

APPENDIX A

Engineering and Geology Field Trip Reports

Yokoh Valley Reservoir

APPENDIX A.1

Engineering Field Trip Report

(June 11, 2002)

Field Trip Log

Trip Log Number:	3	Project No.:	1003032.01180502
Dates:	6/11/02	Times:	1400-1430
Site Name:	New Yokohl Creek	Location:	Exeter
Prepared By:	DKR/JMH/WAM	Reviewed By:	
Date:	6/11/02	Date.:	

Attendees/Visitors Name	Organization/Phone/Email
DKR	MWH, 925.685.6275 x125, david.k.rogers@mwhglobal.com
JMH	MWH, 925.685.6275 x143, james.m.herbert@mwhglobal.com
WAM	MWH, 425.602.4025 x1060, william.a.moler@mwhglobal.com

Weather Conditions:

Clear with slight haze, warm (low 90s), light breeze

Access Route (attach map):

Highway 99, State highway 198 (E) through Visalia to County Road M 296 (E)

Attachments:	Yes	No
Photo Log	✓	
Photos	✓	
Video Log (available)	✓	
Dictation Log (available)	✓	
Topographic Map	✓	

Purpose:

Review proposed location of new dam site.

Field Observations:

Existing Structures/Cultural Features:

A couple residential properties were observed; one upstream (Gill Ranch) and one downstream of the proposed dam site.

Right of Way/Access Restrictions:

Access to the Yokohl Creek dam sites is available via a paved county road (County Road 296).

Overhead/Buried Utilities:

Overhead power and buried telephone lines were noted along the county road.

Description of Proposed Structures (attached a field sketch or sketch on a topo map):

Technical Memorandum 4 (URS, 2000) identified a new Yokohl Creek dam site location as being ~8 miles southwest of Terminus Dam or ~7 miles south of Woodlake Township. URS discussed a new zoned earthfill dam extending to a height of 320 feet and a storage capacity of ~970,000 ac ft. In addition to natural runoff from the upstream drainage area, an 8-mile long, 10-ft diameter tunnel would divert water from Lake Kaweah to Yokohl Reservoir (URS, 2000).

USBR cost takeoffs from April 1958 (5 sites) and February 1975 (one site) summarize possible new Yokohl Creek dam sites. A draft Geologic Report prepared in 1975 by USBR documents recommended a 260-foot high, 12 million cubic yard earthfill dam that would create a 450,000 ac ft reservoir covering a surface area of 4,400 acres. The el. 805 crest would be ~2,960 feet long and 30 feet wide. The spillway would be an ungated overflow crest with a maximum discharge of 1,200 cfs. The outlet works would be capable of discharging 700 cfs. Two small saddle dams in the hills west of the dam site would be required. In the 1975 scenarios, water flow would be moved to Yokohl Creek reservoir from, at the time, the to-be-built 18-mile-long Mid-Valley Canal, a 1 ½-mile long tunnel, and pump stations.

Description of Appurtenant Features (spillways, tunnels, pumping plants, flood routing/coffer dams/dewatering during construction, outlet works, switch yards, transformer yards, transmission lines, conveyance pipelines/canals, access roads, security, operation/maintenance):

The 1975 USBR design shows the axis of the embankment dam extending eastward across Yokohl Creek.

Briefly Describe Geologic/Geotechnical Site Conditions:

The Yokohl Creek dam site is located at the boundary of the Sierra Nevada foothills and the Great Valley. The Yokohl Creek dam site would be located in a north- to northwest-flowing tributary to the Kaweah River. The site is located in the “serpentine belt” along the western margin of the Sierra Nevada. The left abutment location is underlain by Mesozoic ultrabasic

intrusive rocks that reportedly consist of steeply-east dipping schistose to sub-schistose serpentine and meta-gabbro with talcose stringers. The right abutment is reportedly underlain by pre-Cretaceous meta-volcanic rock (amphibolite), undifferentiated pre-Cretaceous metasedimentary rocks and ultrabasic intrusive rocks (meta-gabbro). Mesozoic intrusive granitics are exposed on the east rim of Yokohl Valley.

Recent river alluvium deposits of sand, gravel, and cobbles were encountered in boreholes advanced in February 1975 to depths of up to ~23 feet. Between ~23 to 34 feet below ground surface (bgs), hard gravel and cobbles were reported mixed with sand, silt and sandy clay. Below 34 feet bgs, clayey gravel is reported to the total depth drilled (87 feet bgs). From geophysical data, the alluvium is estimated to be ~ 100 to 120 feet thick.

Previous studies indicate that there are no faults in the area capable of producing ground motions greater than those generated by four known regional sources that include the San Andreas fault system, the Sierra Frontal fault system, the White Wolf fault, and the Garlock fault (USCOE, 1990)

Location/Description of Nearest Borrow Areas (attach map or show on topo map):

The Draft Geologic Report indicated that there may be a number of potential borrow areas within the proposed reservoir footprint.

