the subsurface investigation.

The Boore et al (1997) NEHRP C (520) acceleration-attenuation relation was used to estimate ground accelerations at the site based upon the shear wave velocity data. The seismic coefficients of acceleration and velocity C_a and C_v, as derived from the soil profile type and seismic zone factor, are 0.52 and 0.64 respectively.

The distance between the site and the nearest active fault is less than 2 km; therefore the near-source acceleration and velocity factors N_a and N_v are 1.3 and 1.6 respectively. The nearest known active fault is the Round Valley fault located approximately 1.9 km northwest of the site. The Round Valley Fault is a Type B Seismic Source.

Conformance to the above criteria for strong ground shaking does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur during a large magnitude earthquake. Design of structures should comply with the requirements of the governing jurisdictions, building codes, and standard practices of the Association of Structural Engineers of California. A Design Civil or Structural Engineer in conjunction with the State Architect should determine what level of risk is acceptable for the project considering the recommendations contained in this report, economics, and safety.

9. SECONDARY EARTHQUAKE EFFECTS

Secondary effects that can be associated with severe ground shaking following a relatively large earthquake include ground lurching, faulting and shallow ground rupture, soil lurching liquefaction, seiches and tsunamis, avalanches (rockfall and snow). These secondary effects of seismic shaking are discussed in the following sections.

9.1 Shallow Ground Rupture

Ground surface rupture results when the movement along a fault is sufficient to cause a gap or break along the upper edge of the fault zone on the surface. Our review of

available geologic literature indicated that there are no known active, potentially active, or inactive faults that transect the subject site. The nearest known active regional fault is the Round Valley fault. The closest projected trace for this fault zone is located approximately 1.9 km northwest of the site.

9.2 Soil Lurching

Soil lurching refers to the rolling motion on the ground surface by the passage of seismic surface waves. Effects of this nature are likely to be most severe where the thickness of soft sediments varies appreciably under structures. In its present condition, the potential for lurching below the proposed structures is considered low due to the existence of potentially compressible soils within the upper few feet of material below existing grades. The potential for lurching may be greatly reduced if the potentially compressible soils, present on site, are removed and properly compacted during grading, as per the earthwork recommendations provided herein.

9.3 Liquefaction

Liquefiable soils typically consist of cohesionless sands and silts that are loose to medium-dense and saturated. To liquefy, these soils must be subjected to a ground shaking of sufficient magnitude and duration. The potential for liquefaction to occur is considered non-existent for the site given the lack of a water table and the well indurated nature of bearing soils present on site.

9.4 Seiches and Tsunamis

The potential for tsunamis and seiches as the result of the design level earthquake in a nearby fault are considered non-existent, due to the distance of the ocean or large open bodies of water from the project site.

9.5 Avalanches (Rockfall and Snow)

Avalanches can occur as a result of moderate to large earthquakes in Alpine terrain, which can cause rock and snow to move vertically and laterally downslope. These

hazards typically affect structures which are located at the base of slopes or within close proximity to the area of flow. The potential for rockfall or snow avalanches to occur at the subject site is considered low, given the proximity of the site to a relatively steep slope area.

10. LANDSLIDES

Evidence of past landslides was not observed either during aerial photographic review or in the field.

11. VOLCANIC HAZARDS

The area of eastern California that includes the Long Valley Caldera and the Mono-Inyo Craters volcanic chain has a long history of geologic activity that includes earthquakes and volcanic eruptions. Studies within this area indicate that massive eruptions of the size that accompanied formation of Long Valley Caldera approximately 760,000 years ago are extremely rare (none have occurred during the period of written human history). Currently, there is no evidence that an eruption of such catastrophic proportions might be forming beneath the Long Valley caldera (Miller, 1985; 1989).

A small to moderate volcanic eruption could occur however; somewhere along Mono-Inyo Craters volcanic chain producing pyroclastic flows and surges, as well as volcanic ash and pumice fallout, which could significantly impact the subject site. The odds however, of such an eruption are roughly one in a thousand in a given year (Miller, 1985; 1989).

12. CONCLUSIONS

Based on the results of this investigation, it is our opinion that the construction of the proposed project is feasible from a geotechnical standpoint provided the following recommendations are incorporated into the design and construction. The following sections discuss the principal geotechnical concerns affecting site development and grading and provide preliminary grading and foundation design recommendations which should be implemented during site development to mitigate site geologic constraints. However, implementation of these

recommendations and adherence to the 1997 UBC, and the 2001 CBC, does not preclude property damage during or following a significant seismic event.

- The proposed development is feasible from a geotechnical standpoint and may be constructed as planned provided the recommendations contained within this report are incorporated into the design and construction.

- There are no known active, potentially active, or inactive faults that transect the subject site. Evidence of past soil failures, landslides, or active faulting on the site was not encountered. Seismic hazards at the site may be caused by ground shaking during seismic events on regional active faults. The nearest known active regional fault is the Round Valley fault located approximately 1.9 km from the site.

- Based on the results of the probabilistic analysis, the Upper-Bound and Design Basis Earthquakes for the site yielded peak ground accelerations of 0.60g and 0.47g respectively.

- The project consultants and the Client should discuss various seismic design parameters and decide upon an appropriate design value based upon their seismic performance goals. A design value of 0.47g is the lowest value that should be considered.

- A volcanic eruption could occur somewhere along Mono-Inyo Craters volcanic chain producing pryoclastic flows and surges, as well as volcanic ash and pumice fallout, which could significantly impact the subject site. The odds however, of such an eruption are roughly one in a thousand in a given year (Miller, 1985; 1989).

- Neither a groundwater table nor groundwater seepage was encountered during this field investigation. Based upon information provided from the existing Lower Rock Creek Mutual Water Company, the depth to the groundwater table (excluding the surface run-off from the creek drainage) is approximately 1,000-feet below the existing ground surface.

- Site soils encountered during our field investigation generally consist of loose to dense, silty to clayey, fine to coarse-grained sands, with abundant cobble clasts and large boulders.

- In general, excavations at the site should be achievable using standard earthmoving equipment.

13. RECOMMENDATIONS

The following recommendations should be adhered to during site development. These recommendations are based on empirical and analytical methods typical of the standard of practice in California. If these recommendations appear not to cover any specific feature of the project, please contact our office for additions or revisions to the recommendations.

13.1 Geotechnical Review

Geotechnical review is of paramount importance in engineering practice. The poor performance of many foundation and earthwork projects has been attributed to inadequate construction review. Sierra Geotechnical Services, Inc. should be provided the opportunity to review the following items or we waive all liability for any and all geotechnical issues associated with grading or construction relative to the subject site.

13.1.1 Plan and Specification Review

Detailed plans for construction and grading were not available at the time of this report. SGSI should review the proposed construction projects on an individual basis prior to construction in order to assure that they are in conformance with this report; additional subsurface field work or a revision to the geotechnical recommendations contained herein may be warranted after reviewing.

13.2 Earthwork

Earthwork should be performed in accordance with the General Earthwork and Grading Specifications in Appendix D and the following recommendations. The recommendations contained in Appendix D are general grading specifications provided for typical grading projects. Some of the recommendations may not be strictly applicable to this project. The specific recommendations contained in the text of this report supersede the general recommendations in Appendix D. The contract between the developer and earthwork

contractor should be worded such that it is the responsibility of the contractor to place the fill properly in accordance with the recommendations of this report and the specifications in Appendix D notwithstanding the testing and observation of the geotechnical consultant.

13.2.1 Site Preparation

Prior to grading, the proposed structural improvement areas (i.e. all structural fill, pavements areas and structural building, etc.) of the site should be cleared of surface and subsurface obstructions, including vegetation. Vegetation and debris should be disposed of off site. Holes resulting from removal of buried obstructions, which extend below the recommended removal depths described herein or below finished site grades (whichever is lower) should be filled with properly compacted soil. Should existing underground utilities be encountered they should be completely removed and properly backfilled. Alternatively if the utility is not within the influence zone of the foundation it may be abandoned in place by fully grouting the pipe.

13.2.2 Removals and Compaction

The subject property is situated gently to moderately sloping terrain underlain by up to approximately 2-feet of loose, surficial deposits considered unsuitable for the support of new fill or structural loads. Within the construction areas, these near surface soils will need to be overexcavated to approximately 2-feet below current grades. The excavation should extend to a minimum horizontal distance of at least 5-feet outside any building footprints. Removals and Compaction recommendations are provided in Appendix D.

For any paved roadways, parking areas and other improvements a one-foot removal is recommended depending on site conditions (i.e. depth of root zone, and depth of disturbance which may have locally deeper removal depths). The removal bottom should be observed (tested as needed) by the geotechnical consultant prior to placing fill soils.

13.3 Excavation and Grading Observation

Site grading and footing excavations should be observed by SGSI. Such observations are considered essential to identify field conditions that differ from those anticipated by the investigation, to adjust design to actual field conditions, and to determine that the grading is accomplished in general accordance with the recommendations of this report. Earthwork and grading recommendations which include guidelines for site preparation fill compaction, slopework, temporary excavations, and trench backfill are provided in Appendix D.

13.4 Preliminary Foundation Preparation and Design

The following preliminary recommendations are presented as minimum design recommendations; they are not intended to supercede design by the structural engineer. Preliminary foundations should be designed in accordance with structural considerations and the following recommendations. Upon the completion of the grading and structural plans, Sierra Geotechnical Services Inc. should review the foundation loads and embedment in order to confirm the implementation of the recommendations herein.

13.4.1 Preliminary Foundation Design

Continuous or pad footings may be used to support the proposed structures provided they are founded entirely upon either competent certified fill or competent terrace deposits, or competent Bishop Tuff observed within the test pits at approximately 2-feet below existing grades. An allowable soil bearing pressure of 2,500 pounds per square-foot (psf) may be used for the design of footings founded within certified fill or terrace deposits. An allowable soil bearing pressure of 3,000 pounds per square-foot (psf) may be used for the design of footings founded within the Bishop Tuff.

For footings founded in the above described materials, a friction coefficient for concrete of 0.35 and an allowable capacity increase of 250 psf for every 6 inches of additional embedment up to a maximum value of 3,500 psf may be employed

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX E

DRAINAGE STUDY

Tract 37-56
Rock Creek Ranch
Mono County, California

Drainage Study

Prepared for:
C & L Development L.L.C.
P.O. Box 8898
Mammoth Lakes, CA 93546

Project 2215

Revised: October 2007

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Drainage Report
Tract No. 37-56
Rock Creek Ranch

1 - Project

The project site consists of 54.67 acres and is located off of Lower Rock Creek Road just east of the existing Paradise Lodge in Mono County, California. The properties to the east and northeast of the project site are owned by the Bureau of Land Management and the property to the south is owned by the Los Angeles Department of Water and Power. The property to the west and north is the Paradise Lodge property that is privately owned.

The existing site is vacant and the project will be the subdivision of Parcel 3 of Parcel Map 37-38. The subdivision will consist of 60 single family lots ranging in size from about 10,574 square feet to 25,463 square feet and open space containing about 20 acres. The construction of arterial and access roads will be a part of this project. Furthermore, the construction will include grading, the installation of utilities, and landscaping.

2 - Objective

The objective of this preliminary drainage report is to determine expected hydrologic runoff quantities and design facilities necessary to collect and convey storm runoff through the project site.

3 - Assumptions

Precipitation Frequency Estimates are based upon the NOAA Atlas 14 results from the website, http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html. These results are from the project site at Latitude 37.48° Longitude -118.60° and an approximate elevation of 4990 feet. This information is included in Appendix B.

Storm drainage facilities will be designed to carry the flows generated during a storm of 100 year frequency. Velocities will be limited where possible to less than 5 feet per second and where velocities are greater than 5 feet per second rip-rap will be installed to protect facilities. Runoff uninfluenced by site improvements will be allowed to leave the site in the same historical flow pattern.

Proposed pipe, drywell, and swale sizes will be sized upon Mono County requirements at the time of improvements.

4 – Offsite Drainage

Offsite drainage enters the site from the north and from the east. The estimated tributary area is 18.34 acres. This land is covered with scattered sagebrush, therefore we are assuming a runoff coefficient of 0.20. Furthermore the time of concentration has been determined using the nomograph found in Appendix B and then multiplied by 2 for overland flow. The offsite drainage entering the project site will be collected in swales and directed around the perimeter of the site to maintain a historic flow pattern. Where velocities are considered to be erosive, energy dissipators will be installed. The facilities required to convey offsite drainage entering the property will be sized at the time of final design for improvements.

5 – Onsite Drainage

Post development drainage will be conveyed via brow ditches, road side swales, drop inlets and pipes to drywell retention systems located in various areas of the site. Refer to the attached Proposed Drainage Exhibit included in Appendix A. The drywell systems will be sized to retain the first inch of a 20 year storm event. The onsite drainage facilities will also be sized to convey the flows generated during a storm of 100 year frequency at the time of final design for the improvements. Proposed drywell locations are shown on the Proposed Drainage Map in Appendix A. In sizing the drywells it will be assumed that the post development roof area on each lot will be 2,000 square feet and have about 1,000 square feet of paving for an access driveway.

6 - Calculations

Refer to the Drainage Maps and the Quad map included in Appendix A – Figures, and to the Calculations included in Appendix C.

The historic contribution to runoff from the site during a storm of 25 year intensity is 22.81 cfs for Area A, inclusive of the offsite tributary area, and 2.95 cfs for Area B, as determined by the attached calculations. The developed runoff from the site during a storm of 25 year intensity has been calculated to be 38.27 cfs for Area A and 2.49 cfs for Area B. Area A will have drywells located throughout the area to retain and convey the calculated flow. The hydrologic and hydraulic calculations and final design of the facilities will occur at the time of improvement plan preparation.

7 - Conclusions

The historic condition of this site includes runoff entering the site from the north and the east and exiting the site primarily to the west and south portions of the property. This runoff sheet flows across the property without any distinct swales or ditches. The preliminary design proposed in this report will allow the site to continue to maintain this type of runoff after development.

Runoff Q's have been calculated for general areas. The included summary of calculations indicates the runoff Q-values for a 25 year storm event. Design of facilities will be based on an exceedence level as required by the county. The requirements and standards in place at the time of the improvements will be adhered to.

The designs and calculations included in this preliminary report are for planning purposes. Facility design will be finalized during final design in accordance with Mono County requirements in place at that time.

Drainage facilities have been preliminarily placed and will be designed to contain the first inch of a 25 year storm. These facility types are identified on the Proposed Drainage Exhibit included in this document at an 11"x17" size and attached to this document in a 22"x34" size.

The Storm Drainage Facilities must be maintained to continue to work as designed. Particular items requiring maintenance include but are not limited to the removal of foreign materials from storm drainage pipes and ditches, maintenance as necessary to outlet facilities, desiltation of retention basins, and repairs as necessary to damaged facilities.

The area of disturbance for this project is 8.2 acres. This is greater than 1 acre, so this project is subject to the requirements of the National Pollution Discharge Elimination System (NPDES) requirements for construction projects, General Permit number CAS 000002, enforced by the State Water Quality Control Board – Lahontan Region. The Owner must submit a Notice of Intent to associate this project with the General Permit, then prepare, have on site and conform to a Storm Water Pollution Prevention Plan (SWPPP) during construction.

Preliminary Drainage Study

Tract No. 37-56 – Rock Creek Ranch

Appendix A

Figures

SCALE 1"=100'
CONTOUR INTERVAL = 5'

	OFFSITE AREA (acres)	ONSITE AREA (acres)	TOTAL AREA (acres)	Q_{25}
(A)	18.34	48.23	66.57	22.81
(B)	0	6.45	6.45	2.95

LEGEND

- PROPERTY BOUNDARY
- DIRECTION SHEET FLOW
- DRAINAGE BOUNDARY

EXISTING DRAINAGE EXHIBIT

ROCK CREEK RANCH

PREPARED FOR: C & L DEVELOPMENT L.L.C.

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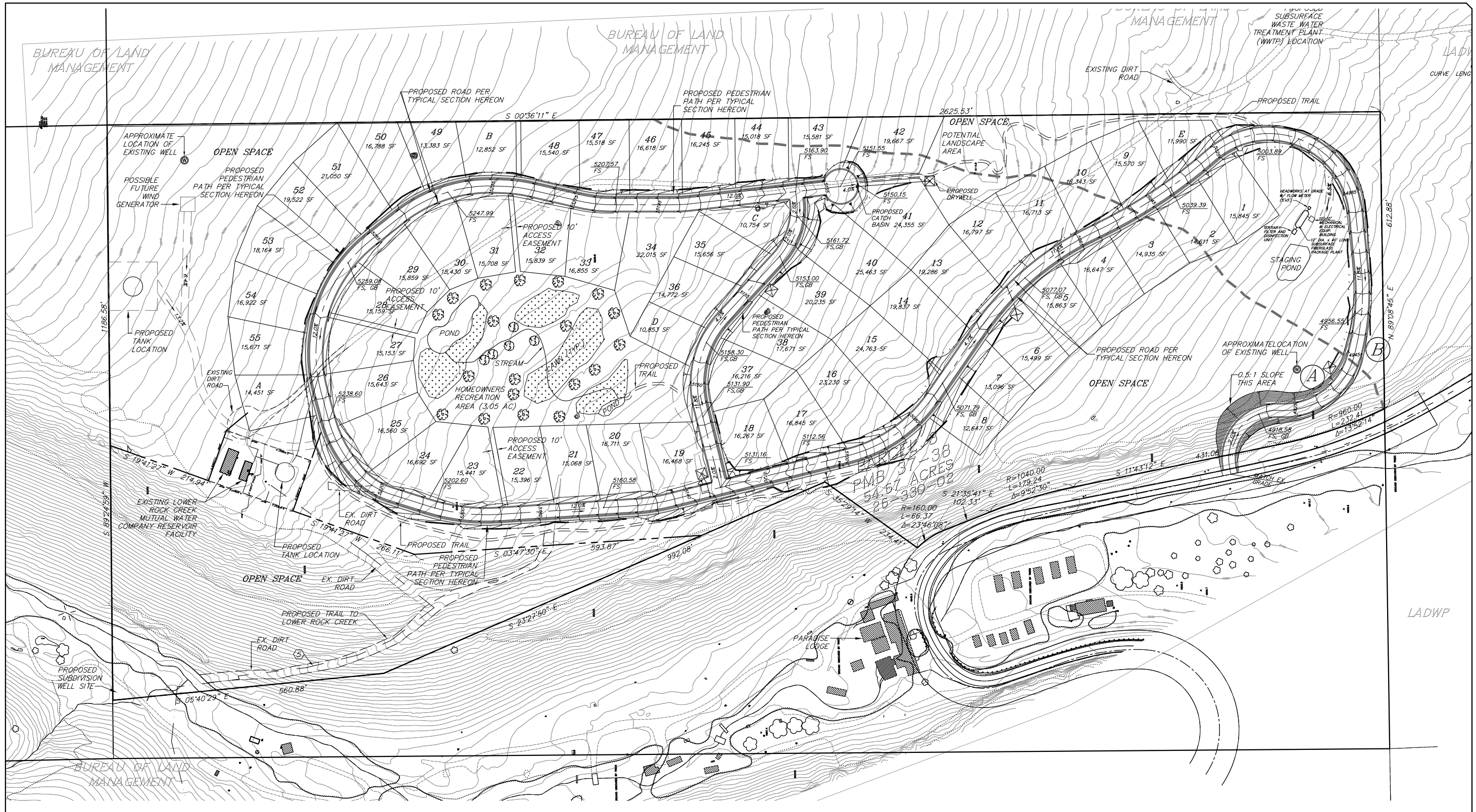
REVISIONS	BY

DATE 10/26/07
SCALE 1" = 100'
DRAWN MV
JOB NO. 2215
DWG 2215_DRNG
SHEET 1
OF 2 SHEETS

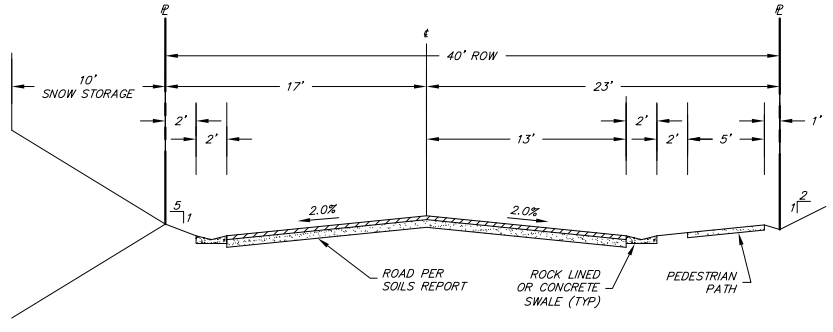
PROPOSED DRAINAGE EXHIBIT

ROCK CREEK RANCH

PREPARED FOR: C & L DEVELOPMENT L.L.C.



SCALE 1"=100'
CONTOUR INTERVAL = 5'



TYPICAL ROAD SECTION
N.T.S.

PROPOSED DRAINAGE FACILITIES

- BROW DITCH
- DROP INLETS
- DRYWELL

SITE RUNOFF

	OFFSITE (acres)	ONSITE (acres)	TOTAL AREA (acres)	Q_{25}
A	18.34	48.23	66.57	38.27
B	0	6.45	6.45	2.49

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513 lincoln avenue, suite c
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555 chorro st., suite a
SAN LUIS OBISPO, ca 93405
phone (805) 544-8908
fax (805) 544-8932
e-mail slo@thainc.com

217 west central avenue, suite a
LOMPOC, ca 93436
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1061 serpentine lane, suite f
PLEASANTON, ca 94566
phone (925) 485-1080
fax (925) 485-1083
e-mail pleasanton@thainc.com

REVISIONS	BY

DATE 07/08/04
SCALE 1" = 100'
DRAWN MV
JOB NO. 2215
DWG 2215_DRNG
SHEET 2 OF 2 SHEETS

Preliminary Drainage Study

Tract No. 37-56 – Rock Creek Ranch

Appendix B

Intensity Curves
Time of Concentration Nomograph

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

California 37.4803°N 118.6014°W 4990 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 3
G.M. Bonnin, D. Todd, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2003

Extracted: Thu Jul 8 2004

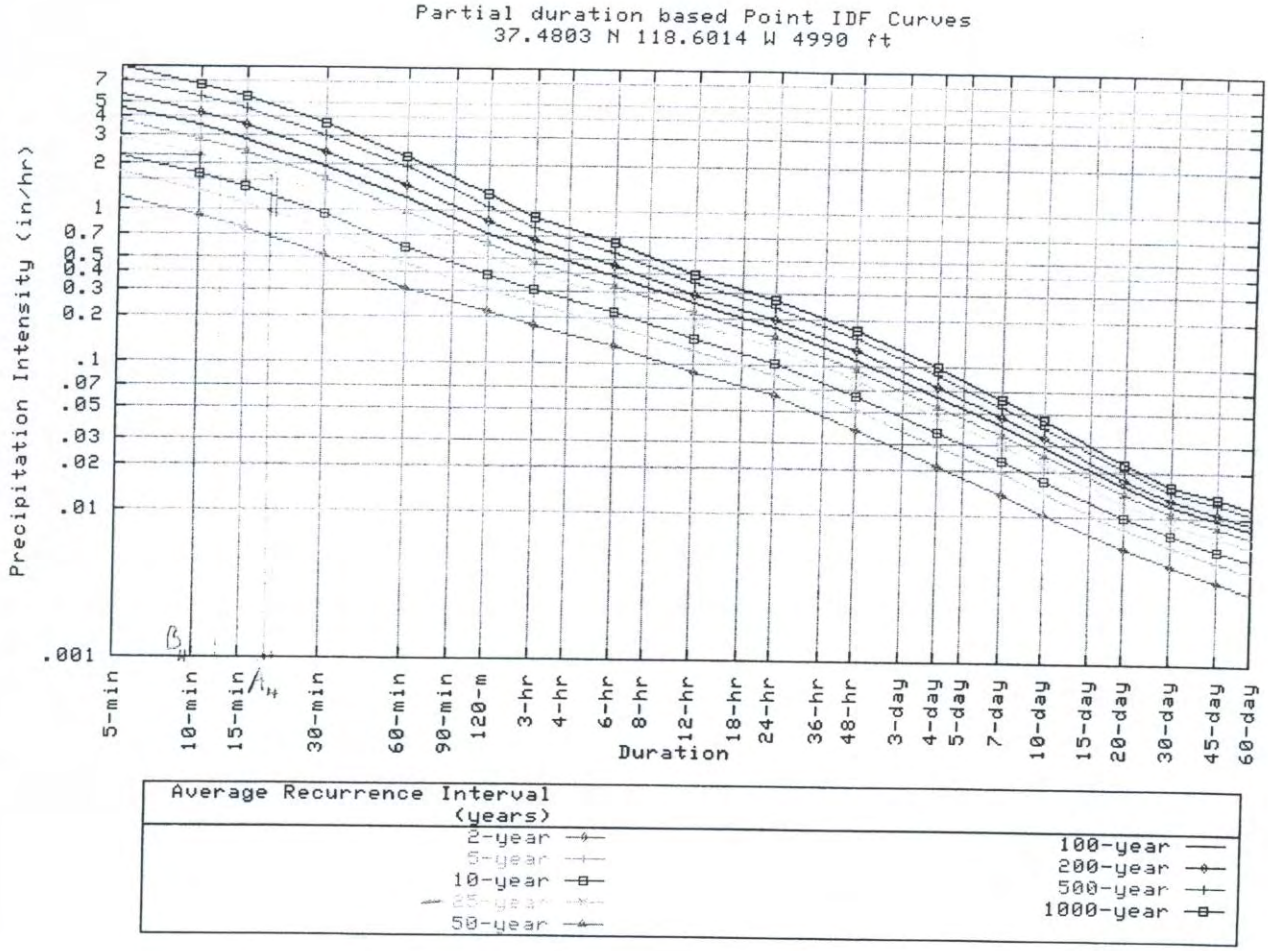
Confidence Limits | Seasonality | Location Maps | Other Info. | Grids | Maps | Help | Docs

Precipitation Intensity Estimates (in/hr)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.20	0.91	0.75	0.51	0.31	0.22	0.18	0.13	0.09	0.06	0.04	0.02	0.01	0.01	0.01	0.00	0.00	0.00
5	1.73	1.31	1.08	0.73	0.45	0.31	0.25	0.18	0.12	0.09	0.05	0.03	0.02	0.01	0.01	0.01	0.00	0.00
10	2.20	1.67	1.38	0.93	0.58	0.38	0.31	0.22	0.15	0.10	0.06	0.04	0.02	0.02	0.01	0.01	0.01	0.01
25	2.98	2.27	1.87	1.26	0.78	0.50	0.40	0.28	0.19	0.13	0.08	0.05	0.03	0.02	0.01	0.01	0.01	0.01
50	3.71	2.83	2.34	1.57	0.97	0.61	0.47	0.33	0.22	0.15	0.09	0.05	0.04	0.03	0.01	0.01	0.01	0.01
100	4.57	3.48	2.88	1.94	1.20	0.73	0.56	0.39	0.26	0.18	0.11	0.06	0.04	0.03	0.02	0.01	0.01	0.01
200	5.59	4.25	3.51	2.37	1.46	0.86	0.65	0.45	0.30	0.21	0.13	0.07	0.05	0.03	0.02	0.01	0.01	0.01
500	7.18	5.47	4.52	3.04	1.88	1.08	0.80	0.55	0.35	0.25	0.15	0.09	0.05	0.04	0.02	0.02	0.01	0.01
1000	8.60	6.55	5.41	3.64	2.25	1.26	0.92	0.63	0.40	0.28	0.17	0.10	0.06	0.04	0.02	0.02	0.01	0.01

Text version of table

* These precipitation frequency estimates are based on a partial duration maxima series. **ARI** is the Average Recurrence Interval. Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.



Confidence Limits -

*** Upper bound of the 90% confidence interval Precipitation Intensity Estimates (in/hr)**

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.40	1.07	0.88	0.59	0.37	0.26	0.21	0.15	0.10	0.07	0.04	0.02	0.02	0.01	0.01	0.01	0.00	0.00
5	1.99	1.51	1.25	0.84	0.52	0.35	0.29	0.21	0.14	0.10	0.06	0.03	0.02	0.02	0.01	0.01	0.01	0.00
10	2.53	1.93	1.59	1.07	0.66	0.43	0.35	0.25	0.17	0.12	0.07	0.04	0.03	0.02	0.01	0.01	0.01	0.01
25	3.42	2.60	2.15	1.45	0.90	0.57	0.45	0.32	0.22	0.15	0.09	0.05	0.03	0.03	0.01	0.01	0.01	0.01
50	4.28	3.26	2.69	1.81	1.12	0.70	0.54	0.38	0.26	0.18	0.11	0.06	0.04	0.03	0.02	0.01	0.01	0.01
100	5.29	4.03	3.33	2.24	1.39	0.84	0.64	0.45	0.30	0.21	0.13	0.07	0.05	0.03	0.02	0.01	0.01	0.01
200	6.54	4.97	4.11	2.77	1.71	1.01	0.76	0.53	0.35	0.24	0.15	0.09	0.05	0.04	0.02	0.02	0.01	0.01
500	8.56	6.51	5.38	3.62	2.24	1.29	0.95	0.65	0.42	0.29	0.18	0.10	0.06	0.05	0.02	0.02	0.01	0.01
1000	10.39	7.91	6.54	4.40	2.72	1.53	1.12	0.75	0.48	0.33	0.21	0.12	0.07	0.05	0.03	0.02	0.02	0.01

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than.
** These precipitation frequency estimates are based on a partial duration maxima series. **ARI** is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

*** Lower bound of the 90% confidence interval**

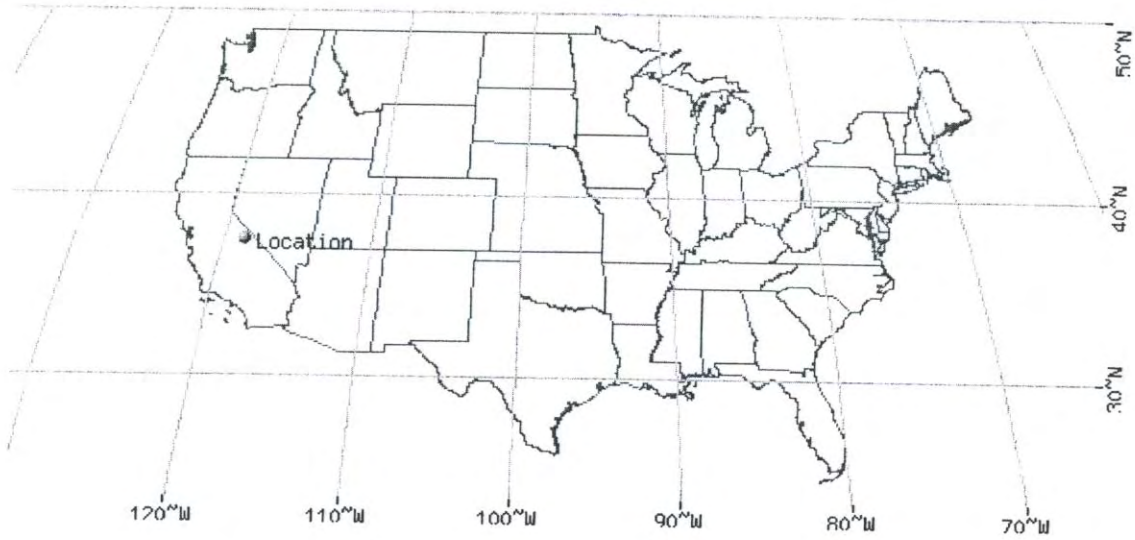
Precipitation Intensity Estimates (in/hr)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.07	0.81	0.67	0.45	0.28	0.20	0.16	0.12	0.08	0.06	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
5	1.54	1.16	0.96	0.65	0.40	0.27	0.22	0.16	0.11	0.07	0.04	0.03	0.02	0.01	0.01	0.01	0.00	0.00
10	1.93	1.46	1.21	0.82	0.51	0.34	0.27	0.20	0.13	0.09	0.05	0.03	0.02	0.02	0.01	0.01	0.01	0.00
25	2.54	1.94	1.60	1.08	0.67	0.43	0.34	0.25	0.17	0.11	0.07	0.04	0.03	0.02	0.01	0.01	0.01	0.01
50	3.11	2.36	1.95	1.31	0.81	0.51	0.40	0.29	0.19	0.13	0.08	0.05	0.03	0.02	0.01	0.01	0.01	0.01
100	3.68	2.80	2.32	1.56	0.96	0.59	0.46	0.33	0.22	0.15	0.09	0.05	0.03	0.03	0.01	0.01	0.01	0.01
200	4.34	3.31	2.73	1.84	1.14	0.68	0.53	0.37	0.25	0.17	0.10	0.06	0.04	0.03	0.02	0.01	0.01	0.01
500	5.30	4.04	3.34	2.25	1.39	0.82	0.62	0.44	0.29	0.20	0.12	0.07	0.04	0.03	0.02	0.01	0.01	0.01
1000	6.12	4.66	3.85	2.59	1.60	0.93	0.70	0.49	0.32	0.22	0.14	0.08	0.05	0.04	0.02	0.01	0.01	0.01

* The **lower** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **less** than.
** These precipitation frequency estimates are based on a partial duration maxima series. **ARI** is the Average Recurrence Interval.

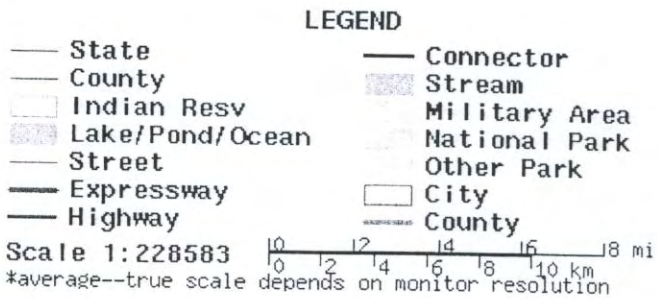
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

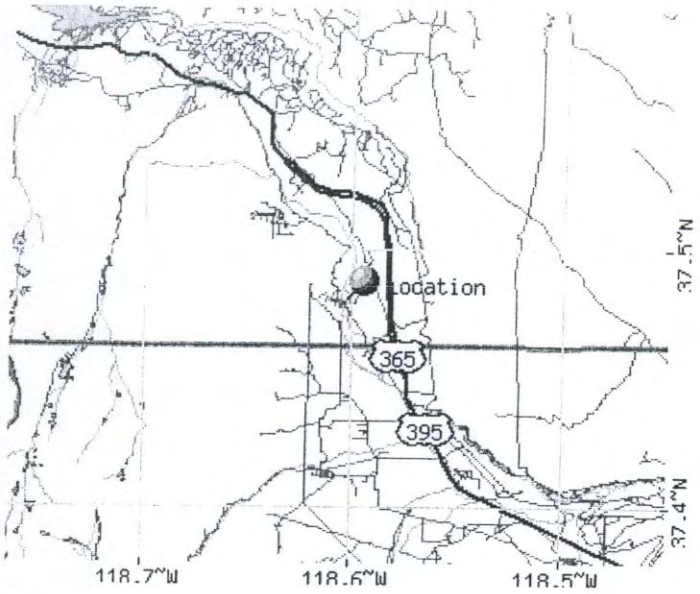
Maps -



These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server.

Please read disclaimer for more information.





Other Maps/Photographs -

View USGS Digital Raster Graphic (DRG) covering this location from TerraServer; **USGS Aerial Photograph** may also be available
from this site. A DRG is a digitized version of a USGS topographic map. Visit the USGS Digital Backyard for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information
about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study,
please refer to our documentation.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

+/-30 minutes ...OR... +/-1 degree of this location (37.4803/-118.6014). Digital ASCII data can be obtained directly from **NCDC**.

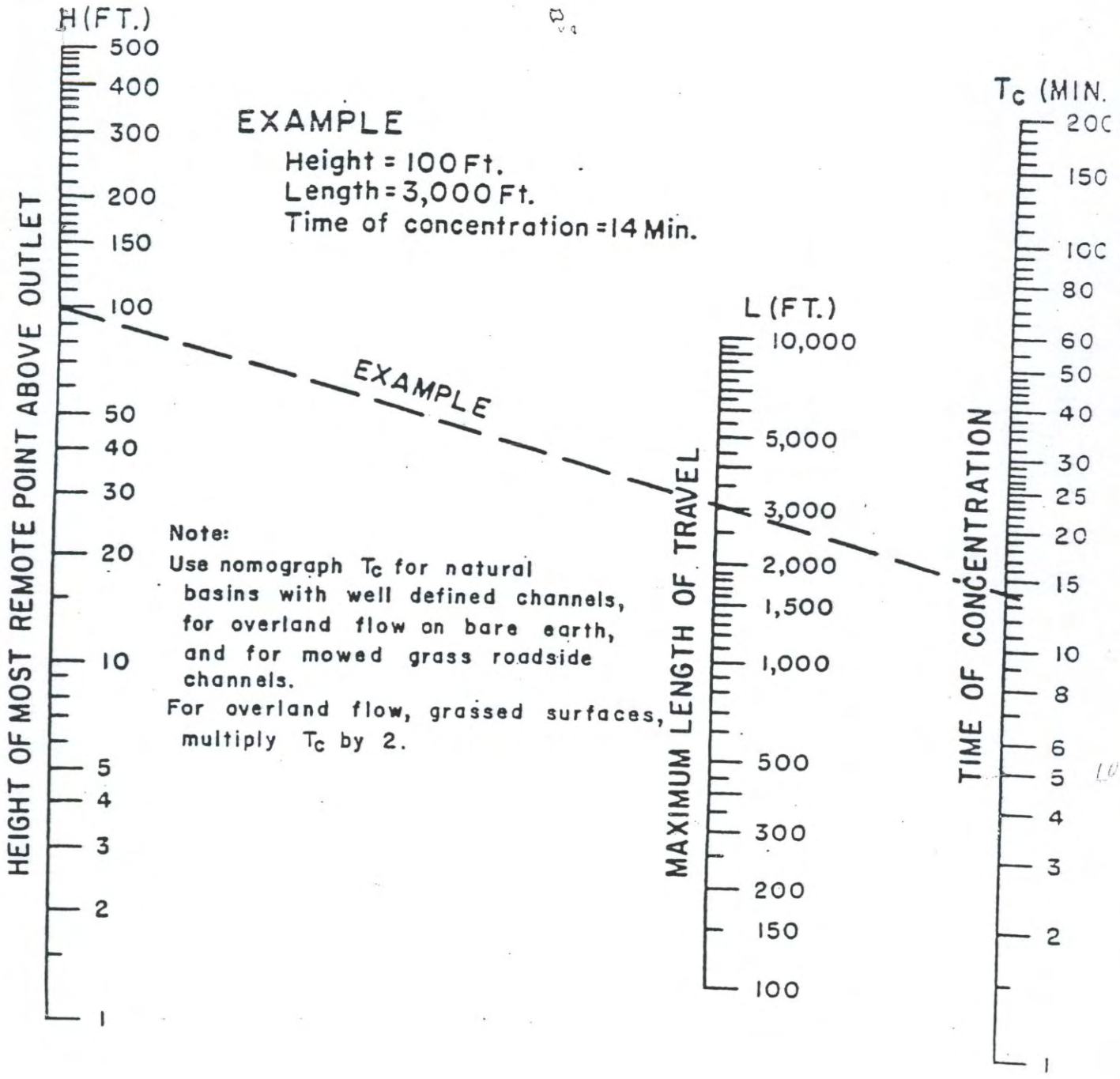
Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the **Western Regional Climate Center's state-specific SNOTEL station maps**.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

(301) 713-1669
Questions?: HDSC.Questions@noaa.gov

Disclaimer

TIME OF CONCENTRATION FOR SMALL DRAINAGE BASINS



Based on study by P. Z. Kirpich,
Civil Engineering, Vol. 10, No. 6, June 1940, p. 332

Rev. 1973

Figure G 261

Preliminary Drainage Study

Tract No. 37-56 – Rock Creek Ranch

Appendix C

Hydrology Calculations

DEVELOPED

Area A		Q=1.008CIA	(rational)		peak	38.27 cfs	I	(25 yr from chart)		2.1
		Item	Area (sf)	Area %	Coefficient	Weighted C		**Total T_C**	13.8	
		Buildings	103000	4%	0.95	0.03		T_C overland	9.0	
	C	Concrete	0	0%	0.95	0.00		T_C ditch	4.8	
		Asphalt	173867	6%	0.95	0.06		length	3452.0	
		Ground	2622931	90%	0.2	0.18		velocity	12.0	
		Total	2899798	100%		**0.27**	A			**66.57 acres**

Area B		Q=1.008CIA	(rational)		peak	2.49 cfs	I	(25 yr from chart)		1.7
		Item	Area (sf)	Area %	Coefficient	Weighted C		**Total T_C**	24.6	
		Buildings	3000	1%	0.95	0.01		T_C overland	22.0	
	C	Concrete	0	0%	0.95	0.00		T_C ditch	2.6	
		Asphalt	23482	8%	0.95	0.08		length	1840.0	
		Ground	254460	91%	0.15	0.14		velocity	12.0	
		Total	280942	100%		**0.23**	A			**6.45 acres**

HISTORIC

		Q=1.008CIA	(rational)		peak	22.81 cfs	I	(25 yr from chart)		1.7
		Item	Area (sf)	Area %	Coefficient	Weighted C		**Total T_C**	20.0	
		Buildings	0	0%	0.95	0.00		T_C overland	20.0	
	C	Concrete	0	0%	0.95	0.00		T_C ditch	0.0	
		Asphalt	0	0%	0.95	0.00		length	3500.0	
		Ground	2899798	100%	0.2	0.20		velocity	2.9	
		Total	2899798	100%		**0.20**	A			**66.57 acres**

		Q=1.008CIA	(rational)		peak	2.95 cfs	I	(25 yr from chart)		2.27
		Item	Area (sf)	Area %	Coefficient	Weighted C		**Total T_C**	10.0	
		Buildings	0	0%	0.95	0.00		T_C overland	10.0	
	C	Concrete	0	0%	0.95	0.00		T_C ditch	0.0	
		Asphalt	0	0%	0.95	0.00		length	1550.0	
		Ground	280942	100%	0.2	0.20		velocity	2.6	
		Total	280942	100%		**0.20**	A			**6.45 acres**

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX F

WELL TESTING REPORT

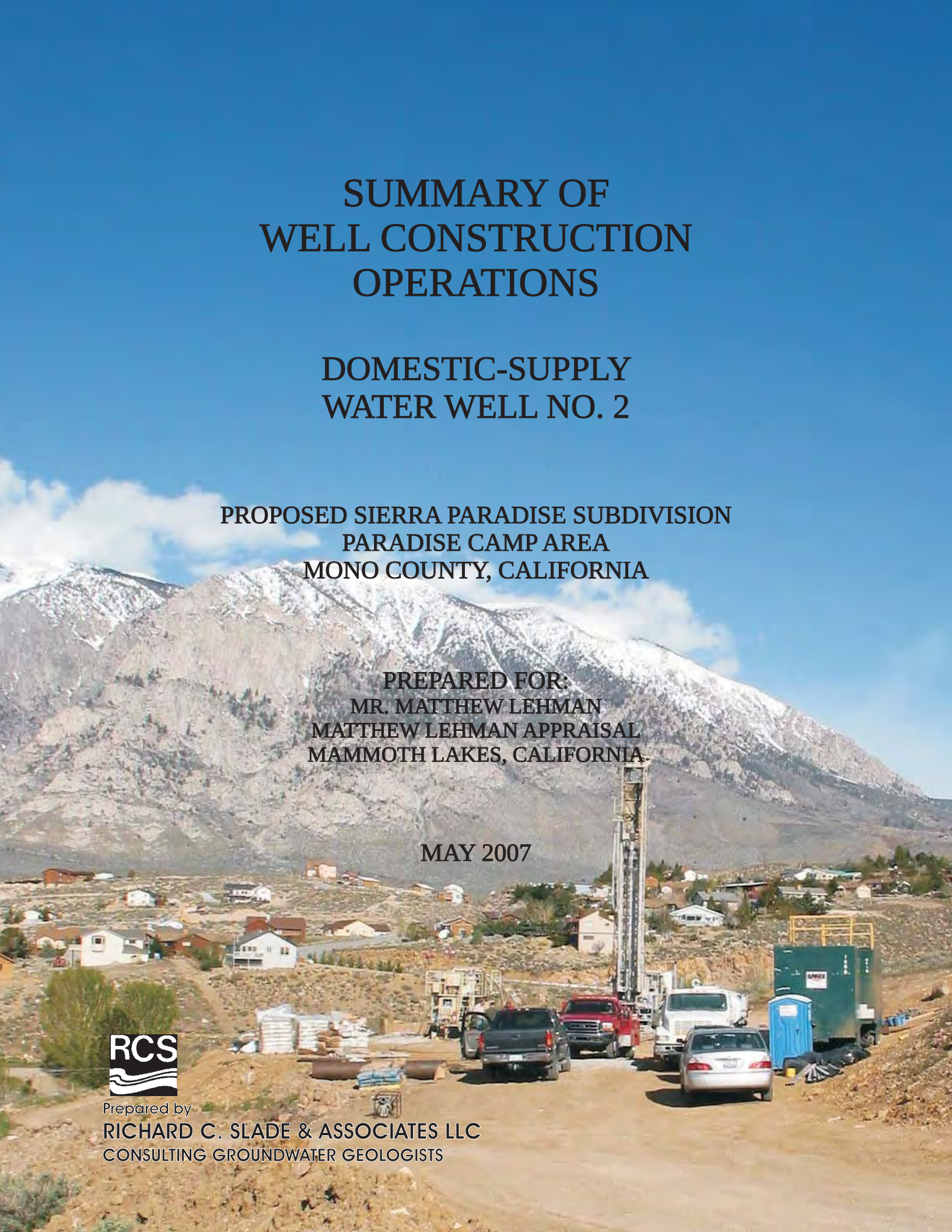
SUMMARY OF WELL CONSTRUCTION OPERATIONS

DOMESTIC-SUPPLY WATER WELL NO. 2

PROPOSED SIERRA PARADISE SUBDIVISION
PARADISE CAMP AREA
MONO COUNTY, CALIFORNIA

PREPARED FOR:
MR. MATTHEW LEHMAN
MATTHEW LEHMAN APPRAISAL
MAMMOTH LAKES, CALIFORNIA

MAY 2007



Prepared by
RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

SUMMARY OF WELL CONSTRUCTION OPERATIONS DOMESTIC-SUPPLY WATER WELL NO. 2

PROPOSED SIERRA PARADISE SUBDIVISION PARADISE CAMP AREA MONO COUNTY, CALIFORNIA

Prepared for

Mr. Matthew Lehman
Matthew Lehman Appraisal
Mammoth Lakes, California

Prepared by

Richard C. Slade & Associates LLC
Studio City, California

RCS Job No. 121-07

May 2007

SUMMARY OF WELL CONSTRUCTION OPERATIONS DOMESTIC-SUPPLY WATER WELL NO. 2

PROPOSED SIERRA PARADISE SUBDIVISION
PARADISE CAMP AREA
MONO COUNTY, CALIFORNIA

Prepared for

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Prepared by:
Richard C. Slade & Associates, LLC
Consulting Groundwater Geologists

RCS Job No. 121-07

May 2007

Earl LaPensee
California Certified Hydrogeologist No. 134

Richard C. Slade
Professional Geologist No. 2998

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FIGURES

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INTRODUCTION

This report has been prepared to summarize the drilling, final design, construction, and testing of a new water-supply well, designated as Well No. 2, at the proposed Sierra Paradise subdivision in Mono County, California. As shown on Figure 1, "Well Location Map," the new well is located in the southwest corner of the proposed Sierra Paradise subdivision, immediately north of Lower Rock Creek Road and about 5700 ft west of Highway 395. The purpose of the new well, in combination with recently (2004-2005) constructed Well No. 1 in the northeast corner of the property, is to provide groundwater for domestic water-supply purposes for the proposed development. Also shown on Figure 1 are the approximate locations of onsite Well No. 1 and an offsite water-supply well owned by the Lower Rock Creek Mutual Water Company (LRCMWC).