Location/Description of Equipment/Material Staging and Lay Down Areas (attach map or show on topo map):

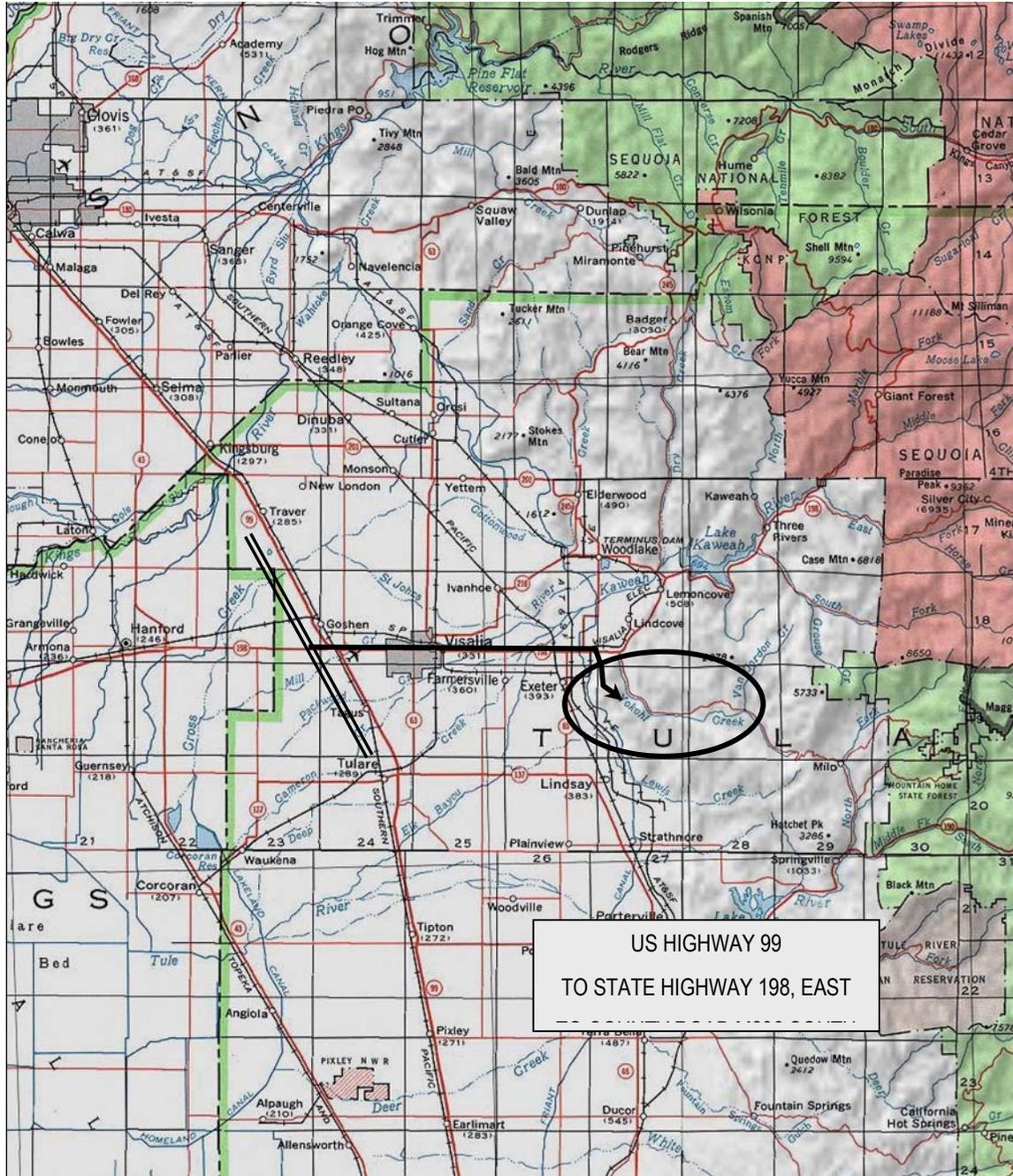
Potential staging and laydown areas are located downstream of the proposed Yokohl Creek dam site.