Drilling, construction, development, and testing of Well No. 2 were performed by the Cascade Drilling Company (Cascade) of Rancho Cordova, California. These activities were performed on an intermittent basis between October 12, 2005 and March 14, 2007. Richard C. Slade & Associates LLC (RCS) of Studio City, California and Sierra Geotechnical Services Inc. (SGSI) of Bishop, California provided the following:

- Limited field observation during the drilling and reaming of the pilot hole.
- Preparation of the final well casing design based on field data and information obtained from the pilot hole.
- Field observation of the installation of the casing, gravel pack and cement seal.
- Monitoring of the development and testing of the well.
- Maintaining liaison with the owner and with Cascade during the various phases of drilling, reaming, casing installation, development and testing of the well.

Prior to drilling, a permit for the new well was obtained in August 2005 by Cascade; the Mono County Health Department (MCHD) permit number is 26-05-76. A copy of this permit, along with a copy of the State Department of Water Resources Well Completion Report prepared by Cascade to help document the construction of the new well, are presented in the Appendix.

DRILLING AND REAMING OPERATIONS

DRILLING OPERATIONS

Drilling of the pilot hole for Well No. 2 was initiated in October, 2005, and the new well was finally cased and gravel packed in January, 2007. Drilling and construction lasted approximately 15 months due to numerous delays. These delays were caused by such factors as severe lost circulation problems in the borehole(s), which required the installation of cement seals/plugs to help seal open fractures in the rocks. Table 1 "Daily Record of Site Activities" provides a chronology of events at the well site. The following provides a summary of the drilling activity from October, 2005 through January, 2007; additional details on these activities are included on Table 1.

a) Drilling of the pilot hole commenced in rocks of the Bishop Tuff on October 26, 2005. Drilling was initially performed with the mud rotary drilling method, using a 9-inch diameter drill bit, on a 24-hour per day basis. Drilling had progressed to a total depth of 480 ft below ground surface (bgs) by November 6, whereupon fluid circulation was initially lost, when extensive fractures in the Bishop Tuff were encountered.

b) Circulation was regained and by November 8 and on 9, drilling had progressed to a depth of 510 ft. However, the drillers were prevented at that time from continuing to drill on a 24-hour per day basis by Mono County, because of excessive noise during night-time drilling. Sierra Paradise sought to obtain a noise variance from the County to resume drilling on a 24-hour per day basis. It was mutually agreed upon by a Sierra Paradise representative and Cascade personnel that the drillers could demobilize their drilling equipment from the site until a later date. Cascade returned to the site on January 16, 2006 but due to snow and mud, they were unable to access the site immediately with drilling equipment. A road was built to the site and the drilling rig setup shortly following that.

c) Drilling resumed on January 24, 2006, with an 18-inch diameter drill bit. Drilling was limited to only daylight hours due to noise concerns. At a depth of 240 ft, the drill bit broke apart (and was subsequently left downhole). Following this, Cascade switched to a 12¼-inch drill bit and by January 31 had achieved a depth of 545 ft bgs. At this depth, drilling was still being conducted within the Bishop Tuff.

d) No drilling was performed until February 7, 2006, at which time Cascade mobilized another mud rotary drill rig to the well site. Drilling resumed on February 8.

e) Drilling continued until March 6, 2006 at which time some tools were lost downhole at a depth of 1200 ft bgs. These tools were retrieved by March 10.

f) Drilling resumed on March 13, 2006 and, by March 21, had achieved a depth of 1700 ft bgs. Initial electric logging of the borehole was performed on March 24 by Dewey

Data Inc (DDI) of Stockton, California. However, the logging probe could not descend past 1460 ft bgs due to a downhole blockage from unknown causes. Because the log could not pass this depth, Cascade drilling was directed to ream out the borehole once again to the total depth and re-run the electric log.

g) On March 27, 2006 reaming commenced and advanced to a depth of 240 ft bgs. However, drilling was halted due to downhole blockage by an unknown cause; the blockage was not removed.

h) Between March 29 and April 10, 2006, Cascade installed cement at various depth intervals to help combat lost circulation, due to voids and/or fractures in the Bishop Tuff.

i) Reaming continued to a depth of approximately 435 ft bgs on April 18, at which time the mud pump on the drill rig broke down. On April 25, 2006, representatives of Cascade, Sierra Paradise, and RCS met to discuss the delays in drilling operations at the site and to allow Cascade to develop a specific work method and final schedule to permit completion of the project.

j) On the following day, April 26, 2006, a new mud pump was installed and drilling commenced again. However, the drill bit twisted off downhole. Retrieval operations began.

k) Between May 1 and June 27, Cascade conducted downhole "fishing" operations to remove the drill bit and debris from the open borehole. By June 28, the pilot hole was cleaned out to 480 ft bgs.

l) Reaming of the borehole was performed from June 29 to August 17, 2006, to a total depth of 1728 ft bgs, At this depth, drilling could not advance any further due to another obstruction. Thus, reaming operations ceased and an electric log, caliper log and deviation surveys were performed by Pacific Surveys LLC (PSL) of Claremont California the next day on August 18, 2006.

During drilling of the boreholes, an SGSI geologist was onsite on a part-time basis to collect and geologically log samples of the encountered materials as drilling progressed. In addition, an RCS geologist was in telephone contact with Cascade personnel in order to receive occasional updates on the progress of the pilot hole drilling. A copy of the geologic log prepared by the SCSI geologist is included in the Appendix.

GEOLOGIC LOGGING AND SUMMARY OF GEOLOGIC CONDITIONS

During drilling of the initial pilot hole, there were virtually no returns of drill cuttings to the ground surface, thereby precluding accurate logging by the geologist. However, during subsequent reaming of the pilot hole, drill cuttings were obtained starting at a depth of 690 ft bgs. However, these collected drill cuttings were of rather dubious quality because of a significant degree of

intermixing of the previously drilled material with the new material. Thus, the geologic log prepared by the onsite SGSI geologist (and provided in the Appendix), does not commence until a depth of 690 ft and may not accurately reflect the geologic material encountered by the drill bit as drilling/reaming proceeded in the borehole. It was also not possible to conduct grain size distribution tests of key aquifer materials due to this lack of drill cuttings returns.

However, notwithstanding the lack of suitable drill cuttings for direct evaluation by the geologist, but, based on the indirect observations of the geologist during drilling and on our review of the subsequent electric log, it appears that rocks of the Bishop Tuff at the drill site extend to a depth of approximately 690 to 700 ft bgs. These rocks are highly fractured and jointed and contained numerous voids, as evidenced by the severe loss of drilling fluids during drilling to 690 ft bgs. Below this depth, a thick sequence (approximately 1000 ft) of fine- to medium-grained sand, interbedded occasionally with clay layers, were encountered to an approximate depth of 1728 ft bgs. These sediments appear to represent older alluvial deposits beneath the geologically younger Bishop Tuff. However, it is possible that some of the upper portions of the alluvial material (directly below the Bishop Tuff) could also contain some volcanic ash that may have been emplaced before the deposition of the main Bishop Tuff.

DOWNHOLE SURVEYS

Downhole Geophysical Surveys

As stated above, downhole geophysical surveying (electric logging) of the pilot hole was initially performed by DDI in the pilot hole on March 24, 2006. This logging consisted of 16-inch, short-normal (short) and 64-inch long-normal (long) resistivity surveys, a point resistivity survey, a self potential (SP) survey, and a natural gamma-ray (NGR) survey. However, at a depth of 1460 ft bgs, an obstruction prevented the logging tool from advancing to the total drilled pilot hole depth. A copy of this initial electric log is presented in the Appendix. Following completion of these surveys, Cascade commenced to ream the pilot hole.

Because initial electric logging of the pilot hole was not completed to its total depth, an additional electric log was requested by RCS, in order to obtain definitive data on the geologic material at depth (drill cuttings returns, as mentioned above, were only indicative of conditions in the pilot hole). Consequently, on August 18, 2006 PSL performed short- and long-normal surveys,

laterolog 3 resistivity survey, a self potential survey, and a natural gamma ray survey to a total depth drilled of 1728 ft bgs.

The two suites of survey logs revealed that the Bishop Tuff appears to extend to a depth of approximately 690 to 700 ft bgs; its resistivity ranges between 600 to 1450 ohm-meters on the long-normal survey. Such values likely represent volcanic tuff material. Below approximately 700 to 720 ft bgs, the resistivities on the long-normal survey of the electric log exhibit a marked decrease in the range of the resistivity values, and span only a resistivity interval from 40 to 300 ohm-meters. Such values are more typical of alluvial-type sediments.

Caliper Survey

Following the electric log on August 18, a caliper survey of the reamed borehole was performed. This caliper survey was performed to determine if any significant "washouts" were present in the reamed borehole. The log from this survey revealed that the borehole to a depth of approximately 430 ft ranged in diameter from 18 to 19 inches. Below this depth the caliper log shows a slight decrease in hole diameter to slightly less than 16 to 18 inches, notwithstanding a few washouts which extended out to 20 inches in diameter. However, at a depth of approximately 1380 ft bgs, the caliper survey log reveals a significant change in diameter to slightly less than 17 inches. From 1380 ft, to a depth of approximately 1700 ft bgs, the borehole shows a gradual reduction in the diameter to 15 inches. Based on this caliper survey log, the onsite geologist examined the drill bit and observed that it was still on the order of 17 to 18 inches in maximum diameter, although the bit also appeared to be well worn on one side. Copies of the electric logs and caliper survey are included in the Appendix.

Deviation Survey

There was some concern, due to the problems during drilling of the borehole, that significant deviations in the borehole would likely be present. Thus, following the August 18 caliper survey, a gyroscopic deviation survey was performed in order to check the plumbness and alignment of the drilled borehole. The deviation survey revealed that the borehole was plumb to a depth of approximately 300 ft bgs. However, at this depth the borehole was found to deviate and form a bend (aka, a "dogleg"). Other "doglegs" are also seen at 400 ft and 500 ft on the deviation survey. However, a very significant "dogleg" is observed at a depth of 1300 to 1400 ft bgs, with

another less significant dogleg at 1600 ft bgs. Due to these 'doglegs," the total deviation at the bottom of the drilled hole is 95 ft to the southwest. The total angle of deviation, from 300 ft to 1725 ft bgs, was calculated to be approximately 4 degrees. It was decided, based on the results of the deviation survey, that the total deviation and doglegs might not impose significant constraints on the installation of the well casing and that this operation should be conducted.

FINAL WELL CONSTRUCTION AND DEVELOPMENT

CASING, GRAVEL PACK, CEMENT SEAL INSTALLATION AND DEVELOPMENT

The final casing design for Well No. 2 was prepared by RCS geologists based on the geologic evaluation of lithologic samples, interpretation of electric log data, and drilling information provided by Cascade. The Final Recommended Casing Design Memorandum, which provided the final well design, was submitted to the Owner and to Cascade on September 21, 2006; a copy of this Memorandum is included in the Appendix. Figure 2, "'As-Built' Well Diagram" helps document the recommended construction of the well.

During installation of the well casing, gravel pack and cement seal, Cascade encountered further difficulties. The following provides a short summary of events during final construction of the well:

a) On September 24, 2006, the temporary tremie pipe used for the emplacement of the gravel pack and cement seal was installed to a depth of 1340 ft bgs. Shortly after completion of this task, installation of the well casing commenced.

b) Casing installation was completed on September 26, 2006 to a depth of 1700 ft bgs. Following this, the drillers flushed the fluids inside the well casing with fresh water in order to thin down the drilling muds.

c) Gravel packing of the annular space between the well casing and the borehole walls was initiated on September 27, 2006. However, shortly following this, the tremie pipe could not be pulled-back after 2 or 3, 20-foot long sections ("joints") had been removed. In addition, approximately 1500 ft of stainless steel sounding cable were lost downhole and could not be recovered. Subsequently, 1300 ft of tremie pipe and the stainless steel sounding cable were left downhole. A second set of temporary tremie pipe was installed to a depth of 500 ft bgs to resume gravel packing.

d) Gravel packing was discontinued on September 30, at which time it was discovered that the top of the gravel pack in the annular space was at a depth of approximately 500 ft bgs. This depth was approximately 190 ft above the targeted 690-foot depth for the top of the gravel pack. The contractor was asked to remove 190 ft of this

gravel pack, and this was accomplished via airjetting methods. Following this, the driller removed the second tremie pipe.

e) Mechanical development, swabbing and airlifting, with a double swab tool was performed between October 2 and 27, 2006, in order to help consolidate ("seat") the gravel pack.

f) On November 11, 2006 a temporary test pump was installed to help further develop the well via pumping methods. Pumping development was performed between November 12 through December 8, 2006.

g) Between December 14 and 22, 2006, the upper 690 ft of the 1300 ft of the original tremie pipe was cut off and removed. The remaining 610 ft of this original tremie pipe was left downhole.

h) On December 27, 2006, and between January 17 and 23, 2007, additional gravel pack was installed in the annulus to raise the top of this pack to a depth of 690 ft bgs. Thereafter, the first lift of the cement seal was installed in the annular space.

i) On January 27, 2007, the final lift of the annular cement seal was installed and pumping development resumed.

j) A new test pump was installed in the well to a depth of 1000 ft between February 8 and 9, 2007. Pumping development was resumed on February 12 and continued through March 1, 2007.

k) Pumping tests were then conducted between March 5 and March 9, 2007.

WELL CONSTRUCTION

The well was constructed with 10-inch outside diameter (O.D.) mild steel well casing, having a ¼-inch wall thickness, to a final depth of 1700 ft bgs. Roscoe Moss Ful-flo louvered well casing, with a slot opening of 0.050 inches ("50-slot"), was placed between the depths of 720 to 1080 ft, 1100 to 1130 ft, 1155 to 1365 ft, and 1380 to 1680 ft bgs; hence, the final well casing has a total of 900 ft of louvered (perforated) casing and 800 ft of blank (non-perforated) casing. Figure 2, "As-Built Well Diagram," present the details of the completed well. A California Department of Water Resources (DWR) State Well Completion Report, prepared by the Cascade, documents the final as-built well and is also presented in the Appendix.

The gravel pack used to fill the annular space surrounding the well casing consisted of a 6 X 12 gradation, delivered to the site in "super sacks" by Tacna Sand and Gravel (Tacna) of Yuma, Arizona. Approximately 40½ "super sacks" of gravel were used to fill the annular space between the borehole wall and the well casing between the depths of 1728 ft and approximately 690 ft bgs. Following the installation of the gravel pack, a 10-sack cement slurry was pumped in

lifts into the remaining annular space above the gravel pack from a depth of approximately 690 ft bgs up to ground surface. Both the gravel pack and the cement annular seal were pumped into place via a tremie pipe, as noted above.

PUMPING (AQUIFER) TESTING

INTRODUCTION

Pumping (aquifer) tests of the well were performed from March 5 through March 9, 2007. This testing was performed, in accordance with the approved guideline document for development and testing of the well (prepared by Mono County), which is dated March 29, 2006. A copy of this guideline document is included in the Appendix of this report. Based on that document, the pumping test consisted of the following major test elements:

- A two-day period of recovery following pumping development operations.
- A step-drawdown test.
- A 72-hour constant-rate "discharge" (pumping) test.
- Monitoring of water levels for a minimum period of 8 hours following completion of the 72-hour pumping test.

Pressure transducers, to continuously record water levels in each well, were installed in Well No. 2 on March 2 and in Well No. 1 on March 3. Onsite Well No.1 which is located approximately 2400 ft to the north-northeast of Well No. 2, and the offsite Lower Rock Creek Mutual Water Company (LRCMWC) well, located approximately 2200 ft to the north-northwest of Well No. 2, served as additional water level observation wells (see Figure 1). Water levels in the LRCMWC well were measured manually, using an electronic water level sounder. This well could only be measured during the constant-rate pumping test, because the well could not be shut down for a period greater than three days according to LRCWMC personnel.

PRE-TEST MONITORING PERIOD

Figure 3, "Plot of Water Levels During Step-Drawdown Testing," presents a graphic illustration of the water level data measured in the new well prior to commencement of the step-drawdown test. That figure shows that the pressure transducer apparently did not accurately measure water levels only during the pre-test period. For example, at 6:00 am on March 3, the water level is shown to be on the order of 340 ft below reference point (brp, which was 3.3 ft above

ground surface). However, around 4:00 pm on that day there appears to be an abrupt rise in the water level up to a depth of 320 ft brp. This same water level depth continues until the start of the step-drawdown test on March 5. However, on March 5, just prior to startup of testing, the static water level (SWL) was measured by an SGSI geologist, using an electronic water level sounder and found to be at a depth of 305.8 ft brp. This depth was approximately 14 ft different (higher) than the pressure transducer-recorded measurement; it appears that the manual measurement of 305.8 ft represents that actual pre-test SWL. The reason for the difference between the transducer-recorded measurement and the manual measurement is not known and the anomaly could not be discovered until after the pressure transducer was removed following the end of all testing. Notwithstanding the apparent initial inaccuracy of the SWL measurements by the transducers, all readings measured after the start of testing appear to correspond well with the actual manual measurements collected by the SGSI geologist during testing (see Figure 3).

STEP-DRAWDOWN TEST

Following the 2-day, pre-test monitoring period, a three-point, step-drawdown test at the RCS-recommended nominal discharge rates of 90, 180, and 270 gpm was performed on March 5, 2007. The well was pumped at each of the recommended discharge rates for a period of 4 hours to allow water levels to partially stabilize. During the step-drawdown test, pumping levels and pumping rates were monitored and recorded by the SGSI geologist, as well as by the pressure transducer. The pre-test SWL was manually measured at a depth of approximately 305.8 feet brp (as noted above). Figure 3 shows the changes in water levels during the step-drawdown testing.

The average pumping rate (as determined from the totalizer flow dial) during each step test, together with the final water levels, calculated drawdown, and resultant specific capacity data for the each of the step rates are shown in Table 2, “Step-Drawdown Test Results”. As shown on that table, the short-term specific capacities of the well ranged between 2.3 and 3.4 gpm per foot of water level drawdown (gpm/ft ddn) for average pumping rates between 268 gpm (highest rate) and 88 gpm (lowest rate), respectively.

During pumping, only trace amounts of sand were reportedly produced at the start of the test, and no additional sand was pumped throughout the remainder of the test. Further, a slight odor of hydrogen sulfide (H_2S) was also detected in the discharge during testing.

The relative degree of the pumping efficiency of the well at the step-drawdown testing rates was calculated based on the data, by a method of analysis to help determine well efficiency using step-drawdown data (as developed by W. Bierschenk in 1964). This method involves determining the specific drawdown (s/Q, in ft/gpm) of the well at each step-test rate and plotting s/Q versus the pumping rate. The slope and intercept of the resulting line yields the well loss and aquifer (formation) coefficients. Figure 4, "Step-Drawdown Test Analysis," shows the resulting data plot utilizing the Bierschenk method of analysis. Based on the Bierschenk method, Table 2 reveals that the pumping efficiencies of the well range from 51.8% at the highest rate of 268 gpm, to 77.1% at the lowest rate of 88 gpm. It is readily apparent that lowest pumping rate is the relatively most efficient pumping rate for the well.

Also shown on Figure 3 are the transducer and manual water level measurements collected in Well No. 1, the other onsite water level observation well. The figure shows that during the step-drawdown pumping test in Well No. 2 there were no impacts induced on the water levels in Well No. 1, indicating that the pumping in Well No. 2 did not create any drawdown interference in Well No. 1.

CONSTANT-RATE PUMPING TEST

From March 6 to March 9, 2007, a 73-hour constant-rate pumping (aquifer) test was conducted; the average pumping rate during this test, as determined from totalizer flow dial readings, was 250 gpm. The purposes of this constant-rate pumping test were to assess longer-term aquifer and pumping characteristics, water level drawdown, and possible sand production in the pumping well and to help ascertain whether of not water level drawdown interference was being created in onsite Well No. 1 to the north-northeast (see Figure 1). Figure 5, "Plot of Water Levels During Constant-Rate Pumping Test," present a graphic illustration of the water level data measured in Well No. 2 and the two observation wells, onsite Well No.1 and the LRCMWC well, during that test.

Prior to pumping, a pre-test SWL was measured at a depth of 313.9 feet brp by the SGSI geologist. At the end of the pumping test, the final pumping water level was measured at a depth of 467.0 feet brp. It appears that in the last two hours of pumping, water levels appeared to have generally stabilized. The final pumping water level yielded a maximum water level draw-

down of 153.1 feet, resulting in a calculated longer-term specific capacity of 1.6 gpm/ft ddn for Well No. 2.

Recovery water levels recorded by the SGSI geologist following completion of the constant-rate discharge test indicate that water levels appeared to have recovered to a depth of 327.1 ft bgs in 38.5 hours; this depth is approximately 13.2 ft lower than the static level prior to the beginning of the constant-rate pumping test.

Figure 5 also shows the transducer and/or manual measurements, as applicable, collected during monitoring of water levels in Well No. 1 and in the LRCMWC well during the pumping test of Well No. 2. In each case, there appears to be no change in the measurements, indicating that pumping of Well No. 2 did not impact water levels in either of the two observation wells during the pumping portion of the test.

During testing, the SGSI geologist observed no sand in the pumped discharge. Also, at startup of testing, a slight H_2S odor was detected. However, by the end of testing, this odor reportedly was not present.

AQUIFER TEST ANALYSIS

A curve-fitting, analytical solution was applied to the water level drawdown data from the constant-rate pumping test in Well No. 2 only, because monitoring of water levels in the observation wells revealed no drawdown data to use for this purpose. Figure 6, "Constant-Rate Pumping Test Analysis, Theis Confined Recovery Solution," illustrates the solution providing the best fit to the water level data from Well No. 2. Based on that graphic solution, an aquifer transmissivity (T) for the 73-hour constant-rate discharge test data was calculated to be approximately 2650 gallons per day per foot of aquifer thickness (gpd/ft).

Table 3 "Final Evaluation of Pump Rate and Pump Intake Depth Setting for Paradise Well No. 2" presents our analysis for the final pump rate and pump depth setting for the new well. Based on that analysis, a pumping rate on the order of 250 gpm appears to be suitable for the well. At this rate, setting the pump intake at a depth of 700 ft bgs (approximately 20 ft above the top of the uppermost perforations) should be more than adequate to account for possible future de-

clines in water levels in the well. Such declines could be caused by a prolonged drought, and/or by a decline in the current specific capacity of the well over time.

Water levels in the observations wells Well No. 1 and the LRCMWC well were not influenced during the recent constant rate pumping test of Well No. 2. Thus, because of this lack of impact of the pumping on those two observation wells, then it appears likely that there is no significant hydraulic connection between Well No. 2 and those two observation wells. Furthermore, because Well No. 2 will, very likely, never be pumped in the future for the continuous period of 73 hours as was done for this testing, then future pumping of Well No. 2 is not anticipated to create adverse water level drawdown impacts in the offsite LRCMWC water wells.

GROUNDWATER QUALITY

FINAL WELLBLEND WATER SAMPLE

Before the end of the 73-hour constant-rate pumping test, a final wellblend water quality sample was collected by the onsite SGSI geologist and submitted to Clinical Lab of San Bernardino, Inc, at Grand Terrace, California for laboratory analyses. Laboratory testing was conducted for the following: California Title 22 general minerals and physical constituents; inorganic (metal) constituents; volatile organic compounds (VOCs); and semi-VOCs; and radiochemicals. Copies of these laboratory analyses for the final wellblend water sample from Well No. 2 are provided in the Appendix.

GENERAL MINERAL ANALYSES

Laboratory analyses for general minerals shows that the final wellblend water sample has a sodium-bicarbonate (Na-HCO_3) character, a total dissolved solids (TDS) concentration of 130 milligrams per liter (mg/L) and a fluoride concentration of 0.98 mg/L. Total hardness (TH) concentration was listed as not detected (ND). The recommended State Secondary Maximum Concentration Level (MCL) for TDS is 500 mg/L; thus, the TDS concentration is below the recommended MCL for TDS. Furthermore, with a TH less than 5.0 mg/L, the water is classified as soft, in accordance with the Water Quality Association (WQA) classification system.

The fluoride concentration of 0.98 mg/L is well below the State MCL of 2 mg/L for this constituent. Nitrate as nitrogen (NO_3 as N) was not detected; the current State Primary MCL for this constituent is 10 mg/L. All other general mineral constituents were either not detected or were present in concentrations below their respective MCLs, as applicable.

INORGANIC CONSTITUENTS

For the inorganic constituents, trace metals and other inorganics, the laboratory analyses reveal that aluminum (Al), arsenic (As), boron (B), iron (Fe), and manganese (Mn) and vanadium (V) were the only such constituents detected in the final wellblend water quality sample. The table below shows the detected results for these constituents:

Constituent	Result (in mg/L)	Maximum Contaminant Level (in mg/L)
Al	0.770	0.200 (secondary)
As	0.009	0.010 (US EPA primary)
B	0.13	1.0 (NL)
Fe	0.730	0.300 (secondary)
Mn	0.021	0.050 (secondary);0.5 (NL)
V	0.031	0.050 (NL)

All MCLs are for California, unless otherwise indicated.
NL = Notification Level

The above table shows that both Al and Fe concentrations are above their respective State Secondary MCLs, whereas the Mn concentration is below its respective MCL. The trace metal As is slightly less than its U.S. Environmental Protection Agency (EPA) Primary MCL. The constituents B and V and below their respective Notification Levels (NLs). The detection of at least some of these inorganic chemicals may be due to the presence of remnant drilling muds in the local groundwater; bentonite is known to contain some of these metals.

ORGANIC COMPOUND ANALYSES

Results of laboratory analyses for volatile organic compounds (VOCs), and semi-VOCs revealed that none of these constituents were detected in the final wellblend water sample from the new well.

RADIOLOGICAL ANALYSES

Results of laboratory analysis of radiological constituents from the new production well are presented in the Appendix and is listed with the Sample ID of M71118R-1A. The results of those analyses revealed that the Gross Alpha concentration was reported by the laboratory as being 6.7 picocuries per Liter (pCi/L), which is below its State MCL of 15 pCi/L. However, it is above the 5.0 pCi/L threshold level, or trigger, requiring the analysis of additional radiologic constituents, such as uranium, radium, tritium and strontium-90. Thus, the State Department of Health Services (DHS) might request these additional laboratory analyses at a later date.

SUMMARY AND RECOMMENDATIONS

SUMMARY

- Drilling and subsequent reaming of the borehole for the new well was greatly inhibited due to problems associated with caving and/or loss of drilling fluids.
- The borehole was completed to a diameter of 18 inches and to a depth of approximately 1380 ft bgs, then reduced to 15 inches in diameter from 1380 ft bgs to 1700 ft bgs. From 1700 ft bgs to its final depth of 1728 ft bgs, the borehole diameter was about 14 inches.
- Bishop Tuff was encountered from ground surface to a depth of 690 ft bgs, and below this, a series of interbedded silty sand and gravel (interpreted to be older alluvium) was encountered in the remainder of the borehole to a depth of 1728 ft bgs.
- The new well was completed with 10-inch outside diameter (O.D.) mild steel well casing with a ¼-inch wall thickness to a depth of 1700 ft bgs. A total of 900 ft of Roscoe Moss Ful-flo louvered well casing, with a 0.050-inch slot width, was placed between the depths of 720 to 1080 ft, 1100 to 1130 ft, 1155 to 1365 ft, and 1380 to 1680 ft bgs.
- Gravel pack in the annular space of the well consisted of a Tacna 6 x 12 gradation and was installed between the depths of 690 ft and 1728 ft bgs. Cement was placed atop the gravel pack from ground surface to 690 ft bgs to form the sanitary seal for the new well. A minimum 50-foot deep cement sanitary seal is required by the State (if the groundwater is to be used for domestic and community water-supply purposes).
- The well was developed by mechanical methods (swab and airlift), by chemical methods (addition of Aqua Clear PFD), and by pumping methods (surge and pump). The final well discharge was clear and free of mud and sand.
- Aquifer testing of the new well was performed on March 8 and 9, 2007, for a 73-hour period at an average pumping rate of 250 gpm. The pre-test non-pumping (static)

water level was approximately 313.9 bgs. The following data were derived from that test: an overall specific capacity of 1.6 gpm/ft ddn; relatively stable water levels near the end of the pumping portion of the test; recovery water levels appeared to be approximately 13.2 ft lower that the pre-test static water level; and based on the results of curve-fitting analysis of the aquifer test data, the aquifer system perforated by the well is considered to be confined, and has a T value of approximately 2650 gpd/ft.

- Transducer-recorded water levels in onsite Well No. 1, and occasional manual water levels recorded in the offsite LRCWMC well revealed that no water level drawdown interference was created in either well by virtue of pumping Well No. 2 at a constant rate of 250 gpm and for a continuous period of 73 hours. Similar long durations of continuously pumping this well at a rate of 250 gpm should not be needed in the future for the proposed project.

RECOMMENDATIONS

- Based on the results of the 12-hour step-drawdown and 72-hour constant rate pumping test, it appears that the well can be placed online at a rate of 250 gpm.
- We recommended that the intake of the permanent pump in the new well be set at a depth of approximately 700 ft bgs, which is within blank casing section and approximately 20 ft above the top of the first perforation interval; the pump and motor should be designed to be as efficient as possible in recognition of the known, deep static and pumping water levels.
- It is recommended that an accurate flow meter with both a totalizer and an instantaneous flow dial be installed on the discharge line from the new well. Measurements from the flow meter should be collected on a regular basis. This will help determine the amount of water produced by the well for operations at the facility.
- To facilitate the monitoring of water levels we recommend that the Contractor install a small diameter PVC tubing adjacent to the permanent pump column at the same time that the pump is placed into the well. Water levels, both pumping and non-pumping, should be measured and recorded on a regular basis. Water level data can be useful when analyzing well conditions, and in determining when rehabilitation of the well may be necessary. It may be possible to install a dedicated pressure transducer to perform this monitoring. This pressure transducer should be capable of automatically recording water levels during pumping and non-pumping periods.
- To maintain well efficiency, it is recommended that periodic maintenance/rehabilitation be performed in the new well. Specific capacity values in wells tend to decline with time as the perforations and gravel pack become clogged with naturally occurring bacterial slimes/growths and/or become encrusted with scale and mineral precipitates. Significant reductions in specific capacity (and hence, well efficiency) will increase pumping costs.
- We recommend that the new well should not stand idle (*i.e.*, not be pumped) for extended periods of time. When the well is finally put into service and if the well is not

to be operated for several months, or longer, we suggest pumping should be performed once or twice per week for a period ranging from 20 to 30 minutes.

- A final wellblend water quality sample was collected from the well prior to shut down of the constant-rate discharge test. Laboratory results reveal a Na-HCO_3 groundwater character, low TDS, an ND value for TH, and low to ND concentrations of most other chemicals and inorganic constituents. The metals Al and Fe were detected at concentrations above their respective MCLs, and may necessitate treatment. The detection of Gross Alpha at a concentration above its trigger level of 5.0 pCi/L may necessitate a re-pumping of the well and re-sampling of groundwater for laboratory analysis of additional radiological constituents. If that becomes mandated by DHS, we recommend that some additional pumping development be performed prior to that sampling; re-testing for Al and Fe is recommended at that time also to help determine if remnant drilling muds were the cause of the slightly excessive detections of these metals. Slight hydrogen sulfide odors were noted in the pumped discharge during the testing of the new well. Treatment for this constituent may be needed in the future.

CLOSURE

The information included in the appendices completes this Summary of Well Construction Operations report regarding the observation and documentation of the drilling, construction, development and testing activities of the new water-supply Well No. 2 for the proposed Sierra Paradise subdivision in Mono County, California. If you have any questions concerning this report, please contact our office.

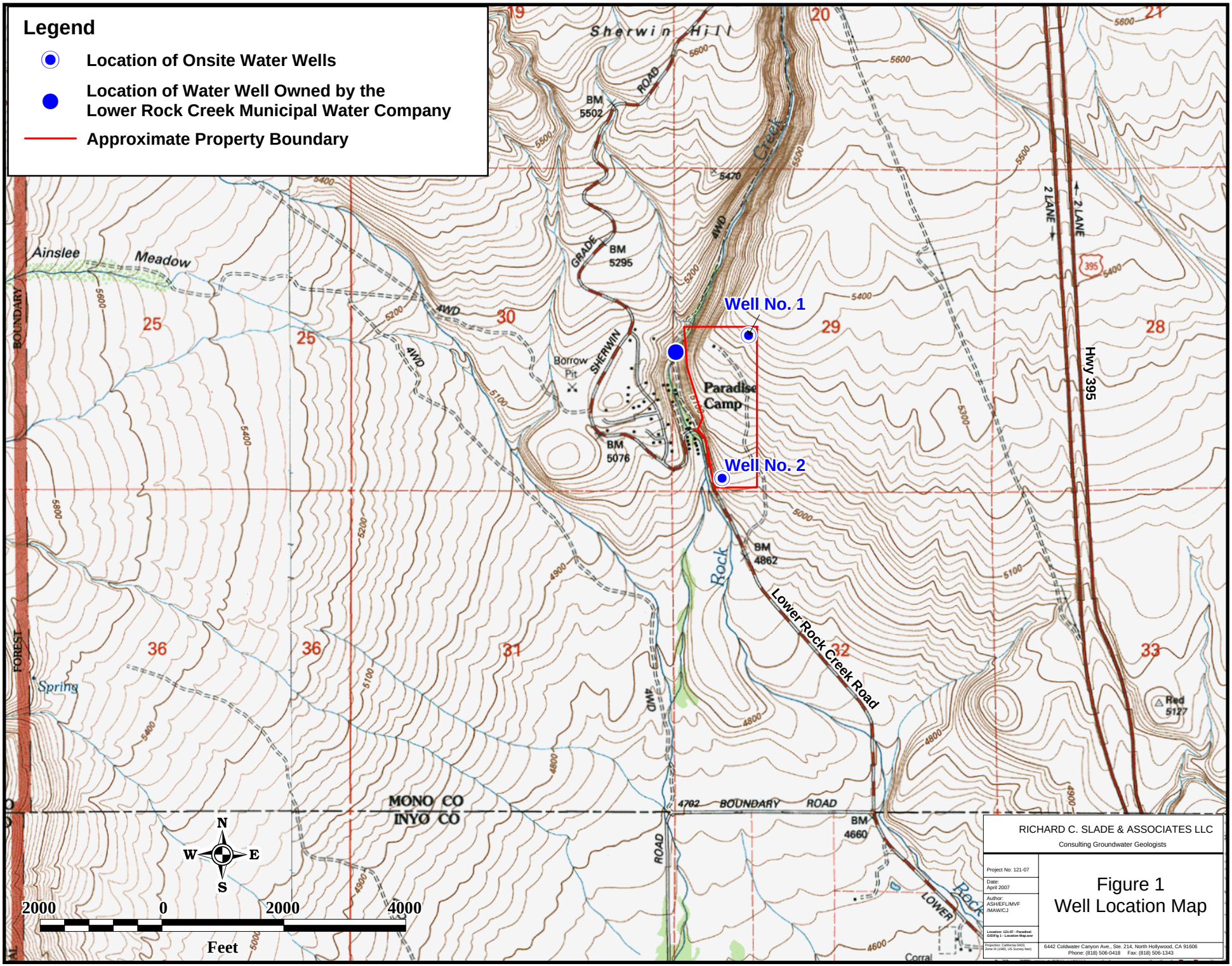
DISCLAIMER

This report has been written for Mr. Matthew Lehman for the Sierra Paradise Subdivision and solely with specific reference to the construction and testing of the new water-supply Well No. 2 for the proposed Sierra Paradise subdivision. The report has been prepared in accordance with the care and skill generally exercised by reputable professionals, under similar circumstances, in this or similar localities. No other warranty, either express or implied, is made as to the professional advice presented herein.

APPENDIX

Tables
Figures
Mono County Well Permit
State Well Completion Report
Geologic Log
Downhole Geophysical Logs
Caliper Log
Deviation Survey Log
Final Well Design Memorandum
Final Wellblend Water Quality Report

Figures



RICHARD C. SLADE & ASSOCIATES LLC
Consulting Groundwater Geologists

Project No: 121-07
Date: April 2007
Author: ASH/EFL/MVF /MAW/CJ

Figure 1
Well Location Map

6442 Coldwater Canyon Ave., Ste. 214, North Hollywood, CA 91606
Phone: (818) 506-0418 Fax: (818) 506-1343

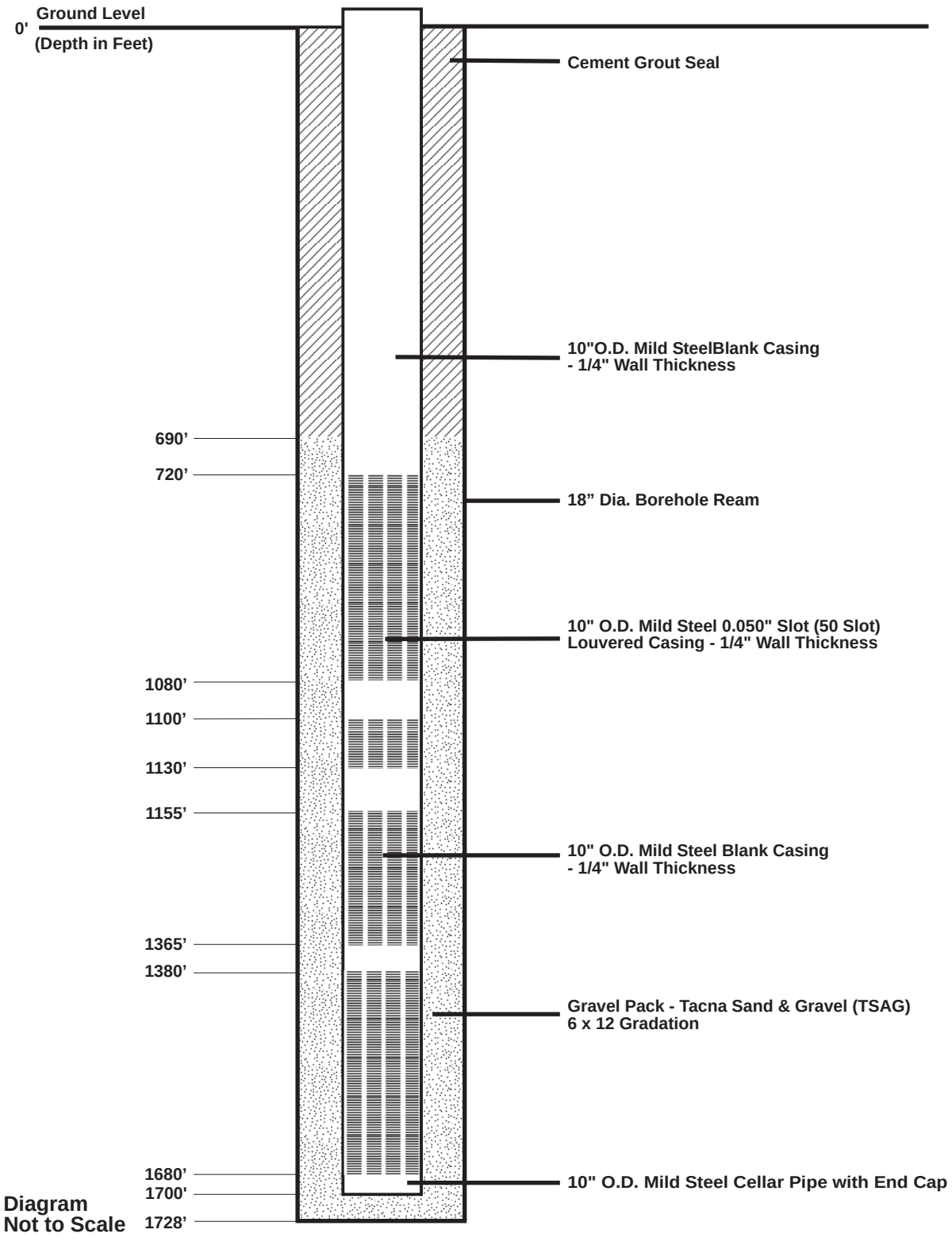


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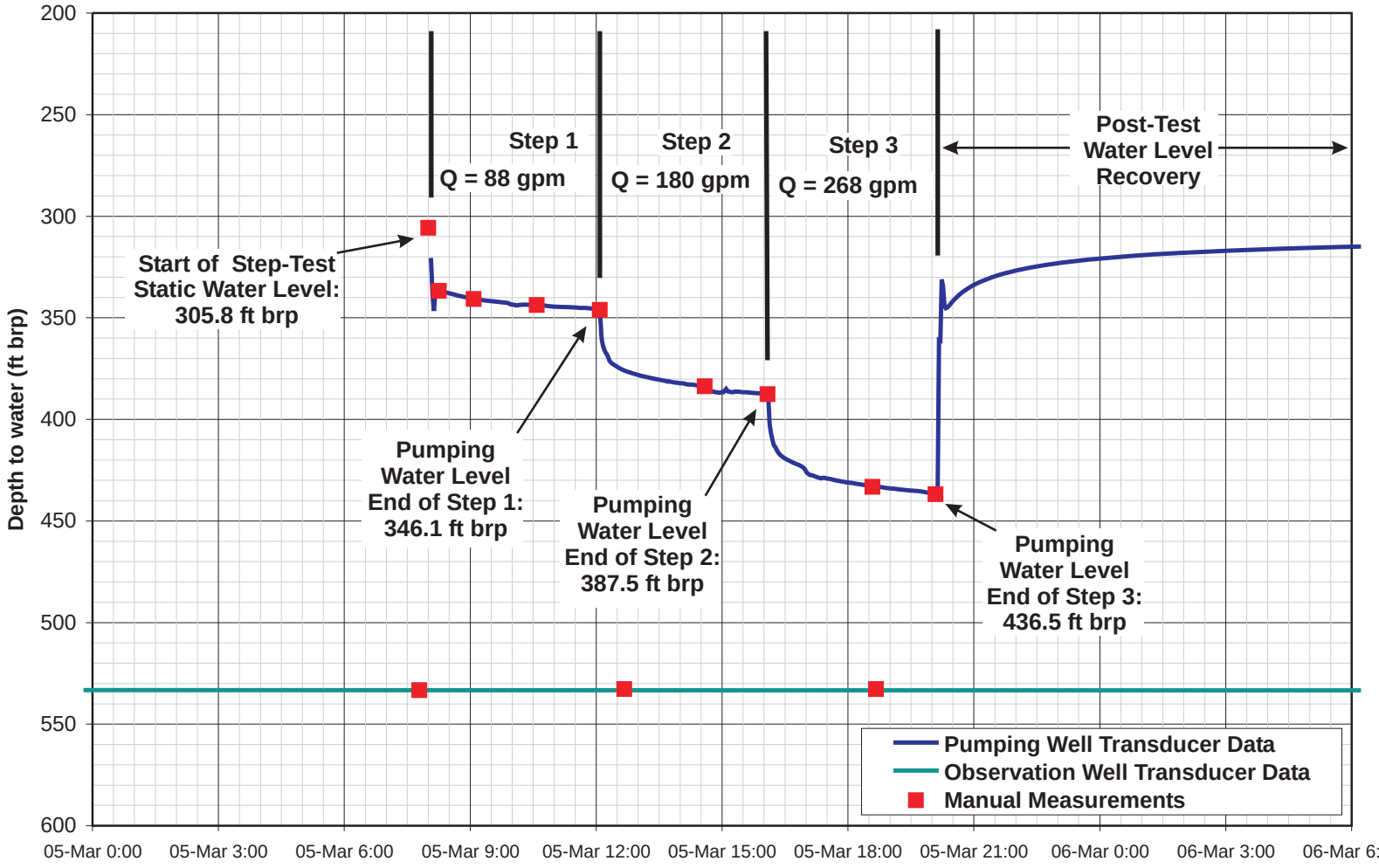
FIGURE 2
AS-BUILT WELL DIAGRAM
WATER-SUPPLY WELL NO. 2
SIERRA PARADISE SUBDIVISION
Job No. 121-07 **May 2007**



NOTE: Major divisions on the X-axis represent 6 hours; minor divisions represent 60 minutes.

See Table 6 for details regarding Step-Drawdown testing.

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FIGURE 3
PLOT OF WATER LEVELS DURING STEP-DRAWDOWN TESTING
SIERRA PARADISE WELL NO. 2

Job No. 121-07 **May 2007**

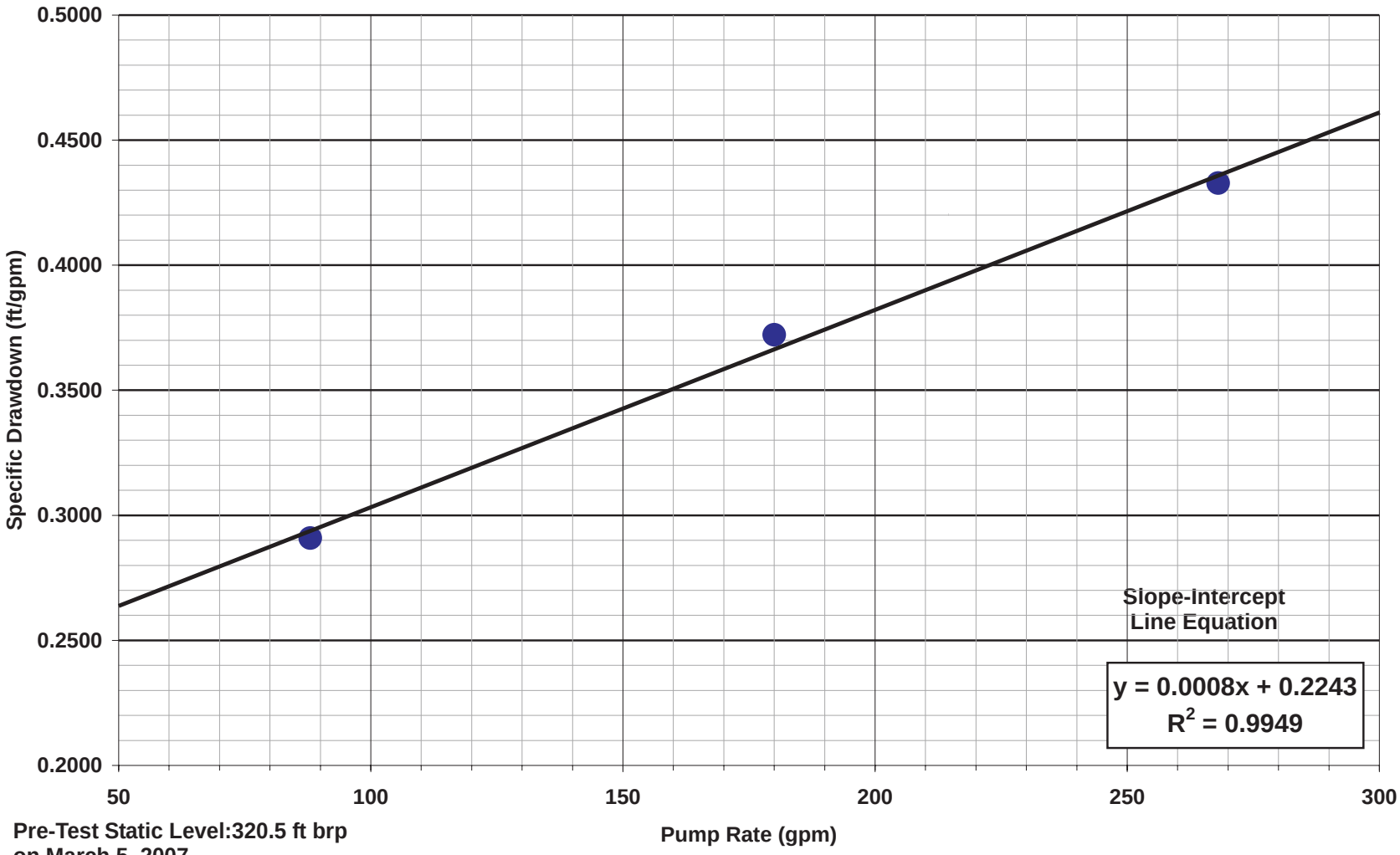

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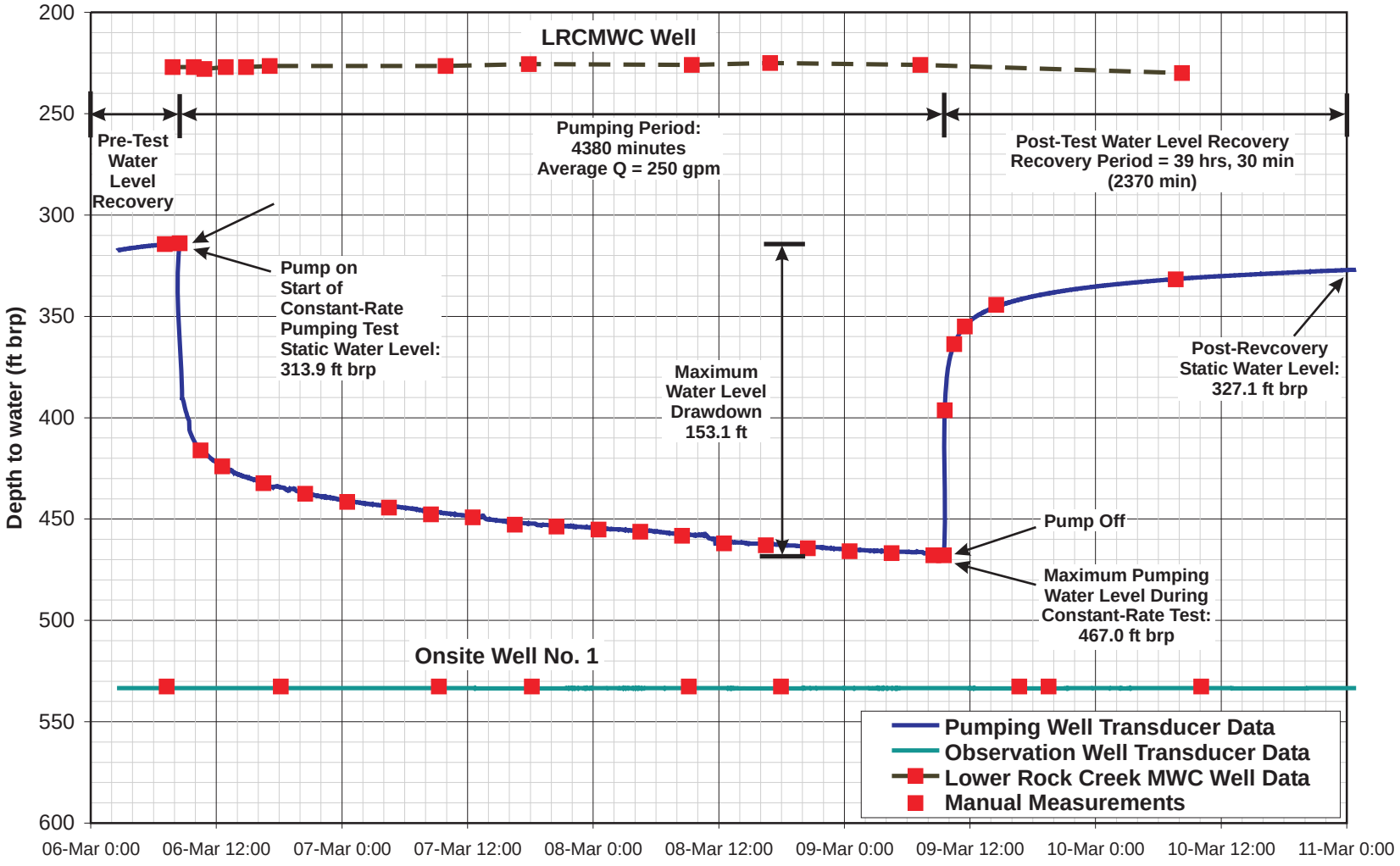
FIGURE 4
BIERSCHENK PLOT OF
STEP-DRAWDOWN TEST DATA
SIERRA PARADISE WELL NO. 2

Job No. 121-07

May 2007



NOTE: Major divisions on the X-axis represent 12 hours; minor divisions represent 2 hours.

Date (2007, 24 hour clock)

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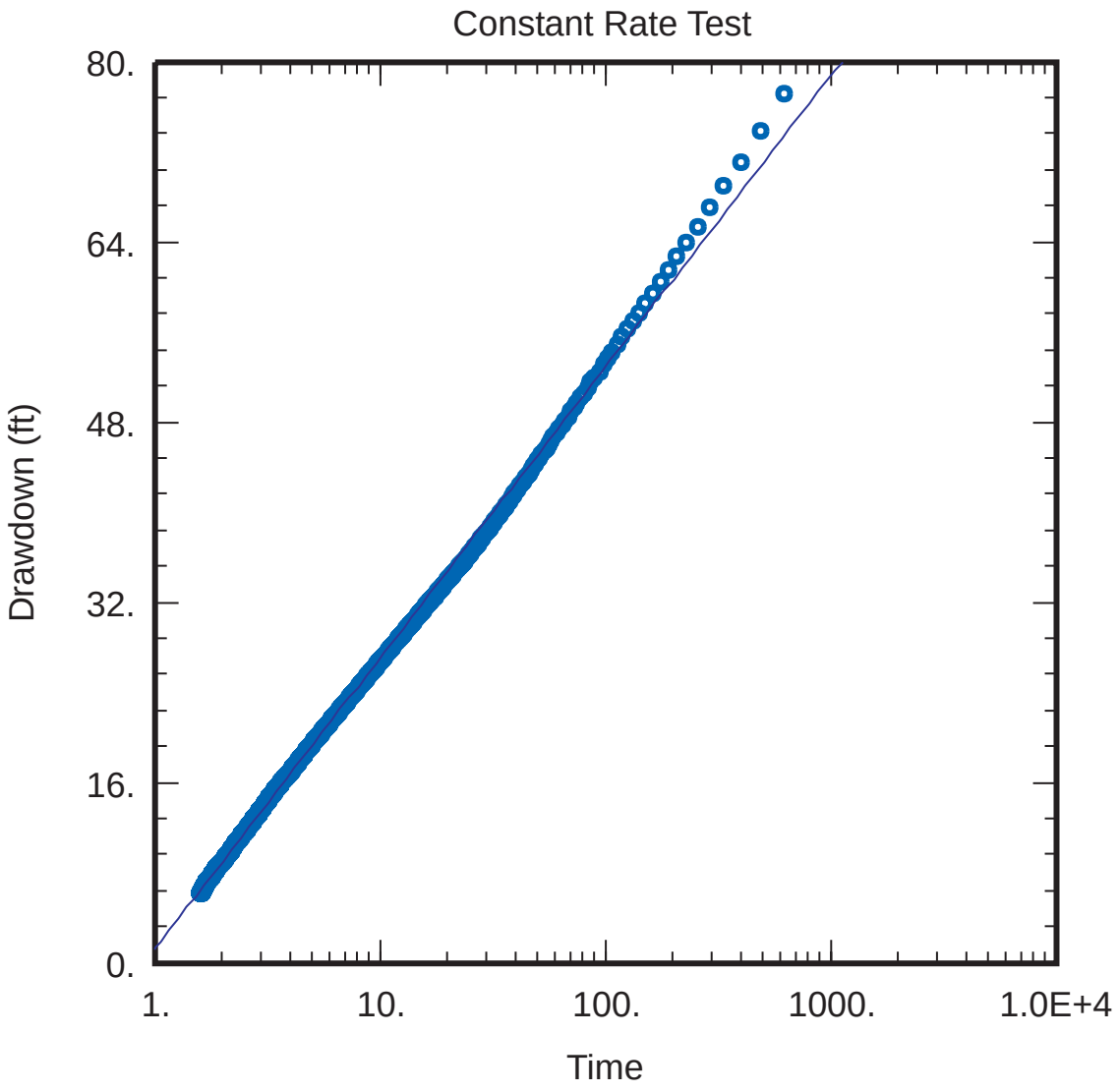
FIGURE 5
PLOT OF WATER LEVELS DURING CONSTANT-RATE PUMPING TEST SIERRA PARADISE WELL NO. 2

Job No. 121-07 **May 2007**



Obs. Wells

Paradise #2

Aquifer Model

Confined

Solution

Theis (Recovery)

Parameters

T = 2650 gal/day/ft

Graphical Solution by:
AQTESOLV Vers. 3.50
by Hydrosolve, Inc.

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FIGURE 6
CONSTANT-RATE PUMPING TEST ANALYSIS
THEIS CONFINED RECOVERY SOLUTION
SIERRA PARADISE WELL NO. 2

Job No. 145-07 **May 2007**

Tables

TABLE 1
DAILY RECORD OF SITE ACTIVITIES
SIERRA PARADISE WELL NO. 2

DATE	SITE ACTIVITY
SET UP ACTIVITIES	
10/12-10/15/2005	Mobilize mud rotary drill rig and equipment to well site.
10/26	Drilling of pilot hole commences.
10/27-10/28	Continue drilling; pilot hole at 200 ft bgs.
10/29-11/3	Mo work on site.
11/4	Drilling resumes, pilot hole at 309 ft bgs. Fracture system encountered, circulation lost and regained.
11/5	Drilling resumes.
11/6	Drilling achieves 480 ft in depth, fracture system encountered; circulation lost.
11/7	Work to regain lost circulation performed.
11/8	Lost circulation regained, resumed drilling to 500 ft bgs.
11/9	Continue drilling. Total depth achieved: 510 ft. Contractor pulls off the job until noise variance can be obtained.
11/10-12/31/2005	No drilling conducted.
YEAR 2006	
1/1-1/15/2006	No drilling conducted.
1/16-1/23	Commence remobilization to site; snow and mud poses an obstacle and new road graded.
1/24	Rig-up onsite. Resume drilling. Actually reaming an 18-inch diameter hole and will re-enter, when finished, with a 9-inch diameter hole. Reason; to allow cuttings to fall into void area of hole during drilling. Borehole reamed to approximately 40 ft bgs
1/25	Borehole reamed to approximately 100 ft bgs.
1/26-1/30	Reaming continues A number of events occurred during this period; 18-inch dia. reaming bit broke at 240 ft, crew switches to 12¼-inch dia, drill bit. Went to 545 ft with this bit. The last 20 to 30 ft of drilling with this bit produced no returns.
1/31	Reaming shuts down at 545 ft bgs.
2/2-2/5	No work.
2/7	Drill rig moved offsite; Cascade moves in a different mud-rotary drill rig.
2/8-2/12	No work on well.
2/13	Resume drilling operations. No cuttings returns on 2/15
2/16	Continue drilling with no cuttings returns.
2/17	At 760 ft bgs, hit alluvium at 620 ft, according to M. Lehman. No cuttings returns to verify.
2/18-2/20	No work onsite.
2/21-2/23	Continue drilling (at 1040 ft bgs on 2/23); no cuttings returns.
2/24	Drilling stops at 1140 ft bgs.
2/25-2/26	No work on site.
2/27-3/1	Drilling continues, unable to get past 1140 ft bgs.
3/2-3/5	No work on site.
3/6	Drilled to 1200 ft bgs; tools lost downhole.
3/7-3/10	Fishing for lost tool downhole.
3/11-3/12	No work.
3/13-3/16	Resume drilling, down to 1420 ft on 3/15 and 1480 ft on 3/16, driller runs out of drill pipe.
3/17-3/19	No work on site.
3/20	Resume drilling, now at 1500 ft.
3/21	Drilling completed at 1700 ft bgs.
3/22-3/23	No work on site.
3/24	Conduct electric logging. Logging cannot get past 1460 ft bgs (dead stop).
3/25-3/26	No work on site.
3/27	Attempt to ream out hole; bit halted at 220 ft by blockage.
3/28-3/29	Ream to 250 ft bgs and place cement plug to seal fractures/voids.
3/30	Measured water level at 250 ft, place additional cement downhole and let sit.
3/31	Cement tagged at 226 ft bgs. Pumped mud down hole up to 74 ft and dropping one-foot per minute. Fill up hole with cement.

DATE	SITE ACTIVITY
4/1-4/2	No work on site.
4/3	Commence reaming of hole to 18-inches in diameter.
4/4-4/6	Continue reaming. Circulation lost at 325 ft and drilled to 340 ft bgs.
4/6-4/7	Cement up hole.
4/8-4/9	No work on site.
4/10	Cement hole with 6 yds of cement
4/11	Cement hole with 6 yds of cement
4/12	Continue reaming, at 320 ft bgs.
4/13-4/14	Continue reaming. Reamed to 390 ft on 4/13. Driller measures drill pipe and discovers that he had actually drilled to 422 ft bgs. 30 ft drill pipes are actually 32.5 ft!
4/15-4/17	No work on site.
4/18	Reaming continues, depth of ream at 435 ft bgs. Hydraulic line ruptures and pump breaks down, reaming very slowly until mechanic arrives.
4/19	Reaming stops, pump goes down.
4/20-4/24	Rig repairs performed.
25-Apr	Site meeting with all; drill rig still down.
26-Apr	New pump installed, start drilling, bit twists off.
27-Apr	Order magnet to remove bit
4/28-4/30	No work performed on pilot hole.
5/1	Crew lowers 1000-lb magnet in and promptly loses it downhole (by cutting cable).
5/2	Send out overshot bit in attempt to remove magnet and bits.
5/3	Magnet retrieved, fishing for other tools.
5/4-5/5	Continue fishing.
5/6-5/9	No work on site.
5/10-5/11	Performing fishing operations.
5/12-5/16	No work.
5/17-5/19	Hole cleaned out to 12-inch bore. Still fishing for tools. Begin pump installation in Well No. 1.
5/19-6/18	Generally, little work on well; drillers occasionally perform retrieval operations, using downhole video camera. On 6/2 Cascade attempted to grind out obstruction with a mill bit.
6/19-6/23	"Fishing" for drill bit (Bruce Niermeyer, owner of Cascade, on site).
6/24	Bit removed from hole.
6/25	No work on site.
6/26	More debris removed from hole.
6/27-6/28	Borehole reamed to 480 ft bgs.
6/29-6/30	Continue ream to 520 ft bgs and cement voids with 5 yards of cement.
7/1-7/9	No work at site.
7/10-7/15	Reaming continues to 571 ft bgs. Fractures cemented.
7/16-7/18	Reaming continues to 671 ft bgs. Fractures cemented.
7/19-7/24	No work.
7/24-8/2	Reaming continues, depth of ream at 1062 ft on 7/31 and 1300 ft on 8/2
8/3-8/6	No work on site.
8/7	Resume reaming at 1300 ft.
8/8-8/12	Continue reaming to 1398 ft bgs; repairs to rig on 8/10.
8/13	No work on site.
8/14	Resume reaming to 1470 ft bgs.
8/15	Ream at 1550 ft
8/16-8/17	Reaming continues. On 8/17 reaming ends at 1728 ft bgs (Driller thought it was 1760 ft bgs; drilling unable to advance any further at this depth.
8/18	Perform electric log, caliper survey and deviation survey..
8/19-9/19	No work at site.
9/21	Run Wiper Pass
9/22	Discontinue the wiper pass
9/23	Continue wiper pass
9/24	Complete wiper pass, install 2-inch dia. tremie pipe to 1340 ft bgs and commence casing installation.
9/25	Continue casing installation.

DATE	SITE ACTIVITY
9/26	Complete casing installation and flush casing with water to help thin heavy mud in borehole/casing.
9/27	Commence gravel packing the well. Tremie cannot be pulled, 1300 ft left in annulus. 1500 ft of stainless steel sounding cable lost downhole. Install 500 ft of additional tremie pipe to continue gravel packing.
9/28	Gravel packing resumes.
9/29	Continue gravel packing.
9/30	Discontinue gravel packing. Start swabbing operations to seat gravel pack.
10/1	Setup for mechanical development.
10/2	Finish setup for mechanical development. Commence development and add a polymer dispersant.
10/3-10/8	No work on site.
10/10	Resume mechanical development. Airlifting about 10 gpm.
10/11-10/18	Continue mechanical development.
10/19-10/22	No work on site.
10/23	Resume mechanical development.
10/24-10/27	Wash gravel out of well annulus from 500 ft to 690 ft bgs.
10/28-11/6	No record of activities
11/7	Tripping out tremie pipe following wash out of annulus.
11/8-11/10	No work on site.
11/11	Install temporary test pump.
11/12-11/20	Perform pumping development of well.
11/21-11/26	No work
11/27	Back onsite.
11/28-12/8	Continue pumping development.
12/9-12/13	No work on site.
12/14-12/22	Remove 690 ft of the 1300-ft of stuck tremie pipe from well annulus.
12/23-12/26	No work onsite.
12/27	Add gravel to annulus.
12/28-12/31	No Work onsite, Holiday.
YEAR 2007	
1/1-1/16	No Work onsite.
1/17-1/23	Conduct final gravel packing, and commence installation of final annular cement seal.
1/24-1/26	No Work onsite.
1/27	Final annular cement seal set. Well construction completed. Commence pumping development of well.
1/28-2/4	No work onsite.
2/5-2/7	Rig down and demobilize from site.
2/8-2/9	Install new test pump in well.
2/10-2/11	No work onsite.
2/12-3/1	Resume and continue pumping development.
3/2-3/3	Install sounding tube and pressure transducers in Well Nos. 1 and 2.
3/4	No work.
3/5	Commence step-drawdown test at 90, 180, and 270 gpm.
3/6	Commence constant-rate discharge testing at the nominal rate of 250 gpm.
3/9	Complete constant-rate discharge test (73 hrs). Collected Title 22 final wellblend sample.
3/10-3/13	No work at site.
3/14	Remove pump from Well No. 2 and pressure transducers from Well Nos. 1 and 2.

TABLE 2
STEP-DRAWDOWN TEST DATA
SIERRA PARADISE WELL NO. 2

STEP RATE NO.	AVERAGE PUMPING RATE[1] (Q, in gpm)	PUMPING WATER LEVEL (ft brp)	WATER LEVEL DRAWDOWN (s, in ft)[2]	SPECIFIC CAPACITY (Q/s, in gpm/ft of drawdown)	EFFICIENCY[3] (%)
1	88	346.1	25.6	3.4	77.1
2	180	387.5	67.0	2.7	60.3
3	268	436.5	116.0	2.3	51.8

Test Date = March 5, 2007
Duration of each step rate =4 hours

NOTES: **(1)** Pumping rates are the average rates determined by the pumper from totalizer flow dial readings.

(2) Based on a static water level of 320.5 ft below reference point (brp), 3.3 ft above ground surface.

(3) Well efficiency calculated using the Biershenk (1964) method of analysis (see text).

TABLE 3 FINAL EVALUATION OF PUMP RATE AND PUMP INTAKE DEPTH SETTING SIERRA PARADISE WELL NO. 2		
A.	**Current Static Water Level Depth (ft brp)[(1)]**	313.9
B.	**Estimated Specific Capacity (gpm/ft ddn)[(1)]**	1.6
C.	**Proposed Design Pumping Rate (gpm).**	250
D.	**Projected Drawdown (in ft brp) at Design Rate of 250 gpm (C/B).**	156.3
E.	**Projected Pumping Water Level Depth (ft brp) at the Design Rate (A+D).**	470.2
F.	**Estimated Future Static Water Level Decline (in ft brp) Due to Potential Long-Term Drought Conditions.[(2)]**	100
G.	**Additional Water Level Decline (in ft bgs) Due to an Estimated 15% Decline in Specific Capacity of Well (to 1.36 gpm/ft ddn).**	28
I.	**Pumping Water Level Depth Following Long-Term Drought,Decline in Specific Capacity, and Pumping Drawdown Interference (ft brp)(E+F+G)**	598
J.	**Estimated Minimum Depth for Pump Intake (ft brp)**	700

NOTES:

brp = below reference point, which is 3.3 ft above ground surface
gpm = gallons per minute
gpm/ft ddn = gpm per foot of drawdown (specific capacity unit)

(1) Estimated values based on results of constant-rate discharge testing on March 6, 2007.
(2) This value based on our experience with similar geological conditions.

Mono County Well Permit

WELL PERMIT APPLICATION

MONO COUNTY HEALTH DEPARTMENT
P.O. Box 476, Bridgeport, Ca 93517 (760) 932-7485, (760) 932-5284 (fax)
P.O. Box 3329, Mammoth Lakes, Ca 93546 (760) 924-5454, (760) 924-5458 (fax)

~~$400.00~~

PLEASE COMPLETE APPLICATION TO THICK BLACK LINE AND RETURN TO THIS OFFICE WITH PERMIT FEE OF $~~360.00~~
FOR A RESIDENTIAL WELL AND $~~400.00~~ 240.00 FOR A PUBLIC WELL. 360 00

THREE COPIES OF THIS APPLICATION FORM, WITH THREE COPIES OF THE SITE PLAN OF THE SEWAGE DISPOSAL SYSTEM SHALL BE SUBMITTED

PROPERTY INFORMATION:

Property Owner Matthew Lehman, Randall & Annette Caplinger Telephone 760-934-8831
Mailing Address P.O. Box 8898 City, State, Zip Mammoth Lakes CA 93546
Assessor's Parcel Number 263302 Property Location Paradise, Southern Mono County

Well Driller Information:

Well Driller Cascade Drilling Inc. Cont. License Number C57-712510
Company Cascade Drilling Inc Telephone Number 916-638-1169
Business Address 3632 Omec Circle City, State, Zip Rancho Cordova CA 95742

WELL INFORMATION:

TYPE OF WORK: New Well X Repair or Modification ____ Destruction ____ PROPOSED DEPTH 1300 feet
USE: Domestic X Irrigation ____ Industrial ____ Test Well ____ Municipal ____ Other ____
EQUIPMENT: Rotary X Cable Tool ____ Other ____
PROPOSED CASING: Steel X PVC ____ Diameter 10" Wall or Gage 5/16

PROPOSED SEALING ZONES:	SEALING MATERIAL:	PROPOSED PERFORATIONS OR SCREEN:
From 0 To 200 Feet	Neat Cement ____	From 500 To 1300 Feet
From ____ To ____ Feet	Cement Grout X	From ____ To ____ Feet
From ____ To ____ Feet	Bentonite Clay ____	From ____ To ____ Feet
	Concrete X	From ____ To ____ Feet

METHOD OF SEALING: Pressure sealed by pumping: Yes X No ____

DATE OF WORK: Start 9-12-05 Completion ____

I hereby agree to comply with all regulations of the Mono County Health Department and with all ordinances and laws of the County of Mono and State of California pertaining to well construction, repair, modification, and destruction. Immediately upon completion of work I will furnish the Mono County Health Department with a complete and accurate log of the well.

APPLICANT'S SIGNATURE: [signature] **DATE** 8-25-05

Check # 005059

WELL PERMIT NO. 26-05-76
(Valid for Twelve (12) Months from Date of Issue)

VERIFICATION OF CONTRACTOR'S LICENSE ____ $ 360.00 FEE PAID ON 8/25/05 REC # ____

This certifies that permission is hereby granted to Cascade Drilling Inc

TO INSTALL THE ABOVE WELL in accordance with the above application.

By: Marlon N. Ackler Environmental Health Specialist 10/6/05 Date

CERTIFICATE OF COMPLETION: ____ Environmental Health Specialist ____ Date

(WHEN SIGNED BY THE HEALTH OFFICER, THIS APPLICATION IS A PERMIT)

State Well Completion Report

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e054297

Page _____ of _____

Owner's Well Number #2

Date Work Began 12/2005 Date Work Ended 2/2007

Local Permit Agency Mono County

Permit Number 25-05-76 Permit Date 10/6/05

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify _____

Drilling Method _____ Drilling Fluid _____

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	690	Bishop tuff
690	810	Fine to med sand
810	1,500	Fine to coarse sand
1500	1,760	Fine to coarse sand sticky yellowish clay
		Main water according to E-Los
		1380-1580

Total Depth of Boring 1760 Feet

Total Depth of Completed Well 1700 Feet

Well Owner

Name C&L Development

Mailing Address P.O. Box 8898

City Mammoth Lakes State CA Zip 93546

Well Location

Address Southern Mono County

City Paradise-Lower Rock Creek Dr County Mono

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

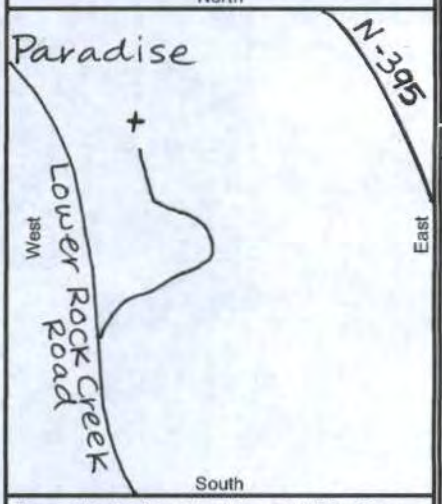
Datum _____ Decimal Lat. _____ Decimal Long. _____

APN Book _____ Page _____ Parcel 2633002

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

◉ New Well
○ Modification/Repair
○ Deepen
○ Other _____
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

◉ Water Supply
☑ Domestic ☑ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water 304 (Feet below surface)

Depth to Static Water Level 268 (Feet) Date Measured 03/08/2007

Estimated Yield * 280 (GPM) Test Type PUMPING

Test Length 75.0 (Hours) Total Drawdown 200 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)
0	720	18	Blank	STEEL	5/16	10		
720	1,684	18	Screen	STEEL	5/16	10		0.050
1,684	1,694	18	Blank	STEEL	5/16	10		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	685	Cement	slurry
685	690	Bentonite	Chips
690	1,760	Fill	Sand #6-12

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other _____

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Cascade Drilling, Inc
Person, Firm or Corporation

3632 Omec Circle Rancho Cordova CA 95742
Address City State Zip

Signed _____ 5/1/2007 717510
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Geologic Log

GEOLOGIC LOG
SIERRA PARADISE WELL NO. 2

Drilling Company:	**Cascade Drilling Company, Rancho Cordova, California**
Drilling Supervisor:	**Ken Thatcher, Cascade Drilling Company**
Onsite Logging Geologist:	**Roger Smith, Richard C. Slade & Associates**
Total Depth of Drilling:	**1765 ft below ground surface**
Approximate Elevation	**5000 ft above mean sea level**

DEPTH (ft bgs)		Unit	Description
From	To		
0	690		No recovery of drill cuttings. Presumed to be the Bishop Tuff.
690	700	Sand	Light gray, fine to medium sand, mostly quartz, with 10 to 20%, Bishop Tuff fragments, & white feldspar washed out.
700	720	Sand	Mottled, mostly backfilled coarse sand from Hyatt Birdseye & Metal Shavings with Bishop Tuff.
720	740	Sand	Birdseye with 10% fine to medium sand.
740	810	Sand	Birdseye with 10% fine to medium sand, with trace amount of Bishop Tuff and Feldspar increases.
810	860	Sand	Mottled, light gray, fine to coarse sand, quartz, feldspar, Bishop Tuff, with trace amount of Birdeye.
860	1030	Sand	Light yellowish gray, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff and Birdeye, metal shavings, plaster
1030	1046		No recovery of drill cuttings.
1046	1057	Sand	Light yellowish gray, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster
1057	1280	Sand	Light yellowish gray, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster
1280	1290	Sand	Yellowish gray, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster, with clay bed, clay is very plastic and sticky, yellow gray in color
1290	1300	Sand	Light yellowish gray, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster, with clay bed, clay is very plastic and sticky, yellow gray in color
1300	1320	Sand	Light yellowish gray, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster, with clay bed, clay is very plastic and sticky, yellow gray in color with wood chips.
1320	1350	Sand	Light grayish yellow, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster, with wood chips.
1350	1360	Sand	Light grayish yellow, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster, with wood chips and clay.
1360	1370	Sand	Light grayish yellow, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster, with wood chips.
1370	1410	Sand	Light grayish yellow, very fine to coarse sand, mostly clear quartz, and feldspar with trace amount of Bishop Tuff, metal shavings, plaster, with wood chips and clay.
1410	1420	Sand	Light grayish yellow and pale red, very fine to coarse sand, mostly clear quartz, and feldspar with 50% Bishop Tuff chips .
1420	1430	Sand	Light grayish yellow and pale red, very fine to coarse sand, mostly clear quartz, and feldspar with 10% Bishop Tuff chips .
1430	1440	Sand	Light grayish yellow and pale red, very fine to coarse sand, mostly clear quartz, and feldspar with 30% Bishop Tuff chips .
1440	1450	Sand	Light grayish yellow and pale red, very fine to coarse sand, mostly clear quartz, and feldspar with 20% Bishop Tuff chips .
1450	1500	Sand	Mixed light greenish gray, pale red and grayish yellow fine to coarse sand, Bishop Tuff chips, Birdseye, quartz, feldspar.
1500	1530	Sand	Mixed light greenish gray, pale red and grayish yellow fine to coarse sand, Bishop Tuff chips, Birdseye, quartz, feldspar, with sticky yellowish gray clay.
1530	1630	Sand	Mixed light greenish gray, pale red and grayish yellow fine to coarse sand, Bishop Tuff chips, Birdseye, quartz, feldspar.
1630	1640	Sand	Mixed light greenish gray, pale red and grayish yellow fine to coarse sand, Bishop Tuff chips, Birdseye, quartz, feldspar, with sticky yellowish gray clay.
1640	1728	Sand	Mixed light greenish gray, pale red and grayish yellow fine to coarse sand, Bishop Tuff chips, Birdseye, quartz, feldspar.

Downhole Geophysical Logs

Caliper Log

Deviation Survey Log

Final Well Design Memorandum

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

MEMORANDUM

August 25, 2006

To: Mr. Mathew Lehman, via email
Sierra Paradise Subdivision
Paradise Camp, Mono County, CA
and
Mr. Ken Thatcher, Mr. Bruce Niermeyer
Cascade Drilling Company
Rancho Cordova, CA

For: Earl LaPensee and Richard C. Slade
Richard C. Slade & Associates LLC
North Hollywood, CA

Re: Final Recommended Casing Design — Job No. 121-07A
New Domestic-Supply Water Well No. 2
Sierra Paradise Subdivision, Mono County, California

This Memorandum provides a summary of drilling operations at the well site and the final recommended casing design for new Well No. 2 at the subject property. This new well is located in the southwestern corner of the development site, northeast of Lower Rock Creek Road and about 3200 ft west of Highway 395, in Mono County, California. Figure 1, "Well Site Location Map," illustrates the location of this new well. Cascade Drilling Inc (Cascade), of Rancho Cordova, California conducted the well drilling operations for the pilot hole and the borehole ream. Implementation of this Final Design by the Contractor is wholly contingent upon various remedial actions currently being contemplated and/or conducted by the Contractor, including his attempt(s) to remediate the non-alignment of and "dog-legs" in the pilot borehole. It is understood that the owner is desirable of obtaining a production rate of at least 160 gallons per minute (gpm) from this new well, if available from the aquifer systems encountered at the drill site.

The pilot hole for Well No. 2 was drilled in an attempt to develop additional groundwater needed to supplement that available from Well No. 1 (which was constructed in May 2005 by the Layne Christensen Company); aquifers perforated at Well No. 1 yielded a pumping rate of 30 to 40 gpm, much lower than the desired 160 gpm. Consequently, the objective of the current well design recommended herein is to help achieve the desired production rate, if permitted by the local aquifers.

Background Information

Based on the information reported by an onsite geologist (Roger Smith) and by Cascade personnel, Table 1, ""Daily Record of Site Activities" provides a listing of activities performed at the well site. The activities conducted at the site generally consisted of the following:

a) Drilling of the pilot hole commenced in rocks of the Bishop Tuff on October 26, 2005. Drilling was initially performed using the mud rotary drilling method, using a 9-inch diameter drill bit, on a 24-hour per day basis. Drilling had progressed to a depth of 480 ft bgs by November 6, whereupon fluid circulation was initially lost.

b) Circulation was regained and by November 9, drilling had progressed to a depth of 510 ft. However, the drillers were stopped from drilling on a 24-hour per day basis and Sierra Paradise sought to obtain a noise variance to resume drilling on a 24-hour per day basis. It was mutually agreed upon by a Sierra Paradise representative and Cascade personnel that the drillers could remove their drilling equipment until a later date. Cascade returned to the site on January 16, 2006 but due to snow and mud, was not able to access the site and, thus did not setup the drill rig until January 24.

c) Drilling resumed on January 24, 2006, with an 18-inch diameter drill bit. Drilling was limited to only daylight hours due to noise concerns. At a depth of 240 ft the drill bit broke apart (and was subsequently left downhole). Following this, Cascade switched to a 12¼-inch drill bit and by January 31 had achieved a depth of 545 ft bgs. At this depth, drilling was still being conducted within the Bishop Tuff.

d) No drilling was performed until February 7, 2006, at which time Cascade mobilized another mud rotary drill rig to the well site. Drilling resumed on February 8.

e) Drilling continued until March 6, 2006 to a depth of 1200 ft bgs at which time some tools were lost downhole. These tools were retrieved by March 10.

f) Drilling resumed on March 13, 2006 and by March 21 had achieved a depth of 1710 ft bgs. Electric logging of the borehole was performed on March 23. However, the logging probe could not descend past 1450 ft due to a blockage from unknown causes. Because the log could not past this depth, Cascade drilling was directed to ream out the borehole to the total depth and re-run the electric log.

g) On March 27, 2006 reaming commenced and advanced to a depth of 240 ft bgs. However, drilling was halted due to a blockage by an unknown cause; the blockage was not removed.

h) Between March 29 and April 10, 2006, Cascade installed cement at various depth intervals to help combat lost circulation, due to voids and/or fractures in the Bishop Tuff.

i) Reaming continued to a depth of approximately 435 ft bgs on April 18, at which time the mud pump on the drill rig broke down. On April 25, 2006, representatives of Cascade, Sierra Paradise, and RCS met to discuss the delays in drilling operations at the site and to allow Cascade to develop a work method and final schedule to permit completion of the project.

j) On the following day, April 26, 2006, a new mud pump was installed and drilling commenced again. However, the drill bit twisted off downhole. Retrieval operations begin.

k) Between May 1 and June 27, Cascade conducted "fishing" operations to remove the drill bit and debris from the hole. By June 29, the pilot hole was cleaned out to 480 ft bgs.

l) Reaming of the borehole was performed from June 29 to August 17, 2006, to a total depth of 1760 ft bgs, At this depth, drilling could not advance any further due to another obstruction. Thus, reaming operations ceased and an electric log, caliper log and deviation surveys were performed the next day on August 18, 2006.

General Lithologic Conditions

It should be noted that because of the problems during drilling of the initial pilot hole, there were virtually no drill cutting returns to the ground surface, thereby precluding accurate logging by the geologist. It was also not possible to conduct grain size distribution tests of key aquifer materials due to this lack of drill cuttings returns. Further, only a limited number of drill cuttings were retrieved during reaming operations, and these were of rather dubious quality because of a significant degree of mixing with drilling debris from the upper portions of the borehole.

However, notwithstanding the lack of suitable drill cuttings for direct evaluation by the geologist, and based on general indirect observations of the geologist during drilling and on our review of the electric log, it appears that rocks of the Bishop Tuff extend to a depth of approximately 700 to 710 ft bgs. These rocks are highly fractured and jointed and may contain numerous voids). Below this depth, a thick sequence (approximately 1000 ft) of fine to medium grained sand, interbedded occasionally with clay layers, were encountered. These sediments appear to represent older alluvial deposits beneath the relatively younger Bishop Tuff. However, it is possible that some of the upper portions of the alluvial material (directly below the Bishop Tuff) could also contain ash that may have been emplaced before the deposition of the main Bishop Tuff.

Downhole Surveys

Downhole Geophysical Surveys

Downhole geophysical surveys (electric logs) were initially performed in the pilot hole on August 18, 2006 by Pacific Surveys of Claremont, California. These downhole surveys consisted of a 16-inch short-normal and a 64-inch long normal resistivity surveys, a laterolog 3 resistivity survey, a self potential (SP) survey, and a natural gamma-ray survey. These surveys were performed to a depth of 1728 ft bgs. The suite of survey logs revealed that the Bishop Tuff appears to extend to a depth of approximately 700 to 710 ft; resistivities for the 64-inch, long-normal resistivity log to this depth range from 500 ohm-meters (at 100 ft bgs), to approximately 1400 ohm-meters in the depth range of 510 ft to 530 ft bgs,. Volcanic rocks, such as tuff, typically have resistivities in this range. Below approximately 710 ft bgs, the resistivities on the 64-inch long-normal log show a marked change (decrease), and range from 30 to 200 ohm-meters. Such values are more typical of alluvial-type sediments.

Caliper Survey

Following the electric log, a caliper survey of the borehole was performed. The log from this survey revealed that the borehole to a depth of approximately 430 ft ranged in diameter from 18 to 19 inches. Below this depth the caliper log shows a slight decrease in hole diameter to slightly less than 16 to 18-inches, notwithstanding a few washouts which extended out to 20 inches in diameter. However, at a depth of approximately 1380 ft bgs, the caliper survey log reveals a significant change in diameter to slightly less than 17 inches. From 1380 ft, to a depth of approximately 1700 ft bgs, the borehole shows a gradual change in the diameter to 15 inches. Based on this caliper survey log, the onsite geologist examined the drill bit and observed that it was still on the order of 17 to 18 inches. However, it also appeared to be well worn on one side.

Deviation Survey

Following the caliper survey, a gyroscopic deviation survey was performed. This deviation survey checks the plumbness and alignment of the borehole. The deviation survey revealed that the borehole was plumb to a depth of approximately 300 ft bgs. However, at this depth the borehole begins to deviate and forms a bend (aka, a "dogleg"). Other "doglegs" are also seen at 400 ft and 500 ft. However, a very significant "dogleg" is observed at a depth of 1300 to 1400 ft bgs, with another less significant dogleg at 1600 ft bgs. Due to these 'doglegs," the total deviation at the bottom of the hole is 95 ft to the southwest. The total angle of deviation, from 300 ft to 1725 ft bgs, was calculated to be approximately 4 degrees.

Discussion of Results

A conference call was conducted between Mathew Lehman, the developer of Sierra Paradise, Cascade Drilling representatives and RCS for the purpose of discussing the results of the downhole surveys, the concerns of RCS based on the newly-available surveys, the history of drilling of this borehole, and possible courses of action by the Contractor for the borehole and well. During this call RCS expressed a few concerns, including:

1. Can Cascade successfully install and properly center the entire casing to the bottom of the reamed borehole?
2. Will Cascade be able to place the gravel pack and cement seal in the well annulus using a temporary tremie pipe?
3. Can a temporary pump (and the permanent pump in the future) be successfully installed and centered inside the casing, which will then perform properly over time.

With regard to these concerns, the following issues were discussed:

- Bruce Niermeyer (owner of Cascade) agreed that there were "doglegs" and thought the dogleg of greatest impact was the one at 1350 ft bgs. Further, the total angle of deviation was mentioned by Cascade to be on the order of 4 to 6 degrees and it was not seen to be a problem by Cascade personnel.
- Based on discussions between Mr. Niermeyer, Roscoe Moss Company personnel and other sources, Cascade proposed to use a "double hole opener" in an attempt to

increase the radius of the "doglegs" and, thereby, help straighten the borehole out. The "bits" on this double hole opener are to be placed 20 ft to 30 ft apart. Following this, a confirmatory deviation survey will be performed.

- There was some mention of using mill-slotted well casing. However, in accordance with the technical guidelines, mill slotted casing was designed to be used in the well, but as a result of the hole deviations, RCS suggested that the casing joints now be butt welded instead of using well casing with collars at each joint. Hence, no casing collars should be used. This should help facilitate the installation of the casing after the "dogleg" problems have been successfully mitigated by the Contractor.
- There is some concern about the installation of the gravel pack and cement seal; RCS suggested that this task may be difficult to achieve because the tremie pipe has collars.
- Mechanical development of the well will be critical and Cascade will need to conduct this task as effectively as possible to help clean all of the bentonite and lost-circulation materials that have been in the borehole for an extended period of time.
- Some of the conversation concerned the installation of the test pump. A pump depth of 1500 ft bgs was desired by RCS. However, based on pump curves of available pumps, this may not be a realistic option accordingly to Cascade. A depth of 1000 ft was discussed as an alternate pump depth setting and, based on pump curves for this depth, Mr. Niermeyer thinks that a flow rate of 260 gallons per minute (gpm) can be achieved, if available.

Based on the discussion, it was agreed by all that the Contractor may proceed, but that primary goals of properly getting the casing, gravel pack and test pump and final pump installed were of paramount importance. Accordingly, Cascade has decided to proceed in an attempt to rectify the current borehole conditions at their own risk.

Well Design and Well Development Issues

Even though Cascade had initially suggested the use of a "double hole opener" (as noted above), it is now understood that they now believe such a tool is not needed and that they can install the casing under current borehole conditions. However, we believe that the use of such a tool would be of greater advantage in mitigating the effect of the "doglegs" in the borehole and could facilitate the installation of the well casing and the pump. Regardless of the method Cascade elects to use, the casing needs to be successfully landed and centered to the depth specified in Table 1 of this Memorandum and the gravel pack installed intact with no bridging or voids, as production of sand could jeopardize the operation of a permanent pump in the well.

It should be noted that recent conversations between RCS and Roscoe Moss Company personnel revealed that the use of casing collars may be of beneficial use, in that if the casing cannot be installed and has to be extracted, then the casing collars will help facilitate the re-welding of the casing joints when re-installed. If butt welds are used, then Cascade should be aware that the joints will likely need to be re-machined to a flat surface, prior to re-installation of the casing. The decision for whether or not casing collars are used is at the sole discretion of Cascade.

Further, because of the delays in the drilling process, the residence time for the bentonite mud and lost circulation materials in the borehole could cause an impact in the production of the well, if these muds and materials cannot be effectively removed during the well development process. Thus, it is recommended that a very aggressive program of chemical and mechanical development be performed in order to provide for the successful breakdown and removal of the bentonitic clay particles from the borehole.

The first step of this process should consist of "superchlorinating" the water in the well, to break down the muds, and then applying a polyacrilymide thinner/dispersant, such as NW-220, Aqua-Clear PFD, "SuperThin," or similar)

In addition, many lost circulation problems occurred within the Bishop Tuff, requiring the use of such extreme measures as cementing up the borehole at various depths above 400 ft bgs, in an attempt to plug up the void/fractures which may have been causing the lost circulation. Based on this information, it is possible that the rocks in the Bishop Tuff should not be utilized as a potential (partial) source of groundwater for the new well.

Further, it is understood that the future wastewater treatment plant will be located approximately 1200 ft north of and approximately upgradient from Well No. 2. Because of this, there could be the potential for leachate disposed of at the onsite wastewater pond to migrate through the fractures and voids of the Bishop Tuff, and thereby possibly adversely impacting the water quality of the new well. Moreover, it is understood in conversations with you, that Mono County may only allow a 50% "credit" of the maximum pumping rate in the new well, if it were to contain any perforations within the Bishop Tuff and that if there were no perforations in this tuff unit, then you are allowed "full credit" for the pumping rate. Therefore, for these two compelling reasons, it appears not to be viable to place perforations in the Bishop Tuff and, consequently, the well is designed to derive all of its flow from the older alluvial sediments.

It should be noted that groundwater was encountered while drilling the pilot borehole for onsite Well No. 1, while using air rotary methods within the lower (deeper portions of the Bishop tuff). Hence, there is at least some groundwater available from this volcanic unit; however, the relative amount of production for the tuff alone is not known at Well No. 1. The resulting difficulty is that if no perforations are placed in the lower part of the Bishop Tuff encountered at Well No. 2, then any possible production from this zone will be lost and it could ultimately affect the overall production of the well.

Table 1, outlines our recommended acceptable design for the new well at this site. The design provided accounts for an anticipated deep static water level observed in the initial borehole (possibly 500 ft or greater).

For pumping development and testing purposes, the pump intake is to be set as deep as possible, hopefully to a depth of at least 1000 ft bgs. It should also be noted that it is difficult, at this time, to provide an initial assessment of potential pumping rates; such rates cannot be predicted reliably and can not be fully known until a temporary test pump is placed in the well and final post-development rates are documented.