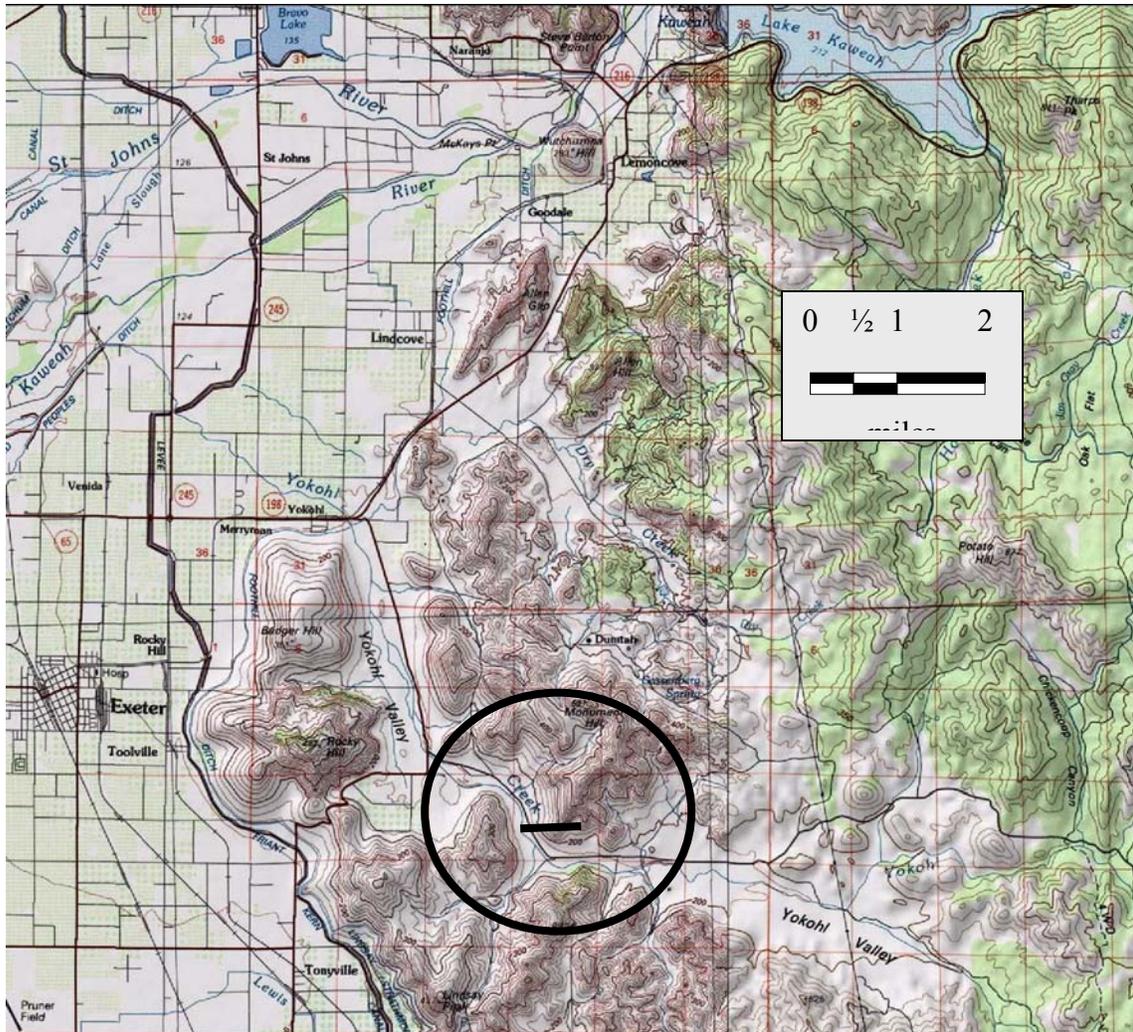
Identification of Environmental Sensitive Areas (wetlands, springs, rivers, streams, endangered/threatened species habitats, etc.):

Oak woodland habitat and grassy grazeland surrounds the dam site.

Description of Mining or Other Anthropologic Activities:

None noted.







Yokohl Creek – View toward proposed right dam abutment.



View toward proposed left dam abutment.



Yokohl Creek – View toward proposed right dam abutment.



View toward proposed right dam abutment.

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APPENDIX A.2

Hydropower Team Trip Report

(June 18-20, 2003)

UPPER SAN JOAQUIN RIVER BASIN STORAGE INVESTIGATION - PHASE 1

HYDROPOWER ANALYSIS TRIP REPORT - SITE VISITS TO RETAINED SITES

June 18 – 20, 2003

INTRODUCTION

This field trip report was prepared to document on-site data collection activities in support of an appraisal-level hydropower evaluation of surface storage options under consideration in the Phase 1 Upper San Joaquin River Basin Storage Investigation. As part of Task 1, Data Collection, field trips were made to three potential Temperance Flat dam locations on the San Joaquin River at river mile (RM) 274, RM 279, RM 286; and at two potential dam sites for off-stream storage reservoirs at Fine Gold Creek and Yokohl Creek. Field trips were also made to the Pacific Gas and Electric (PG&E) and Southern California Edison (SCE) hydroelectric facilities likely to be impacted by dams at RM 274, RM 279 and RM 286. The PG&E facilities included Wishon Powerhouse, Kerckhoff Dam, Kerckhoff No: 1 Powerhouse and Kerckhoff No: 2 Powerhouse. The SCE facilities included Big Creek No: 4 Powerhouse, Redinger Dam and Big Creek No: 3 Powerhouse. The PG&E and SCE facilities are all located on the San Joaquin River.

Potential dam locations and existing PG&E and SCE facilities were visited as follows:

Wednesday, June 18, 2003: RM 286, Big Creek No: 4 Powerhouse, Redinger Dam, Big Creek No: 3 Powerhouse, and Fine Gold Creek.

Thursday, June 19, 2003: Kerckhoff Dam, Wishon Powerhouse, Kerckhoff No: 1 Powerhouse, Kerckhoff No: 2 Powerhouse, and Yokohl Creek.