Attachments: Table 1
Figure 1

Table 1
Recommendations for Final Casing Design
New Domestic-Supply Water Well No. 2
Sierra Paradise Subdivision, Mono County, California

Job No. 121-07A

Conductor Casing:	None
Borehole Below Conductor:	18-inch diameter from ground surface to 1725 ft bgs,

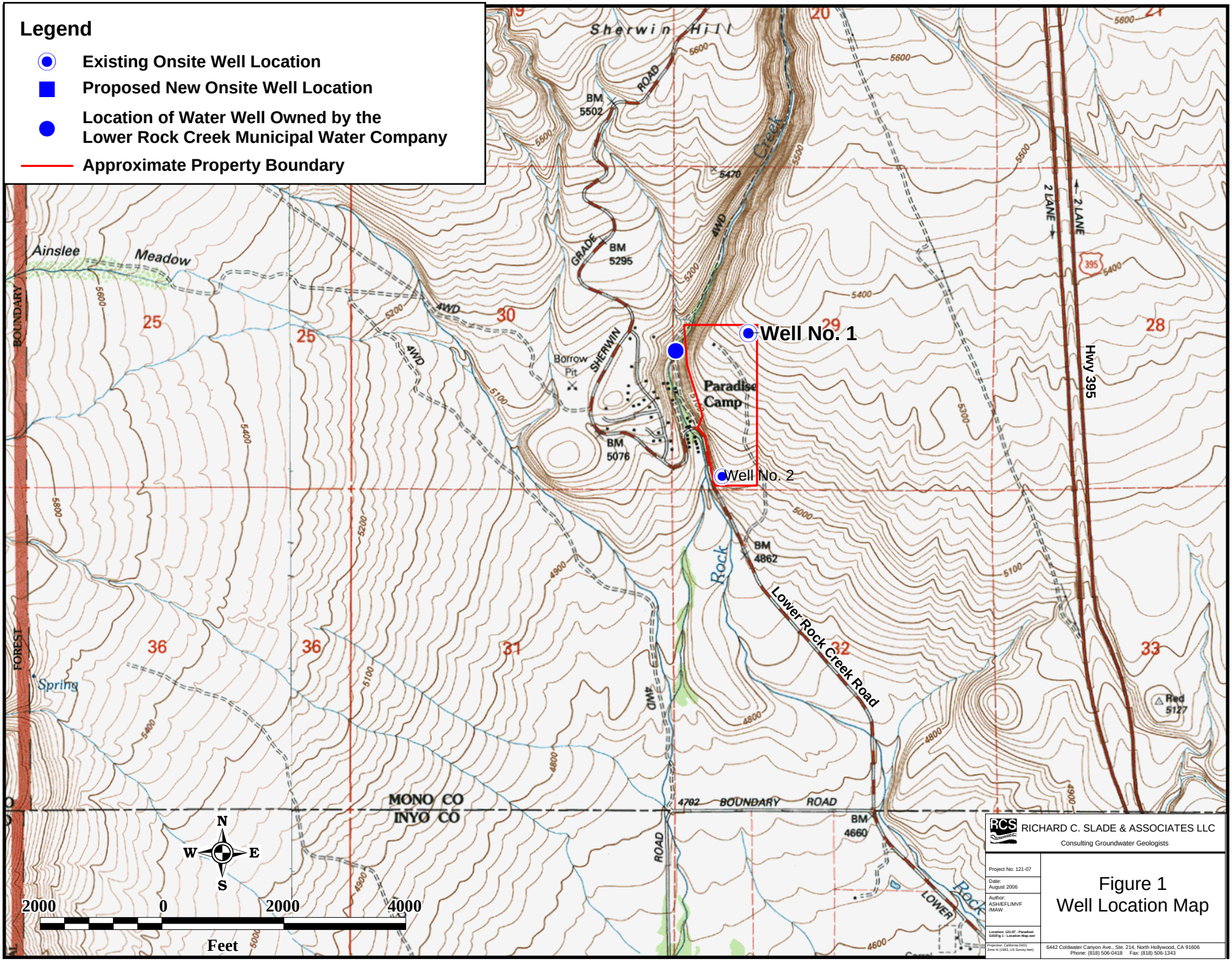
Casing Schedule:

Depth Zone (ft bgs)	Casing	Casing Length (ft)	
		Blank	Screen
0 to 720	10-in dia. blank casing	720	---
720 to 1070	10-in dia. 50-slot mill-slotted casing	---	350
1070 to 1100	10-in dia. blank casing	30	---
1100 to 1125	10-in dia. 50-slot mill-slotted casing	---	25
1125 to 1155	10-in dia. blank casing	30	----
1155 to 1365	10-in dia. 50-slot mill-slotted casing	---	210
1365 to 1380	10-in dia. blank casing (test pump setting)	15	----
1380 to 1680	10-in dia. 50-slot mill-slotted casing	---	300
1680 to 1700	10-in dia. cellar casing with end cap	20	----
bgs = below ground surface	**TOTALS**	815	885

Gravel Pack:		
	Type:	A Tacna 6 X 12 gradation gravel pack, or similar.
	Interval:	50 ft to 1725 ft bgs
Cement Sanitary Seal:		Ground surface to 690 ft bgs. A Mono County inspector must witness and approve the seal.

Notes:

1) All casing to be 10-inch diameter, steel casing, with a ¼-inch wall thickness and strength to be suitable and appropriate for the depth settings recommended herein.
2) To help break down the bentonite drilling muds/clay in the borehole and in the well casing, following installation of the casing and gravel pack, approximately 150 gallons of a 10% chlorine solution should be mixed and swabbed into the well, in order to aid in the breakup of the bentonite muds. Following this, 15 gallons of a mud dispersant, such as Aqua Clear PFD, New Well 220 (NW-220) or "Super Thin" should then be properly mixed and thoroughly agitated within the perforated sections of the casing. Two gallons of properly mixed mud dispersant should be emplaced. After allowing the dispersant to remain in the casing for 12 hours, the fluids in the casing should be evacuated from the well.
3) Conduct airlift development of all perforated sections of the casing; surge the air compressor a few times every 10 to 15 minutes while airlifting within each 20 ft zone of perforations.
4) Drill cuttings and clay-laden drill cuttings should either be hauled offsite or placed at an onsite location, pre-approved by the owner, which will not be subject to subsequent erosion. Further, fluids extracted from the well should not be allowed to flow offsite or into any canyons or drainages.
5) It is vital to ensure that fluids generated during mechanical and chemical development, do not flow offsite or into any nearby swales or creeks channels.
6) For testing purposes, the pump intake should be placed at a depth of 1000 ft bgs.


Legend
Existing Onsite Well Location
Proposed New Onsite Well Location
Location of Water Well Owned by the Lower Rock Creek Municipal Water Company
Approximate Property Boundary
Well No. 1
Well No. 2
Paradise Camp
Borrow Pit
Sherwin Hill
Ainslee Meadow
Spring
Lower Rock Creek Road
Hwy 395
MONO CO
INYO CO
BOUNDARY ROAD
N
W
E
S
2000 0 2000 4000
Feet
RICHARD C. SLADE & ASSOCIATES LLC
Consulting Groundwater Geologists
Figure 1
Well Location Map
6442 Coldwater Canyon Ave., Ste. 214, North Hollywood, CA 91606
Phone: (818) 506-0418 Fax: (818) 506-1343

Final Wellblend Water Quality Report

EX

CLINICAL LAB OF SAN BERNARDINO, INC
21881 BARTON ROAD
GRAND TERRACE, CA 92313

GENERAL MINERAL & PHYSICAL & INORGANIC ANALYSIS (9/99)

Date of Report: 07/04/02 Sample ID No.M71118-1A

Laboratory Signature Lab Director:

Name: CLINICAL LABORATORIES OF SAN BERNARDINO

Name of Sampler:ROGER SMITH Employed By: C.L.D.

Date/Time Sample Collected:07/03/09/0810 Date/Time Sample Received @ Lab:07/03/12/0800 Date Analyses Completed:07/03/28

System Name:C & L DEVELOPMENT System Number: 14CXX 1

Name or Number of Sample Source:ROCK CREEK RANCH WELL 2

* User ID: 14C Station Number:

* Date/Time of Sample: |07|03|09|0810| Laboratory Code: 3761

YY MM DD TTTT YY MM DD

Date Analysis completed: |07|03|28|

* Submitted by: Phone #:

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
	mg/L	Total Hardness (as CaCO3) (mg/L)	00900	ND	5.0
	mg/L	Calcium (Ca) (mg/L)	00916	1.1	1.0
	mg/L	Magnesium (Mg) (mg/L)	00927	ND	1.0
	mg/L	Sodium (Na) (mg/L)	00929	28	1.0
	mg/L	Potassium (K) (mg/L)	00937	ND	1.0
Total Cations		Meq/L Value: 1.27			
	mg/L	Total Alkalinity (as CaCO3) (mg/L)	00410	64	5.0
	mg/L	Hydroxide (OH) (mg/L)	71830	ND	5.0
	mg/L	Carbonate (CO3) (mg/L)	00445	ND	5.0
	mg/L	Bicarbonate (HCO3) (mg/L)	00440	78	5.0
*	mg/L+	Sulfate (SO4) (mg/L)	00945	11	0.50
*	mg/L+	Chloride (Cl) (mg/L)	00940	3.8	1.0
45	mg/L	Nitrate (as NO3) (mg/L)	71850	ND	2.0
2.0	mg/L	Fluoride (F) (Natural-Source)	00951	0.98	0.10
Total Anions		Meq/L Value: 1.67			
	Std.Units+	PH (Laboratory) (Std.Units)	00403	8.2	
***	umho/cm+	Specific Conductance (E.C.) (umhos/cm)	00095	120	2.0
****	mg/L+	Total Filterable Residue@180C(TDS)(mg/L)	70300	130	5.0
15	Units	Apparent Color (Unfiltered) (Units)	00081	5	3
3	TON	Odor Threshold at 60 C (TON)	00086	1	1
5	NTU	Lab Turbidity (NTU)	82079	1.7	0.1
0.5	mg/L+	MBAS (mg/L)	38260	ND	0.10

* 250-500-600 ** 0.6-1.7 *** 900-1600-2200 **** 500-1000-1500

GE 2 OF 2 INORGANIC CHEMICALS M71118-1A

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
1000	ug/L	Aluminum (Al) (ug/L)	01105	770	50
6	ug/L	Antimony (ug/L)	01097	ND	6.0
10	ug/L	Arsenic (As) (ug/L)	01002	9.0	2.0
1000	ug/L	Barium (Ba) (ug/L)	01007	ND	100
4	ug/L	Beryllium (ug/L)	01012	ND	1.0
5	ug/L	Cadmium (Cd) (ug/L)	01027	ND	1.0
50	ug/L	Chromium (Total Cr) (ug/L)	01034	ND	10
1000	ug/L+	Copper (Cu) (ug/L)	01042	ND	50
300	ug/L+	Iron (Fe) (ug/L)	01045	730	100
	ug/L	Lead (Pb) (ug/L)	01051	ND	5.0
50	ug/L+	Manganese (Mn) (ug/L)	01055	21	20
2	ug/L	Mercury (Hg) (ug/L)	71900	ND	1.0
100	ug/L	Nickel (ug/L)	01067	ND	10
50	ug/L	Selenium (Se) (ug/L)	01147	ND	5.0
100	ug/L+	Silver (Ag) (ug/L)	01077	ND	10
2	ug/L	Thallium (ug/L)	01059	ND	1.0
5000	ug/L+	Zinc (Zn) (ug/L)	01092	ND	50

ADDITIONAL ANALYSES

	C	Source Temperature C	00010	20	
		Langelier Index Source Temp.	71814	- 1.30	
		Langelier Index at 60 C	71813	- 0.60	
		Agressiveness Index	82383	10.45	
	ug/L	Boron (ug/L)	01020	130	100
.0000	ug/L	Nitrate + Nitrite as Nitrogen(N) (ug/L)	A-029	ND	400
1000	ug/L	Nitrite as Nitrogen(N) (ug/L)	00620	ND	400
150	ug/L	Cyanide (ug/L)	01291	ND	100
	ug/L	Vanadium (ug/L)	01087	31	3.0

+ Indicates Secondary Drinking Water Standards

aboratory comments and description of any additional components found:

:TRATE, NITRITE-N, MBAS, PH, TURBITY RECEIVED AND ANALYZED OUTSIDE HOLD TIME.

EX

CLINICAL LAB OF SAN BERNARDINO, INC
21881 BARTON ROAD
GRAND TERRACE, CA 92313
RADIOACTIVITY ANALYSIS (9/99)

Date of Report: 07/03/23 Sample ID No.M71118R-1A
Laboratory Signature Lab
Name: CLINICAL LABORATORIES OF SAN BERNARDINO Director:_____
Name of Sampler:ROGER SMITH Employed By: C & L DEV.
Date/Time Sample Collected:07/03/09/0810 Date/Time Sample Received @ Lab:07/03/12/0800 Date Analyses Completed:07/03/19

System Name:C & L DEVELOPMENT System Number: 14CXX 1
Name or Number of Sample Source:ROCK CREEK RANCH WELL 2

* User ID: 14C Station Number: *
* Date/Time of Sample: |07|03|09|0810| Laboratory Code: 3761 *
* YY MM DD TTTT YY MM DD *
* Date Analysis completed: |07|03|19| *
* Submitted by:_____ Phone #:_____ *

MCL	REPORT UNITS	CHEMICAL	STORET CODE	ANALYSES RESULTS	DLR
15	pCi/L	Gross Alpha	01501	6.7	3.0
	pCi/L	Gross Alpha Counting Error	01502	1.0	
	pCi/L	Gross Alpha MDA (95% Confidence)	A-072	0.36	
20	pCi/L	Uranium	28012		1.0
	pCi/L	Uranium Counting Error	A-028		
	pCi/L	Uranium MDA (95% Confidence)	A-073		
	pCi/L	Radium 226	09501		1.0
	pCi/L	Radium 226 Counting Error	09502		
	pCi/L	Radium 226 MDA (95% Confidence)	A-074		
	pCi/L	Radium 228	11501		1.0
	pCi/L	Radium 228 Counting Error	11502		
	pCi/L	Radium 228 MDA (95% Confidence)	A-075		
5	pCi/L	Ra 226 + Ra 228	11503		2.0
	pCi/L	Ra 226 + Ra 228 Counting Error	11504		
50	pCi/L	Gross Beta	03501		4.0
	pCi/L	Gross Beta Counting Error	03502		
	pCi/L	Gross Beta MDA (95% Confidence)	A-077		
8	pCi/L	Strontium 90	13501		2.0
	pCi/L	Strontium 90 Counting Error	13502		
	pCi/L	Strontium 90 MDA (95% Confidence)	A-078		
20000	pCi/L	Tritium	07000		1000
	pCi/L	Tritium Counting Error	07001		
	pCi/L	Tritium MDA (95% Confidence)	A-079		

CLINICAL LAB OF SAN BERNARDINO, INC

21881 BARTON ROAD

GRAND TERRACE, CA 92313

EX

ORGANIC CHEMICAL ANALYSIS (9/99)

Date of Report: 07/03/29 Sample ID No.M71118X-1A

Laboratory Signature Lab

Name: CLINICAL LABORATORIES OF SAN BERNARDINO Director: _____

Name of Sampler:ROGER SMITH Employed By: C.L.D.

Date/Time Sample Collected:07/03/09/0810 | Date/Time Sample Received @ Lab:07/03/12/0800 | Date Analyses Completed:07/03/29

System Name:C & L DEVELOPMENT | System Number: 14CXX 1

Name or Number of Sample Source:ROCK CREEK RANCH WELL 2

* User ID: 14C Station Number:

* Date/Time of Sample: |07|03|09|0810| YY MM DD TTTT Laboratory Code: 3761

YY MM DD

Date Analysis completed: |07|03|29|

* Submitted by: _____ Phone #: _____

REGULATED ORGANIC CHEMICALS

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS	MCL ug/L	DLR ug/L
524.2	Total Trihalomethanes (TTHMs)	82080	ND	80	
524.2	Bromodichloromethane	32101	ND		1.0
524.2	Bromoform	32104	ND		1.0
524.2	Chloroform (Trichloromethane)	32106	ND		1.0
524.2	Dibromochloromethane	32105	ND		1.0
524.2	Benzene	34030	ND	1	0.50
524.2	Carbon Tetrachloride	32102	ND	.5	0.50
524.2	1,2-Dichlorobenzene (o-DCB)	34536	ND	600	0.50
524.2	1,4-Dichlorobenzene (p-DCB)	34571	ND	5	0.50
524.2	1,1-Dichloroethane (1,1-DCA)	34496	ND	5	0.50
524.2	1,2-Dichloroethane (1,2-DCA)	34531	ND	.5	0.50
524.2	1,1-Dichloroethylene (1,1-DCE)	34501	ND	6	0.50
524.2	cis-1,2-Dichloroethylene (c-1,2-DCE)	77093	ND	6	0.50
524.2	trans-1,2-Dichloroethylene (t-1,2-DCE)	34546	ND	10	0.50
524.2	Dichloromethane (Methylene Chloride)	34423	ND	5	0.50
524.2	1,2-Dichloropropane	34541	ND	5	0.50
524.2	Total 1,3-Dichloropropene	34561	ND	.5	0.50
524.2	Ethyl Benzene	34371	ND	300	0.50
524.2	Methyl tert-Butyl Ether(MTBE)	46491	ND	5	3.0
524.2	Monochlorobenzene (Chlorobenzene)	34301	ND	70	0.50
524.2	Styrene	77128	ND	100	0.50
524.2	1,1,2,2-Tetrachloroethane	34516	ND	1	0.50
524.2	Tetrachloroethylene (PCE)	34475	ND	5	0.50
524.2	Toluene	34010	ND	150	0.50
524.2	1,2,4-Trichlorobenzene	34551	ND	5	0.50
524.2	1,1,1-Trichloroethane (1,1,1-TCA)	34506	ND	200	0.50
524.2	1,1,2-Trichloroethane (1,1,2-TCA)	34511	ND	5	0.50
524.2	Trichloroethylene (TCE)	39180	ND	5	0.50
524.2	Trichlorofluoromethane (FREON 11)	34488	ND	150	5.0

ge 2 of 2 REGULATED ORGANIC CHEMICALS CONTINUED M71118X-1A

TEST METHOD	CHEMICAL ALL CHEMICALS REPORTED ug/L	ENTRY #	ANALYSES RESULTS	MCL ug/L	DLR ug/L
524.2	Trichlorotrifluoroethane (FREON 113)	81611	ND	1200	10
524.2	Vinyl Chloride (VC)	39175	ND	.5	0.50
524.2	m,p-Xylene	A-014	ND		1.0
524.2	o-Xylene	77135	ND		0.50
524.2	Total Xylenes (m,p, & o)	81551	ND	1750	
04.1	Dibromochloropropane (DBCP)	38761	ND	.2	0.010
04.1	Ethylene Dibromide (EDB)	77651	ND	.05	0.020
08.1	Endrin	39390	ND	2	0.10
08.1	Lindane (gamma-BHC)	39340	ND	.2	0.20
08.1	Methoxychlor	39480	ND	30	10
08.1	Toxaphene	39400	ND	3	1.0
08.1	Chlordane	39350	ND	.1	0.10
08.1	Heptachlor	39410	ND	.01	0.010
08.1	Heptachlor epoxide	39420	ND	.01	0.010
15.4	Bentazon (BASAGRAN)	38710	ND	18	2.0
15.4	2,4-D	39730	ND	70	10
15.4	2,4,5-TP (SILVEX)	39045	ND	50	1.0
31.1	Carbofuran (FURADAN)	81405	ND	18	5.0
15.4	Dalapon	38432	ND	200	10
15.4	Dinoseb (DNBP)	81287	ND	7	2.0
47	Glyphosate	79743	ND	700	25
08.1	Hexachlorobenzene	39700	ND	1	0.50
08.1	Hexachlorocyclopentadiene	34386	ND	50	1.0
31.1	Oxamyl (Vydate)	38865	ND	50	20
15.4	Pentachlorophenol (PCP)	39032	ND	1	0.20
15.4	Picloram	39720	ND	500	1.0
08.1	Polychlorinated Biphenyls, Total, as DCB	39516	ND	.5	0.50
	UNREGULATED ORGANIC CHEMICALS				
524.2	tert-Amyl Methyl Ether (TAME)	A-034	ND		3.0
524.2	tert-Butyl Alcohol (TBA)	77035	ND		2.0
524.2	Dichlorodifluoromethane (Freon 12)	34668	ND		0.50
524.2	Ethyl tert-Butyl Ether (ETBE)	A-033	ND		3.0

Clinical Laboratory of San Bernardino, Inc.

March 23, 2007

C & L Development
Water Quality Supervisor
P.O. Box 1445
Mammoth Lakes, CA 93546

re: High Gross Alpha Results ...

Dear Water Quality Supervisor,

The following sample(s) had a gross alpha + 0.84 counting error result of greater than 5.0 pCi/L. This high result will often trigger additional analyses such as uranium, radium 226, or radium 228; if you are unsure about your requirements please contact your State District Engineer. Should you require any further analyses please fill out this sheet and fax or mail it back to Clinical Laboratory.

Sample ID	Sample	Sample Date	Alpha ± Error	Additional Analysis
M71118R-1A	Well 2	03/09/07	6.7 ± 1.0	_____

If you need further analyses please fax or mail the completed sheet to:

Bob Glaubig FAX (909) 825-7696
-OR-
Bob Glaubig
Clinical Laboratory of San Bernardino, Inc.
P.O. Box 329
San Bernardino, CA 92402

Thank You.

Sincerely,

Bob Glaubig
Laboratory Manager

Clinical Laboratory of San Bernardino, Inc. — Chain of Custody

Client	C & L Development
Address	P.O. BOX 1445
	MAMMOTH LAKES CA. 93546
System No.	ROCK CREEK RANCH WELL #2
Phone No.	7609659003 FAX No. 760 934 3319
Project Name	Title 22 Regulated Analyses
Sampled By	ROGER SMITH
Comments	

Client Job No.:

Destination Laboratory
[X] Clinical Laboratory
[ ] Other:

Date	Time	Sample Identification	Matrix	No.	Pres.	Asbestos	Dioxin	Diquat	Endothall	Glyphosate	Carbamate Pesticides	DEHP/DEHA/PAH/Triazine	Chlorinated Herbicides	Chlorinated Pesticides	EDB/DBCP	Volatile Organics	Gross Alpha	Inorganic Chemical	Gen Min/Corrosivity/Gen Phys	Turn Around Time
						X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
3/9/07	8:10	[redacted]	DW																	
		ROCK CREEK RANCH WELL #2																		
						1 - quart plastic	2 - EPA 1613 amber glass	1 - EPA 549 amber plastic	1 - EPA 548 amber glass	1 - EPA 547 amber glass	1 - EPA 531 amber glass	2 - EPA 525 amber glass	1 - EPA 515 amber glass	1 - EPA 508 amber glass	2 - 40 ml EPA 504 vials	2 - 40 ml EPA 524 vials	1 - 1/2 gallon plastic	1 - pint plastic	1 - 1/2 gallon plas/phys glass	

Preservatives: (1) $Na_2S_2O_3$ (3) Cold (2) H_2SO_4/HCl (4)

Turn Around Time: (10) 10 Day (normal) (5) Five Day Rush (2) Two Day Rush
All turn around times are expressed as working days / Not all analyses can be processed as rush

Relinquished By: (Sign)	Print Name / Company	Date / Time	Received By (Sign)	Print Name / Company
[signature] 3/9/07	JASON MOORE C/C DW	3-9-2007		
		UPS		

Rec'd at Lab By: [signature] 3-12-07 0800 Rec'd Date / Time: 3-9-07 11:15 GN Comments:

Shipped Via [ ] Fed X [ ] Golden State [X] UPS [ ] Client [ ] Other _____ Page ___ of ___

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX G

BOTANICAL RESOURCE ANALYSIS

To: Sandra Bauer
Bauer Planning and Environmental Services, Inc.
220 Commerce Street, Suite 200
Irvine, CA 92602

August 25, 2007

From: Jim Paulus
Consulting Botanist
PO Box 2657
Oakhurst, CA 93644

RE: Supplemental botanical survey for the Paradise Housing Project

Dear Ms. Bauer,

I am writing to inform you of the results of supplemental botanical survey work completed on August 13, 2007 within the area of potential effect for the proposed Paradise Housing Project. The botanical survey was performed as you requested, in order to supplement botanical survey work that I performed under your direction in 2004. This communication should therefore be considered as an addendum to my survey report resulting from the 2004 field work, "Botanical Survey Report for the Proposed Paradise Subdivision", which was sent to your office in July 2004.

On August 13, 2007, I walked the entire developable extent of the Paradise site, spending a total of 6 hours on-site. All species present were noted, and no populations of rare plants were found. As in 2004, the High Desert Blackbush Scrub (HDBS) community was found throughout the site on currently undeveloped, dry rolling hills and slopes. Vegetation cover associated with surface water or shallow groundwater was restricted to where one (not buildable) corner of the site intersects the narrow riparian corridor along Lower Rock Creek. No hydrologic features (streams, seeps, wet meadows) were encountered elsewhere within the site, as in 2004. However, a recently constructed, internally drained basin of approximately 100 square feet was encountered near the southern site edge. This new basin is serviced by a scraped access road that also was not present when the 2004 survey was performed.

Growing conditions were clearly much less favorable in 2007. Generally, annuals were very sparse, and perennials exhibited vegetative dieback throughout High Desert Blackbush Scrub. The dominant annual in the HDBS is the noxious weed *Bromus tectorum* (rated A-1 by CalEPPC pest listings: "the most invasive exotic plants, and are already widespread"). The population is unchanged since 2004, when *B. tectorum* was also noted as the most common annual, even within less disturbed parts of the site. The local seedbank also previously included a tenuously established population of the noxious weed *Salsola tragus* (rated "considered but not listed" by CalEPPC, and C by CDFA: "weeds not subject to eradication actions by the CDFA" pest listings), with all individuals found in 2004 in Big Sagebrush Scrub near the edge of Lower Rock Creek Road. However, *S. tragus* was found in 2007 to have spread firmly to all areas of HDBS disturbed during the course of building access roads, digging soil pits, and drilling wells

in 2004-2007. This species has advanced from the edge of Lower Rock Creek Road to more than 1000 ft from the road, and should now be considered a member of the seedbank throughout the project's area of potential effect.

Two new species, both common weeds of the Central Valley region, were found in the immediate vicinity and on the edges of the above-mentioned constructed basin. These weeds, *Triticum* sp. and *Avena* sp., have likely been transported into the area with the large store of hay bales left near the basin's edge. These two species are new to the area, in the sense that they do not appear on the plant list from the July 2004 floristic survey (when annual species abundances were high across the site), and should be specifically addressed if weed eradications are proposed for the area. In context with the spread documented for *S. tragus*, the establishment of these two species would support a conclusion that HDBS in this project area is susceptible to invasion by common non-native weeds wherever new soil disturbance is to occur.

In summary, no significant changes in vegetation were noted except for new scrapes and associated weed invasions in disturbed soil. Please contact me if you require further information regarding my observations in 2004 or 2007.

Yours truly,

Jim Paulus, Ph.D.

Botanical Survey Report for the Proposed Paradise Subdivision

Prepared for:

Bauer Planning and Environmental Services, Inc.
220 Commerce St., Suite 200
Irvine, CA 92602

Prepared by:

Jim Paulus, Ph.D.
Consulting Botanist
P.O. Box 244
Bishop, CA 93515

June 20, 2004

Botanical Survey Report for the Proposed Paradise Subdivision

June 20, 2004

Introduction

A botanical survey was performed where subdivision of 53.4 acres of privately owned property ("study area") has been proposed. The study area is located near the town of Paradise (a.k.a. "Paradise Camp"), within Section 29, SW ¼, T5S, R31E in Mono County, California (Figure 1). Land within the study area is now undeveloped and open, and it abuts mainly BLM and LADWP lands that are managed as open space. The town of Paradise, where there is existing and ongoing development of privately owned parcels for mountain cabin and ranch style housing, is located to the west across Lower Rock Creek. Regionally, the Paradise area is associated with the steeply sloping eastern flank of the central Sierra Nevada Range. The purpose of the botanical survey was to determine if rare plant species are present, and to describe existing vegetation that would be subject to disturbance if the property is subdivided to create 53 lots for single family home sites.

The average elevation of the area surveyed is 5120 ft (1560 m). The local climate at this elevation is montane. About 50% of the annual precipitation falls as snow (Mono County Planning Department, 1993). The average winter temperature is 32° F. The frost-free growing season is about 150 days. The average air temperature during summer months is 70° F (Natural Resource Conservation Service, 1996). During the annual growing season, the normal pattern of moderate daytime temperatures, low humidity, and long xeric periods can be interrupted by late summer thunderstorms.

Lots proposed for development are located between the elevations of 5100 ft and 5340 ft (average elevation of housing would be 5220 ft), on slopes that average about 10-15%. Lower Rock Creek intersects the extreme northwest corner of the property, outside the area proposed for development and at a substantially lower elevation of 5010 ft. Proposed open space totaling 17.1 acres would be designated on the lowermost portion of the 10-15% slope area, and an additional 7.6 acres would be designated on a steep west-facing slope (30-40%) that is located in a buffer-like position between the proposed housing and Lower Rock Creek (Figure 2). Slopes across the study area are thus mainly moderate and southwest-facing, with the exception being the steep west-facing slope. Disturbance of plants in the moderate (10-15%) slope area would be associated with construction of roads, water and sewer infrastructure, and there would be permanent conversion of up to 30 acres of currently vegetated scrublands to impervious surfaces and introduced landscaping. Disturbances to vegetation at the steep west-facing slope and the riparian area would be created during development of the water system, and by proposed trails that would access Lower Rock Creek from the new housing above.

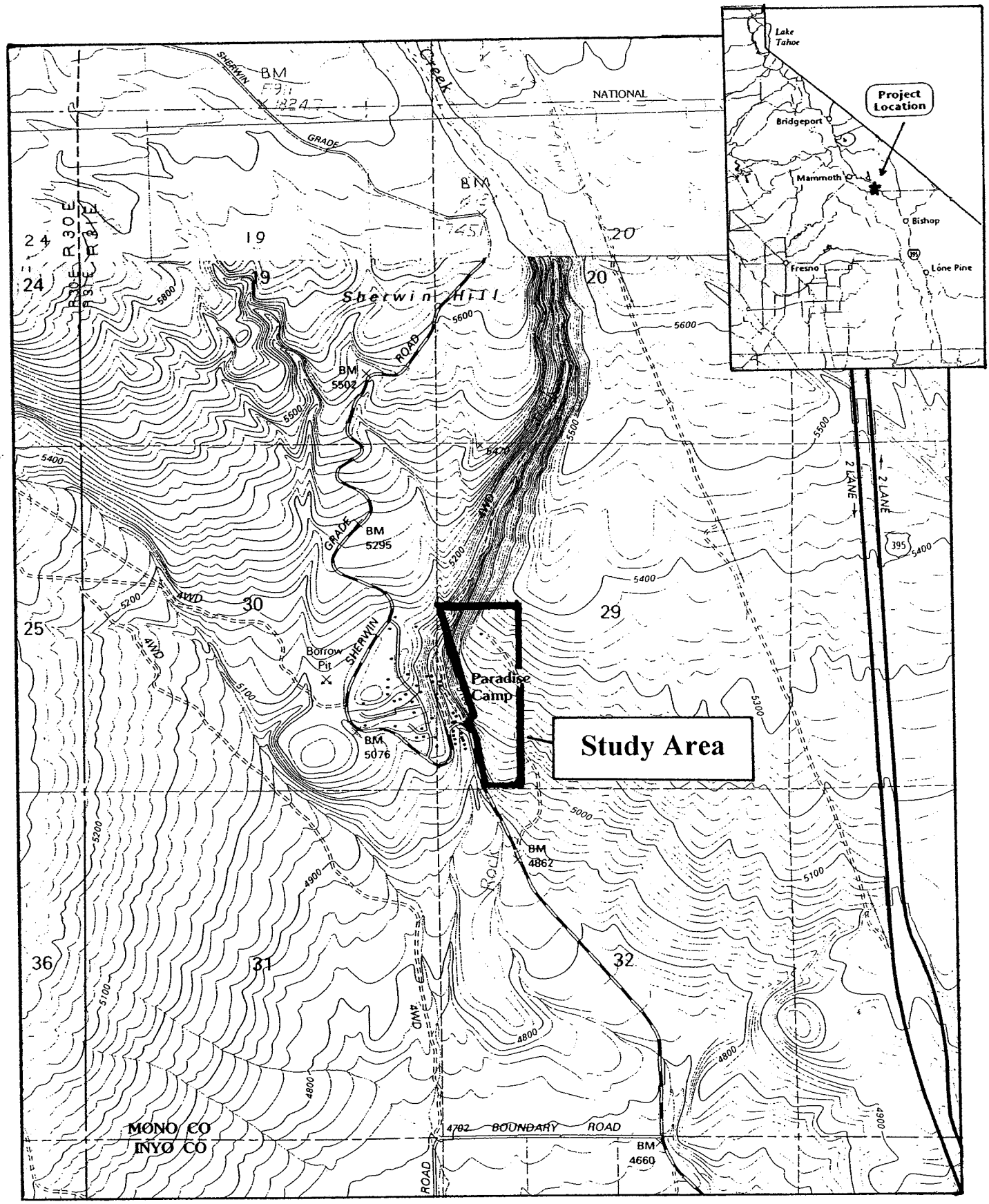


Figure 1. Map showing the study area at the proposed Paradise 53.4 ac Subdivision near Paradise, California.

Literature Search

A list of eight rare plant species that could have some potential to occur within the study area was compiled. All are herbaceous perennials (Table 1). These species are *Arabis cobrensis* (Masonic rock cress), *Arabis dispar* (pinyon rock cress), *Astragalus johannis-howellii* (Long Valley milkvetch), *Astragalus lemmonii* (Lemmon's milkvetch), *Astragalus monoensis* var. *monoensis* (Mono milkvetch), *Hulsea vestita* ssp. *inyoensis* (Inyo hulsea), *Mentzelia torreyi* (Torrey blazing star), and *Thelypodium integrifolium* ssp. *complanatum* (foxtail thelypodium). These potentially occurring rare plant species, and potentially occurring rare plant communities, were identified during a review of available regional data (Mono County Planning Department, 1993, California Native Plant Society (CNPS), 2001, 2004, California Department of Fish and Game (CDFG), 2003a, 2004a, 2004b), published regional floras (Cronquist, *et. al.*, 1984, Hickman, 1993), environmental documents for recent area projects (Paulus 1997, 2002, 2003a, Quad Knopf, 2002), and a March 2004 search of the California Natural Diversity Database records for the Rovana and Mt. Diablo Quadrangles (CDFG, 2004c). Potentially occurring rare species were also drawn from the current sensitive and watch lists prepared by the local BLM (Halford and Fatooh, 1994) and Inyo National Forest offices (U.S. Forest Service, 1998a, 1998b).

Field Surveys

Thorough field searches for rare plants were conducted on April 15-17, May 1-5, and June 1-2, 2004, with preliminary visits to map plant communities on March 14-15, 2004. The months of April through June are within the normal anthesis periods for all potentially occurring rare plants (Table 1). Unusually warm weather that began in March accelerated plant growth in early spring 2004, especially within the study area's upland scrub vegetation. Upland annuals were nearing complete senescence when survey work was concluded in June, and work then was concentrated on assessing relatively late-developing riparian vegetation along Lower Rock Creek. On all dates, rare plant search transects were walked across the study area slowly, while wandering side-to-side to view areas around and under the canopies of larger plants. Transects were centered every 50-100 feet in scrub habitats (ca. 3 mile total transect length) by navigating cross-slope to GPS waypoints established along the eastern property edge and at the western edge of the proposed housing. The steep west-facing slope was searched on contour in a similar way. Transect spacing was very dense amid the narrow riparian zone, where the plant community corridor was searched from the (entire) perimeter, with incursions to investigate all subcanopy and canopy gap populations.

All plant species encountered were identified (Appendix A). Any species that were not at once recognized were keyed by the consulting botanist using the Jepson Manual (Hickman, 1993). Plants were identified to the level of taxa sufficient to determine rare species presence or absence. The site's plant community descriptions were developed by recording the relative frequencies and average height of dominants at 43 points, using a modified point-quarter method (Brower and Zar, 1984). Communities were classified using the CDFG (2003a) naming system. Community classification numbers were cross-referenced (Table 2) to the Holland (1986) system. James Paulus of Bishop, California, performed all survey work, totaling 74 hours.

Table 1. Rare plant species that could potentially occur within the proposed Paradise subdivision. Flowering period data is from CNPS (2001). NL = not listed.

Scientific Name Common Name Life Form	Rank or Status[1]					Habitat	Flowering Period
	USFWS	DFG	USFS	CNPS	NDDB		
Arabis cobrensis Masonic rock cress herbaceous perennial	NL	NL	NL	2	S1-S2	sagebrush scrub	June-July
Arabis dispar pinyon rock cress herbaceous perennial	NL	NL	W	2	S2.3	pinyon-juniper woodland	March-June
Astragalus johannis-howellii Long Valley milkvetch herbaceous perennial	NL	R	W	1B	S2.2	sagebrush scrub	June-August
Astragalus lemmonii Lemmon's milkvetch herbaceous perennial	SC	NL	NL	1B	S2.2	alkaline scrub, meadow	May-August
Astragalus monoensis var. *monoensis* Mono milkvetch herbaceous perennial	SC	R	S	1B	S2.2	open scrub or forest, pumice	June-August
Hulsea vestita ssp. *inyoensis* Inyo hulsea herbaceous perennial	SC	NL	W	2	S1.2	pinyon-juniper woodland	April-June
Mentzelia torreyi Torrey blazing star herbaceous perennial	NL	NL	NL	2	S2.2	pinyon-juniper woodland	June-August
Thelypodium integrifolium ssp. *complanatum* foxtail thelypodium herbaceous annual/perennial	NL	NL	NL	2	S2.2	scrub, alkaline soils	June-October

1. **USFWS** = US Fish and Wildlife Service status under the Endangered Species Act (CDFG, 2004a)
   SC = species of concern (former C1/C2, as listed by the Sacramento USFWS office)
   DFG = California Department of Fish and Game listings under the Native Plant Protection Act and the California Endangered Species Act (CDFG, 2004a).
   R = Rare
   USFS = US Forest Service, Inyo National Forest, Bishop Office (1998a, 1998b)
   S = Sensitive List, June 1998 W = Watch List, December 1998
   CNPS = California Native Plant Society listings (CNPS, 2001, 2004)
   1B = rare and endangered in Calif. and elsewhere
   2 = rare, threatened or endangered in California, but more common elsewhere
   NDDB = California Natural Diversity Data Base rankings by the CDFG (CDFG, 2004b)
   S1 is < 6 occurrences or < 1000 individuals or < 1000 acres
   S2 is 6-20 occurrences or 1000-3000 individuals or 2000-10000 acres
   "threat numbers" follow decimal: .1 = very threatened, .2 = threatened, .3 = no threat currently known, ? indicates CNDDB uncertainty in status.

Plant Communities and Species

The areas proposed for subdivision and for construction of sewage facilities and a new paved access road from Lower Rock Creek Road support a contiguous stand of open scrub vegetation that is classified as High Desert Blackbush Scrub (Figure 2). A somewhat modified assemblage also classified as High Desert Blackbush Scrub was mapped on the steep west-facing slope. The community Big Sagebrush Scrub has developed on thin strips of more level terrain located west of the Lower Rock Creek riparian zone and between the base of the steep slope and Lower Rock Creek Road. The relatively small portion of the study area that is immediately adjacent to Lower Rock Creek is classified as Water Birch Riparian Scrub (Table 2).

The High Desert Blackbush Scrub and Big Sagebrush Scrub communities are considered common and widespread throughout the Great Basin Floristic Province and on the eastern slopes of the Sierra Nevada. High Desert Blackbush Scrub occurs in the study area as a rather diverse assemblage, and thus could be characterized as a blackbush-dominated variant of the regional catch-all community type Great Basin Mixed Scrub. Big Sagebrush Scrub in the study area is relatively uniform. It is differentiated by its greater structural complexity, its transitional location in the landscape, and to some degree by its species assemblage. Water Birch Riparian Scrub is a water birch-dominated variant of Great Basin Riparian Scrub, as defined by Holland (1986). The Water Birch Riparian Scrub plant community occurs as a continuous but narrow corridor within the Lower Rock Creek riparian zone both upstream and downstream from the study area. While known to be locally "widespread" at Lower Rock Creek (CDFG, 2003b, 2004c, Paulus, 2003b), Water Birch Riparian Scrub is regionally confined to relatively small or patchy habitats, and is considered rare by the State of California (CDFG, 2003a).

Table 2. Plant communities found within the proposed Paradise housing subdivision study area.

Plant Community Name[1]	Holland Number[2]	CNDDB Number[1]	Acreage in Study Area
High Desert Blackbush Scrub	34300	33.020.00	52.0
Big Sagebrush Scrub	35210	35.110.00	1.3
Water Birch Riparian Scrub	63510	63.610.00	0.1

1. Taken from classification presented by CDFG (2003b)
2. Taken from Holland (1986)

Transitions in species composition that signal plant community boundaries are abrupt within the study area. Intervening or ecotone-like Wet or Dry Montane Meadow communities were not found between the upland and riparian scrub types, likely due to the steepness and rockiness of the surrounding slopes that fall almost to the water's edge. Disturbance patterns also appear to enforce stark boundaries in the riparian zone, as outer edges of the thicket-like Water Birch Riparian Scrub community are visually defined by well-traveled "fishing trails".

All plant communities within the study area exhibit scattered signs of past and ongoing human use and associated vegetation disturbance. High Desert Blackbush Scrub exhibits the least ongoing disturbance overall, but does appear to be recovering from (incomplete) burning that occurred 20-30 years ago. Two unpaved roadways that cross the study area, totaling less than 1 acre of surface area, were judged to be in current use where they pass through either High Desert Blackbush Scrub or Big Sagebrush Scrub. The moderately to highly disturbed scrub vegetation at abandoned firebreaks and roadways, including the one existing scrape that traverses up the steep west-facing slope, is recovering to relative species frequencies (but not yet total cover) that are similar to the surrounding less disturbed scrub.

High Desert Blackbush Scrub

Upland community type

Vegetation on dry slopes was assigned the classification High Desert Blackbush Scrub (33.020.00, as per CDFG, 2003). Shrubs with stiff (but usually not thorny) habit are clearly dominant. Mature blackbush (*Coleogyne ramosissima*) usually forms 40-60% of the diverse shrub canopy. Blackbush attains 80% dominance on lower slopes within the southern half of the study area and widely to the south off-site, and gains similar canopy prominence on the slopes adjacent to the north (upslope) and east (cross-slope) edges of the study area. The average height of High Desert Blackbush Scrub is 2 ft, and total cover is rarely greater than 10%. Average cover as high as 20% is found only on the lowest slopes in the area proposed for the new approach road, where blackbush assumes dominance greater than 50%. Although slightly incised channels and recent scour marks indicate that flows cross (at least ephemerally) through areas mapped as scrub, no changes in species frequencies or changes in abundances that could be associated with wetter habitats were observed there.

Most of the habitat occupied by High Desert Blackbush Scrub (45 of 52 total acres) slopes moderately, and includes widespread areas of shallow soil profile. Soil depth appears to strongly influence the shrub species assemblage, average height, and total cover development. While blackbush is the most ubiquitous canopy species in scrub areas outside the influence of the riparian corridor, High Desert Blackbush Scrub also includes areas where blackbush is not the clearly dominant shrub. Mountain monardella (*Monardella odoratissima*), wishbone bush (*Mirabilis bigelovii*), and several native buckwheat perennial herbs and shrubs (*Eriogonum* spp.) are more important in smaller areas where the tuff parent material is nearest (or at) the soil surface. Big sagebrush (*Artemisia tridentata*) averaging 1-2 ft in height may patchily attain numerical dominance where soils are deeper. Similarly, rubber rabbitbrush (*Chrysothamnus nauseosus*), green rabbitbrush (*C. teretifolius*), and curl-leaved rabbitbrush (*C. viscidiflorus* ssp. *viscidiflorus*) usually are sub-dominant, but subcommunity-sized patches of up to 40% relatively frequency were recorded for each of these species. Blackbush, rabbitbrush, and big sagebrush widely co-dominate the northern, upslope half of the area, which is the area that would be most impacted by home construction. The patchiness of dominants in this case could be soil-related, but such a pattern also is typical of the appearance of a post-fire sere. Similar post-fire or other patch-sized successional mosaics are common on slopes around the nearby Round Valley.

The steep west-facing slope, which is proposed to be reserved as open space (Figure 2), includes 6.8 acres (of 52 total acres) of habitat occupied by High Desert Blackbush Scrub. A few species that are minor components (or were absent) in the widespread assemblage where housing is proposed are clearly increased in abundance (or restricted to occurring) there. Cut-leaved thelypody (*Thelypodium laciniatum*), brickellbush (*Brickellia microphylla*), California thistle (*Cirsium occidentale* var. *californicum*), and chia (*Salvia columbariae*) grow only from cracks in outcrops and in areas of intense groundcreep. Where soil and rockfall have accumulated, desert peach (*Prunus andersonii*), four-wing saltbush (*Atriplex canescens*), and antelope bitterbrush (*Purshia tridentata*) join with big sagebrush and blackbush to form a thin canopy, providing 5-10% total cover. Trees are absent from High Desert Blackbush Scrub, except for two stunted singleleaf pinyon pine (*Pinus monophylla*) that were found on the steep west-facing slope.

Native perennial grassses are consistently present between the shrubs, but always at relatively low frequencies. The most common upland scrub species include Cusick bluegrass (*Poa cusickii* ssp. *cusickii*), foxtail barley (*Hordeum jubatum*), and two needlegrasses (*Achnatherum hymenoides* and *A. speciosum*). By far the most abundant grass in 2004 was the introduced annual cheatgrass (*Bromus tectorum*). Cheatgrass formed dense stands like carpets under and between shrub canopies in 2004. Cheatgrass is present throughout the study area. It achieves lower abundance only on the steepest and rockiest slopes, and in deep leaf litter immediately adjacent to Lower Rock Creek. Skeletal plant remains from the relatively wet 2003 growing season attest to the well-established cheatgrass seedbank at this site, but also suggest that a great variety of native annuals are present. The stand of native annuals was overall thinner in 2004, with white tidytips (*Layia glandulosa*), Fremont yellow throats (*Phacelia fremontii*), Great Basin woollystar (*Eriastrum sparsiflorum*), Nevada gilia (*Gilia brecciarum* ssp. *brecciarum*), blazing star (*Mentzelia obscura*), cushion cryptantha (*Cryptantha circumscissa*), spotted buckwheat (*Eriogonum maculatum*), and moth combseed (*Pectocarya setosa*) being the most common of the native annuals.

Big Sagebrush Scrub
Transitional community type

Blackbush and many of the subdominant canopy species with stiff habits that are typical of High Desert Blackbush Scrub in the study area are absent at two locations near Lower Rock Creek, where the vegetative cover averages 50% (Figure 2) and big sagebrush (*A. tridentata*) averaging 4 ft in height contribute the majority (50-60%) of the canopy. These two relatively dense and tall stands were classified as Big Sagebrush Scrub (35.110.00). Average Big Sagebrush Scrub community height is 4 ft, however scattered Sierra coffeeberry, which reach 10 ft in height, and the close proximity of riparian corridor trees (see below) add greater structural character. Large talus boulders account for most of the canopy gaps. The presence of scattered wild rose (*Rosa woodsii*) and narrow-leaved willow (*Salix exigua*) stems, and the community's location on relatively level ground near a perennial stream channel, suggests that episodic or seasonal groundwater elevation increases do play a role in maintaining the current Big Sagebrush Scrub assemblage.

Herbaceous plants were generally not prominent within Big Sagebrush Scrub in 2004. Herbs and grasses found in greater abundance in High Desert Blackbush Scrub were present at low frequencies in Big Sagebrush Scrub. Open soil habitat availability is limited. Talus is so dense in much of the community that parallels Lower Rock Creek Road that habitat for herbs is sparse. Ongoing disturbance, which is mainly due to the adjacent paved road (southern stand) and to a trail highly used for mountain bicycling and for fishing access (northern stand, along Lower Rock Creek) is associated with a higher diversity of non-native colonizers. As in High Desert Blackbush Scrub, non-native bromes (*Bromus* spp.), especially cheatgrass, were abundant in 2004. The non-native annual Russian thistle (*Salsola tragus*), which has apparently not invaded other communities within the study area, was found throughout Big Sagebrush Scrub in 2004.

Water Birch Riparian Scrub
Wetland community type

Surface water was encountered within the study area at Lower Rock Creek only. The perennial flow there is currently subject to partial diversion (for municipal water consumption) within the stream reach that crosses the study area. Narrow strips of stream bank and exposed bed immediately adjacent to the flowing water were classified as Water Birch Riparian Scrub (63.610.00). This "corridor" community ranges between 20 ft and 40 ft wide, and its occurrence in the study area is completely within the area proposed as open space (Figure 2). Changes in species composition are abrupt and complete at the community's outer edges. The presence of a coniferous overcanopy and riparian understory trees visually distinguishes Water Birch Riparian Scrub. All trees are native species. A total of five Jeffrey Pine (*Pinus jeffreyi*), averaging 50 ft tall and 24-36 inch dbh, occur within the small segment of corridor that intersects the study area. Water birch (*Betula occidentalis*) to 10 ft tall, arroyo willow (*Salix lasiolepis*) and narrow-leaved willow (*S. exigua*) form a dense subcanopy that shades Lower Rock Creek.

Dense birch and willows, when combined with a wild rose understory, can make this community impassable, despite its narrowly corridor-like character within the study area. The tree canopy provided by understory birch and willows is nearly continuous, as these rapidly growing species have filled in much of the bank area that was disturbed when water diversions structures were installed. Any new disturbance to narrow strip of Water Birch Riparian Scrub in the study area would have a high likelihood of creating (at least) temporary, discontinuous subcanopy gaps. Existing gaps provide small, less shaded habitats along the water's edge. They support vigorous populations of spreading perennials such as wild rose, false Solomon's seal (*Smilacina stellata*), and green bog orchid (*Platanthera hyperborea*). In all, 22 of the 24 species found in Water Birch Riparian Scrub are classified by Reed (1988) as FAC, FACW, or OBL with regard to wetland indicator status (Jeffrey pine and cheatgrass are the two exceptions).

No evidence of riparian disturbance due to grazing by range cattle was detected. The herbaceous groundcover is continuous, except in the deepest shade and where fishing trails approach the stream. Emergent twotooth sedge (*Carex serratodens*) are often dense, and help to stabilize the bank. In general, a high degree of native character has been maintained. The widely spread Kentucky bluegrass (*Poa pratensis* ssp. *pratensis*) is one of only two non-native species

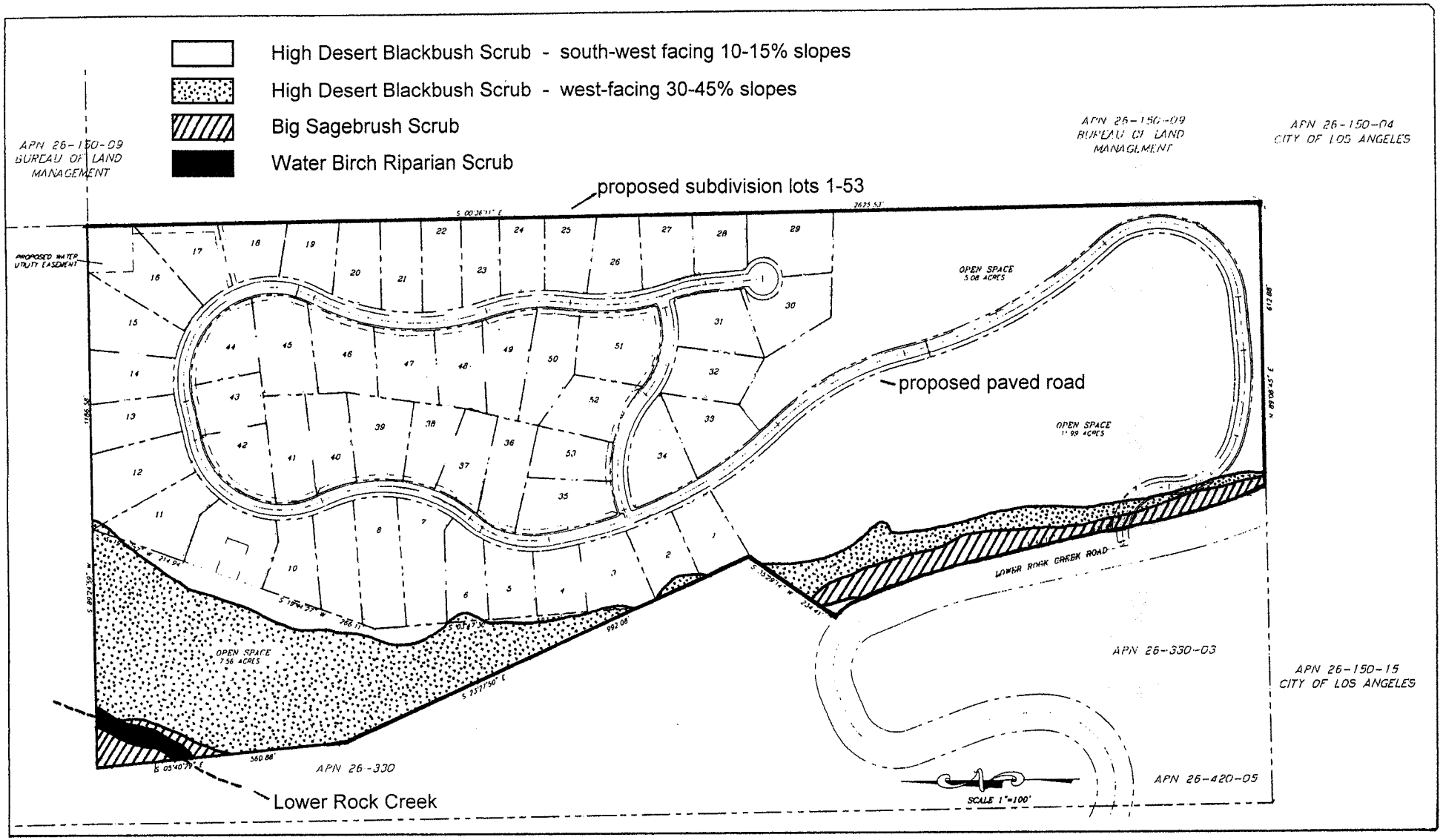


Figure 2. Plant communities mapped in 2004 within the study area for the proposed Paradise Housing Subdivision project. Project elements are overlain on the communities, which include High Desert Blackbush Scrub, Big Sagebrush Scrub, and Water Birch Riparian Scrub.

that were found in Water Birch Riparian Scrub, the other is cheatgrass. Leaf litter falling from the overstory Jeffrey pine and other trees has often accumulated deeply and may, with the increased degree of shading, explain why even cheatgrass is nearly absent.

Rare plant communities and species

One known on-site occurrence of a rare plant community was found during the literature search. Water Birch Riparian Scrub was documented in CNDDB records as occurring in 1994 and 1998 along Lower Rock Creek, including the section intersected by the study area. The extent of this occurrence within the study area was verified and mapped during field surveys in 2004 (see community description). Two stands of Water Birch Riparian Scrub, which are located upstream of the study area at 6900-7200 ft and were used for the community description by T. Keeler-Wolf (Sawyer and Keeler-Wolf, 1995), were visited for comparison with the stand that crosses through the study area. Both are associated with perennial surface flow, and the list of species given by T. Keeler-Wolfe, and that was observed by this author in 2004, is very similar to the riparian corridor vegetation that was classified in the study area as Water Birch Riparian Scrub.

No known occurrences of rare plant species within the study area were uncovered during the literature search. Recent CNDDB records (CDFG, 2004c) indicate that five rare species (two *Mentzelia torreyi* occurrences, and one occurrence each of *Arabis dispar*, *Hulsea vestita* ssp. *inyoensis*, and *Thelypodium integrifolium* ssp. *complanatum*) occur within 5 miles of the study area. No rare plants were found within the study area during searches in April, May, and June 2004. The upland and streamside habitats that were classified as High Desert Blackbush Scrub, Big Sagebrush Scrub, and Water Birch Riparian Scrub, and the limited disturbed areas, support only non-native species and native species that are considered common in the Long Valley, Round Valley, and Owens Valley areas.

Two *Arabis* species that were found within the study area share broadly cruciferous characters that could allow confusion with either of the potentially occurring rare species *A. cobrensis* or *A. dispar*. The common species that occurred within the study area were routinely distinguished from the potentially occurring rare species as follows: Both *A. holboellii* and *A. pulchra* exhibited violet to purple petals, in contrast to the white petals expected for *A. cobrensis*. In the Long Valley area, this species typically occurs among stands of big sagebrush (A. Halford, pers. comm.). The nearest known *A. cobrensis* population occurs nearly 20 miles to the north, in Big Sagebrush Scrub at an elevation of 7100 ft (Paulus, 2003a). Plants in this population were observed to be highly branched, in contrast to the single-stemmed plants consistently found in the study area. Mature fruits were available during the survey period, allowing for rapid observation of seed arrangement within fruit. Plants with two rows of seeds in each chamber were *A. pulchra*, as other potentially occurring *Arabis* would have only one row of seeds in each chamber. The nearest known population of *A. dispar* documented by CNDDB occurs in "Mohave Desert Scrub" 4 miles to the northwest at 8000 ft elevation (plants in this population also were described as "multi-branched"). *A. holboellii* var. *retrofracta* was firmly distinguished from *A. dispar* by its

reflexed fruit arrangement. The fruits were consistently appressed closely to the inflorescence axis, which contrasts sharply with the ascending fruit expected of *A. dispar*. The spreading fruit exhibited by *A. pulchra* var. *gracilis* were sparsely hairy, and were never held in what would be considered ascending arrangement once the fruit matured. No members of the genus *Arabis* with *A. dispar's* combination of ascending, glabrous fruit were found.

One member of the genus *Astragalus*, a single individual of the perennial *A. purshii* var. *tinctus*, was found growing in recently disturbed soil within Big Sagebrush Scrub. This specimen exhibited purple petals and "cotton-ball" fruit with tangled long and wavy hairs. It was readily distinguished from the three potentially occurring rare species of *Astragalus* – *A. johannis-howellii*, *A. lemmonii*, and *A. monoensis* var. *monoensis*: Fruit produced by *A. johannis-howellii* would be expected to be glabrous-appearing, and those produced by *A. lemmonii* and *A. monoensis* var. *monoensis* would have glabrous to sparsely short-hairy fruit. The nearest known occurrence of *A. lemmonii* is at Hilton Creek, ten miles to the northwest at 6900 ft (2100 m). It occurs there in streamside Wet Montane Meadow habitat. Populations of *A. lemmonii* have also been associated with scrub or alkaline meadow soils in the Long Valley Area. The nearest known *A. johannis-howellii* populations occur in dry scrub habitat 15 miles north of the study area, across Crowley Lake in volcanic, gravelly pumice soil at 6800 ft (2070 m). Pumice soils were not found in the study area.

Inyo hulsea (a.k.a. "beautiful hulsea") is a relatively showy plant that is typically found in forest gaps. The nearest known occurrence of *H. vestita* ssp. *inyoensis* is in forested habitat 2.8 miles to the northwest at an elevation of 6600 ft. No members of the genus *Hulsea* were found, nor were any woolly-hairy, thick-leaved composites with radiate heads that could be confused with *H. vestita* ssp. *inyoensis*.

All four members of the genus *Mentzelia* found within the study area are small, common annual species. Mentzelia found within the study area exhibited small-minutely toothed or lobed leaves, and all were nearing complete senescence at the time of the June survey. The potentially occurring *M. torreyi*, in contrast, is a perennial plant that maintains at some herbage throughout the growing season. The nearest known populations of *M. torreyi* occur on steep, mainly west-facing volcanic slopes above Lower Rock Creek, 0.5 miles and 1.8 miles upstream to the north of the study area. Similar volcanic soils and loose rocky slopes are present within the study area, especially at the steep, west-facing slope that is proposed as open space between the new housing and Lower Rock Creek. Careful searching of this slope did not detect any *M. torreyi* occurrence, and no (perennial) *Mentzelia* exhibiting long-lobed leaves were found within the study area.

The perennial herb *Thelypodium integrifolium* ssp. *complanatum* probably reaches the southern extent of its distribution near the study area. The nearest known population (last observed in 1936, according to CNDDB records) is located in the Sherwin Summit area, at 7000-8000 ft. More well-known occurrences to the north indicate that the species is typically found in scrub, especially near meadow margins and in alkaline soil types. *Thelypodium laciniatum*, a common species observed in steeper and rockier portions of the study area, was distinguished from the potentially occurring *T. integrifolium* by the shape of the largest, basal leaves. Leaves of the common *T. lanciniatum* observed in the study area were widest near the petiole, and were always deeply lobed to compound. The widest point of the rare *T. integrifolium*'s leaves would be at the middle or near the tip away from the petiole, and their margins would be entire or nearly so. The absence of alkaline soil or meadow habitats from the study area would tend to exclude

this species, and would certainly exclude other rare plants that are associated with alkaline meadow habitats in the Owens Valley area, such as *Crepis runcinata* ssp. *hallii*, *Sidalcea covillei*, and *Calochortus excavatus*..

During the transect surveys, sign of light use by deer was seen throughout the property. High deer use areas were observed to be concentrated in scrub atop the upper edge of the steep west-facing slope, and along trails leading from there down to Lower Rock Creek. No areas used for grazing of cattle were found. Annual plants were common but not abundant (excepting cheatgrass) in 2004, while perennial herbs and most shrub species bloomed and set seed during the survey period. It is concluded that grazing activity and climate did not influence the ability to detect rare plants during this survey.

Conclusions

- The High Desert Blackbush Scrub and Big Sagebrush Scrub communities that will be impacted by the project are widespread and common. All plant species found during the floristic survey are likewise common. If Water Birch Riparian Scrub is completely avoided, there will be no direct or cumulative impacts to rare plant populations or species, or to plant communities that are considered rare. Measures intended to mitigate impacts to rare plant species or communities are not warranted.

- Seedbanks in all plant communities (including Water Birch Riparian Scrub) that occur within the area surveyed contain a large and self-sustaining population of the noxious weed *Bromus tectorum* (rated A-1 by CalEPPC pest listings: "the most invasive exotic plants, and are already widespread"). These seedbanks also contain a tenuously established population of the noxious weed *Salsola tragus* (rated "considered but not listed" by CalEPPC, and C by CDFA: "weeds not subject to eradication actions by the CDFA" pest listings. Measures intended to mitigate the potential spread of noxious weeds resulting from the project may be required.

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Appendix A. List of plant species occurring in the area of the proposed Paradise housing subdivision Habit summarizes the growth form of each species. Codes are defined below.

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Ephedraceae					
Ephedra nevadensis	NS	x			
Equisetaceae					
Equisetum cf. arvense	NPH			x	
Equisetum laevigatum	NPH			x	
Pinaceae					
Pinus jeffreyi	NT			x	
Pinus monophylla	NT	x			
Asteraceae					
Artemisia tridentata ssp. *vaseyana*	NS	x	x		
Artemisia douglasiana	NPH			x	
Artemisia ludoviciana ssp. *ludoviciana*	NS			x	
Brickellia microphylla	NS	x_R			
Chrysothamnus nauseosus ssp. *albicaulis*	NS	x	x		x
Chrysothamnus teretifolius	NS	x	x		
Chrysothamnus viscidiflorus ssp. *viscidiflorus*	NS	x			
Cirsium occidentale var. *californicum*	NBH	x_R			
Encelia actoni	NPHS	x			
Ericameria cooperi var. *cooperi*	NS	x			
Erigeron aphanactis var. *aphanactis*	NPH	x			
Eriophyllum pringlei	NAH	x			
Layia glandulosa	NAH	x	x		
Malacothrix sonchoides	NAH	x			
Solidago sp.	NPH			x	
Stephanomeria parryi	NPHS	x			x
Stephanomeria sp.	NAH	x			
Tetradymia axillaris var. *longispina*	NS	x			
Tetradymia glabrata	NS	x			
Betulaceae					
Betula occidentalis	NT			x	

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Boraginaceae					
Amsinckia lycopsoides	NAH	x			
Amsinckia tessellata var. *tessellata*	NAH	x			x
Cryptantha circumscissa	NAH	x			x
Cryptantha confertiflora	NPH	x			
Cryptantha micrantha	NAH	x			x
Cryptantha pterocarya	NAH	x			
Cryptantha simulans	NAH	x			x
Pectocarya setosa	NAH	x			
Brassicaceae					
Arabis holboellii var. *retrofracta*	NPH	x			
Arabis pulchra var. *gracilis*	NPH	x			
Arabis pulchra var. *pulchra*	NPH	x			
Caulanthus pilosus	NBH	x	x		
Descurainia incisa	NAH				x
Lepidium fremontii var. *stipitatum*	NPH	x			
Thelypodium milleflorum	NBH	x_R	x		
Thysanocarpus curvipes	NAH	x			
Cactaceae					
Opuntia basilaris var. *basilaris*	NPH$	x			
Chenopodiaceae					
Atriplex canescens ssp. *canescens*	NS	x	x		
Grayia spinosa	NS	x	x		
Salsola tragus	IAH				x
Fabaceae					
Astragalus purshii var. *tinctus*	NPH				x
Lotus oblongifolius var. *oblongifolius*	NPH			x	
Lupinus argenteus var. *heteranthus*	NPH	x		x	
Lupinus microcarpus	NAH	x			
Psorothamnus arborescens var. *minutifolius*	NS	x			
Vicia americana var. *americana*	NPHV			x	
Hydrophyllaceae					
Phacelia curvipes	NAH	x			
Phacelia fremontii	NAH	x			
Phacelia saxicola	NAH	x			

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Hyperaceae					
Hypericum formosum var. *scouleri*	NPH			x	
Lamiaceae					
Monardella odoratissima ssp. *odoratissima*	NPHS	x_R			
Salvia columbariae	NAH	x_R			
Salvia dorrii var. *pilosa*	NS	x			
Loasaceae					
Mentzelia albicaulis	NAH	x			x
Mentzelia congesta	NAH	x			
Mentzelia obscura	NAH	x	x		x
Mentzelia veatchiana	NAH	x	x		
Malvaceae					
Sphaeralcea ambigua var. *rugosa*	NPH	x	x		
Nyctaginaceae					
Mirabilis bigelovii var. *bigelovii*	NPHS	x_R	x		
Onagraceae					
Epilobium saximontanum	NPH			x	
Oenothera caespitosa ssp. *marginata*	NPH	x			
Polemoniaceae					
Eriastrum sparsiflorum	NAH	x			
Gilia brecciarum ssp. *brecciarum*	NAH	x			
Polygonaceae					
Centrostegia thurberi	NAH	x			
Chorizanthe brevicornu var. *spathulata*	NAH	x			x
Chorizanthe watsonii	NAH	x			
Eriogonum esmeraldense var. *esmeraldense*	NAH	x			
Eriogonum fasciculatum var. *polifolium*	NS	x			
Eriogonum inflatum var. *inflatum*	NPH	x			
Eriogonum maculatum	NAH	x			x
Eriogonum nudum var. *westonii*	NPH	x			
Eriogonum pusillum	NAH	x			
Eriogonum umbellatum var. *nevadense*	NS	x	x		
Polygonum cf. *lapathifolium*	NAH			x	

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Ranunculaceae					
Delphinium parishii ssp. *parishii*	NPH	x			
Rhamnaceae					
Rhamnus rubra	NS		x		
Rosaceae					
Coleogyne ramosissima	NS	x			
Prunus andersonii	NS	x			
Purshia tridentata	NS	x	x		
Rosa woodsii var. *ultramontana*	NS	x		x	
Rubiaceae					
Galium multiflorum	NPHS	x_R			
Salicaceae					
Salix exigua	NT	x			
Salix lasiolepis	NT	x			
Scrophulariaceae					
Castilleja angustifolia	NPH	x			
Castilleja miniata ssp. *miniata*	NPH			x	
Penstemon cf. *floridus*	NPH		x		
Cyperaceae					
Carex serratodens	NPGLE			x	
Scirpus diffusus	NPGL			x	
Juncaceae					
Juncus balticus	NPGL			x	
Juncus sp.	NPGLE			x	
Liliaceae					
Smilacina stellata	NPGL			x	
Zigadenus venenosus var. *venenosus*	NPGL	x			
Orchidaceae					
Platanthera hyperborea	NPGL			x	

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Poaceae					
Achnatherum hymenoides	NPG	X	X		
Achnatherum speciosum	NPG	X	X		
Aegilops cylindrica	IAG		X		X
Bromus hordeaceus	IAG	X	X		X
Bromus madritensis ssp. *rubens*	IAG	X			X
Bromus tectorum	IAG	X	X	X	X
Bromus trinii	IAG	X			
Hordeum jubatum	NPG	X	X		
Melica geyeri	NPG	X_R			
Muhlenbergia andina	NPG			X	
Poa cusickii ssp. *cusickii*	NPG	X			
Poa fendleriana ssp. *longiligula*	NPG	X			
Poa pratensis ssp. *pratensis*	IPG			X	
Poa secunda ssp. *secunda*	NPG	X			
Vulpia octoflora var. *hirtella*	NAG	X			

key to growth habit codes:

A	annual
B	biennial
E	*emergent*
G	grass
GL	grass-like
H	herb
HS	half shrub
I	introduced
N	native
P	perennial
S	shrub
T	tree

X_R Occurrence restricted to rocky areas on steep west-facing slope

Botanical Survey Report for the Proposed Paradise Subdivision

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Botanical Survey Report for the Proposed Paradise Subdivision

June 20, 2004

Introduction

A botanical survey was performed where subdivision of 53.4 acres of privately owned property ("study area") has been proposed. The study area is located near the town of Paradise (a.k.a. "Paradise Camp"), within Section 29, SW ¼, T5S, R31E in Mono County, California (Figure 1). Land within the study area is now undeveloped and open, and it abuts mainly BLM and LADWP lands that are managed as open space. The town of Paradise, where there is existing and ongoing development of privately owned parcels for mountain cabin and ranch style housing, is located to the west across Lower Rock Creek. Regionally, the Paradise area is associated with the steeply sloping eastern flank of the central Sierra Nevada Range. The purpose of the botanical survey was to determine if rare plant species are present, and to describe existing vegetation that would be subject to disturbance if the property is subdivided to create 53 lots for single family home sites.

The average elevation of the area surveyed is 5120 ft (1560 m). The local climate at this elevation is montane. About 50% of the annual precipitation falls as snow (Mono County Planning Department, 1993). The average winter temperature is 32° F. The frost-free growing season is about 150 days. The average air temperature during summer months is 70° F (Natural Resource Conservation Service, 1996). During the annual growing season, the normal pattern of moderate daytime temperatures, low humidity, and long xeric periods can be interrupted by late summer thunderstorms.

Lots proposed for development are located between the elevations of 5100 ft and 5340 ft (average elevation of housing would be 5220 ft), on slopes that average about 10-15%. Lower Rock Creek intersects the extreme northwest corner of the property, outside the area proposed for development and at a substantially lower elevation of 5010 ft. Proposed open space totaling 17.1 acres would be designated on the lowermost portion of the 10-15% slope area, and an additional 7.6 acres would be designated on a steep west-facing slope (30-40%) that is located in a buffer-like position between the proposed housing and Lower Rock Creek (Figure 2). Slopes across the study area are thus mainly moderate and southwest-facing, with the exception being the steep west-facing slope. Disturbance of plants in the moderate (10-15%) slope area would be associated with construction of roads, water and sewer infrastructure, and there would be permanent conversion of up to 30 acres of currently vegetated scrublands to impervious surfaces and introduced landscaping. Disturbances to vegetation at the steep west-facing slope and the riparian area would be created during development of the water system, and by proposed trails that would access Lower Rock Creek from the new housing above.

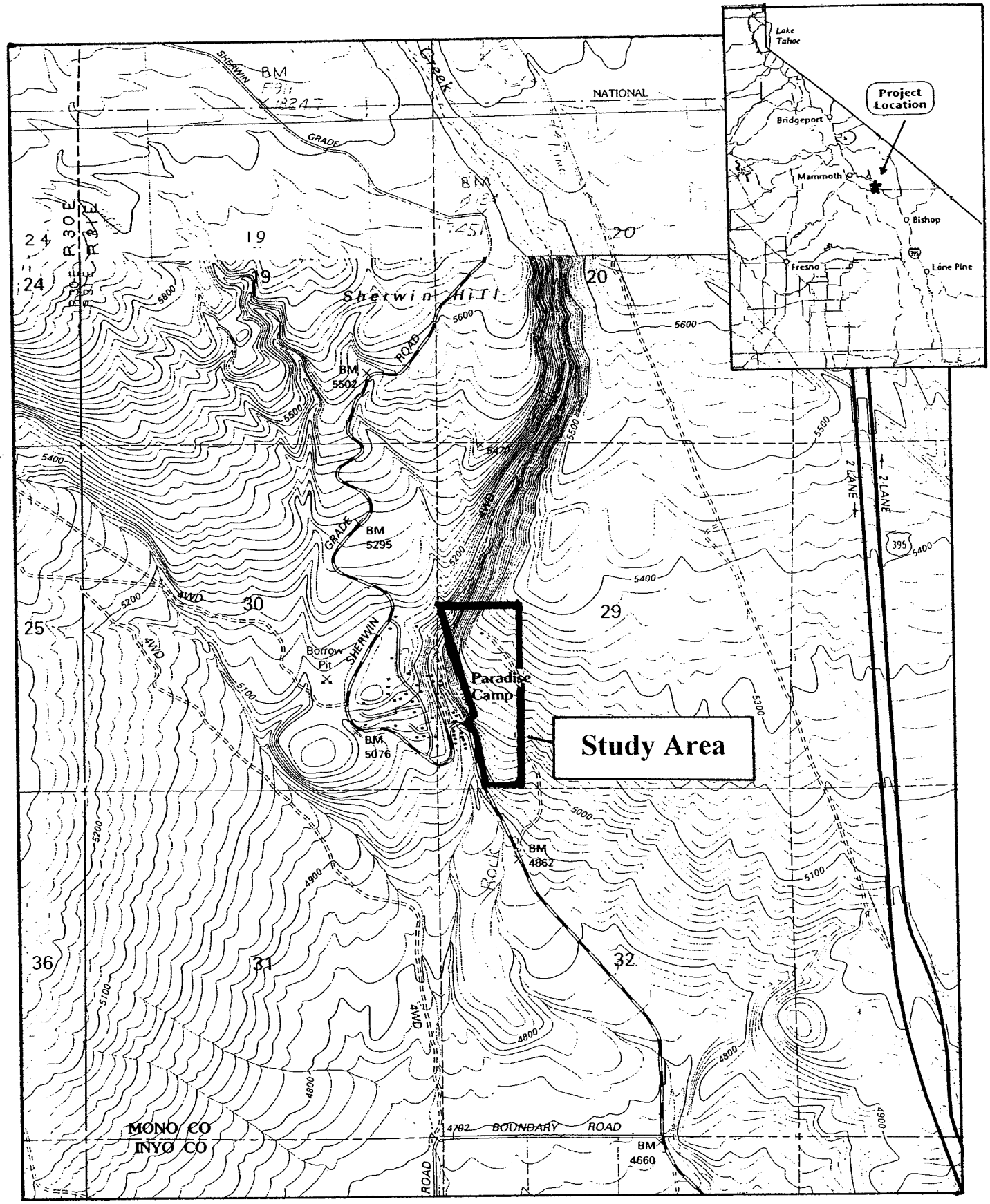

Figure 1. Map showing the study area at the proposed Paradise 53.4 ac Subdivision near Paradise, California.

Literature Search

A list of eight rare plant species that could have some potential to occur within the study area was compiled. All are herbaceous perennials (Table 1). These species are *Arabis cobrensis* (Masonic rock cress), *Arabis dispar* (pinyon rock cress), *Astragalus johannis-howellii* (Long Valley milkvetch), *Astragalus lemmonii* (Lemmon's milkvetch), *Astragalus monoensis* var. *monoensis* (Mono milkvetch), *Hulsea vestita* ssp. *inyoensis* (Inyo hulsea), *Mentzelia torreyi* (Torrey blazing star), and *Thelypodium integrifolium* ssp. *complanatum* (foxtail thelypodium). These potentially occurring rare plant species, and potentially occurring rare plant communities, were identified during a review of available regional data (Mono County Planning Department, 1993, California Native Plant Society (CNPS), 2001, 2004, California Department of Fish and Game (CDFG), 2003a, 2004a, 2004b), published regional floras (Cronquist, *et. al.*, 1984, Hickman, 1993), environmental documents for recent area projects (Paulus 1997, 2002, 2003a, Quad Knopf, 2002), and a March 2004 search of the California Natural Diversity Database records for the Rovana and Mt. Diablo Quadrangles (CDFG, 2004c). Potentially occurring rare species were also drawn from the current sensitive and watch lists prepared by the local BLM (Halford and Fatooh, 1994) and Inyo National Forest offices (U.S. Forest Service, 1998a, 1998b).

Field Surveys

Thorough field searches for rare plants were conducted on April 15-17, May 1-5, and June 1-2, 2004, with preliminary visits to map plant communities on March 14-15, 2004. The months of April through June are within the normal anthesis periods for all potentially occurring rare plants (Table 1). Unusually warm weather that began in March accelerated plant growth in early spring 2004, especially within the study area's upland scrub vegetation. Upland annuals were nearing complete senescence when survey work was concluded in June, and work then was concentrated on assessing relatively late-developing riparian vegetation along Lower Rock Creek. On all dates, rare plant search transects were walked across the study area slowly, while wandering side-to-side to view areas around and under the canopies of larger plants. Transects were centered every 50-100 feet in scrub habitats (ca. 3 mile total transect length) by navigating cross-slope to GPS waypoints established along the eastern property edge and at the western edge of the proposed housing. The steep west-facing slope was searched on contour in a similar way. Transect spacing was very dense amid the narrow riparian zone, where the plant community corridor was searched from the (entire) perimeter, with incursions to investigate all subcanopy and canopy gap populations.

All plant species encountered were identified (Appendix A). Any species that were not at once recognized were keyed by the consulting botanist using the Jepson Manual (Hickman, 1993). Plants were identified to the level of taxa sufficient to determine rare species presence or absence. The site's plant community descriptions were developed by recording the relative frequencies and average height of dominants at 43 points, using a modified point-quarter method (Brower and Zar, 1984). Communities were classified using the CDFG (2003a) naming system. Community classification numbers were cross-referenced (Table 2) to the Holland (1986) system. James Paulus of Bishop, California, performed all survey work, totaling 74 hours.

Table 1. Rare plant species that could potentially occur within the proposed Paradise subdivision. Flowering period data is from CNPS (2001). NL = not listed.

Scientific Name Common Name Life Form	Rank or Status[1]					Habitat	Flowering Period
	USFWS	DFG	USFS	CNPS	NDDB		
Arabis cobrensis Masonic rock cress herbaceous perennial	NL	NL	NL	2	S1-S2	sagebrush scrub	June-July
Arabis dispar pinyon rock cress herbaceous perennial	NL	NL	W	2	S2.3	pinyon-juniper woodland	March-June
Astragalus johannis-howellii Long Valley milkvetch herbaceous perennial	NL	R	W	1B	S2.2	sagebrush scrub	June-August
Astragalus lemmonii Lemmon's milkvetch herbaceous perennial	SC	NL	NL	1B	S2.2	alkaline scrub, meadow	May-August
Astragalus monoensis var. *monoensis* Mono milkvetch herbaceous perennial	SC	R	S	1B	S2.2	open scrub or forest, pumice	June-August
Hulsea vestita ssp. *inyoensis* Inyo hulsea herbaceous perennial	SC	NL	W	2	S1.2	pinyon-juniper woodland	April-June
Mentzelia torreyi Torrey blazing star herbaceous perennial	NL	NL	NL	2	S2.2	pinyon-juniper woodland	June-August
Thelypodium integrifolium ssp. *complanatum* foxtail thelypodium herbaceous annual/perennial	NL	NL	NL	2	S2.2	scrub, alkaline soils	June-October

1. **USFWS** = US Fish and Wildlife Service status under the Endangered Species Act (CDFG, 2004a)
   SC = species of concern (former C1/C2, as listed by the Sacramento USFWS office)
   DFG = California Department of Fish and Game listings under the Native Plant Protection Act and the California Endangered Species Act (CDFG, 2004a).
   R = Rare
   USFS = US Forest Service, Inyo National Forest, Bishop Office (1998a, 1998b)
   S = Sensitive List, June 1998 W = Watch List, December 1998
   CNPS = California Native Plant Society listings (CNPS, 2001, 2004)
   1B = rare and endangered in Calif. and elsewhere
   2 = rare, threatened or endangered in California, but more common elsewhere
   NDDB = California Natural Diversity Data Base rankings by the CDFG (CDFG, 2004b)
   S1 is < 6 occurrences or < 1000 individuals or < 1000 acres
   S2 is 6-20 occurrences or 1000-3000 individuals or 2000-10000 acres
   "threat numbers" follow decimal: .1 = very threatened, .2 = threatened, .3 = no threat currently known, ? indicates CNDDB uncertainty in status.

Plant Communities and Species

The areas proposed for subdivision and for construction of sewage facilities and a new paved access road from Lower Rock Creek Road support a contiguous stand of open scrub vegetation that is classified as High Desert Blackbush Scrub (Figure 2). A somewhat modified assemblage also classified as High Desert Blackbush Scrub was mapped on the steep west-facing slope. The community Big Sagebrush Scrub has developed on thin strips of more level terrain located west of the Lower Rock Creek riparian zone and between the base of the steep slope and Lower Rock Creek Road. The relatively small portion of the study area that is immediately adjacent to Lower Rock Creek is classified as Water Birch Riparian Scrub (Table 2).

The High Desert Blackbush Scrub and Big Sagebrush Scrub communities are considered common and widespread throughout the Great Basin Floristic Province and on the eastern slopes of the Sierra Nevada. High Desert Blackbush Scrub occurs in the study area as a rather diverse assemblage, and thus could be characterized as a blackbush-dominated variant of the regional catch-all community type Great Basin Mixed Scrub. Big Sagebrush Scrub in the study area is relatively uniform. It is differentiated by its greater structural complexity, its transitional location in the landscape, and to some degree by its species assemblage. Water Birch Riparian Scrub is a water birch-dominated variant of Great Basin Riparian Scrub, as defined by Holland (1986). The Water Birch Riparian Scrub plant community occurs as a continuous but narrow corridor within the Lower Rock Creek riparian zone both upstream and downstream from the study area. While known to be locally "widespread" at Lower Rock Creek (CDFG, 2003b, 2004c, Paulus, 2003b), Water Birch Riparian Scrub is regionally confined to relatively small or patchy habitats, and is considered rare by the State of California (CDFG, 2003a).

Table 2. Plant communities found within the proposed Paradise housing subdivision study area.

Plant Community Name[1]	Holland Number[2]	CNDDB Number[1]	Acreage in Study Area
High Desert Blackbush Scrub	34300	33.020.00	52.0
Big Sagebrush Scrub	35210	35.110.00	1.3
Water Birch Riparian Scrub	63510	63.610.00	0.1

1. Taken from classification presented by CDFG (2003b)
2. Taken from Holland (1986)

Transitions in species composition that signal plant community boundaries are abrupt within the study area. Intervening or ecotone-like Wet or Dry Montane Meadow communities were not found between the upland and riparian scrub types, likely due to the steepness and rockiness of the surrounding slopes that fall almost to the water's edge. Disturbance patterns also appear to enforce stark boundaries in the riparian zone, as outer edges of the thicket-like Water Birch Riparian Scrub community are visually defined by well-traveled "fishing trails".

All plant communities within the study area exhibit scattered signs of past and ongoing human use and associated vegetation disturbance. High Desert Blackbush Scrub exhibits the least ongoing disturbance overall, but does appear to be recovering from (incomplete) burning that occurred 20-30 years ago. Two unpaved roadways that cross the study area, totaling less than 1 acre of surface area, were judged to be in current use where they pass through either High Desert Blackbush Scrub or Big Sagebrush Scrub. The moderately to highly disturbed scrub vegetation at abandoned firebreaks and roadways, including the one existing scrape that traverses up the steep west-facing slope, is recovering to relative species frequencies (but not yet total cover) that are similar to the surrounding less disturbed scrub.

High Desert Blackbush Scrub

Upland community type

Vegetation on dry slopes was assigned the classification High Desert Blackbush Scrub (33.020.00, as per CDFG, 2003). Shrubs with stiff (but usually not thorny) habit are clearly dominant. Mature blackbush (*Coleogyne ramosissima*) usually forms 40-60% of the diverse shrub canopy. Blackbush attains 80% dominance on lower slopes within the southern half of the study area and widely to the south off-site, and gains similar canopy prominence on the slopes adjacent to the north (upslope) and east (cross-slope) edges of the study area. The average height of High Desert Blackbush Scrub is 2 ft, and total cover is rarely greater than 10%. Average cover as high as 20% is found only on the lowest slopes in the area proposed for the new approach road, where blackbush assumes dominance greater than 50%. Although slightly incised channels and recent scour marks indicate that flows cross (at least ephemerally) through areas mapped as scrub, no changes in species frequencies or changes in abundances that could be associated with wetter habitats were observed there.

Most of the habitat occupied by High Desert Blackbush Scrub (45 of 52 total acres) slopes moderately, and includes widespread areas of shallow soil profile. Soil depth appears to strongly influence the shrub species assemblage, average height, and total cover development. While blackbush is the most ubiquitous canopy species in scrub areas outside the influence of the riparian corridor, High Desert Blackbush Scrub also includes areas where blackbush is not the clearly dominant shrub. Mountain monardella (*Monardella odoratissima*), wishbone bush (*Mirabilis bigelovii*), and several native buckwheat perennial herbs and shrubs (*Eriogonum* spp.) are more important in smaller areas where the tuff parent material is nearest (or at) the soil surface. Big sagebrush (*Artemisia tridentata*) averaging 1-2 ft in height may patchily attain numerical dominance where soils are deeper. Similarly, rubber rabbitbrush (*Chrysothamnus nauseosus*), green rabbitbrush (*C. teretifolius*), and curl-leaved rabbitbrush (*C. viscidiflorus* ssp. *viscidiflorus*) usually are sub-dominant, but subcommunity-sized patches of up to 40% relatively frequency were recorded for each of these species. Blackbush, rabbitbrush, and big sagebrush widely co-dominate the northern, upslope half of the area, which is the area that would be most impacted by home construction. The patchiness of dominants in this case could be soil-related, but such a pattern also is typical of the appearance of a post-fire sere. Similar post-fire or other patch-sized successional mosaics are common on slopes around the nearby Round Valley.

The steep west-facing slope, which is proposed to be reserved as open space (Figure 2), includes 6.8 acres (of 52 total acres) of habitat occupied by High Desert Blackbush Scrub. A few species that are minor components (or were absent) in the widespread assemblage where housing is proposed are clearly increased in abundance (or restricted to occurring) there. Cut-leaved thelypody (*Thelypodium laciniatum*), brickellbush (*Brickellia microphylla*), California thistle (*Cirsium occidentale* var. *californicum*), and chia (*Salvia columbariae*) grow only from cracks in outcrops and in areas of intense groundcreep. Where soil and rockfall have accumulated, desert peach (*Prunus andersonii*), four-wing saltbush (*Atriplex canescens*), and antelope bitterbrush (*Purshia tridentata*) join with big sagebrush and blackbush to form a thin canopy, providing 5-10% total cover. Trees are absent from High Desert Blackbush Scrub, except for two stunted singleleaf pinyon pine (*Pinus monophylla*) that were found on the steep west-facing slope.

Native perennial grassses are consistently present between the shrubs, but always at relatively low frequencies. The most common upland scrub species include Cusick bluegrass (*Poa cusickii* ssp. *cusickii*), foxtail barley (*Hordeum jubatum*), and two needlegrasses (*Achnatherum hymenoides* and *A. speciosum*). By far the most abundant grass in 2004 was the introduced annual cheatgrass (*Bromus tectorum*). Cheatgrass formed dense stands like carpets under and between shrub canopies in 2004. Cheatgrass is present throughout the study area. It achieves lower abundance only on the steepest and rockiest slopes, and in deep leaf litter immediately adjacent to Lower Rock Creek. Skeletal plant remains from the relatively wet 2003 growing season attest to the well-established cheatgrass seedbank at this site, but also suggest that a great variety of native annuals are present. The stand of native annuals was overall thinner in 2004, with white tidytips (*Layia glandulosa*), Fremont yellow throats (*Phacelia fremontii*), Great Basin woollystar (*Eriastrum sparsiflorum*), Nevada gilia (*Gilia brecciarum* ssp. *brecciarum*), blazing star (*Mentzelia obscura*), cushion cryptantha (*Cryptantha circumscissa*), spotted buckwheat (*Eriogonum maculatum*), and moth combseed (*Pectocarya setosa*) being the most common of the native annuals.

Big Sagebrush Scrub
Transitional community type

Blackbush and many of the subdominant canopy species with stiff habits that are typical of High Desert Blackbush Scrub in the study area are absent at two locations near Lower Rock Creek, where the vegetative cover averages 50% (Figure 2) and big sagebrush (*A. tridentata*) averaging 4 ft in height contribute the majority (50-60%) of the canopy. These two relatively dense and tall stands were classified as Big Sagebrush Scrub (35.110.00). Average Big Sagebrush Scrub community height is 4 ft, however scattered Sierra coffeeberry, which reach 10 ft in height, and the close proximity of riparian corridor trees (see below) add greater structural character. Large talus boulders account for most of the canopy gaps. The presence of scattered wild rose (*Rosa woodsii*) and narrow-leaved willow (*Salix exigua*) stems, and the community's location on relatively level ground near a perennial stream channel, suggests that episodic or seasonal groundwater elevation increases do play a role in maintaining the current Big Sagebrush Scrub assemblage.

Herbaceous plants were generally not prominent within Big Sagebrush Scrub in 2004. Herbs and grasses found in greater abundance in High Desert Blackbush Scrub were present at low frequencies in Big Sagebrush Scrub. Open soil habitat availability is limited. Talus is so dense in much of the community that parallels Lower Rock Creek Road that habitat for herbs is sparse. Ongoing disturbance, which is mainly due to the adjacent paved road (southern stand) and to a trail highly used for mountain bicycling and for fishing access (northern stand, along Lower Rock Creek) is associated with a higher diversity of non-native colonizers. As in High Desert Blackbush Scrub, non-native bromes (*Bromus* spp.), especially cheatgrass, were abundant in 2004. The non-native annual Russian thistle (*Salsola tragus*), which has apparently not invaded other communities within the study area, was found throughout Big Sagebrush Scrub in 2004.

Water Birch Riparian Scrub
Wetland community type

Surface water was encountered within the study area at Lower Rock Creek only. The perennial flow there is currently subject to partial diversion (for municipal water consumption) within the stream reach that crosses the study area. Narrow strips of stream bank and exposed bed immediately adjacent to the flowing water were classified as Water Birch Riparian Scrub (63.610.00). This "corridor" community ranges between 20 ft and 40 ft wide, and its occurrence in the study area is completely within the area proposed as open space (Figure 2). Changes in species composition are abrupt and complete at the community's outer edges. The presence of a coniferous overcanopy and riparian understory trees visually distinguishes Water Birch Riparian Scrub. All trees are native species. A total of five Jeffrey Pine (*Pinus jeffreyi*), averaging 50 ft tall and 24-36 inch dbh, occur within the small segment of corridor that intersects the study area. Water birch (*Betula occidentalis*) to 10 ft tall, arroyo willow (*Salix lasiolepis*) and narrow-leaved willow (*S. exigua*) form a dense subcanopy that shades Lower Rock Creek.

Dense birch and willows, when combined with a wild rose understory, can make this community impassable, despite its narrowly corridor-like character within the study area. The tree canopy provided by understory birch and willows is nearly continuous, as these rapidly growing species have filled in much of the bank area that was disturbed when water diversions structures were installed. Any new disturbance to narrow strip of Water Birch Riparian Scrub in the study area would have a high likelihood of creating (at least) temporary, discontinuous subcanopy gaps. Existing gaps provide small, less shaded habitats along the water's edge. They support vigorous populations of spreading perennials such as wild rose, false Solomon's seal (*Smilacina stellata*), and green bog orchid (*Platanthera hyperborea*). In all, 22 of the 24 species found in Water Birch Riparian Scrub are classified by Reed (1988) as FAC, FACW, or OBL with regard to wetland indicator status (Jeffrey pine and cheatgrass are the two exceptions).