Friday, June 20, 2003: Millerton Lake, RM 274, Fine Gold, and RM 279.

The core field trip team consisted of the following MWH members of staff:

Foster Pelton, Civil Engineer

James M. Herbert, Engineering Geologist

Jill N. Miller, Civil Engineer

The field trip on Wednesday, June 18 was made in conjunction with the MWH team of environmental specialists. On Thursday, June 19, a representative of PG&E accompanied the core field trip team. On Friday, June 20, sites were viewed by boat on Lake Millerton where the core field trip team was part of a larger Bureau of Reclamation and MWH group.

The field trip team stayed each night in the town of Clovis just northeast of Fresno. The team assembled in Clovis on the evening of Tuesday, June 17.

Details of the field trips are given below for each day. Photographs are given in the Attachment in the order the sites were visited.

FIELD TRIP – WEDNESDAY, JUNE 18

This section of the report deleted from Yokohl Valley Reservoir TM, but included in Temperance Flat Reservoir TM.

FIELD TRIP – THURSDAY, JUNE 19

This section of the report deleted from Yokohl Valley Reservoir TM, but included in Temperance Flat Reservoir TM.

Kerckhoff Dam

This section of the report deleted from Yokohl Valley Reservoir TM, but included in Temperance Flat Reservoir TM.

Wishon Powerhouse

This section of the report deleted from Yokohl Valley Reservoir TM, but included in Temperance Flat Reservoir TM.

Kerckhoff No: 1 Powerhouse

This section of the report deleted from Yokohl Valley Reservoir TM, but included in Temperance Flat Reservoir TM.

Kerckhoff No: 2 Powerhouse

This section of the report deleted from Yokohl Valley Reservoir TM, but included in Temperance Flat Reservoir TM.

Yokohl Creek Site

The field team proceeded to the Yokohl Creek Site from Auberry via Auberry Road, Route 168, Academy Avenue, Route 99, and Route 198 to Yokohl and thence to the site location.

For reference, details of the Yokohl Creek site are given in the Draft Technical Memorandum dated March 2003 on the Yokohl Valley Reservoir.

The site location was inspected and afterwards the team proceeded to the Friant-Kern Canal to look at a possible location for a forebay for a pump/generating station. The potential forebay site is located on the east side of the Friant-Kern Canal, about ¾-mile northeast of the small community of Tonyville. It consists of a relatively level, roughly triangular parcel

of agricultural land within a small side valley at the base of the adjacent low mountains. Based on USGS topographic maps (20-foot contour intervals), it appears that the forebay could potentially cover about 15 to 20 acres.

Water from the forebay would be pumped into the reservoir through the adjacent mountain via an approximately 1- to 1½-mile long tunnel. The tunnel would traverse Jurassic ultrabasic rocks variably altered to serpentinite. The serpentinite is dark green and massive, and is considered sound. It locally grades to dark to light green schistose to sub-schistose serpentinitized rock. The serpentinite forms bold to inconspicuous outcrops that are lightly to moderately weathered and moderately jointed.

FIELD TRIP – FRIDAY, JUNE 20

Millerton Lake Tour

This section of the report deleted from Yokohl Valley Reservoir TM, but included in Temperance Flat Reservoir TM.

Attachments

Field Trip Photos

- A. -
- B. -
- C. -
- D. -
- E. -
- F. -
- G. -
- H. -
- I. -
- J. Yokohl Creek
- K. -



J – Yokol ~01.jpg
6/19/2003

APPENDIX B

Environmental Field Trip Report

Yokohl Valley Reservoir

ENVIRONMENTAL TRIP REPORT. YOKOHL VALLEY RESERVOIR

INTRODUCTION

A team of environmental specialists completed an initial field trip to the potential Yokohl Valley Dam and Reservoir site on May 29, 2002. The field trip was the first task in the environmental study of several potential surface storage options identified for initial review during the Upper San Joaquin River Basin Storage Investigation. For initial consideration, the environmental review focused mainly on construction and potential upstream impacts associated with surface storage sites. The site visit provided an opportunity to conduct preliminary reconnaissance of existing resources at the various locations for the following resource areas: terrestrial biology; aquatic biology and water quality; recreation; cultural resources; and land use.

This appendix includes a brief overview of the resource specialists' observations, trip logs prepared by team members, photographs taken during the field trip, and maps used to identify and review existing resources.

SUMMARY OF FIELD OBSERVATIONS

This measure would involve constructing a new dam on Yokohl Creek, which is a tributary to the Kaweah River and New Dry Creek. The new dam site and reservoir would be situated on private property. Existing facilities include a paved county road, paved and unpaved private roads, several private residences and ranch buildings, and orchards.

Botany

Yokohl Valley is a relatively narrow valley with open grass and meadow fields being used for cattle production.

The valley is vegetated with grasslands and meadow type habitats.

The stream is ephemeral and currently dry.

The vegetation suggests the water table is relatively high.

Overall habitat losses could be substantial.

Wildlife

- The site has the potential for San Joaquin kit fox and San Joaquin pocket mouse.

Aquatic Biology/Water Quality

- Yokohl Creek may be an ephemeral stream that loses all its water in the dry season.
- The creek likely contains no significant aquatic biological resources, but this issue should be further investigated.

- Diversions from Lake Kaweah would potentially affect fisheries and water quality of that reservoir.
- Construction of the new reservoir would create aquatic habitat and fisheries opportunities, primarily for exotic fish species.
- Inundation of abandoned mines, if any are present, could result in water quality degradation.

Recreation

- There are no developed recreation facilities in either the Yokohl Creek or New Dry Creek areas. As such, no recreation-related impacts are expected.
- This measure would involve diverting water from Lake Kaweah. Lower water levels at Lake Kaweah could affect recreation facilities such as boat ramps and the marina, and recreation opportunities such as fishing and boating.

Cultural Resources

- A formerly more extensive riparian zone is likely, compared to that observed at present. The stream nonetheless may be year-round, or nearly so.
- Blue Oak woodland has probably been cleared for agricultural development. There is a moderate to high probability of prehistoric archaeological sites including BRM stations, hunting and fishing camps, and possibly seasonal village sites.
- A roadside historic marker notes that the Jordan Toll Trail ran through Yokohl Valley, providing access across the Sierra to Owens Lake and silver mines in the Coso Range. Rock walls were observed on the lower slopes of Rocky Hill.
- There are also piles of quarried granite, and mounds of soil (possible placer mining) closer to the stream, near Rocky Hill. Historic sites are likely, associated with mining, trans-Sierran travel, agriculture, and other activities.

Land Use

- The area in the vicinity of the dam location includes many substantial ranch houses with established vegetation. Some of these homes may be inundated.
- A large new hillside housing development would overlook the dam off Route 217.

Field Trip Log - Botany		
Trip Log Number:	S11	Project No.: 8004094
Dates:	May 29, 2002	
Site Name:	Yokohl Valley Dam	
Location:	Yokohl Creek west of Exeter	
Prepared By:	Jeff Glazner/Barry Anderson/David Stevens	
Date:	June 5, 2002	

Weather Conditions:	Hot and dry
Areas Covered (attach map with notations)	
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	No

Field Observations:

Existing Facilities:

None, except for residences and farms.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Yokohl Valley is relatively narrow valley with open grass and meadow fields being

utilitized for cattle production. The valley is vegetated with grasslands and meadow type habitats. The stream is ephemeral and currently dry. The vegetation suggests the water table is relatively high. Could be wetlands associated with high water table. Vernal pools could be present in dry areas.

Need for additional (engineering/hydrological, or other) information on measures

Geology or soils information
Groundwater hydrology, if available
Spillway elevation and limits of inundation
Location of diversion structures and tunnel
Location of realigned existing roads
Location of work pads, access roads, and other construction areas

Additional data needs (within each specific discipline)

CNDDDB report
CNPS report
Ceres report
Field surveys for wetlands and special status species and habitats

Field Trip Log - Wildlife		
Trip Log Number:	S11	Project No.: 8004094
Dates:	May 29, 2002	
Site Name:	Yokohl Valley Dam	
Location:	Yokohl Creek west of Exeter	
Prepared By:	Dave Stevens, Stephanie Murphy	
Date:	June 5, 2002	

Weather Conditions:	Hot and dry
Areas Covered (attach map with notations)	
Attachments	
Photo Log	
Photos	
Topographic Map(s)	

Field Observations:

Existing Facilities:

None

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Yokohl Valley is relatively narrow valley with open grass and meadow fields being

utilitized for cattle production. The valley is vegetated with grasslands and meadow type habitats. the stream is ephemeral and currently dry. The vegetation suggests the water table is relatively high. The site has the potential for San Joaquin kit fox and San Joaquin pocket mouse.

Need for additional (engineering/hydrological, or other) information on measures

Need map showing each alternative dam location, inundation levels, calculated acreages of habitat loss, etc.

Topo that shows inundation zone and extent of loss of various habitats including tributary creeks.

Additional data needs (within each specific discipline)

Need to coordinate with resource agency biologists and agency files on known distribution of sensitive species for this area.

Field Trip Log – Fish and Water Quality		
Trip Log Number:	S11	Project No.: 8004094
Dates:	May 29, 2002	
Site Name:	Yokohl Valley Dam	
Location:	Yokohl Creek west of Exeter	
Prepared By:	Philip Unger	
Date:	June 10, 2002	

Weather Conditions:	Hot and dry	
Areas Covered (attach map with notations)	Yokohl Creek	
Attachments		
Photo Log	No	
Photos	No	
Topographic Map(s)	Yes	

Field Observations:

Existing Facilities:

Existing facilities include a paved county road, paved and unpaved private roads, several private residences and ranch buildings, and orchards.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Yokohl Valley is a grassland valley with an ephemeral stream. The stream, Yokohl Creek, was dry at the time of the field trip and probably remains dry until winter rains. Moist meadow vegetation occurs in various areas, probably indicating a high water table. The valley appears to be entirely fenced and used for cattle ranching.