No evidence of riparian disturbance due to grazing by range cattle was detected. The herbaceous groundcover is continuous, except in the deepest shade and where fishing trails approach the stream. Emergent twotooth sedge (*Carex serratodens*) are often dense, and help to stabilize the bank. In general, a high degree of native character has been maintained. The widely spread Kentucky bluegrass (*Poa pratensis* ssp. *pratensis*) is one of only two non-native species

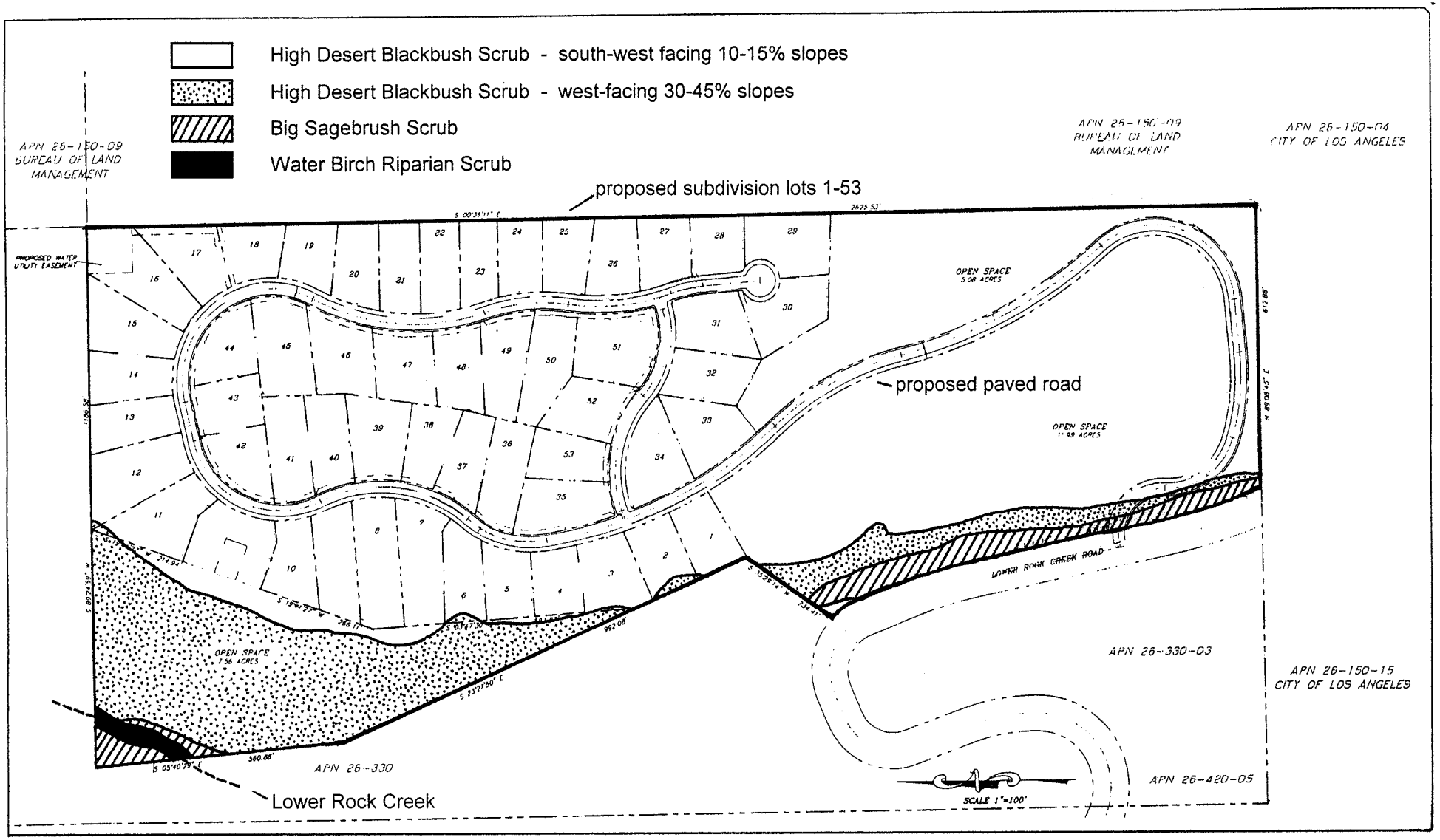

Figure 2. Plant communities mapped in 2004 within the study area for the proposed Paradise Housing Subdivision project. Project elements are overlain on the communities, which include High Desert Blackbush Scrub, Big Sagebrush Scrub, and Water Birch Riparian Scrub.

that were found in Water Birch Riparian Scrub, the other is cheatgrass. Leaf litter falling from the overstory Jeffrey pine and other trees has often accumulated deeply and may, with the increased degree of shading, explain why even cheatgrass is nearly absent.

Rare plant communities and species

One known on-site occurrence of a rare plant community was found during the literature search. Water Birch Riparian Scrub was documented in CNDDB records as occurring in 1994 and 1998 along Lower Rock Creek, including the section intersected by the study area. The extent of this occurrence within the study area was verified and mapped during field surveys in 2004 (see community description). Two stands of Water Birch Riparian Scrub, which are located upstream of the study area at 6900-7200 ft and were used for the community description by T. Keeler-Wolf (Sawyer and Keeler-Wolf, 1995), were visited for comparison with the stand that crosses through the study area. Both are associated with perennial surface flow, and the list of species given by T. Keeler-Wolfe, and that was observed by this author in 2004, is very similar to the riparian corridor vegetation that was classified in the study area as Water Birch Riparian Scrub.

No known occurrences of rare plant species within the study area were uncovered during the literature search. Recent CNDDB records (CDFG, 2004c) indicate that five rare species (two *Mentzelia torreyi* occurrences, and one occurrence each of *Arabis dispar*, *Hulsea vestita* ssp. *inyoensis*, and *Thelypodium integrifolium* ssp. *complanatum*) occur within 5 miles of the study area. No rare plants were found within the study area during searches in April, May, and June 2004. The upland and streamside habitats that were classified as High Desert Blackbush Scrub, Big Sagebrush Scrub, and Water Birch Riparian Scrub, and the limited disturbed areas, support only non-native species and native species that are considered common in the Long Valley, Round Valley, and Owens Valley areas.

Two *Arabis* species that were found within the study area share broadly cruciferous characters that could allow confusion with either of the potentially occurring rare species *A. cobrensis* or *A. dispar*. The common species that occurred within the study area were routinely distinguished from the potentially occurring rare species as follows: Both *A. holboellii* and *A. pulchra* exhibited violet to purple petals, in contrast to the white petals expected for *A. cobrensis*. In the Long Valley area, this species typically occurs among stands of big sagebrush (A. Halford, pers. comm.). The nearest known *A. cobrensis* population occurs nearly 20 miles to the north, in Big Sagebrush Scrub at an elevation of 7100 ft (Paulus, 2003a). Plants in this population were observed to be highly branched, in contrast to the single-stemmed plants consistently found in the study area. Mature fruits were available during the survey period, allowing for rapid observation of seed arrangement within fruit. Plants with two rows of seeds in each chamber were *A. pulchra*, as other potentially occurring *Arabis* would have only one row of seeds in each chamber. The nearest known population of *A. dispar* documented by CNDDB occurs in "Mohave Desert Scrub" 4 miles to the northwest at 8000 ft elevation (plants in this population also were described as "multi-branched"). *A. holboellii* var. *retrofracta* was firmly distinguished from *A. dispar* by its

reflexed fruit arrangement. The fruits were consistently appressed closely to the inflorescence axis, which contrasts sharply with the ascending fruit expected of *A. dispar*. The spreading fruit exhibited by *A. pulchra* var. *gracilis* were sparsely hairy, and were never held in what would be considered ascending arrangement once the fruit matured. No members of the genus *Arabis* with *A. dispar's* combination of ascending, glabrous fruit were found.

One member of the genus *Astragalus*, a single individual of the perennial *A. purshii* var. *tinctus*, was found growing in recently disturbed soil within Big Sagebrush Scrub. This specimen exhibited purple petals and "cotton-ball" fruit with tangled long and wavy hairs. It was readily distinguished from the three potentially occurring rare species of *Astragalus* – *A. johannis-howellii*, *A. lemmonii*, and *A. monoensis* var. *monoensis*: Fruit produced by *A. johannis-howellii* would be expected to be glabrous-appearing, and those produced by *A. lemmonii* and *A. monoensis* var. *monoensis* would have glabrous to sparsely short-hairy fruit. The nearest known occurrence of *A. lemmonii* is at Hilton Creek, ten miles to the northwest at 6900 ft (2100 m). It occurs there in streamside Wet Montane Meadow habitat. Populations of *A. lemmonii* have also been associated with scrub or alkaline meadow soils in the Long Valley Area. The nearest known *A. johannis-howellii* populations occur in dry scrub habitat 15 miles north of the study area, across Crowley Lake in volcanic, gravelly pumice soil at 6800 ft (2070 m). Pumice soils were not found in the study area.

Inyo hulsea (a.k.a. "beautiful hulsea") is a relatively showy plant that is typically found in forest gaps. The nearest known occurrence of *H. vestita* ssp. *inyoensis* is in forested habitat 2.8 miles to the northwest at an elevation of 6600 ft. No members of the genus *Hulsea* were found, nor were any woolly-hairy, thick-leaved composites with radiate heads that could be confused with *H. vestita* ssp. *inyoensis*.

All four members of the genus *Mentzelia* found within the study area are small, common annual species. Mentzelia found within the study area exhibited small-minutely toothed or lobed leaves, and all were nearing complete senescence at the time of the June survey. The potentially occurring *M. torreyi*, in contrast, is a perennial plant that maintains at some herbage throughout the growing season. The nearest known populations of *M. torreyi* occur on steep, mainly west-facing volcanic slopes above Lower Rock Creek, 0.5 miles and 1.8 miles upstream to the north of the study area. Similar volcanic soils and loose rocky slopes are present within the study area, especially at the steep, west-facing slope that is proposed as open space between the new housing and Lower Rock Creek. Careful searching of this slope did not detect any *M. torreyi* occurrence, and no (perennial) *Mentzelia* exhibiting long-lobed leaves were found within the study area.

The perennial herb *Thelypodium integrifolium* ssp. *complanatum* probably reaches the southern extent of its distribution near the study area. The nearest known population (last observed in 1936, according to CNDDB records) is located in the Sherwin Summit area, at 7000-8000 ft. More well-known occurrences to the north indicate that the species is typically found in scrub, especially near meadow margins and in alkaline soil types. *Thelypodium laciniatum*, a common species observed in steeper and rockier portions of the study area, was distinguished from the potentially occurring *T. integrifolium* by the shape of the largest, basal leaves. Leaves of the common *T. lanciniatum* observed in the study area were widest near the petiole, and were always deeply lobed to compound. The widest point of the rare *T. integrifolium*'s leaves would be at the middle or near the tip away from the petiole, and their margins would be entire or nearly so. The absence of alkaline soil or meadow habitats from the study area would tend to exclude

this species, and would certainly exclude other rare plants that are associated with alkaline meadow habitats in the Owens Valley area, such as *Crepis runcinata* ssp. *hallii*, *Sidalcea covillei*, and *Calochortus excavatus*..

During the transect surveys, sign of light use by deer was seen throughout the property. High deer use areas were observed to be concentrated in scrub atop the upper edge of the steep west-facing slope, and along trails leading from there down to Lower Rock Creek. No areas used for grazing of cattle were found. Annual plants were common but not abundant (excepting cheatgrass) in 2004, while perennial herbs and most shrub species bloomed and set seed during the survey period. It is concluded that grazing activity and climate did not influence the ability to detect rare plants during this survey.

Conclusions

- The High Desert Blackbush Scrub and Big Sagebrush Scrub communities that will be impacted by the project are widespread and common. All plant species found during the floristic survey are likewise common. If Water Birch Riparian Scrub is completely avoided, there will be no direct or cumulative impacts to rare plant populations or species, or to plant communities that are considered rare. Measures intended to mitigate impacts to rare plant species or communities are not warranted.

- Seedbanks in all plant communities (including Water Birch Riparian Scrub) that occur within the area surveyed contain a large and self-sustaining population of the noxious weed *Bromus tectorum* (rated A-1 by CalEPPC pest listings: "the most invasive exotic plants, and are already widespread"). These seedbanks also contain a tenuously established population of the noxious weed *Salsola tragus* (rated "considered but not listed" by CalEPPC, and C by CDFA: "weeds not subject to eradication actions by the CDFA" pest listings. Measures intended to mitigate the potential spread of noxious weeds resulting from the project may be required.

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Appendix A. List of plant species occurring in the area of the proposed Paradise housing subdivision Habit summarizes the growth form of each species. Codes are defined below.

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Ephedraceae					
Ephedra nevadensis	NS	x			
Equisetaceae					
Equisetum cf. arvense	NPH			x	
Equisetum laevigatum	NPH			x	
Pinaceae					
Pinus jeffreyi	NT			x	
Pinus monophylla	NT	x			
Asteraceae					
Artemisia tridentata ssp. *vaseyana*	NS	x	x		
Artemisia douglasiana	NPH			x	
Artemisia ludoviciana ssp. *ludoviciana*	NS			x	
Brickellia microphylla	NS	x_R			
Chrysothamnus nauseosus ssp. *albicaulis*	NS	x	x		x
Chrysothamnus teretifolius	NS	x	x		
Chrysothamnus viscidiflorus ssp. *viscidiflorus*	NS	x			
Cirsium occidentale var. *californicum*	NBH	x_R			
Encelia actoni	NPHS	x			
Ericameria cooperi var. *cooperi*	NS	x			
Erigeron aphanactis var. *aphanactis*	NPH	x			
Eriophyllum pringlei	NAH	x			
Layia glandulosa	NAH	x	x		
Malacothrix sonchoides	NAH	x			
Solidago sp.	NPH			x	
Stephanomeria parryi	NPHS	x			x
Stephanomeria sp.	NAH	x			
Tetradymia axillaris var. *longispina*	NS	x			
Tetradymia glabrata	NS	x			
Betulaceae					
Betula occidentalis	NT			x	

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Boraginaceae					
Amsinckia lycopsoides	NAH	x			
Amsinckia tessellata var. *tessellata*	NAH	x			x
Cryptantha circumscissa	NAH	x			x
Cryptantha confertiflora	NPH	x			
Cryptantha micrantha	NAH	x			x
Cryptantha pterocarya	NAH	x			
Cryptantha simulans	NAH	x			x
Pectocarya setosa	NAH	x			
Brassicaceae					
Arabis holboellii var. *retrofracta*	NPH	x			
Arabis pulchra var. *gracilis*	NPH	x			
Arabis pulchra var. *pulchra*	NPH	x			
Caulanthus pilosus	NBH	x	x		
Descurainia incisa	NAH				x
Lepidium fremontii var. *stipitatum*	NPH	x			
Thelypodium milleflorum	NBH	x_R	x		
Thysanocarpus curvipes	NAH	x			
Cactaceae					
Opuntia basilaris var. *basilaris*	NPH$	x			
Chenopodiaceae					
Atriplex canescens ssp. *canescens*	NS	x	x		
Grayia spinosa	NS	x	x		
Salsola tragus	IAH				x
Fabaceae					
Astragalus purshii var. *tinctus*	NPH				x
Lotus oblongifolius var. *oblongifolius*	NPH			x	
Lupinus argenteus var. *heteranthus*	NPH	x		x	
Lupinus microcarpus	NAH	x			
Psorothamnus arborescens var. *minutifolius*	NS	x			
Vicia americana var. *americana*	NPHV			x	
Hydrophyllaceae					
Phacelia curvipes	NAH	x			
Phacelia fremontii	NAH	x			
Phacelia saxicola	NAH	x			

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Hyperaceae					
Hypericum formosum var. *scouleri*	NPH			x	
Lamiaceae					
Monardella odoratissima ssp. *odoratissima*	NPHS	x_R			
Salvia columbariae	NAH	x_R			
Salvia dorrii var. *pilosa*	NS	x			
Loasaceae					
Mentzelia albicaulis	NAH	x			x
Mentzelia congesta	NAH	x			
Mentzelia obscura	NAH	x	x		x
Mentzelia veatchiana	NAH	x	x		
Malvaceae					
Sphaeralcea ambigua var. *rugosa*	NPH	x	x		
Nyctaginaceae					
Mirabilis bigelovii var. *bigelovii*	NPHS	x_R	x		
Onagraceae					
Epilobium saximontanum	NPH			x	
Oenothera caespitosa ssp. *marginata*	NPH	x			
Polemoniaceae					
Eriastrum sparsiflorum	NAH	x			
Gilia brecciarum ssp. *brecciarum*	NAH	x			
Polygonaceae					
Centrostegia thurberi	NAH	x			
Chorizanthe brevicornu var. *spathulata*	NAH	x			x
Chorizanthe watsonii	NAH	x			
Eriogonum esmeraldense var. *esmeraldense*	NAH	x			
Eriogonum fasciculatum var. *polifolium*	NS	x			
Eriogonum inflatum var. *inflatum*	NPH	x			
Eriogonum maculatum	NAH	x			x
Eriogonum nudum var. *westonii*	NPH	x			
Eriogonum pusillum	NAH	x			
Eriogonum umbellatum var. *nevadense*	NS	x	x		
Polygonum cf. *lapathifolium*	NAH			x	

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Ranunculaceae					
Delphinium parishii ssp. *parishii*	NPH	x			
Rhamnaceae					
Rhamnus rubra	NS		x		
Rosaceae					
Coleogyne ramosissima	NS	x			
Prunus andersonii	NS	x			
Purshia tridentata	NS	x	x		
Rosa woodsii var. *ultramontana*	NS	x		x	
Rubiaceae					
Galium multiflorum	NPHS	x_R			
Salicaceae					
Salix exigua	NT	x			
Salix lasiolepis	NT	x			
Scrophulariaceae					
Castilleja angustifolia	NPH	x			
Castilleja miniata ssp. *miniata*	NPH			x	
Penstemon cf. *floridus*	NPH		x		
Cyperaceae					
Carex serratodens	NPGLE			x	
Scirpus diffusus	NPGL			x	
Juncaceae					
Juncus balticus	NPGL			x	
Juncus sp.	NPGLE			x	
Liliaceae					
Smilacina stellata	NPGL			x	
Zigadenus venenosus var. *venenosus*	NPGL	x			
Orchidaceae					
Platanthera hyperborea	NPGL			x	

Species	habit	Desert Blackbush Scrub	Big Sagebrush Scrub	Water Birch Riparian Scrub	Disturbed
Poaceae					
Achnatherum hymenoides	NPG	X	X		
Achnatherum speciosum	NPG	X	X		
Aegilops cylindrica	IAG		X		X
Bromus hordeaceus	IAG	X	X		X
Bromus madritensis ssp. *rubens*	IAG	X			X
Bromus tectorum	IAG	X	X	X	X
Bromus trinii	IAG	X			
Hordeum jubatum	NPG	X	X		
Melica geyeri	NPG	X_R			
Muhlenbergia andina	NPG			X	
Poa cusickii ssp. *cusickii*	NPG	X			
Poa fendleriana ssp. *longiligula*	NPG	X			
Poa pratensis ssp. *pratensis*	IPG			X	
Poa secunda ssp. *secunda*	NPG	X			
Vulpia octoflora var. *hirtella*	NAG	X			

key to growth habit codes:

- A annual
- B biennial
- E *emergent*
- G grass
- GL grass-like
- H herb
- HS half shrub
- I introduced
- N native
- P perennial
- S shrub
- T tree

X_R Occurrence restricted to rocky areas on steep west-facing slope

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX H

WILDLIFE RESOURCE ANALYSIS

DRAFT
SIERRA PARADISE
WILDLIFE ASSESSMENT

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December 26, 2007

DRAFT
SIERRA PARADISE
WILDLIFE ASSESSMENT

I. PURPOSE

The purpose of this report is to assess the important wildlife resources of the Sierra Paradise project site in Paradise, Mono County, California, analyze the potential impacts to those resources from development of the site, determine the level of significance of those impacts, and recommend mitigations to reduce the level of significance of the potential impacts.

II. PROPOSED PROJECT

The proposed project consists of developing a 55 home residential development, onsite sewage facilities, and roads on an approximately 54 acre site. Approximately 31 acres of the site would be developed for the project with approximately 23 acres remaining as undeveloped open space. Additional wells or roads may be developed in the undeveloped open space in the future.

The approximately 54-acre project site is located immediately east of the community of Paradise Camp, approximately one (1) mile west of Highway 395, and approximately 14 miles northwest of Bishop California. The project site is in the southwest quarter of Section 29, Township 5 South, Range 31 East on the Rovana USGS 7.5 minute topo quad. The site is in Mono County and is bordered by Bureau of Land Management (BLM) land on the north and east, private land on the west and City of Los Angeles land on the south. Lower Rock Creek crosses the northwest corner of the site; a steep slope rises from the creek to the rest of the site. The site varies in elevation from approximately 5,000 feet to 5,400 feet. The site is at the northern edge of Round Valley and is approximately two miles east of Wheeler Ridge.

III. METHODS

A. Literature and Data Review

Documentation pertinent to the general and sensitive biological resources in the vicinity of the project site was reviewed. Information reviewed included: (1) the Federal Register listing package for each federally listed endangered or threatened species potentially occurring on site; (2) literature pertaining to habitat requirements of special status species potentially occurring on the site; (3) California Natural Diversity Data Base (CNDDB) (RareFind2) information regarding Federal and State special status species potentially occurring on the site; (4) recent EIRs prepared for proposed projects in the region, (5) Riparian Bird Conservation Plan (RHJV 2003) and (6) Owens Basin Sensitive Wetland and Aquatic Species Management Guidelines Plan.

The California Natural Diversity Data Base was searched twice for information on special status species reported to occur on the Rovana, Casa Diablo, Bishop, Tungsten Hills, White Mountain Peak, and Fish Slough USGS 7.5 minute Topo Quads. The original search was done in June 2004 and the second search was done in August 2007.

Prior to beginning the survey of the project site, the U.S. Geological Survey (USGS) Rovana Quadrangle topographic map was examined to determine areas of potential biological resources and U.S. Army Corps of Engineers (USACE) and CDFG jurisdiction.

B. Field Surveys

Gregg Miller, terrestrial ecologist, performed field surveys of the study site on April 10, 2004 and August 18, 2007. The purpose of the surveys was to determine wildlife resources present at the study site and adjacent areas, and assess potential impacts to those resources. Surveys of the entire site were conducted on foot.

During the survey, particular focus was placed on locating sensitive biological resources including special status species and their habitats. Potential impacts to wildlife resources were assessed.

IV. EXISTING SETTING

A. General Setting

The project site is on the sloping flank of the eastern side of the Sierra Nevada mountain range. The site is in the rain shadow of the mountains the site and receives most of its annual precipitation as snow.

B. Natural Communities and Wildlife

There are three natural communities on the project site: high desert blackbush scrub, water birch riparian scrub, and big sagebrush scrub. The natural communities appear to have burned in the past and do not appear to be grazed.

High desert blackbush scrub is the major natural community on site, occupying approximately 50 acres of the site. The high desert blackbush scrub on site forms an open stand with generally less than 25% total shrub canopy cover. The shrub canopy layer is dominated by blackbush (*Coleogyne ramosissima*) and also contains mountain monardella (*Monardella odoratissima*), wishbone bush (*Mirabilis bigelovii*), big sagebrush (*Artemisia tridentata*) and several species of rabbitbrush (*Chrysothamnus* spp.). The open spaces between shrubs contain non-native cheatgrass (*Bromus tectorum*), some native grasses, and herbaceous species (forbs). The shrub canopy varies from one to three feet in height.

Water birch riparian scrub on site occurs along Lower Rock Creek in a band up to 50 feet wide. The water birch riparian scrub forms a dense stand that is dominated by water birch (*Betula occidentalis*) and willows (*Salix* spp.). There are also five Jeffrey pine (*Pinus jeffreyi*) about 50 feet in height in the riparian scrub. Water was flowing in Lower Rock Creek at the time of the field survey.

Big sagebrush scrub is found on the site in two narrow bands roughly parallel to Lower Rock Creek and bordering the water birch riparian scrub. Big sagebrush is the dominant species with wild rose (*Rosa woodsii*), Russian thistle (*Salsola tragus*), and Sierra coffeeberry (*Rhamnus rubra*) also occurring. Blackbush does not occur in this community. The sagebrush scrub is generally four to six feet in height and forms a moderately dense stand.

The natural communities form the basis of the wildlife habitats of the project area. They provide the primary plant productivity upon which wildlife depends, along with nesting and denning sites, escape cover and protection from adverse weather. Many of the wildlife species that occur in the area use several natural communities to obtain all their life history needs.

In general, more complex natural communities, with more vegetation layers and more plant species, provide higher value wildlife habitat than less complex natural communities. More complex natural communities have more niches for wildlife and usually support more animal species than less complex communities.

Vertebrate wildlife observed during the field survey include: mourning dove (*Zenaida macroura*), Steller's jay (*Cyanocitta stelleri*), white-crowned sparrow (*Zonotrichia leucophrys*), common raven (*Corvus corax*), northern flicker (*Colaptes auratus*), and black-tailed jackrabbit (*Lepus californicus*). Evidence of coyote (*Canis latrans*) was observed and sign of mule deer (*Odocoileus hemionus*) and was found throughout the site. Table 1 shows wildlife expected and observed on the site.

Although no bat surveys have been done on the project site, several species are known to occur in the immediate vicinity of the site including: fringed myotis, long-legged myotis, Yuma myotis, little brown bat, and spotted bat (P. Brown pers. comm.). These species are expected to forage above the project site, and may roost in the trees in the water birch riparian scrub or in crevices between large rocks on the project site.

Species Observed or Expected on the Sierra Paradise Site			
Common Name	**Species Name**	**Observed**	**Expected**
Western fence lizard	*Sceloporus occidentalis*		X
Sagebrush lizard	*Sceloporus graciosus*		X
Great horned owl	*Bubo virginianus*		X
Red-tailed hawk	*Buteo jamaicensis*		X
Common nighthawk	*Chordeiles minor*		X
Great blue heron	*Ardea herodius*		X
California quail	*Callipepla californica*		X
Mourning dove	*Zenaida macroura*	X	
Downy woodpecker	*Picoides pubescens*		X
Cliff swallow	*Hirundo pyrrhonota*		X
Barn swallow	*Hirundo rustica*		X
American crow	*Corvus brachyrhynchos*		X
Common raven	*Corvus corax*	X	
Black-billed magpie	*Pica pica*		X
Steller's jay	*Cyanocitta stelleri*	X	
Black-chinned hummingbird	*Archilochus alexandri*		X
Anna's hummingbird	*Calypte anna*		X
American robin	*Turdus migratorius*		X
Western bluebird	*Sialia currucoides*		X
Black-throated sparrow	*Amphispiza bilineata*		X
White crowned sparrow	*Zonotrichia leucophrys*		X
Lark sparrow	*Chondestes grammacus*		X
Song sparrow	*Melospiza melodia*		X
Lazuli bunting	*Passerina amoena*		X
California towhee	*Pipilo crissalis*		X
Spotted towhee	*Pipilo maculatus*		X
Western tanager	*Piranga ludoviciana*		X
Red winged blackbird	*Agelaius phoeniceus*		X
Brewer's blackbird	*Euphagus cyanocephalus*		X
Brown-headed cowbird	*Molothrus ater*		X
Lesser goldfinch	*Carduelis psaltria*		X
Fringed myotis	*Myotis thysanodes*		X
Long-legged myotis	*Myotis volans*		X
Yuma myotis	*Myotis yumanensis*		X
Little brown bat	*Myotis lucifugus*		X
Spotted bat	*Euderma maculatum*		X
Raccoon	*Procyon lotor*		X
Striped skunk	*Mephitis mephitis*		X
Black-tailed jackrabbit	*Lepus californicus*	X	
Mule deer	*Odocoileus hemionus*	X	

Mule Deer

Mule deer occur on the project site. They forage in the high desert blackbush scrub, water birch riparian scrub and big sagebrush scrub on site. They are expected to use the water birch riparian scrub for shelter from inclement weather and to use Lower Rock Creek as a water source.

The project site is within the winter range of the Round Valley Deer Herd (BLM 1991, CAJA 2007). The Round Valley Herd was previously identified as two herds: the Buttermilk Deer Herd and the Sherwin Grade Deer Herd.

The Round Valley Herd is a migratory herd: deer from this herd summer at high elevations (7,500ft – 11,000ft) in the Sierra's and winter at lower elevations (5,000 –7,500ft) on the east side of the mountains. The winter range of the herd is located in the lower elevations of Round Valley, extending north of Pine Creek in Inyo County into southern Mono County.

The Herd migrates quickly downslope in the fall with the onset of snow, in heavy snowfall years the fall migration can take just a few days. The spring upward migration is slower taking several weeks to a month with deer staying in several holding area for periods before migrating upslope again.

The Round Valley Deer Herd is dependent on forage in the Round Valley region in the winter. The quality and abundance of winter forage affects winter survival and herd population numbers. Deep winter snow at lower elevations reduces survivorship in the herd. In late winter and early spring (February and March) vegetation on the winter range greens up providing nutrition that is important to reproduction. Late, unavailable, or poor nutritional quality spring forage lowers reproduction.

The number of deer in the herd has varied from a high of over 6,000 in 1985 to an estimated low of 900 in the mid 1990's (Ellsworth pers. com., Pierce *et. al.* 2004). The herd was estimated to number in the range of 2,200 to 2,300 deer in 2003 (Quad Knopf 2004) and was estimated to be approximately 2,500 in 2006 (Taylor pers. com.) The decline from over 6,000 to less than 1,000 was primarily caused by poor food conditions in the Round Valley winter range (CAJA 2007). Over 10,000 acres of bitterbrush winter and spring feeding habitat, important to the Round Valley deer herd, has been lost in the last 5 years (Ellsworth 2007). The 2,700-acre Birch Fire in 2002 just north of the project site contributed to this loss (Ellsworth 2007).

C. Special Status Species and Habitats

Definitions and regulations

Special status species are native species that have been accorded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels. Sensitive habitats are those that support special status species or are under the jurisdiction of the US Army Corps of Engineers (USACE) or the California Department of Fish and Game (CDFG) due to their wetland or riparian characteristics.

Federal regulations

Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) administers the federal Endangered Species Act (ESA). The ESA was passed in 1973 and has since been amended and reauthorized. The ESA provides a process for listing species as either threatened or endangered, and methods of protecting listed species. The ESA has several major sections that are usually referred to by section number.

Species are listed as either endangered or threatened under the ESA. The ESA defines as "endangered" any plant or animal species that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is a species that is likely to become endangered in the foreseeable future. A "proposed" species is one that has been officially proposed by USFWS for addition to the federal threatened and endangered species list.

The ESA requires that all federal departments and agencies shall use their authority to conserve threatened and endangered species. Procedural rulemakings provide for interagency cooperation with USFWS in meeting the goals of the Act.

Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include disturbance to habitats used by a threatened or endangered species during any portion of its life history. The presence of any federally threatened or endangered species in a project site generally imposes severe constraints on development; particularly if development would result in "take" of the species or its habitat.

Under the regulations of the ESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act. Authorization is granted in one of three means:

- Obtain 10(a) Permit - A 10(a) permit is issued under section 10(a)(1)(b) of the ESA or any other equivalent statutory or regulatory framework designed to protect species of concern. A Habitat Conservation Plan (HCP) must be prepared and approved by USFWS prior to issuance of a 10(a) Permit.
- Participate in a Section 7 Consultation - Section 7 of the ESA requires federal agencies (conducting or authorizing the proposed action), in consultation with USFWS, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of critical habitat of endangered or threatened species. An incidental take statement is obtained resulting from the above-mentioned consultation. This statement includes conclusions from the consultation and any required mitigation measures to offset the adverse impacts of the incidental take.
- Compliance with Special Rule - Under Section 4(d) of the FESA, USFWS initiates a special rule to allow for take of threatened species only in conjunction with a state-initiated conservation plan.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act protects all native breeding birds, whether or not they are considered sensitive by resource agencies.

California State regulations

Endangered Species Act

The CDFG administers the state Endangered Species Act. The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management. And a rare species is one present in such small numbers throughout its range that it may become endangered if its present environment worsens. Rare species applies to California native plants. State threatened and endangered species are fully protected against take, as defined above.

California Fish and Game Code

All raptors and their nests are protected under Section 3503.5 of the California Fish and Game Code.

Species that are California fully protected include those protected by special legislation for various reasons, such as the mountain lion and white-tailed kite.

Management and Conservation Concerns

Species of Special Concern is an informal designation used by CDFG for some declining wildlife species that are not proposed for listing as threatened or endangered. This designation does not provide legal protection, but signifies that these species are recognized as sensitive by CDFG.
Sensitive habitats are natural communities that support concentrations of sensitive plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife. Sensitive habitats are not afforded legal protection unless they support protected species, except for wetland habitats, which cannot be filled without authorization from the U.S. Army Corps of Engineers (USACE) and CDFG.

Information on the location, status, and condition of California's endangered, threatened, rare, and sensitive plants, animals, and natural communities is maintained by CDFG's California Natural Diversity Data Base (CNDDB). This computerized database is regularly updated with current information.

Special status animals

There are thirty-five (35) special status animal species known to occur in the region of the project site. These are shown in Table 2 along with their status. A brief description of each species follows along with an assessment of their potential to occur on the project site.

Table 2
Special Status Animal Species Known to Occur in the Region of the
Proposed Sierra Paradise Project

English name	Species name	State Status	Federal Status	Other Status
INVERTEBRATES				
Wong's springsnail	*Pyrgulopsis wongi*			OBWS
Fish Slough springsnail	*Pyrgulopsis perturbata*			OBWS
Owens valley springsnail	*Pyrgulopsis owensensis*			OBWS
Aardhal's springsnail	*Pyrgulopsis aardhali*			OBWS

Table 2
Special Status Animal Species Known to Occur in the Region of the
Proposed Sierra Paradise Project

FISH				
Owens pupfish	*Cyprinodon radiosus*	SE	FE	OBWS
Owens sucker	*Catostomus fumeiventris*	CSC		
Owens tui chub	*Gila bicolor*	SE	FE	
Owens speckled dace	*Rhinichthys osculus* ssp 2	CSC		
Long Valley speckled dace	*Rhynichthys osculus* spp. 5			OBWS
AMPHIBIANS				
Yosemite toad	*Bufo canorus*	CSC	FC	
Mountain yellow-legged frog	*Rana muscosa*	CSC	FE	
Northern leopard frog	*Rana pipens*	CSC		
Mount Lyell salamander	*Hydromantes platycephalus*	CSC	FSC	
BIRDS				
Swainson's hawk (nesting)	*Buteo swainsoni*	ST	FSC	PIF
Northern goshawk (nesting)	*Accipiter gentilis*	CSC	FSC	
Prairie falcon (nesting)	*Falco mexicanus*	CSC		
Osprey (nesting)	*Pandion haliaeteus*	CSC		OBWS
Least bittern	*Ixobrychus exilis*			OBWS
Yellow rail	*Coturnicops noveboracensis*	CSC		OBWS
Western snowy plover (nesting)	*Charadrius alexandrinus nivosus*	CSC		OBWS
Yellow-billed cuckoo	*Coccyzus americanus*			PIF
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	SE	FC	PIF
Bank swallow (nesting)	*Riparia riparia*	ST	FSC	PIF
Swainson's thrush	*Catharus ustulatus*			PIF
Bell's vireo	*Vireo bellii*			PIF
Least Bell's vireo (nesting)	*Vireo bellii pusillus*	SE	FE	PIF
Warbling vireo	*Vireo gilvus*			PIF
Yellow breasted chat (nesting)	*Icteria virens*	CSC		PIF
Common yellowthroat	*Geothylypis trichas*			PIF
Willow flycatcher	*Empidonax traillii*	SE		PIF
Southwestern willow flycatcher	*Empidonax traillii extimus*	SE	FE	PIF
Yellow warbler	*Dendroica petechia*			PIF
Wilson's warbler	*Wilsonia pusilla*			PIF
Black-headed grosbeak	*Pheuticus melanocephalus*			PIF
Blue grosbeak	*Guiraca caerulea salicaria*			PIF
Song sparrow	*Melospiza melodia*			PIF
MAMMALS				
California bighorn sheep	*Ovis canadensis californiana*	SE	FE	
Owens Valley vole	*Microtis californicus vallicola*	CSC		OBWS
State Status				
SE California State Endangered				
ST California State Threatened				
CSC California Species of Special Concern				
Federal Status				
FE Federal Endangered				
FT Federal Threatened				
FPE Federal Proposed Endangered				
FPT Federal Proposed Threatened				
FC Federal Candidate for Listing				
FSC Federal Species of Concern				
Other Status				

Table 2 Special Status Animal Species Known to Occur in the Region of the Proposed Sierra Paradise Project
PIF Partners in Flight Riparian Focal Species
OBWS Owens Basin Wetland and Aquatic Species
Source: CDFG 2007, CDFG 2004b, MacMillen 1996, RHJV 2003.

Wong's springsnail

Wong's springsnail is a freshwater mollusk that is found in the Owens Valley region from the Big Pine area in the north to Little Lake in the south. Wong's springsnail inhabits springs, seeps and small spring-fed streams. Most freshwater mollusks are restricted to waters with calcium concentrations greater than 3 mg/liter, as calcium is essential to shell development.

Wong's springsnail is not expected to occur on the site due to the absence of suitable habitat.

Fish Slough springsnail, Owens Valley springsnail, Aardhal's springsnail

Fish Slough springsnail, Owens Valley springsnail and Aardhal's springsnail generally inhabit aquatic vegetation and gravel substrates in flowing water where they feed on algae (USFWS 1998). These three Owens Basin springsnails typically inhabit only springs and short sections of spring brooks with good water quality that are below 7,500 ft elevation (USFWS 1998).

Fish Slough springsnail, Owens Valley springsnail and Aardhal's springsnail may occur in Lower Rock Creek.

Owens pupfish

The Owens pupfish is a small, fish with a maximum size of about 3 inches. Males and females are easily distinguished by coloration. Pupfish occupy most available aquatic habitat where water is relatively warm and food is plentiful, using all available microhabitats. Adults tend to occur in occupy deeper water than juveniles. Owens pupfish are omnivores that consume a wide range of plant and animal foods, generally consuming food that is most abundant (USFWS 1998).

Owens pupfish were believed extinct until a single population of approximately 200 fish was rediscovered in Fish Slough in 1964 (USFWS 1998). Currently populations occur only in refuges at Fish Slough, BLM Spring, and Warm Springs where they are protected by isolating them from non-native fishes (USFWS 1998).

Owens pupfish are not expected to occur on the project site.

Owens sucker

Little is known of the life history of Owens sucker (CDFG 1995). Based on knowledge of the Tahoe sucker it is thought that Owens suckers are nocturnal feeders that eat aquatic insects, algae, detritus and inorganic matter picked off the bottom. It is also thought that Owens suckers spawn from late May to early July. Young Owens sucker larvae are usually found in quiet, sedge-dominated margins and backwater areas (CDFG 1995).

In the lower Owens River and two of its tributaries, Lower Rock Creek and Lower Hot Creek, Owens sucker adults are most abundant in sections with long runs and few riffles. The substrate

in these sections consists mostly of fine material, with lesser amounts of gravel and rubble. Adults occur in lakes and reservoirs, but presumably need gravelly riffles in tributary streams for spawning (CDFG 1995).

The Owens sucker currently occurs in Crowley and Convict Lakes in the upper Owens River drainage, Mammoth Creek and Hot Creek in Long Valley, in Bishop Creek, Rock Creek, irrigation canals near Bishop, and the Owens River through Pleasant Valley They have been found in lower Horton Creek, Lower Rock Creek and Pine Creek, and other waters near Bishop (USFWS 1998).

The Owens sucker is expected to occur in Lower Rock Creek on the project site.

Owens tui chub

Owens tui chubs prefer pool habitats with low water velocities and dense aquatic vegetation that provides adequate cover and habitat for insect food items (USFWS 1998). Prime habitat for Owens tui chub contains cool, high quality water, cover of rocks, undercut banks, or aquatic vegetation, and a sufficient insect food base.

Owens tui chub populations occur at the headsprings at Hot Creek Fish Hatchery, the Owens River downstream from Crowley Lake, the ponds at Cabin Bar Ranch near Lone Pine, and Mule Spring.

Owens tui chub are not expected to occur on the project site.

Owens speckled dace

The Owens speckled dace is a small torpedo-shaped fish usually less than 3 inches long that occurs in the Owens River drainage and the Walker River. In clear waters they have numerous black speckles over the body. Speckled dace feed on small aquatic insects and algae and typically live three years. Owens speckled dace occur in small coldwater stream habitats, hot-spring systems, and irrigation ditches. Currently there are populations in a spring near Benton, Whitmore Hot Springs and Little Alkali Lake in Long Valley, the East Fork Owens River and five sites in the northern Owens Valley. Owens speckled dace are widespread in the streams and irrigation ditches around Bishop, where scattered populations occur at low densities (CDFG 1995).

The Owens speckled dace is not expected to occur on site due to its limited range and the known distribution of the species.

Long Valley speckled dace

Little is known of the ecology and life history of the Long Valley speckled dace (USFWS 1998). Speckled dace are habitat generalists that feed on insects picked from the substrate, water surface, and throughout the water column. Speckled dace are able to occupy habitats as diverse as thermal springs, headwater streams, and large rivers. They spawn in springs over gravel substrates (USFWS 1998).

Long Valley speckled dace populations in occur in Whitemore Spring and Little Alkali Lake (CDFG 1995).

The Owens speckled dace is not expected to occur on site due to its limited range.

Yosemite toad

The Yosemite toad is a moderate-sized toad about 3 inches in length that shows strong color sexual dimorphism. The males are yellow-green to drab olive to darker greenish brown on the back while the females have gray, tan, or brown backs with black spots or blotches with whitish edges (CDFG 1994). The Yosemite toad is diurnal and hibernates in winter, emerging in spring when snowmelt pools form (CDFG 1994). The Yosemite toad is found at high elevations (6,400 to 11,300 ft) and prefers open montane meadows but also occurs in seasonal ponds associated with lodgepole pine and subalpine conifer forest (CDFG 1994, CDFG 2004).

The Yosemite toad is not expected to occur on the project site.

Mountain yellow-legged frog

The mountain yellow legged frog occurs at elevations from 4,500 to 12,000 feet in the Sierra Nevada Mountains from Plumas County to southern Tulare County. In the north, a population in Butte Co. is separated from the main Sierra group by the Feather River Canyon. In southern California, isolated populations exist in the San Gabriel, San Bernardino, and San Jacinto Mountains

This aquatic species is always encountered within a few feet of water. In the Sierra, this species is associated with streams, lakes and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadow habitat types. The mountain yellow-legged frog appears to prefer open stream and lake margins that gently slope. It seems to be absent from habitats with introduced predatory fish and bullfrogs. In southern California, populations are restricted to streams in ponderosa pine, montane hardwood-conifer, and montane riparian types. The mountain yellow-legged frog feeds primarily on aquatic and terrestrial invertebrates and favors terrestrial insects. (CDFG 1994, CDFG 2004)

The mountain yellow-legged frog may occur on the project site in Lower Rock Creek and the immediately adjacent water birch riparian scrub.

Northern Leopard frog

The northern leopard frog is a slim green or brownish frog with roundish dark spots on its back and a light whitish underside. Adults are opportunistic feeders, taking a variety of aquatic and terrestrial prey. They primarily feed on small insects; but have been observed eating a variety of other invertebrates including: spiders, sowbugs, snails, and leeches. This species occurs in or near permanent or semi-permanent water in a variety of habitats; submerged and emergent aquatic vegetation and shoreline cover appear to be important habitat characteristics. Cattail and sedge marshes and weedy ponds are preferred for reproduction. Eggs are attached to emergent vegetation and normally hatch within three weeks. A dense, relatively tall, grass- or forb-dominated habitat with a moist substrate for foraging during the active season must occur in the vicinity of the aquatic habitat used for oviposition and overwintering (CDFG 1994)

The northern leopard frog is not expected to occur on the project site due to the absence of suitable habitat.

Mount Lyell salamander

The range of the Mount Lyell salamander extends through the Sierra Nevada Mountains from the Smith Lake area in El Dorado County to Franklin Pass in Tulare County (CDFG 1994). They are found from 4,000 to 11,600 feet elevation.

Mount Lyell salamanders are insectivorous with hatchlings and juveniles apparently restricted to eating smaller foods.

Mount Lyell salamanders are largely restricted to alpine or subalpine vegetation communities. Mount Lyell salamanders occur where extensive outcrops of rock and scattered boulders are found near water. They are highly dependent on water and are always found within a few feet of water. They are associated with permanent streams, waterfalls seeps and runoff from melting snow.

Mount Lyell salamanders may occur in Lower Rock Creek on the project site.

Swainson's hawk (nesting)

The Swainson's hawk is an uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and the Mojave Desert. Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves. It breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Swainson's hawks forage in grasslands, open grain or alfalfa fields, and livestock pastures close to nesting sites. In southern California, Swainson's hawks are now mostly spring and fall transients (CDFG 1994).

Swainson's hawks are not expected to nest on the project site.

Northern goshawk (nesting)

Northern goshawks are usually found in heavily wooded habitats, either coniferous or deciduous, often near lakes, rivers and open meadows. These hawks prefer to nest near openings in mature forest stands that have well-developed crowns and an open understory. Nesting occurs from March 1 through August 15. Usually, adults will return to the same nesting vicinity each year and build a new nest. Sometimes the same nest is used in consecutive years.

The northern goshawk is not expected to nest on the project site, as the site does not contain extensive forest.

Prairie falcon (nesting)

Prairie falcons are fast flying birds of prey, which generally eat small mammals and small to medium size birds. They capture mammals on the ground and birds in flight. They are birds of open country habitats, which allow for fast pursuit of prey. They nest on high cliff faces that are 20 to 400 feet in height (Verner and Boss 1980). The peak of prairie falcon nesting is from early May to late August (Verner and Boss 1980). Nest sites may be rock outcrops of thirty feet, to high vertical cliffs. The nest sites typically have commanding views of the surrounding open countryside.

Prairie falcons are not expected to nest on the project site although they may use the project site and surrounding open habitats in the project area for hunting.

Osprey (nesting)

The osprey is a large bird of prey, which eats large fish. Ospreys catch fish near the water surface by aerial dives from flight (Verner and Boss 1980). Although Osprey nest around large lakes in northern California, they no longer nest in southern California (CDFG 1994 CDFG 2004). They use large trees, snags, and dead-topped trees in open forest habitats for nesting. Generally nest sites are very conspicuous and have a commanding view of the surrounding area.

Osprey are not expected to nest on the project site.

Least bittern

The least bittern is a common summer resident in southern California. It occurs at the Salton Sea and the Colorado River. The least bittern is found in dense emergent wetlands near sources of freshwater, and in desert riparian habitats. The bittern eats small fishes, aquatic and terrestrial insects, amphibians, small mammals and crayfish (CDFG 1978, CDFG 2004).

The least bittern constructs nests of dried and living plants low in tules or cattails, usually over water that is greater than one foot in depth (CDFG 2004).

At least two pair of least bittern are believed to be nesting in Saline Valley, in Inyo County (CDFG 1978)

Least bittern are not expected to nest or occur on the project site.

Yellow rail

The yellow rail is a rare and secretive sparrow-sized bird that is brownish with a short yellow bill and yellow feet. Although white wing patches can be seen in flight, the yellow rail can seldom be induced to fly (CDFG 1978). They generally conceal themselves in grass and are difficult to observe (CDFG 1978). They inhabit grassy marshes and wet meadows.

Yellow rails are not expected to occur on the project site due to the absence of suitable habitat.

Western snowy plover (nesting)

The snowy plover is a small, pale colored shorebird with dark patches on either side of the upper breast. Snowy plovers forage on invertebrates in wet sand.