Need for additional (engineering/hydrological, or other) information on measures

Need information on exact area that would be submerged by a dam on Yokohl Creek.

Need information on range of seasonal flow conditions in Yokohl Creek.

Need the following estimates for proposed reservoir:

Mean depth for each month, April – October.

Mean surface area of shallow water habitat (less than 15 feet deep) in each month, April – October.

Mean rate of water level fluctuation for each month, April – October.

Need information on how Lake Kaweah would be affected by diversions to Yokohl Creek Reservoir, including changes in water level, timing and duration.

Additional data needs (within each specific discipline)

Need information on wet season occurrences, if any, of fish species in Yokohl Creek.

Need information on fish species residing in Lake Kaweah. Information on the location and types of active and abandoned mines in the inundation zone of the proposed reservoir.

Field Trip Log – Recreation		
Trip Log Number:	S11	Project No.: 8004094
Dates:	May 29, 2002	
Site Name:	Yokohl Valley Dam	
Location:	Yokohl Creek west of Exeter	
Prepared By:	Sandra Perry	
Date:	June 4, 2002	

Weather Conditions:	Hot and dry
Areas Covered (attach map with notations)	Yokohl Creek
Attachments	
Photo Log	No
Photos	No
Topographic Map(s)	Yes

Field Observations:

Existing Facilities:

This project would involve constructing a new dam on Yokohl Creek, which is a tributary to the Kaweah River. The new dam site and reservoir would be situated on private property. Existing facilities include a paved county road, paved and unpaved private roads, several private residences and ranch buildings, and orchards.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

There are no developed recreation facilities located in the immediate project area. However, this project would involve diverting water from Lake Kaweah to the new Yokohl Creek Reservoir. Lower water levels at Lake Kaweah could affect recreation facilities such as boat ramps and marinas and recreation opportunities such as fishing and boating.

Need for additional (engineering/hydrological, or other) information on measures

Need information on exact area that would be submerged by a dam on Yokohl Creek.
Need information on how Lake Kaweah would be affected by diversions to Yokohl Creek Reservoir, including changes in water level, timing and duration.

Additional data needs (within each specific discipline)

Need the following recreation-related information for Lake Kaweah:
Exact location of existing recreation facilities along the margins of Lake Kaweah
General information about recreation activities and use levels.

Field Trip Log – Land Use		
Trip Log Number:	S11	Project No.: 8004094
Dates:	May 29, 2002	
Site Name:	Yokohl Valley Dam	
Location:	Yokohl Creek west of Exeter	
Prepared By:	Irina Torrey	
Date:	June 12, 2002	

Weather Conditions:	Hot and dry	
Areas Covered (attach map with notations)	Yokohl Creek	
Attachments		
Photo Log	Yes	
Photos	Yes	
Topographic Map(s)	No	

Field Observations:

Existing Facilities:

This measure would involve constructing a new dam on Yokohl Creek, which is a tributary to the Kaweah River. The new dam site and reservoir would be situated on private property. Existing facilities include a paved county road, paved and unpaved private roads, several private residences and ranch buildings, and orchards.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

The area in the vicinity of the dam location includes many well built ranch houses with established vegetation. Some of these homes may be inundated. In addition there is a substantial new housing development on a hill which would overlook the dam off Route 217.

Need for additional (engineering/hydrological, or other) information on measures

Need information on exact area that would be submerged by a dam on Yokohl Creek.

Additional data needs (within each specific discipline)

Need to know how many homes would be within the inundation area.

Field Trip Log – Cultural Resources		
Trip Log Number:	S11	Project No.: 8004094
Dates:	May 29, 31 2002	
Site Name:	Yokohl Valley Dam	
Location:	Yokohl Creek west of Exeter	
Prepared By:	David White	
Date:	May 31 2002	

Weather Conditions:	Hot & dry
Areas Covered (attach map with notations)	Aerial reconnaissance May 29; vehicular reconnaissance May 31, along road parallel to creek on its east side
Attachments	
Photo Log	Yes – MWH 0205
Photos	Yes – nos. 44-45
Topographic Map(s)	Area examined is on Rocky Hill quad; potential reservoir may extend east into Chickencoop Canyon and Frazier Valley quads

Field Observations:

Existing Facilities:

No existing dam. Residences and ranches.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Cultural resources:

Prehistoric: More extensive riparian zone likely in the past than observed at present.

Stream may be year-round, or nearly so. Blue Oak woodland has probably been cleared for agricultural development. Moderate to high probability of prehistoric archaeological sites including BRM stations, hunting & fishing camps, possibly seasonal village sites.

Historic: Roadside marker notes that the Jordan Toll Trail ran through Yokohl Valley providing access across the Sierra to Owens Lake and silver mines in the Coso Range. Rock walls observed on the lower slopes of Rocky Hill (Section 8, lat./long. 36°17'39"N, 199°4'20"W). Also piles of quarried granite, and mounds of soil (possible placer mining?) observed closer to the stream, in Sections 5 and 8. Various sites likely, associated with mining, trans-Sierran travel, agriculture, and other activities.

Need for additional (engineering/hydrological, or other) information on measures

Need precisely mapped footprint of reservoir, with various potential dam levels; also need footprint of all associated project-related ground disturbance areas, to include but not be limited to project offices and maintenance buildings, construction set-up and lay-down areas, access roads, electric transmission lines, water conveyance structures, and all other project facilities.

Additional data needs (within each specific discipline)

Need archaeological records search with California Historic Resources Inventory System (CHRIS) information center. Clearinghouse: Southern San Joaquin Valley Info Center, CSU-Bakersfield.

Also need brief review of archaeological and ethnographic literature pertaining to the area. Minimal level of effort: (1) to identify types of archaeological remains expected, time periods represented; and (2) to identify Native American tribes historically occupying the area, along with published information on major named villages or other ethnographic sites.



Picture: P5290055 Yokohl Creek, May 29 2002, afternoon



Picture: P5290056 Yokohl Creek, May 29 2002, afternoon



Picture: P52900129 Yokohl Creek dam abutment site looking west from road. Note riparian zone of Yokohl Creek.



New Yokohl Dam, looking West, toward new housing development 5/31/2002



New Yokohl Dam, farm houses

5/31/02



New Yokohl Dam, farm houses

5/31/02



New Yokohl Dam, near dam site location, farm houses

5/31/02



New Yokohl Dam Site, looking West

5/31/02

2PM



New Yokohl Dam Site

5/31/02



Yokohl Valley, view SE, 5/29/92



Yokohl Valley, view SE, 5/29/92

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APPENDIX C

Cost Estimate

Yokohl Valley Reservoir

ESTIMATE WORKSHEET

PLANT ACCT.		PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
FEATURE:			PROJECT:					
YOKOHL VALLEY DAM AND APPURTENANT FEATURES			USJRBSI					
ZONED EARTH FILL DAM, 260 FEET HIGH			DIVISION:					
			P:\US_Bureau_Reclamation\DIQ_01CS20210B\Upper FILE: _San_Joaquin_Phase_1\Documents\Surface Storage Option TM\TM Yokohl\YOKOHL DAM ESTIMATE (revsd).xls					
20 DAM STRUCTURE								
PREVENTION OF WATER POLUTION			1 LS \$250,000.00 \$250,000					
DIVERSION AND CARE OF WATER			1 LS \$400,000.00 \$400,000					
EXCAVATION DAM FOUNDATION			560,000 CY \$6.00 \$3,360,000					
EXCAVATION STIPPING OF BORROW PITS			1,140,000 CY \$2.70 \$3,078,000					
EXCAVATION ROCK GROUT CAP			1,020 CY \$8.00 \$8,160					
EXCAVATION TO EMBANKMENT			11,339,000 CY \$4.15 \$47,056,850					
EXCAVATION TO SAND AND GRAVEL BEDDING			113,000 CY \$12.00 \$1,356,000					
EXCAVATION ROCK TO EMBANKMENT			2,040,000 CY \$6.45 \$13,158,000					
EMBANKMENT EARTHFILL IMPERVIOUS			9,638,000 CY \$1.60 \$15,420,800					
EMBANKMENT ROCK			2,855,300 CY \$1.60 \$4,568,480					
EMBANKMENT SAND AND GRAVEL			107,400 CY \$5.00 \$537,000					
Dam Structure Subtotal			\$89,193,290					
30 DRILLING AND GROUTING								
MOBILIZATION GROUTING			1 LS \$100,000.00 \$100,000					
DRILL 0 TO 30 FT			11,550 FT \$18.00 \$207,900					
DRILL 30 TO 60 FT			4,620 FT \$20.00 \$92,400					
DRILL 60 TO 110FT			3,850 FT \$22.00 \$84,700					
DRILL 110 TO 160 FT			1,925 FT \$25.00 \$48,125					
FURNISH AND PLACE GROUT PIPE AND FITTINGS			6,754 LB \$2.00 \$13,508					
CONCRETE IN GROUT CAP			1,020 CY \$250.00 \$255,000					
HOOKUPS TO GROUT HOLES			307 EA \$100.00 \$30,700					
PRESSURE GROUTING			22,300 SKS \$20.00 \$446,000					
CEMENT			28,400 SKS \$5.00 \$142,000					
GRAVEL IN CREST			1,100 CY \$15.00 \$16,500					
Drilling and Grouting Subtotal			\$1,436,833					
QUANTITIES				PRICES				
BY Don Crone		CHECKED Stephen Osgood 10/30/03		BY Don Crone		CHECKED Stephen Osgood 10/30/03		
DATE PREPARED 10/30/2003		APPROVED		DATE 10/30/03		PRICE LEVEL Appraisal 03		