The snowy plover is a ground nesting bird that requires a sandy, gravelly or friable soil substrate for nesting. Snowy plovers use simple nests of shallow depressions in the sand or soil, sometimes lined with small pebbles, glass fragments, or gravel. They frequently nest near or under objects such as driftwood, rocks, or defoliated bushes. Nests may also occur on open barren ground with no nearby cover. Inland nesting areas occur at the Salton Sea and Mono Lake in California. The western snowy plover is known to nest at Owens Dry Lake.

The western snowy plover is not expected to occur on the project site due to the lack of habitat.

Yellow-billed cuckoo, Western yellow-billed cuckoo

The yellow-billed cuckoo is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California (CDFG 2004c). They are known from the Sacramento and Owens Valleys; along the South Fork of the Kern River, and the Santa Ana and Amargosa Rivers.

The cuckoo requires dense riparian woods or thickets with dense understory (Garrett and Dunn 1981). Cuckoos inhabit extensive willow riparian thickets or forests with dense, low-level or understory foliage, along slow-moving watercourses (CDFG 2004c).

The yellow-billed cuckoo is not expected to occur on the project site due to the lack of habitat.

Bank swallow (nesting)

The bank swallow is a breeding migrant in California that nests in riparian habitats and forages in other adjacent habitats (CDFG 2004c). They capture insects in flight, generally over riparian areas, consuming soft-bodied insects including flies, bees, and beetles.

Bank swallows nest semi-colonially in burrows in sandy banks or cliffs near water. Bank swallow colonies usually have 100-200 nests but colonies as large as 1,500 have been reported (CDFG 2004c). They require fine-textured soil to dig nest holes.

Bank swallows are not expected to nest on the project site due to the lack of habitat.

Swainson's thrush

The Swainson's thrush is a robin-sized bird that is olive-brownish on the back with spots on a whitish breast. It is a migrant and summer resident in California and is common east of Sierra Nevada crest. The Swainson's thrush inhabits wooded riparian areas, preferring those with a dense understory. The Swainson's thrush consumes insects, and spiders, berries and other fruits.

Although the Swainson's thrush has not been observed breeding on Lower Rock Creek (PIF 2004), the thrush may occur on the project site as the site contains suitable riparian habitat and is within the range of the thrush.

Bell's vireo, Least Bell's vireo (nesting)

The least Bell's vireo is a migratory songbird that requires riparian woodlands with a dense understory for breeding. This species has declined as a result of habitat loss and nest parasitism by brown-headed cowbirds. In California the least Bell's vireo is a summer resident of

cottonwood-willow forest, oak woodland, shrubby thickets, and dry washes with willow thickets at the edges (CDFG 2004c).

The Bell's vireo inhabits low, dense riparian growth along streams or lakes. The Bell's vireo is strongly associated with willow, cottonwood, and baccharis, or mesquite in desert localities

The least Bell's vireo is not expected to nest on site, due to the absence of suitable riparian habitat.

Warbling vireo

The warbling vireo is common, summer resident throughout much of California. It breeds in montane and valley foothill riparian, valley foothill hardwood, valley foothill hardwood-conifer, and aspen habitats. It is also found in desert riparian, orchard-vineyard, and urban habitats. The vireo nests in riparian areas, preferring large deciduous trees. The vireo eats insects and spiders and occasionally fruits and seeds.

The warbling vireo has been observed breeding along Upper Rock Creek (PIF 2004) and may occur along Lower Rock Creek in the project site.

Yellow breasted chat (nesting)

The yellow-breasted chat is a spring and summer migrant to California that inhabits dense, brushy thickets and tangles near water, and thick understory in riparian woodlands (CDFG 2003). The chat has not been observed breeding along Upper Rock Creek or Lower Rock Creek (PIF 2004).

Due to the lack of appropriate riparian habitat, the yellow-breasted chat is not expected to occur on the project site.

Common yellowthroat

The common yellowthroat is considered a common summer resident, and fairly common winter resident throughout most of California, but is considered a transient in the Sierras and desert regions of California (CDFG 2004c). The common yellowthroat breeds and winters in wet meadow, fresh emergent wetland, and saline emergent wetland habitats. It also breeds in valley foothill riparian, and occasionally in desert riparian, annual grassland, and perennial grassland habitats.

The common yellowthroat has not been observed breeding along Upper Rock Creek or Lower Rock Creek (PIF 2004). The common yellowthroat may occur in the water birch riparian scrub on the project site, but it is not expected to breed onsite.

Willow flycatcher, Southwestern willow flycatcher

The southwestern willow flycatcher breeds in dense riparian thickets and trees. In southern California, this species is extremely rare and is generally restricted to large drainages with high quality riparian habitats, such as the Santa Inez and San Luis Rey Rivers. There are two areas in southern California where stable nesting populations are known: the South Fork of the Kern River, and the Santa Margarita River on Camp Pendleton (CVAG 2003). Although the project site is within the breeding range of the southwestern willow flycatcher, the flycatcher is not expected to occur on site, due to the absence of suitable riparian habitat.

Yellow warbler

The yellow warbler is a spring and summer migrant in California, breeding in riparian areas, wetlands, second growth woodlands and gardens that are well watered.

The yellow warbler has not been observed breeding along Lower Rock Creek, but has been observed breeding along Upper Rock Creek (PIF 2004). Due to the lack of appropriate riparian or wetland habitat, the yellow warbler is not expected to breed on the project site.

Wilson's warbler

The Wilson's warbler is a common migrant and summer visitor throughout California. The Wilson's warbler breeds in riparian willow, alder, aspen coastal valley foothill and montane riparian habitats. It eats insects gleaned from foliage low in the canopy or in understory vegetation.

The Wilson's warbler has not been observed breeding along Upper Rock Creek or Lower Rock Creek (PIF 2004). It is not expected to breed on the project site.

Black-headed grosbeak

The black-headed grosbeak a common breeder throughout most of California, except in the higher mountains, Great Basin, and southern deserts (CDFG 2004c). The grosbeak inhabits valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, and montane riparian habitats. It is often found near water and areas where deciduous oaks are numerous. The black-headed grosbeak is a rare and local breeder in lowlands east of the Cascade Sierra Nevada crest.

The black-headed grosbeak has not been observed breeding along Upper Rock Creek or Lower Rock Creek (PIF 2004). It may occur along Lower Rock Creek on the project site.

Blue grosbeak

The blue grosbeak inhabits and breeds in dense, riparian habitats, including willow thickets, young cottonwood, and tamarisk. It has been observed in the Owens Valley (CDFG 2004c).

The blue grosbeak has not been observed breeding along Upper Rock Creek or Lower Rock Creek (PIF 2004). Surveys of other riparian stream locations in Mono County on the eastern slope of the Sierras have not located breeding blue grosbeak (PIF 2004). It is not expected to breed on the project site.

Song sparrow

The song sparrow is a common resident of most of California, inhabiting many habitats. It generally breeds in riparian thickets of willows, other shrubs, vines, and tall herbs (CDFG 2004c).

The song sparrow has been observed breeding along Upper Rock Creek, and is a possible breeder along Lower Rock Creek (PIF 2004).

California bighorn sheep

The California bighorn sheep is one of three subspecies of bighorn sheep that occur in California. Prior to 1979 there were two native California bighorn herds, Mt. Baxter and Mt. Williamson, in the southern Sierra Nevada. Since then the Mt. Baxter herd has been used as a source for reintroduction of bighorns into Inyo County south of the project site. California bighorn sheep inhabit the alpine and subalpine zones above 10,000 feet during the summer, using open slopes where the land is rough, rocky, sparsely vegetated and characterized by steep slopes and canyons. They migrate to lower elevation areas of sagebrush-steppe habitat to winter. California bighorn sheep winter above 7,000 feet in elevation (Quad Knopf 2004).

There is a small population of about 30 bighorn at near Wheeler Crest, 10 miles northwest of Bishop, at an elevation of 9,200 feet (CDFG 2007, CDFG 2004b).

California bighorn sheep are not expected to occur on the project site.

Owens valley vole

The Owens Valley vole, a subspecies of the California vole, is found in the Owens Valley and areas to the south. Voles breed throughout the year, and reach population peaks if food and cover are abundant. Voles forage on the ground feeding on leafy parts of grasses, sedges, and herbs. They clip grasses and forbs at the base, which forms a network of runways around their burrows. The Owens Valley vole is found in wetlands and dense grass habitats in the Owens Valley. The CNDDB contains twelve occurrences of the Owens Valley vole, largely from historic records, ranging from the Bishop area in the north to Little Lake in the south (CNDDB 2004).

Although the site is within the historic range of the Owens Valley vole, the vole is not expected to occur on site due to the absence of suitable habitat.

No raptor nests or potential raptor nest sites were found within the project site.

Sensitive habitats

The riparian zone along Lower Rock Creek is considered a sensitive habitat due to its biological importance, and because it meets the criteria for USACE and CDFG jurisdiction.

D. Jurisdictional Areas

Definitions and regulations

Both the US Army Corps of Engineers (USACE) and the California Department of Fish and Game (CDFG) have jurisdiction over streams, watercourses and wetlands as described below. Alteration of these jurisdictional areas requires a permit from USACE and a Streambed Alteration Agreement from CDFG.

Pursuant to Section 404 of the Clean Water Act, USACE regulates the discharge of dredged and/or fill material into waters of the United States. The term “waters of the United States” is defined as: (1) all navigable waters (including all waters subject to the ebb and flow of the tide); (2) all interstate waters and wetlands; (3) all other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet

meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce; (4) all impoundments of waters mentioned above; (5) all tributaries to waters mentioned above; (6) the territorial seas; and (7) all wetlands adjacent to waters mentioned above.

In the absence of wetlands, the limits of USACE jurisdiction in non-tidal waters, such as rivers, lakes and intermittent streams, extend to the ordinary high water mark (OHWM), which is defined as:

... that line on the shore established by the fluctuation of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Typically in southern California, the OHWM is indicated by the presence of an incised streambed with defined bank shelving. However, in court cases the interpretation of the lateral extent of the OHWM, various criteria have been used, including vegetation and soil characteristics.

If the water of the United States consists only of wetlands, the limits of USACE jurisdiction extends to the limit of the wetlands which is defined as:

... those areas that are inundated, or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Pursuant to Division 2, Chapter 6, Sections 1600-1603 of the California Fish and Game Code, CDFG regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife resources. There are some significant differences between USACE and CDFG jurisdictions. The CDFG uses less well defined and more ecologically based criteria in their jurisdiction determinations. For a watercourse to be considered under CDFG jurisdiction, it must have a terminus, banks, and channel through which water can flow, at least periodically. Historic court cases have further extended CDFG jurisdiction to include watercourses that seemingly disappear, but re-emerge elsewhere. Under the CDFG definition, a watercourse need not exhibit evidence of an OHWM to be claimed as jurisdiction.

Jurisdictional areas

The Lower Rock Creek channel and immediately adjacent areas with periodically saturated soils are considered USACE jurisdictional. The Lower Rock Creek channel and the adjacent water birch riparian scrub is considered CDFG jurisdictional.

IV. POTENTIAL IMPACTS

A. CEQA Definition of Significance

Significance thresholds for biological resources were derived from a review of the California Environmental Quality Act (CEQA) guidelines (Bass et al 1996), important California biological management guidelines established by state and local agencies, and local/regional plans and ordinances. CEQA guidelines Section 15382 states that a project has a significant effect on biological resources within the project site or immediately surrounding region if the project:

- Substantially affects a rare or endangered species of plant or animal or the habitat of such species;
- Interferes substantially with the movement of any resident or migratory fish or wildlife species; or
- Substantially diminishes habitat for fish, wildlife, or plants.

Section 15065(a) of the CEQA guidelines also states that a project may have a significant effect on the environment when "the project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal."

Substantial impacts would be those that diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA because, although they would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of, an important resource on a populationwide, or regionwide, basis.

In addition, all native breeding birds, whether or not they are considered sensitive by resource agencies, are protected by the Migratory Bird Treaty Act. Impacts to breeding birds and their nests during the breeding season would be considered significant.

All raptors and their nests are protected under Section 3503.5 of the California Fish and Game Code. Loss of any active raptor nest is considered a significant impact.

B. Natural Communities and Wildlife

There will be a permanent loss of approximately 30 acres of high desert blackbush scrub natural community due to development of the project. This loss is not considered significant under CEQA, as this natural community is widespread in the region.

No big sagebrush scrub or water birch riparian scrub habitat would be impacted by development of the project.

There will be a permanent loss of approximately 31 acres of high desert blackbush scrub that may provide roosting habitat for bats. This is an adverse impact but is not considered significant under CEQA as there is substantial potential roosting habitat in the vicinity of the site and this loss of potential roosting habitat is not expected to substantially diminish habitat for bats. This impact is not expected to substantially reduce bat populations in the area.

There will be a permanent loss of approximately 31 acres of high desert blackbush scrub that serves a wintering habitat for mule deer in the Round Valley deer herd. This is considered a significant impact, as it would diminish an important biological resource.

Additional loss of high desert blackbush scrub may occur due to unplanned, inadvertent, accidental or intended use for construction staging, equipment storage, landscaping or modification by future residents.

Indirect impacts to mule deer are expected to occur from project development. An increase in traffic along Lower Rock Creek Road and Highway 395 is expected due to the project. This is expected to cause an increase in deer mortality. Additionally the increase in human activity, noise, increased night lighting, and the presence of dogs and other domestic pets is expected to indirectly impact deer in the area through decreased use of habitat and alteration of migration routes. Increased human and domestic animal activity is expected to decrease deer foraging opportunity and increase deer energy expenditure during winter; combined these indirect impacts are expected to reduce deer reproduction. These indirect impacts are potentially significant, as the loss of breeding age does and reduced winter nutritional intake would reduce the reproductive capacity of the Round Valley Deer Herd.

C. Special status species and habitats

Special status animals

No impacts are expected to any special status animal species due to project development.

No impacts are expected to the following special status animal species because no suitable habitat is present on the project site: Wong's springsnail, Owens pupfish, Owens tui chub, Owens speckled dace, Long Valley speckled dace, Yosemite toad, northern leopard frog, Swainson's hawk, northern goshawk, osprey, least bittern, yellow rail, western snowy plover, yellow-billed cuckoo, bank swallow, least Bell's vireo, yellow breasted chat, southwestern willow flycatcher, yellow warbler, Wilson's warbler, blue grosbeak, California bighorn sheep, Owens Valley vole.

No impacts are expected to the following special status animal species because potential habitat on the project site will not be impacted: Fish slough springsnail, Owens Valley springsnail, Aardhal's springsnail, Owens sucker, Mount Lyell salamander, mountain yellow-legged frog, Swainson's thrush, warbling vireo, common yellowthroat, black-headed grosbeak, song sparrow,

Approximately 31 acres of potential foraging habitat for the prairie falcon would be impacted. This is not expected significantly impact prairie falcon populations in the area as there are large areas of potential foraging habitat in the region.

Sensitive habitats

No impacts to sensitive habitats are expected from development of the project site.

D. Jurisdictional areas

The area at the base of the slope on the west side of the site containing Lower Rock Creek would be designated open space and would not be developed.

No impacts to jurisdictional areas are expected from development of the project.

E. Cumulative Impacts

Numerous proposed or approved projects in the region are expected to impact the Round Valley Deer Herd including: Rimrock Ranch Specific Plan, Pine Creek Communities Development Project, Starlite Estates, Sherwin/Snowcreek Ski Area, Snowcreek Golf Course Expansion, and Lakeridge Ranch Estates. These projects are expected to directly impact over 2,000 acres of deer habitat and to indirectly impact deer through increased traffic, and disturbance from domestic animals, lights and noise.

The cumulative impacts of the proposed project and other projects in the area on the Round Valley Deer Herd are considered significant.

V. MITIGATION MEASURES

The following mitigation measures are designed to reduce impacts to biological resources.

Open space easements for the twenty-four undeveloped acres of open space shall be recorded on the final maps for the project. The final maps shall note that permitted land uses within the open space easements shall be limited to undisturbed natural uses.

All designated open space areas and all areas where construction is prohibited will be permanently fenced to prevent unplanned, inadvertent, accidental or intended impact. Fencing that allows passage of wildlife, such as split-rail fencing, will be used.

Parcel grading operations, structural foundation work, framing work and similar heavy construction activities shall be restricted to the period between May 15 and October 1 to minimize disturbance to migrating and wintering deer.

Natural vegetation shall be retained except where it must be removed for project development. Project CC&Rs shall specify that homeowners shall landscape with native vegetation. Additionally the CC&Rs shall list and prohibit the use of invasive plant species for landscaping in order to minimize the potential for invasive plants to degrade deer habitat in the project vicinity.

Areas disturbed during construction shall be revegetated with native species in order to establish deer habitat as soon as possible following construction. Revegetation of disturbed areas shall require the use of native seeds, native plants grown from seeds or seedlings obtained from local native stock. Revegetated areas shall be monitored for a period of five years to ensure the success of the project and shall be replanted if necessary.

Dogs belonging to individuals involved in construction activities shall be prohibited in the project area during construction phases.

Property owners shall refrain from clearing native vegetation except as necessary for construction

Domestic animals shall be restrained at all times, either through the use of leashes or private fenced areas. Project CC&Rs shall specify that pets shall be under owners control at all times. No domestic animals shall be allowed to be free roaming.

In order to minimize the impacts to deer and other wildlife, exterior lighting on individual lots shall be designed and maintained to minimize the effects of lighting on the surrounding environment. Exterior lighting shall be limited to that necessary for health and safety purposes; high intensity outdoor lighting shall be avoided or adequately shielded; the source of lighting must be concealed on all exterior lighting and all lighting must be designed to confine light rays to the premises of each individual lot. In no event shall a lighting device be placed or directed so as to permit light to fall upon a public street, adjacent lot, or adjacent land area.

To minimize direct mortality impacts to deer from vehicle collisions, signs shall be posted along roads within the project area warning drivers of the presence of deer. A 25-mile per hour speed limit shall be enforced on residential streets in the proposed project.

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ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX I

CULTURAL RESOURCE ANALYSIS

TRANS-SIERRAN ARCHAEOLOGICAL RESEARCH
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July 17, 2007

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RE: Sierra Paradise Subdivision

Dear Ms. Bauer:

This letter reports on an archaeological survey of the proposed Sierra Paradise Subdivision, Mono County, California, conducted by Trans-Sierran Archaeological Research (TSAR) for Bauer Planning and Environmental Services, Inc. of Irvine, California. The work was completed as a first step in meeting *California Environmental Quality Act* (CEQA) requirements for mitigating the effects of the proposed project on cultural resources.

The proposed project is the subdivision of approximately 55 acres into 53 clustered residential lots (each from 15,000 to 30,000 sq ft in size) and 24.7 acres of open space (Map 1). The project would include access from Lower Rock Creek Road, development of a well, water storage, and distribution system, and a sewage treatment plant.

Archaeological work completed included a records check and a 100 percent survey of the project area (Map 2). To summarize, four isolated occurrences of cultural material were found, but no archaeological sites were encountered.

The project area is located in section 29, Township 5 South, Range 31 East, Mount Diablo Meridian. The southern part of the project area is adjacent to Rock Creek Road, and the project area reaches into the steep-sided canyon formed by Rock Creek along the northern part of its western boundary (Figure 1). Terrain in the rest of the project area slopes moderately or gently to the south and southwest (Figure 2). Soils within the project area are derived from volcanic tuffs, with lesser amounts of granite cobbles and sediments from the Sierra Nevada range. There are tuff outcrops along the canyon edge and small bits of obsidian "blast" throughout the area.

e-mail:burall@sprynet.com

At an elevation of 5300 feet, the project area is within the desert scrub vegetation community. Dominant plant species include sagebrush, rabbitbrush, bitterbrush, desert broom, and buckwheats. A gallery forest of Jeffrey pine and other riparian vegetation grows along Rock Creek. Indian paintbrush, desert dandelion, grasses, ephedra, mallow, and beavertail were also observed during the survey.

A records check was completed through the regional office of the California Historic Resources Information System (CHRIS) at the Eastern Information Center, University of California, Riverside (Attachment 1). As the designated information center for Inyo, Mono, and Riverside counties, the Eastern Information Center has copies of all archaeological reports and site records for the area. Their records indicated that four archaeological surveys (listed under References, below) had been conducted within a one-mile radius of the project area and that one of these surveys included a small portion of the project area.

No sites were recorded within the project area, however, six prehistoric sites and two historic sites had been recorded within one mile of the project area. Five of the previously recorded prehistoric sites consist of sparse to moderate-density debitage and flaked stone tool scatters. The other recorded prehistoric site, designated CA-MNO-1991, is a large occupation site, with evidence of substantial habitation and a variety of activities. Time-sensitive artifacts suggest use during the late prehistoric period, from ca. A.D. 600 into historic times (Enfields and Weller 1962).

The two previously recorded historical sites in the vicinity consist of a 300-meter-long abandoned rock-lined ditch and an area of trash concentrations with two possible graves (Burton 1990). The trash at the latter site, which includes a wide variety of items, indicates a post-1920 date.

Rock Creek Road follows the original Sherwin's Grade Toll Road between Rovana and Toms Place, which in 1967 was registered as a "Point of Historical Interest" by the State of California. It has not been evaluated as a State Registered Landmark or for its eligibility for listing on the National Register of Historic Places.

Field work for the proposed Sierra Paradise Subdivision was conducted April 18, 2004. The entire project area was surveyed by three archaeologists with pedestrian traverses 15 meters apart along compass bearings. However, the very steep slopes adjacent to Rock Creek were not walked, but examined from a safe distance for evidence of cultural features. Ground visibility was good and the project area was free of snow.

No archaeological sites were encountered. Four isolates discovered within or near the project area (Map 3) include:

1. One utilized flake, of Casa Diablo obsidian;
2. One Elko series projectile point fragment, possibly of Mono Glass Mountain obsidian (this isolate was found just east of the project area on BLM land [Figure 3]);

3. One flake, of Casa Diablo obsidian; and
4. Two flakes, of Casa Diablo obsidian.

The isolates do not meet regional site-definition criteria, nor CEQA's criteria for important, significant, or unique resources. Therefore, no further consideration of cultural resources is recommended in project planning.

In closing, the proposed Sierra Paradise Subdivision will have no effects on significant cultural resources and no further archaeological work is recommended.

Sincerely,

Jeff Burton

TRANS-SIERRAN ARCHAEOLOGICAL RESEARCH
332 EAST MABEL STREET, TUCSON, ARIZONA 85705-7455 (520) 620-6804

May 8, 2004

Sandra Bauer
Bauer Planning and Environmental Services, Inc.
220 Commerce, Suite 200
Irvine, CA 92602
bauer7@earthlink.net
(714) 508-2522 [tel]
(714) 508-2113 [fax]

RE: Sierra Paradise Subdivision

Dear Ms. Bauer:

This letter reports on an archaeological survey of the proposed Sierra Paradise Subdivision, Mono County, California, conducted by Trans-Sierran Archaeological Research (TSAR) for Bauer Planning and Environmental Services, Inc. of Irvine, California. The work was completed as a first step in meeting *California Environmental Quality Act* (CEQA) requirements for mitigating the effects of the proposed project on cultural resources.

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In closing, the proposed Sierra Paradise Subdivision will have no effects on significant cultural resources and no further archaeological work is recommended.

Sincerely,

Jeff Burton

References Cited

Bureau of Land Management

1978 California Desert Program – Archaeological Sample Unit Records for Owens Valley Planning Unit. Bureau of Land Management, Bishop, California.

Burton, Jeffery F.

1990 An Archaeological Survey of the Contel Mammoth to Bishop Fiber Optics Line, Mono and Inyo Counties, California. *Contributions to Trans-sierran Archaeology* 18. Trans-Sierran Archaeological Research, Tucson, Arizona.

Clay, Vicky L. and Matthew C. Hall

1988 Results of the 1987 Field Season Cultural Resources Survey for the Historic and Archaeological Preservation Plan for the Lee Vining Creek Hydroelectric Project (FERC #1388) and the Rush Creek Hydroelectric Project (FERC #1389). Archaeological Research Services, Virginia City, Nevada.

Crist, Michael K.

1982 A Cultural Resource Reconnaissance of the Paradise Camp Hydroelectric Project, Mono County, California. Ms. on file, California Small Hydro, Thousand Oaks, California.

Enfield, Rolin, Grace Enfield, and Norman Weller

1962 CA-MNO-1991 Site Record. On file, Inyo National Forest, Bishop, California.

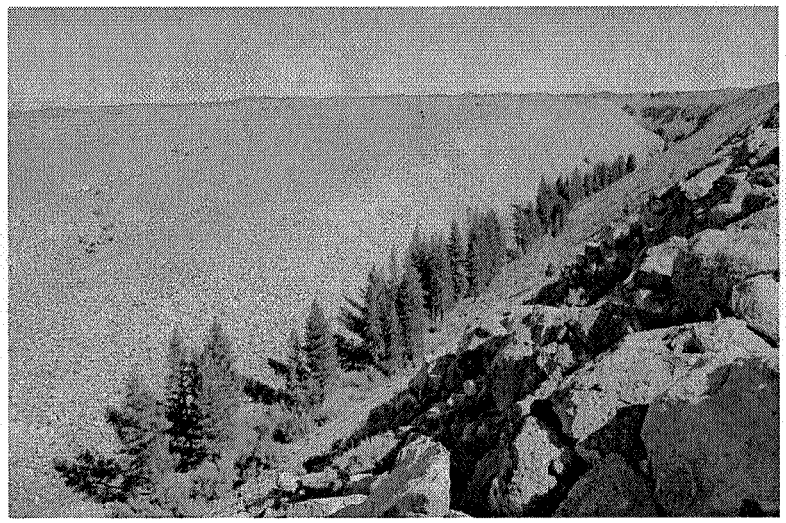


Figure 1. Rock Creek Canyon on the western edge of the project area.

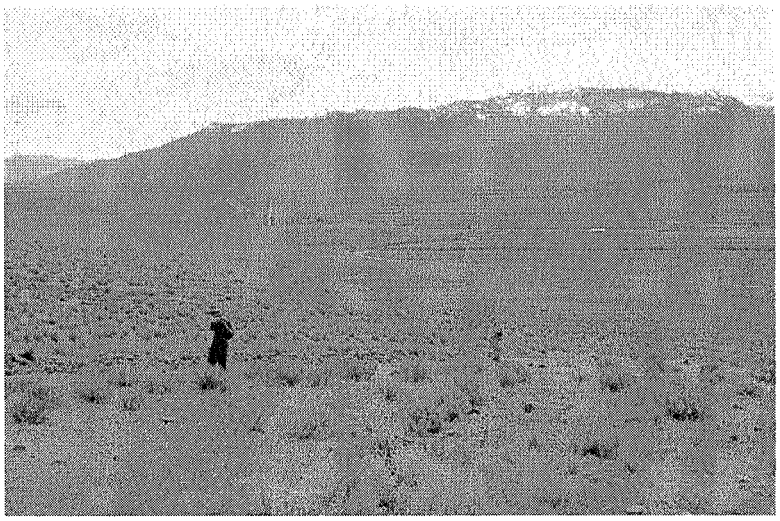


Figure 2. Project area, view towards the south.

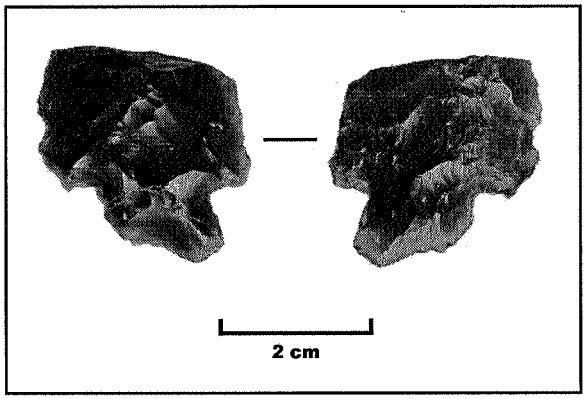
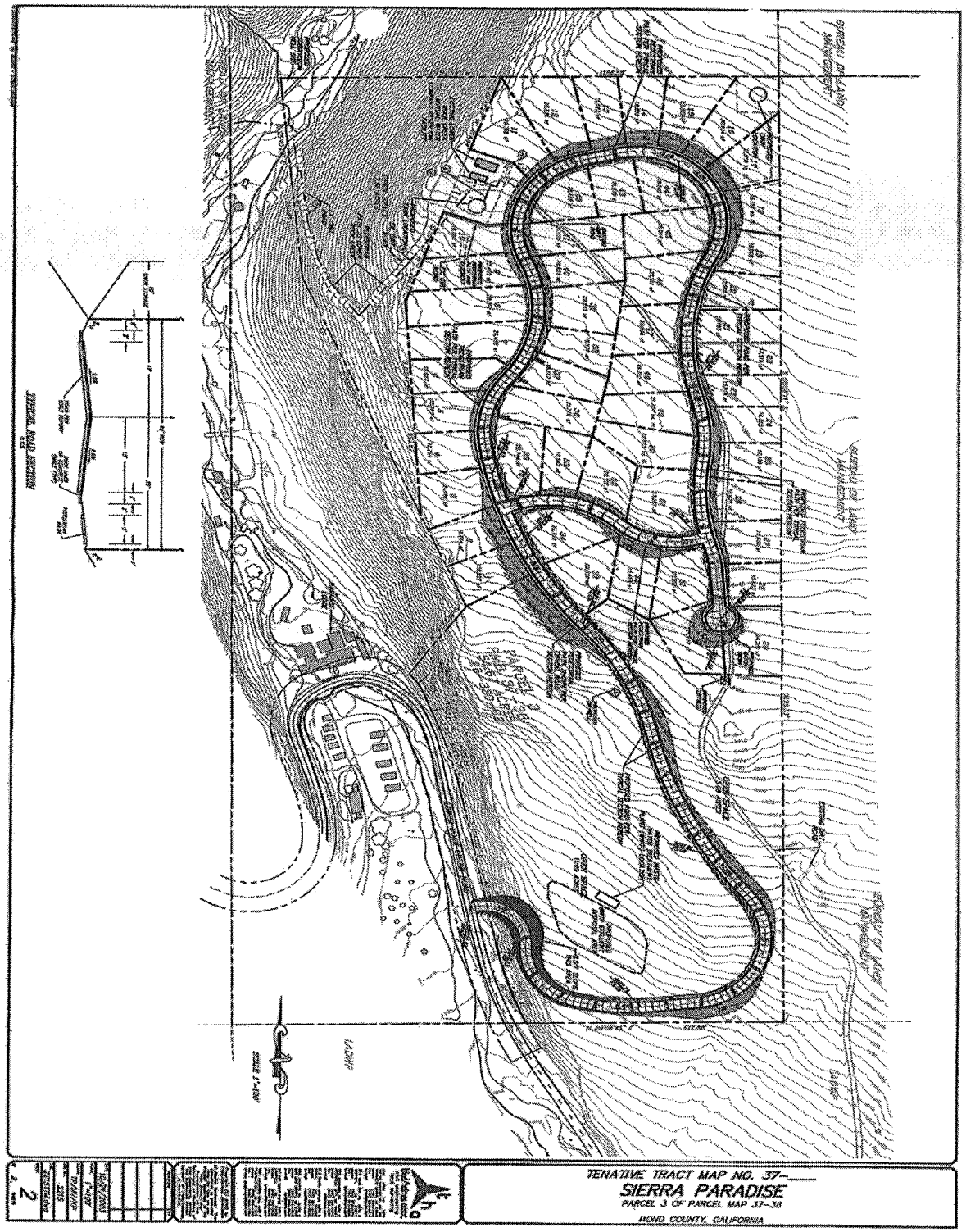
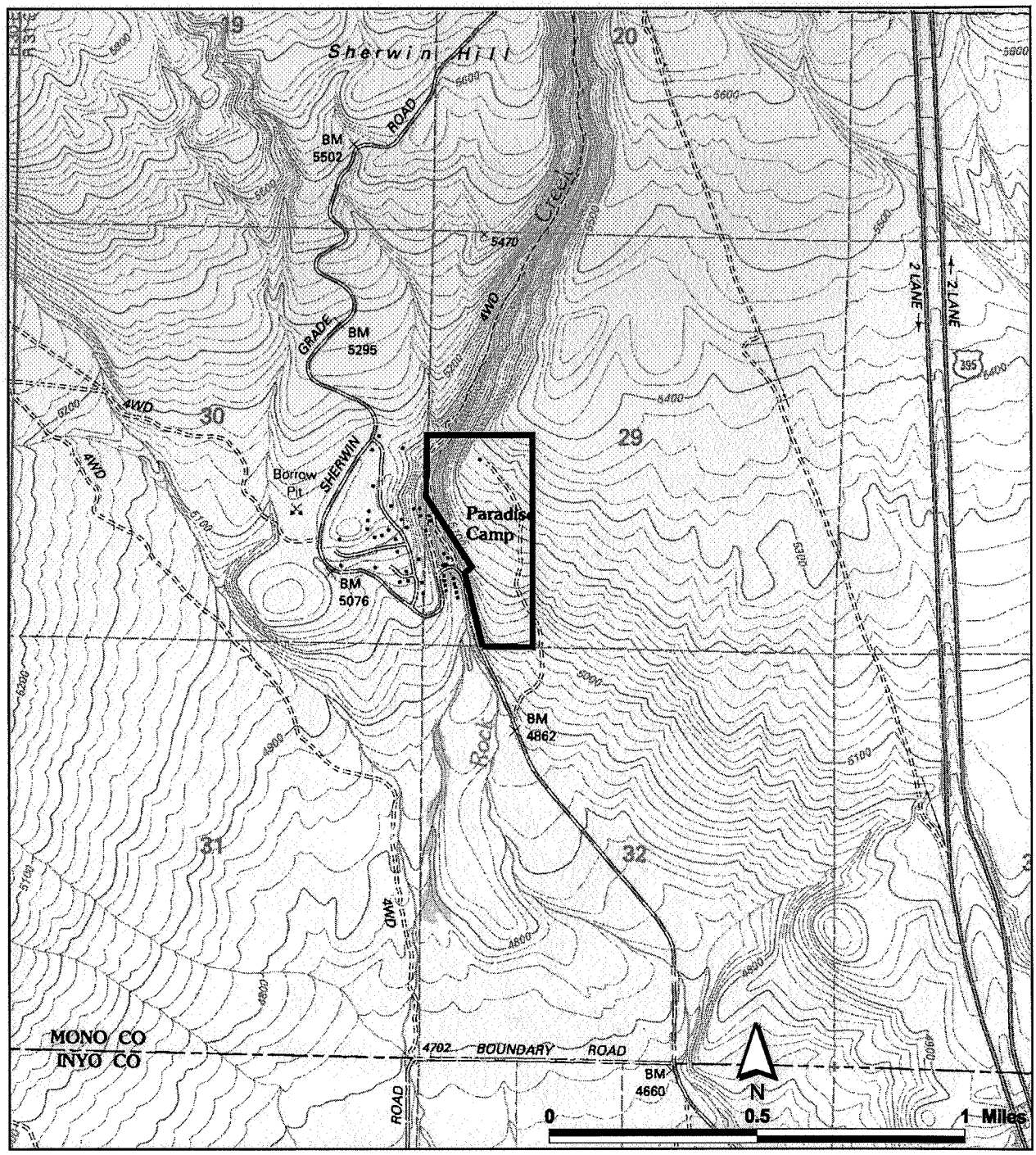


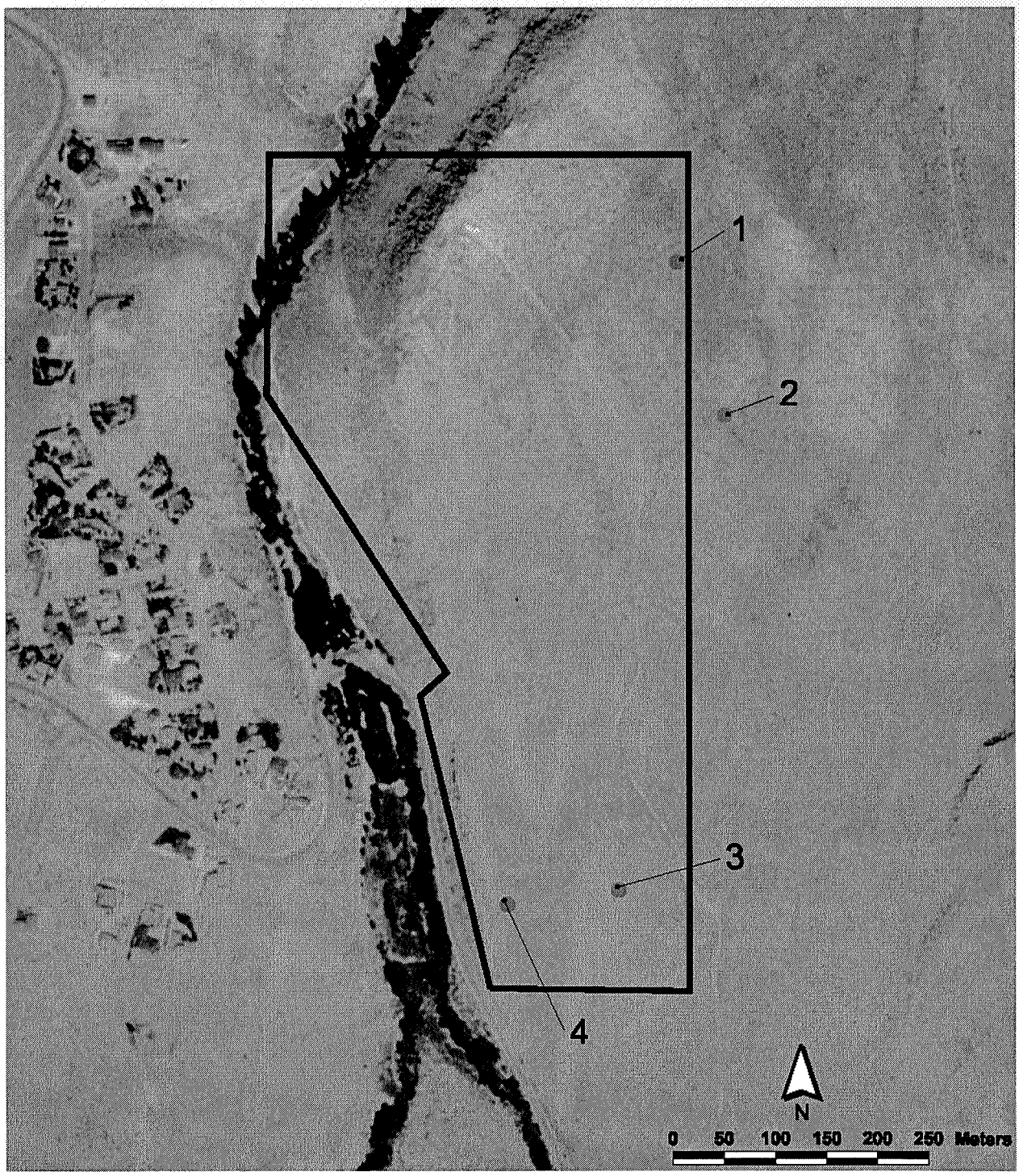
Figure 3. Elko series projectile point fragment (Isolate #2).



Map 1. Sierra Paradise tentative tract map.



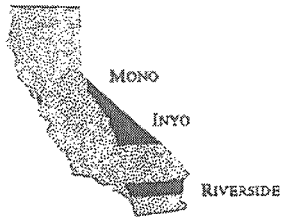
Map 2. Sierra Paradise project area and survey coverage (adapted from USGS 7.5' map Rovana, California).



Map 3. Sierra Paradise isolate locations (adapted from USGS orthophoto quarter quadrangle Rovana, California, NE, 1998).

Attachment 1
CHRIS Records Search

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM



Eastern Information Center
Department of Anthropology
University of California
Riverside, CA 92521-0418

Phone (909) 787-5745
Fax (909) 787-5409

March 24, 2004
RS #3087

Jeff Burton
Trans-Sierran Archaeological Research
332 East Mabel Street
Tucson, AZ 85705

Re: Cultural Resources Records Search for Sierra Paradise Project Area

Dear Mr. Burton:

We received your request on March 24, 2004, for a cultural resources records search for the Sierra Paradise project area located in Section 29, T.5S, R.31E, MDBM, in the Rock Creek area of Mono County. We have reviewed our site records, maps, and manuscripts against the location map you provided.

Our records indicate that four cultural resources studies have been conducted within a one-mile radius of your project area. One of these studies involved a small portion of the project area; a copy of this report is included for your reference. One additional study provides an overview of cultural resources in the general project vicinity. These reports are listed on the attachment entitled "Archeological Reports" and are available upon request at 15¢/page plus $30/hour. The KEYWORD section of each citation lists the geographic area, quad name, listing of trinomials (when identified), report number in our manuscript files (RI #), and the number of pages per report.

No cultural resources properties are recorded within the boundaries of the project area. Our records indicate that one property has been recorded within a one-mile radius of the project area. A copy of this record is included for your reference.

The above information is reflected on the enclosed map. Areas that have been surveyed are highlighted in yellow. Numbers marked in blue ink refer to the report number in our manuscript files (RI #). Cultural resources properties are marked in red; numbers in black refer to Trinomial designations, those in green to Primary Number designations.

Additional sources of information consulted are identified below.

National Register of Historic Places (10/15/03): no listed properties are located within the boundaries of the project area.

Office of Historic Preservation, Archaeological Determinations of Eligibility (02/03/04): no listed sites are located within the boundaries of the project area.

Office of Historic Preservation, Directory of Properties in the Historic Property Data File (02/03/04): property (26-3061) is listed and is ineligible for listing on the National Register of Historic Places. The applicable portion of this directory is enclosed for your study needs.

Copies of the 1949 USGS Mt. Tom 15' and 1912 (reprinted 1945) USGS Mt. Goddard 30' topographic maps are included for your reference.

As the Information Center for Mono County, it is necessary that we receive a copy of all cultural resources reports and site information pertaining to this county in order to maintain our map and manuscript files. Confidential information provided with this records search regarding the location of cultural resources outside the boundaries of your project area should not be included in reports addressing the project area.

Sincerely,

Matthew C. Hall

M. C. Hall
Coordinator

Enclosures

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX J

TRAFFIC ANALYSIS

Submitted to:

Ms. Sandra Bauer
220 Commerce, Suite 230
Irvine, CA 92602

Prepared by:

Traffic Safety Engineers, Inc
3100 Marywood Drive
Orange, CA 92867

Traffic Impact Study
For
Sierra Paradise Housing Project

Mono County, California

September 17, 2007

1. PROJECT DESCRIPTION

Sierra Paradise Project is located on the east side of Lower Rock Creek Road, approximately 5 miles north of Pine Creek Road. The project proposes a total of 60 single-family houses. The project is served by U.S. Highway 395, which is the primary route connecting Mono County with the Reno Metropolitan Area to the north and with the Los Angeles Metropolitan Area to the south.

2. EXISTING TRAFFIC AND CIRCULATION CONDITIONS

In order to assess the ability of accommodating future traffic from the project site, existing traffic volume counts were collected during the morning and afternoon peak traffic periods at the following potentially impacted locations. These traffic volumes are shown in Figure 1.

- Highway 395 and Lower Rock Creek Road
- Highway 395 and Swall Meadows/Owens Gorge Road
- Lower Creek Road and Swall Meadows

3. PROJECT TRIP GENERATION

The number of automobile trips which will be generated by the project can be estimated through application of known trip generation rates. The rates used for this study were derived from the Institute of Transportation Engineers (ITE) publication, Trip Generation (7th Edition). Table 1 presents the trip generation rates for Land Use Code 210 (Single-Family Detached Housing) utilized in this traffic study.

TABLE 1
TRIP GENERATION RATE

LAND USE	QUANTITY	DAILY TRIPS PER UNIT	AM PEAK HOUR / PM PEAK HOUR		
			% IN	% OUT	TRIPS PER DWELLING UNIT
Single Family Residential	Dwelling Units	9.57(*)	25% 63%	75% 37%	0.75 1.01

(*) The daily trip generation estimate of 9.57 trips per unit is a standard urban residential factor. As such, it does not account for the fact that rural residential trip generation is typically lower than urban areas due to higher rates of second homeownership and retired residents. In Mono County, second homeownership is a significant factor in housing occupancy. According to the Housing Element, the unincorporated area had a vacancy rate of 39% in 2000, (down from 44% in 1990), which reflects the large number of vacation homes in the area. In addition to the considerations above, it is anticipated that at least some of the secondary units would be used to house individuals employed by the homeowners, which would serve to reduce vehicle trips associated with employees traveling to and from work each day. In consideration of these facts, the daily trip generation factor of 9.57 trips per unit is considered more than sufficient to incorporate traffic generation that would be associated with the 60 primary units and the eleven deed-restricted secondary units proposed by the project.

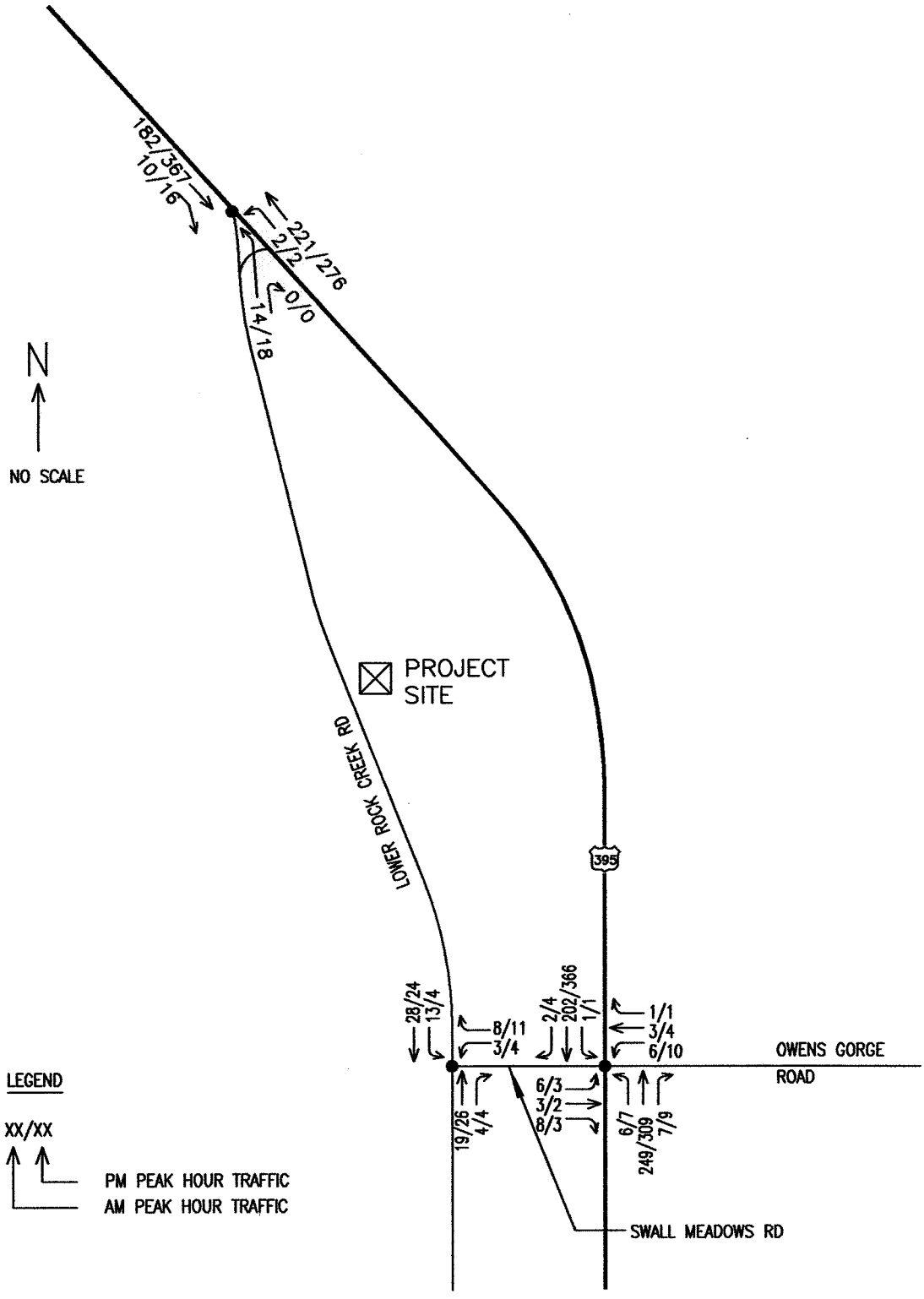


FIGURE 1
EXISTING TRAFFIC VOLUMES

As shown, in Table 2, the project would generate daily trips with trips occurring during the A.M. peak hour and trips occurring during the P.M. peak hour.

TABLE 2
PROJECT TRIPS

LAND USE	QUANTITY	DAILY TRIPS	AM PEAK HOUR			PM PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Single Family Residential	60 Primary Dwelling Units with eleven deed-restricted secondary units	575	11	34	45	38	23	61

4. TRAFFIC DISTRIBUTION AND ASSIGNMENT

The directional orientation of the additional traffic that would be generated by the proposed project was estimated based on:

i. Existing intersection traffic turning movement volume counts.
ii. Configuration of the surrounding street networks and traffic circulation patterns.

From these combined data sources, it was estimated that 30% of the project trips would be originated from the north, and 70% from the south. In order to quantify the resultant traffic impacts on the surrounding street systems, project traffic volumes were distributed and assigned as turning movements at each of the potentially impacted study intersections (Figure 2).

5. OTHER RELATED PROJECTS

Other approved developments in the general vicinity of the proposed project site are summarized in the following table. Figure 3 shows the cumulative peak hour project traffic from these other related projects assigned at each of the study intersections. Figure 4 shows the existing traffic plus project traffic plus cumulative traffic from other related project traffic.

TABLE 3
OTHER APPROVED PROJECTS

PROJECT NAME	PROJECT DESCRIPTION
Pine Creek Communities in Rovana	275 single-family and 43 multiple family dwelling units
Rimrock Ranch	35 custom home lots
Sierra Springs	70 custom home lots
Lakeridge	120 custom home lots

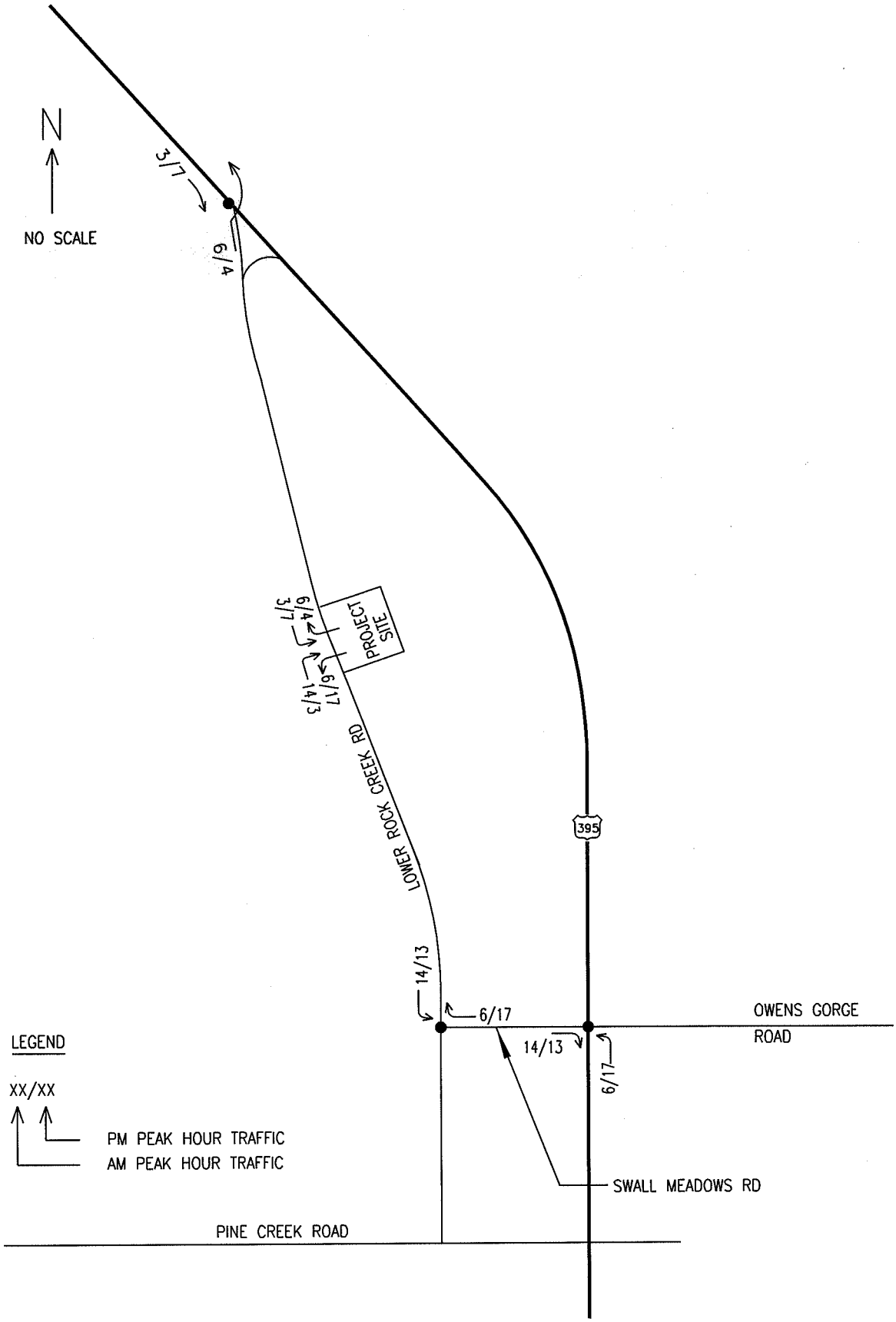


FIGURE 2
PEAK HOUR PROJECT TRAFFIC ASSIGNMENTS

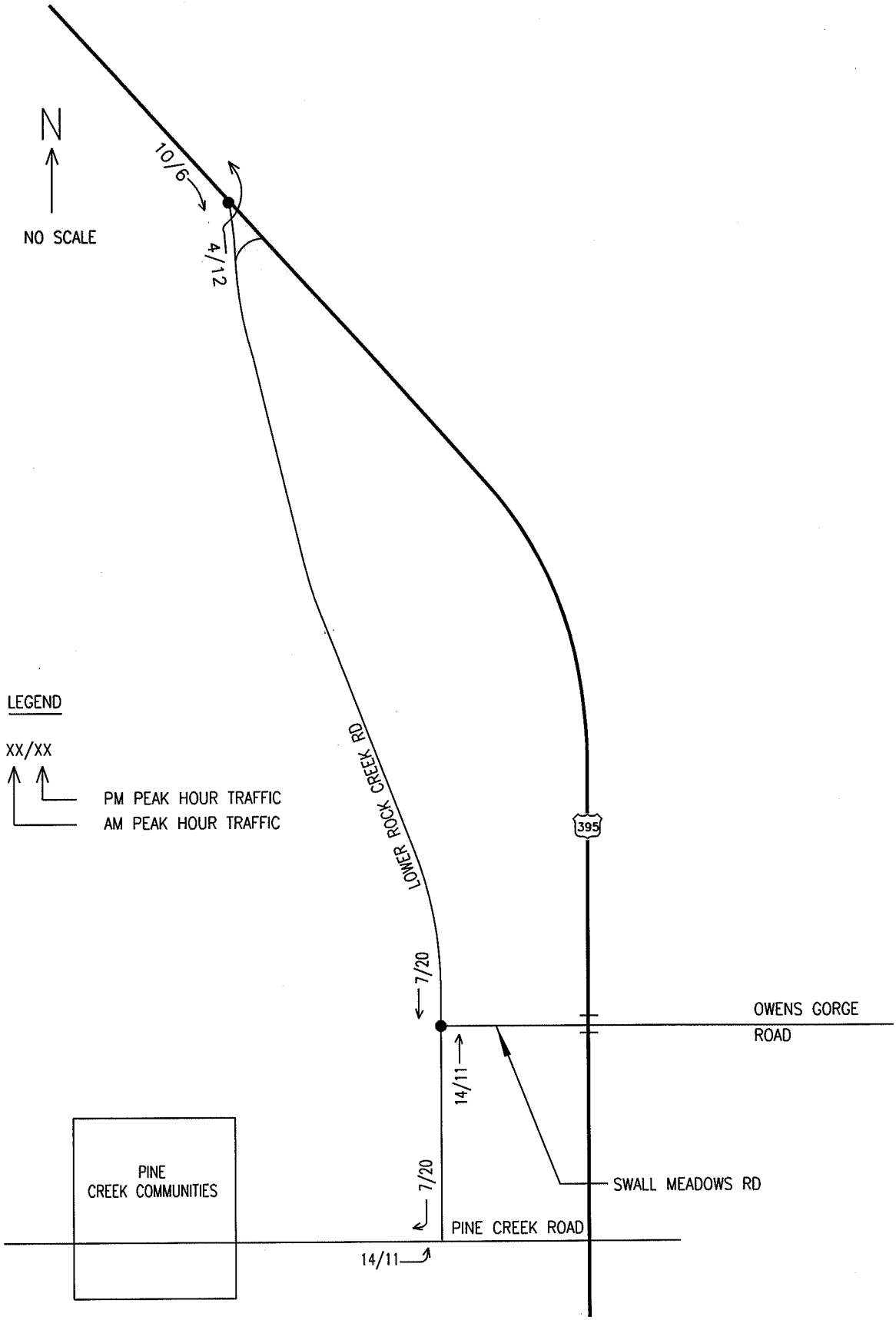


FIGURE 3
CUMULATIVE TRAFFIC FROM OTHER RELATED PROJECT TRAFFIC

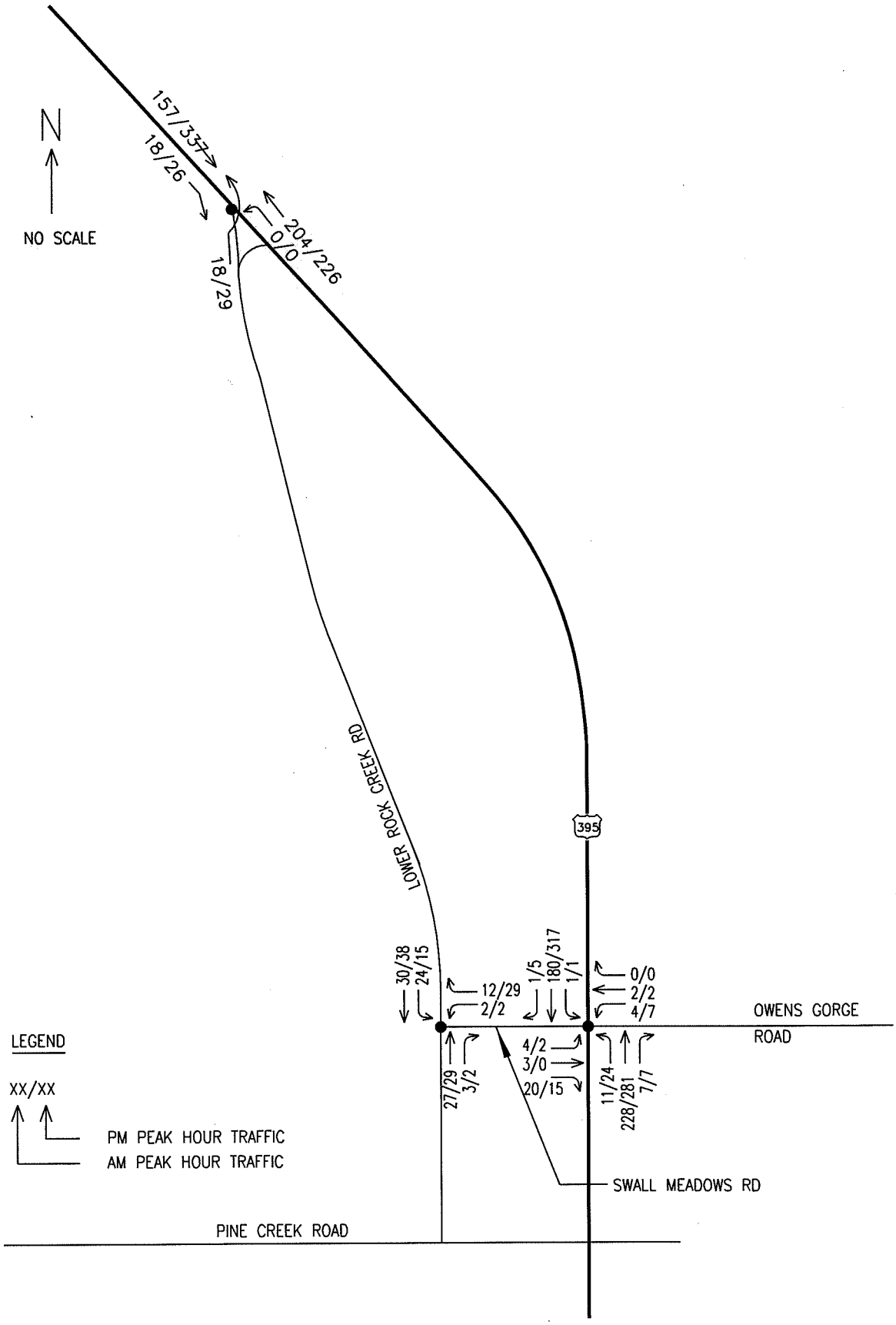


FIGURE 4
EXISTING TRAFFIC PLUS PROJECT TRAFFIC PLUS OTHER APPROVED RELATED PROJECT TRAFFIC

6. TRAFFIC IMPACT ANALYSIS

The preceding sections have estimated the vehicle trips from the proposed project and assigned them to the surrounding street systems. This section will investigate the extent to which the project traffic will impact the three study intersections mentioned in the previous section. In order to analyze the ability of these intersections to accommodate the project traffic, the Highway Capacity Manual Analysis (HCM) technique was utilized. The analysis of intersection capacity is a sound traffic engineering tool to ascertain how many traffic lanes and traffic signal control should be provided to adequately handle traffic demands.

Another term "Level of Service" is used in conjunction with street capacity analysis studies. Since the traffic flow on a street is of a dynamic nature and changes from minute to minute, the "Level of Service" becomes a good tool to interpret many traffic phenomenas which may have lacked an adequate explanation before. Level of Service is a relative measure of driver satisfaction. There are six "Levels of Service", ranging from A (free-flow; volume-to-capacity ratio less than 0.60) to F (traffic jam; volume to capacity ratio value in excess of 1.0). Level of Service D (volume-to-capacity ratio of 0.81 to 0.90) is traditionally considered the acceptable threshold level for urban peak traffic hour conditions. Level of Service E (volume-to-capacity ratio of 0.91 to 1.00) is the maximum traffic volume a facility can accommodate before a traffic jam occurs.

Exhibit A shows the detailed level of service calculations for the various traffic scenarios during the peak traffic periods for each of the three study intersections. These calculated level of services are re-outlined in Table 4 for comparison.

TABLE 4

LEVEL OF SERVICE SUMMARY

Study Intersection	Existing Traffic		Existing Traffic Plus Project Traffic		Existing plus Project Plus Other Related Project Traffic	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Hwy 395 and Swall Meadows/Owens Gorge	B	B	B	B	B	B
Lower Creek Road & Hwy 395	A	B	B	B	B	B
Lower Creek Rd & Swall Meadows	A	A	A	A	A	A

Lower Rock Creek Road

Existing Traffic		Existing Plus Project Traffic		Existing Traffic Plus Project Traffic Plus Other Related Project Traffic	
AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
65	76	94	117	124	153
A (11%)	A (13%)	A (16%)	A (20%)	A (21%)	A (26%)

A (10%)

A - Level of Service
10% - Percent of total street carrying traffic capacity

7. CONCLUSIONS AND RECOMMENDATIONS

Analysis of traffic generated by the proposed Sierra Paradise Project indicates that Lower Rock Creek Road including the intersection of Highway 395 and Lower Creek Road, Highway 395 and Swall Meadows, and Swall Meadows and Lower Rock Creek Road will continue to continue to maintain an "B" level of service or better even with the addition of project traffic. The Institute of Transportation Engineers defines the operational characteristic of an intersection or roadway with the term "Level of Service". There are six "Levels of Service", ranging from "A" (light traffic) to "F" (traffic jam). Level of Service "D" is traditionally considered the acceptable threshold level for urban peak traffic hour conditions and "C" for rural street like Lower Rock Creek Road. Since there are no impacts resulted by the project, off-site mitigating improvements will not be required as part of the project implementation.

EXHIBIT "A"

LEVEL OF SERVICE CALCULATIONS

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: 395 & Owens Gorge
Jurisdiction: Mono County
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing Traffic
East/West Street: Owens Gorge Road
North/South Street: Hwy 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	5	228	7	1	180	1
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	5	228	7	1	180	1
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			Yes			Yes
Lanes	1	2	1	1	2	1
Configuration	L	T	R	L	T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	4	2	0	4	3	6
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	4	2	0	4	3	6
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Median Storage 1						
Flared Approach: Exists?		No			No	
Storage						
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L		LTR			LTR	
v (vph)	5	1		6			13	
C(m) (vph)	1408	1352		613			741	
v/c	0.00	0.00		0.01			0.02	
95% queue length	0.01	0.00		0.03			0.05	
Control Delay	7.6	7.7		10.9			9.9	
LOS	A	A		B			A	
Approach Delay				10.9			9.9	
Approach LOS				B			A	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: 395 & Owens Gorge
Jurisdiction: Mono County
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Projct Traffic
East/West Street: Owens Gorge Road
North/South Street: Hwy 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	11	228	7	1	180	1
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	11	228	7	1	180	1
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			Yes			Yes
Lanes	1	2	1	1	2	1
Configuration	L	T	R	L	T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	4	2	0	4	3	20
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	4	2	0	4	3	20
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Median Storage 1						
Flared Approach: Exists?		No			No	
Storage						
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L		LTR			LTR	
v (vph)	11	1		6			27	
C(m) (vph)	1408	1352		598			835	
v/c	0.01	0.00		0.01			0.03	
95% queue length	0.02	0.00		0.03			0.10	
Control Delay	7.6	7.7		11.1			9.5	
LOS	A	A		B			A	
Approach Delay				11.1			9.5	
Approach LOS				B			A	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: 395 & Owens Gorge
Jurisdiction: Mono County
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Projct + Cumulative Traffic
East/West Street: Owens Gorge Road
North/South Street: Hwy 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	11	228	7	1	180	1
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	11	228	7	1	180	1
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			Yes			Yes
Lanes	1	2	1	1	2	1
Configuration	L	T	R	L	T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	4	2	0	4	3	20
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	4	2	0	4	3	20
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Median Storage 1						
Flared Approach: Exists?		No			No	
Storage						
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L		LTR			LTR	
v (vph)	11	1		6			27	
C(m) (vph)	1408	1352		598			835	
v/c	0.01	0.00		0.01			0.03	
95% queue length	0.02	0.00		0.03			0.10	
Control Delay	7.6	7.7		11.1			9.5	
LOS	A	A		B			A	
Approach Delay				11.1			9.5	
Approach LOS				B			A	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: 395 & Owens Gorge
Jurisdiction: Mono County
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing Traffic
East/West Street: Owens Gorge Road
North/South Street: Hwy 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	7	281	7	1	317	5
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	7	281	7	1	317	5
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1	1	2	1
Configuration	L	T	R	L	T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	7	2	0	2	0	2
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	7	2	0	2	0	2
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Median Storage 1						
Flared Approach: Exists?		No			No	
Storage						
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L		LTR			LTR	
v (vph)	7	1		9			4	
C(m) (vph)	1249	1286		542			672	
v/c	0.01	0.00		0.02			0.01	
95% queue length	0.02	0.00		0.05			0.02	
Control Delay	7.9	7.8		11.8			10.4	
LOS	A	A		B			B	
Approach Delay				11.8			10.4	
Approach LOS				B			B	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: 395 & Owens Gorge
Jurisdiction: Mono County
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project Traffic
East/West Street: Owens Gorge Road
North/South Street: Hwy 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	24	281	7	1	317	5
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	24	281	7	1	317	5
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1	1	2	1
Configuration	L	T	R	L	T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	7	2	0	2	0	15
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	7	2	0	2	0	15
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Median Storage 1						
Flared Approach: Exists?		No			No	
Storage						
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L		LTR			LTR	
v (vph)	24	1		9			17	
C(m) (vph)	1249	1286		511			806	
v/c	0.02	0.00		0.02			0.02	
95% queue length	0.06	0.00		0.05			0.06	
Control Delay	7.9	7.8		12.2			9.6	
LOS	A	A		B			A	
Approach Delay				12.2			9.6	
Approach LOS				B			A	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: 395 & Owens Gorge
Jurisdiction: Mono County
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project + Cumulative Traffic
East/West Street: Owens Gorge Road
North/South Street: Hwy 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	24	281	7	1	317	5
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	24	281	7	1	317	5
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			Yes			Yes
Lanes	1	2	1	1	2	1
Configuration	L	T	R	L	T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	7	2	0	2	0	15
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	7	2	0	2	0	15
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?		No			No	
Storage						
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L		LTR			LTR	
v (vph)	24	1		9			17	
C(m) (vph)	1255	1293		512			806	
v/c	0.02	0.00		0.02			0.02	
95% queue length	0.06	0.00		0.05			0.06	
Control Delay	7.9	7.8		12.2			9.6	
LOS	A	A		B			A	
Approach Delay				12.2			9.6	
Approach LOS				B			A	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: 395 & Lower Rock Creek
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing Traffic
East/West Street: Lower Rock Creek
North/South Street: Highway 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	204			157	5
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	0	204			157	5
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Raised curb					
RT Channelized?						No
Lanes	1	2			2	1
Configuration	L	T			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				8		0
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				8		0
Percent Heavy Vehicles				0		0
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	0						8	
C(m) (vph)	1429						729	
v/c	0.00						0.01	
95% queue length	0.00						0.03	
Control Delay	7.5						10.0-	
LOS	A						A	
Approach Delay							10.0-	
Approach LOS							A	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: 395 & Lower Rock Creek
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project Traffic
East/West Street: Lower Rock Creek
North/South Street: Highway 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	204			157	8
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	0	204			157	8
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Raised curb					
RT Channelized?						No
Lanes	1	2			2	1
Configuration	L	T			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				14		0
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				14		0
Percent Heavy Vehicles				0		0
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	0						14	
C(m) (vph)	1426						729	
v/c	0.00						0.02	
95% queue length	0.00						0.06	
Control Delay	7.5						10.0+	
LOS	A						B	
Approach Delay							10.0+	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: 395 & Lower Rock Creek
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project + Cumulative Traffic
East/West Street: Lower Rock Creek
North/South Street: Highway 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	204			157	18
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	0	204			157	18
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Raised curb					
RT Channelized?						No
Lanes	1	2			2	1
Configuration	L	T			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				18		0
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				18		0
Percent Heavy Vehicles				0		0
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	0						18	
C(m) (vph)	1414						729	
v/c	0.00						0.02	
95% queue length	0.00						0.08	
Control Delay	7.5						10.1	
LOS	A						B	
Approach Delay							10.1	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: 395 & Lower Rock Creek
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing Traffic
East/West Street: Lower Rock Creek
North/South Street: Highway 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	226			337	13
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	0	226			337	13
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Raised curb					
RT Channelized?						No
Lanes	1	2			2	1
Configuration	L	T			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				13		0
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				13		0
Percent Heavy Vehicles				0		0
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	0						13	
C(m) (vph)	1220						596	
v/c	0.00						0.02	
95% queue length	0.00						0.07	
Control Delay	8.0						11.2	
LOS	A						B	
Approach Delay							11.2	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: 395 & Lower Rock Creek
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project Traffic
East/West Street: Lower Rock Creek
North/South Street: Highway 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	226			337	20
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	0	226			337	20
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Raised curb					
RT Channelized?						No
Lanes	1	2			2	1
Configuration	L	T			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				17		0
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				17		0
Percent Heavy Vehicles				0		0
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	0						17	
C(m) (vph)	1213						596	
v/c	0.00						0.03	
95% queue length	0.00						0.09	
Control Delay	8.0						11.2	
LOS	A						B	
Approach Delay							11.2	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: 395 & Lower Rock Creek
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project + Cumulative Traffic
East/West Street: Lower Rock Creek
North/South Street: Highway 395
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	226			337	26
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	0	226			337	26
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Raised curb					
RT Channelized?						No
Lanes	1	2			2	1
Configuration	L	T			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				29		0
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				29		0
Percent Heavy Vehicles				0		0
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	0						29	
C(m) (vph)	1207						596	
v/c	0.00						0.05	
95% queue length	0.00						0.15	
Control Delay	8.0						11.3	
LOS	A						B	
Approach Delay							11.3	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: Lower Rock Creek & Ownes Gorge
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing Traffic
East/West Street: Owens Gorge Rd.
North/South Street: Lower Rock Creek Rd.
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		13	3	10	23	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		13	3	10	23	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2		6			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	2		6			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		10		8				
C(m) (vph)		1615		1038				
v/c		0.01		0.01				
95% queue length		0.02		0.02				
Control Delay		7.2		8.5				
LOS		A		A				
Approach Delay				8.5				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: Lower Rock Creek & Ownes Gorge
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project Traffic
East/West Street: Owens Gorge Rd.
North/South Street: Lower Rock Creek Rd.
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		13	3	24	23	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		13	3	24	23	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2		12			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	2		12			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		24		14				
C(m) (vph)		1615		1045				
v/c		0.01		0.01				
95% queue length		0.05		0.04				
Control Delay		7.3		8.5				
LOS		A		A				
Approach Delay				8.5				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: AM Peak
Intersection: Lower Rock Creek & Ownes Gorge
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project + Cumulative Traffic
East/West Street: Owens Gorge Rd.
North/South Street: Lower Rock Creek Rd.
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		27	3	30	24	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		27	3	30	24	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2		12			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	2		12			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		30		14				
C(m) (vph)		1596		1023				
v/c		0.02		0.01				
95% queue length		0.06		0.04				
Control Delay		7.3		8.6				
LOS		A		A				
Approach Delay				8.6				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: Lower Rock Creek & Ownes Gorge
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing Traffic
East/West Street: Owens Gorge Rd.
North/South Street: Lower Rock Creek Rd.
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		18	2	2	18	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		18	2	2	18	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2		12			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	2		12			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		2		14				
C(m) (vph)		1609		1051				
v/c		0.00		0.01				
95% queue length		0.00		0.04				
Control Delay		7.2		8.5				
LOS		A		A				
Approach Delay				8.5				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: Lower Rock Creek & Ownes Gorge
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project Traffic
East/West Street: Owens Gorge Rd.
North/South Street: Lower Rock Creek Rd.
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		18	2	15	18	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		18	2	15	18	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2		29			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	2		29			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		15		31				
C(m) (vph)		1609		1055				
v/c		0.01		0.03				
95% queue length		0.03		0.09				
Control Delay		7.3		8.5				
LOS		A		A				
Approach Delay				8.5				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: TSE
Agency/Co.:
Date Performed: 5/23/2004
Analysis Time Period: PM Peak
Intersection: Lower Rock Creek & Ownes Gorge
Jurisdiction: Mono Co.
Units: U. S. Customary
Analysis Year: 2004
Project ID: Existing + Project + Cumulative Traffic
East/West Street: Owens Gorge Rd.
North/South Street: Lower Rock Creek Rd.
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		29	2	15	38	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		29	2	15	38	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2		29			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	2		29			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		15		31				
C(m) (vph)		1595		1039				
v/c		0.01		0.03				
95% queue length		0.03		0.09				
Control Delay		7.3		8.6				
LOS		A		A				
Approach Delay				8.6				
Approach LOS				A				

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX K

WASTEWATER GENERATION, TREATMENT & DISPOSAL STUDY

WASTEWATER GENERATION, TREATMENT AND DISPOSAL STUDY

TENTATIVE TRACT 37-56, ROCK CREEK RANCH

Mono County, California

May, 2004
Revised October, 2007
Job #2215

Prepared By:

TRIAD/HOLMES ASSOCIATES
P.O. Box 1570
Mammoth Lakes, California 93546
(619) 934-7588

_____
Thomas A. Platz, P.E. C41039
License Expires 3/31/09

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LIST OF FIGURES AND ATTACHMENTS

INTRODUCTION

Tentative Tract 37-56 is proposed as a 60 lot single-family residential subdivision located north of Round Valley approximately twelve miles northwest of the City of Bishop in Mono County, California. An existing residential development, Paradise Estates (PE), is located west of the site. Residences within the PE subdivision currently utilize engineered individual onsite sewage disposals for treatment of wastewater prior to disposal. The engineered systems are required by the Lahontan Regional Water Quality Control Board (LRWQCB) due to concerns that groundwater contamination could occur from conventional sewage disposal systems. Their concern is based on shallow (less than 3 feet below the surface) fractured bedrock that could be a direct avenue for untreated wastewater to contaminate the groundwater table.

The entire project area of TTM 37-56 is similarly located on a bluff consisting of shallow soils underlain by fractured Bishop Tuff. Due to LRWQCB concerns, the developers of Tract 37-56 will be required to construct a wastewater treatment plant (WWTP) in lieu of onsite disposal systems to mitigate the potential for groundwater contamination. This report addresses estimated wastewater generation for the subdivision, the proposed method of treatment and disposal.

SITE AND PROJECT DESCRIPTION

The residential subdivision portion of the site is located on a bluff east of Lower Rock Creek. The project slopes at grades of between 10% and 30%to the south. The westerly edge of the subdivision ends abruptly at a bluff ranging in height from 60 feet to 100 feet. Lower Rock Creek is located roughly 300 feet to the west.

As stated previously, the subdivision as proposed consists of a total of 60 single family residential lots. The lots will range in size from 10,500 to 25,500 square feet. It is expected that a significant majority of the residences will be occupied by families that will be

year round residents of Mono County. For purposes of estimating anticipated WWTP capacity requirements all lots are anticipated to be occupied by year-round residents.

WASTEWATER GENERATION AND COLLECTION

The wastewater generated by the project is estimated to be 17,300 gal/day (gpd) on average. This is based on an average daily wastewater generation of 90 gpd per capita with an average family size of 3.2 in Mono County. A peaking factor of three can be anticipated for this project as most residents are expected to work in Mammoth Lakes which will create a high wastewater generation in the morning prior to leaving for work. Maximum day flows of up to 26,000 gpd are expected during weekends.

A wastewater collection system will be installed to convey wastewater from the residences to the proposed wastewater treatment plant (WWTP). The proposed system will consist of sewer laterals at the residences connecting to sewer mains in the streets. The sewer mains will convey the wastewater to the WWTP to be located in the southern portion of the project site.

WASTEWATER TREATMENT

As stated previously, a WWTP will be installed as part of the project. The WWTP will be constructed and operated in the south central portion of the project as shown on Figure 1. The WWTP will provide treatment of wastewater to meet California Title 22 tertiary treatment standards. The WWTP will be a package treatment plant using either the Sequencing Batch Reactor (SBR) process or extended aeration process. Either method provides secondary treatment of the effluent. The WWTP will be equipped with a filtration system and a disinfection system in order to meet Title 22 tertiary treatment standards for wastewater. There are a number of packaged treatment plant manufacturers including Santec, ITT Sanitaire, and Advanced Environmental Systems that provide design, installation and monitoring services for their products.

Overall dimensions of the WWTP vary by manufacturer however the footprint will fit within a footprint of 30 feet by 60 feet as shown on the tentative map. All components of that plant will be set at grade except for a building approximately 12 feet by 14 feet which will include air blowers and process control hardware (SCADA) which will be equipped with remote monitoring software. The proposed location of the WWTP with respect to the rest of the project is presented on Figure 1. A schematic drawing of an extended aeration treatment plant with tertiary filtration and disinfection is presented on Figure 2.

WWTP RECYCLED WATER DISPOSAL

Disposal of the tertiary treated recycled water will be through spray irrigation of landscaped park and open space areas. Storage ponds will be constructed to provide storage of recycled water for a total of 30 days (520,000 gal.) of recycled water production or as deemed necessary by LRWQCB.

Based on an estimated evapotranspiration rate of 48 inches (4 feet) per year and a percolation rate of one-half inch per day into the ground, an acre of irrigated area will absorb 1.5 million gallons per year when water is applied 200 days of the year. Therefore 4.8 acres of land is anticipated to be needed for disposal of the annual recycled water generated for the project (17,300 gpd x 365 days = 6.31 mg.).

Adequate area is available on the site for disposal of the recycled water generated by the project. The designated areas shown on the tentative map can be supplemented with additional area within the project open space if needed. The LRWQCB will determine the actual area required when an Application for Waste Discharge is reviewed and permitted.

WASTEWATER PLANT OPERATION, MAINTENANCE AND MONITORING

The method, design and construction of all wastewater treatment and disposal facilities proposed for this project will be regulated and approved by the LRWQCB. The LRWQCB will require a certified WWTP operator to maintain and monitor the plant and establish minimum intervals for water quality testing and reporting to the LRWQCB. In addition the LRWQCB will require the installation of groundwater monitoring wells downgradient of the plant to monitor the impacts, if any, on groundwater from disposal of WWTP effluent.

Costs for WWTP operation and maintenance of the WWTP will be borne by the home homeowners in the subdivision. A homeowners association or a community services district will be formed to collect the fees necessary to cover the WWTP O & M costs.

EXISTING DIRT ROAD
EXISTING DIRT ROAD
SECONDARY ACCESS CONNECTOR
PROPOSED TRAIL
IRRIGATION MAIN
HEADWORKS AT GRADE W/ FLOW METER (5'x5')
10'x10' MECHANICAL & ELECTRICAL EQUIP. BUILDING INCLUDING RECYCLED WATER PUMP STATION
12' DIA x 40' LONG SUBSURFACE FIBERGLASS PACKAGE PLANT
TERTIARY FILTER AND DISINFECTION UNIT
IRRIGATION STAGING/ STORAGE POND
OPEN SPACE 1.28 ACRES
LANDSCAPE AREA IRRIGATED WITH RECYCLED WATER
OPEN SPACE 8.72 ACRES
POTENTIAL RECYCLED WATER IRRIGATION AREA
S 00°36'11" E
2625.53'
N. 89°08'45" E
612.88'
PROPOSED 10' ACCESS EASEMENT
PROPOSED 10' ACCESS EASEMENT
PROPOSED 10' ACCESS EASEMENT
IRRIGATION SYSTEM PUMP STATION (SUBSURFACE)
IRRIGATION
POND
AREA WITH RECYCLED WATER
STREAM
HOMEOWNERS RECREATION AREA (3.05 AC)
PROPOSED TRAIL
SUBMERSIBLE RECIRCULATION PUMP
POND
IRRIGATION MAIN
IRRIGATION MAIN
IRRIGATION MAIN
EX. DIRT ROAD
PROPOSED TRAIL
S 19°41'27" W
266.11'
S 03°47'30" E
593.87'
992.08'
S 35°29'14" W
234.41'
R=160.00
L=66.37
Δ=23°46'08"
S 21°35'41" E
102.33'
R=1040.00
L=179.24
Δ=9°52'30"
S 11°43'12" E
431.00'
R=960.00
L=232.41
Δ=13°52'14"
PARCEL 3
PMB 37-38
54.67 ACRES
26-330-02

51 21,050 SF	50 16,788 SF	49 13,383 SF	B 12,852 SF
48 15,540 SF	47 15,518 SF	46 16,618 SF	45 16,245 SF
44 15,018 SF	43 15,581 SF	42 19,667 SF	E 11,990 SF
9 15,570 SF	10 16,343 SF	11 16,713 SF	12 16,797 SF
C 10,754 SF	41 24,355 SF	3 14,935 SF	4 16,647 SF
29 15,859 SF	30 15,430 SF	31 15,708 SF	32 15,839 SF
33 16,855 SF	34 22,015 SF	35 15,656 SF	36 14,772 SF
D 10,853 SF	40 25,463 SF	13 19,286 SF	14 19,837 SF
5 15,863 SF	6 15,499 SF	7 13,096 SF	8 12,647 SF
39 20,235 SF	38 17,671 SF	15 24,763 SF	16 23,230 SF
37 16,216 SF	18 16,267 SF	17 16,845 SF	20 16,711 SF
19 16,468 SF	24 16,692 SF	23 15,441 SF	22 15,396 SF
21 15,068 SF	28 15,159 SF	27 15,153 SF	26 15,643 SF
25 16,560 SF			

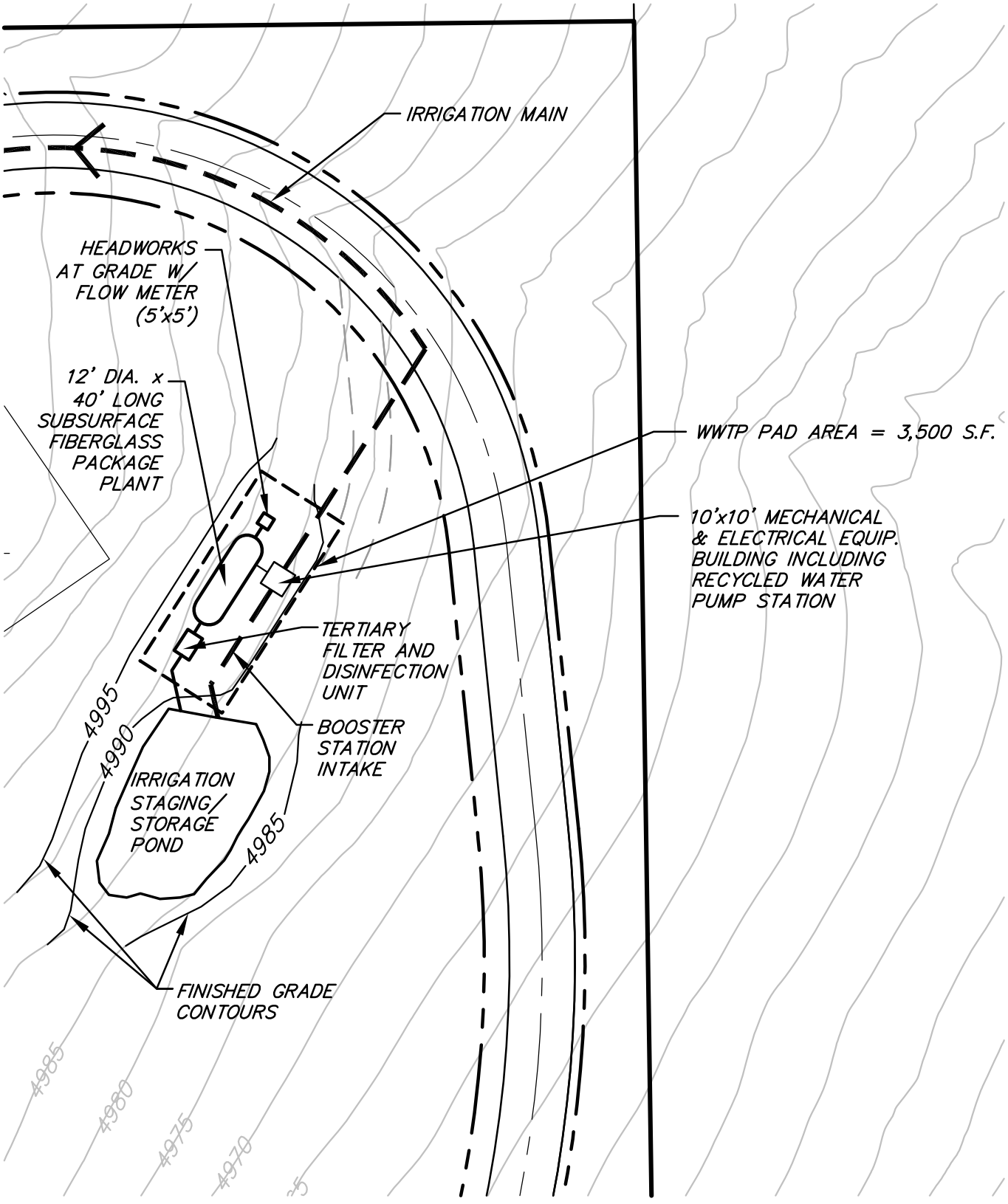
SCALE 1"=150'

WASTEWATER TREATMENT AND RECYCLED WATER IRRIGATION SCHEMATIC

FIGURE 1

JOB NO. 2215
DWG SITE-PLAN.DWG
triad/holmes associates
11/8/07

K:\01 Mammoth\2215\Tentative\Working Drawing\2215TM_Altern-Rec. Wat. Figure 1and2.dwg



SCALE 1"=50'

WASTEWATER TREATMENT PLANT SCHEMATIC

FIGURE 2

JOB NO. 2215	triad/holmes associates	11/8/07
DWG DH		

ROCK CREEK RANCH SPECIFIC PLAN AND DRAFT EIR

APPENDIX L

SUMMARY OF WELL #1 AND WELL #2 SAMPLING AND TESTING

SIERRA GEOTECHNICAL SERVICES INC.

ENVIRONMENTAL • GEOTECHNICAL • GEOLOGY • HYDROGEOLOGY • MATERIALS

March 26, 2008
Revised April 18, 2008

Mr. Matthew Lehmann
C & L Development, LLC
Box 1445
1949 Sierra Park Road, 2nd Floor
Mammoth Lakes, California 93546

SUBJECT: **SUMMARY OF SAMPLING AND ANALYTICAL TESTING**
Well Nos. 1 and 2
Proposed Rock Creek Ranch Subdivision
Paradise, Mono County, California

Mr. Lehman:

On February 11, 2008, Sierra Geotechnical Services, Inc. performed Title 22 well water sampling at the subject site for compliance purposes. Observations, field procedures, and analytical results are described below.

Field Procedures

Well Nos. 1 and 2 were both purged for 24 hours continuously prior to sampling. During sampling, the temperature and pH of the water from each well were measured using a temp-pH-EC meter. These data are presented on the attached Chain of Custody (COC) forms that were submitted to the analytical laboratory. Purged water was discharged to the grounds on the site at a location measuring greater than 100 feet from the wellhead.

Samples were collected from Well No. 1 at the end of the discharge pipe, and from Well No. 2 at a spigot tapped into the wellhead discharge line. All samples were stored in an ice chest with "blue-ice" until delivery to the analytical lab. The samples were shipped overnight via FedEx to FGL Environmental in Santa Paula, California. FGL is state-certified to perform the necessary analyses and accredited in accordance with the National Environmental Laboratory Accreditation Conference (NELAC). A copy of the COC that accompanied the samples is attached. SGSI is now in receipt of the analytical results. It should be noted that water from Well No. 1 was analyzed for the complete suite of Title 22 analytes (include Radiochemistry), while Well No. 2 was analyzed for Radiochemistry analytes only. The results of testing revealed the following with regard to these analytes:

General Mineral Analyses/General Physical Analyses – Well No. 1

Laboratory analyses for general minerals shows that the final well-blend water sample from both Well No. 1 has a sodium-bicarbonate (Na-HCO3) character. The following details specific key general water quality constituents and their regulatory limits:

- Total dissolved solids (TDS) concentration of 60 milligrams per liter (mg/L). The recommended California Department of Public Health (CDPH) Secondary Maximum Concentration Level (MCL) for TDS is 500 mg/L; thus, the TDS concentration is below the recommended MCL for TDS.
- The fluoride concentration was reported at 0.3 mg/L. With a CDPH Primary MCL of 2 mg/L, this constituent is below its MCL.
- Sulfate was reported at a concentration of 6 mg/L, well below the recommended or lower CDPH Secondary MCL of 250 mg/L.

All other general mineral constituents were either not detected or were present in concentrations below their respective MCLs, as applicable.

Inorganics (trace metals) – Well No. 1

For the inorganic constituents, trace metals and other inorganics, the laboratory analyses reveal that aluminum (Al), arsenic (As), barium (Ba), iron (Fe), manganese (Mn), tungsten (W), vanadium (V) and zinc (Zn) were the only trace metal constituents detected in the final well-blend water quality sample. The table below shows the detected results for these constituents and their listed regulatory levels:

Constituent	Result (in µg/L or ppb)	Maximum Contaminant Level (in µg/L or ppb)
Al	20	1000 (primary)
As	3	10 (US EPA)
Ba	3.4	1000 (NL)
Fe	170	300 (secondary)
Mn	20	50 (secondary)
W	15	Not regulated
V	4	50 (NL)
Zn	30	5000 (primary)

All MCLs are for CDPH, unless otherwise indicated.
NL = Notification Level (CDPH)

The above table shows all detected trace metals are below their listed regulatory levels. It should be noted that the trace metal W was also tested and is provided herein for informational purposes; it is not a regulated constituent.

Organic Compounds – Well No. 1

Results of laboratory analyses of samples for volatile organic compounds (VOCs), semi-VOCs, pesticides, and polychlorinated biphenyls (PCBs) were all reported as being not-detected (ND) from Well No. 1. Thus, the sample is in compliance with California Title 22 listed organic compound standards.

Radiological Constituents – Well Nos. 1 & 2

Results of laboratory analyses of radiological constituents from Well Nos. 1 and 2 revealed that the Gross Alpha, Gross Beta, Strontium 90, Radium 226 and 228, Tritium and Uranium were each below their current CPDH MCLs.

Other Constituents – Well No. 1

Asbestos was reportedly not detected and, thus, is in compliance.

This opportunity to be of service is appreciated. If you have any questions regarding this letter, please contact us.

Respectfully submitted,
SIERRA GEOTECHNICAL SERVICES, INC.

H. Dean Dougherty, III, Principal
Principal Geologist
PG No. 6497

Attachment: FGL "Laboratory Report" for Well Nos. 1 and 2 dated March 24, 2008