CODE:D-8170

ESTIMATE WORKSHEET

SHEET 2 OF 3

FEATURE: YOKOHL VALLEY DAM AND APPURTENANT FEATURES ZONED EARTH FILL DAM, 260 FEET HIGH	PROJECT: USJRBSI DIVISION: P:\US_Bureau_Reclamation\DIQ_01CS20210B\Upper FILE: _San_Joaquin_Phase_1\Documents\Surface Storage Option TM sTM Yokohl\YOKOHL DAM ESTIMATE (revsd).xls
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PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	40	SPILLWAY					
		EXCAVATION UNCLASSIFIED		112,000	CY	\$6.00	\$672,000
		BACKFILL		8,250	CY	\$15.00	\$123,750
		CONCRETE CREST STRUCTURE		110	CY	\$325.00	\$35,750
		CONCRETE IN FLOORS		900	CY	\$325.00	\$292,500
		CONCRETE WALLS		3,540	CY	\$325.00	\$1,150,500
		DRILL AND GROUT ANCHOR BARS		7,170	LF	\$8.00	\$57,360
		CEMENT		26,000	CWT	\$5.00	\$130,000
		RESTEEL		692,000	LB	\$0.75	\$519,000
		RIPRAP		1,450	CY	\$50.00	\$72,500
		ANCHOR BARS		53,330	LB	\$2.00	\$106,660
		Spillway Subtotal					\$3,160,020
	50	OUTLET WORKS					
		EXCAVATION UNCLASSIFIED		54,700	CY	\$6.00	\$328,200
		EXCAVATION TUNNEL 6.5 DIA		4,600	CY	\$290.00	\$1,334,000
		EXCAVATION TUNNEL 9 FT HORSESHOE		5,560	CY	\$260.00	\$1,445,600
		EXCAVATION GATE CHAMBER		300	CY	\$75.00	\$22,500
		CONCRETE CIRCULAR TUNNEL		2,780	CY	\$325.00	\$903,500
		CONCRETE HORSESHOE TUNNEL		2,800	CY	\$325.00	\$910,000
		CEMENT		31,500	CWT	\$5.00	\$157,500
		RESTEEL		558,000	LB	\$0.75	\$418,500
		CONCRETE IN GATE CHAMBER 1ST STAGE		126	CY	\$375.00	\$47,250
		CONCRETE IN GATE CHAMBER 2ND STAGE		34	CY	\$350.00	\$11,900
		CONCRETE IN CONTROL HOUSE		240	CY	\$400.00	\$96,000
		CONCRETE IN O. W. BASIN		753	CY	\$325.00	\$244,725
		TRASHRACKS		26,000	LB	\$4.00	\$104,000
		PENSTOCK		170,300	LB	\$2.50	\$425,750
		SLIDE GATE 3.5FT X 4 FT GATE 2EA		76,000	LB	\$4.00	\$304,000
		SLIDE GATE CONTROL HOUSE		1	LS	\$25,000.00	\$25,000
		HOLLOW JET VALVE		1	EA	\$15,000.00	\$15,000
		RIPRAP		1,220	CY	\$50.00	\$61,000
		BACKFILL		1,750	CY	\$15.00	\$26,250
		Outlet Works Subtotal					\$6,880,675
QUANTITIES				PRICES			
BY Don Crone		CHECKED Stephen Osgood 10/30/03		BY Don Crone		CHECKED Stephen Osgood 10/30/03	
DATE PREPARED 10/30/03		APPROVED		DATE 10/30/03		PRICE LEVEL Appraisal 03	

CODE:D-8170

ESTIMATE WORKSHEET

SHEET 3 OF 3

FEATURE:		PROJECT:					
YOKOHL VALLEY DAM AND APPURTENANT FEATURES ZONED EARTH FILL DAM, 260 FEET HIGH		USJRBSI					
		DIVISION:					
		P:\US_Bureau_Reclamation\DIQ_01CS20210B\Upper_S FILE: an_Joaquin_Phase_1\Documents\Surface Storage Option TM\TM Yokoh\YOKOHL DAM ESTIMATE (revsd).xls					
PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		60 PUMPSTATIONS					
		PUMPSTATION 4EA 30MW UNITS		120	MW	\$500,000.00	\$60,000,000
		Pumpstation Subtotal					\$60,000,000
		70 CANAL AND PIPELINES					
		INTAKE CHANNEL EXCAVATION		5,500	CY	\$5.00	\$27,500
		CONCRETE CHANNEL		780	CY	\$300.00	\$234,000
		HEADWORKS		1	LS	\$50,000.00	\$50,000
		Canal and Pipelines Subtotal					\$311,500
		80 TUNNEL					
		TUNNEL 15FT DIA		7,600	LF	\$2,000.00	\$15,200,000
		CONCRETE LINING		13,300	CY	\$350.00	\$4,655,000
		TUNNEL OUTLET STRUCTURE		200	CY	\$350.00	\$70,000
		Tunnel Subtotal					\$19,925,000
		90 SWITCHYARDS					
		SWITCHYARD 60mva 115-13.8kv		1	LS		\$1,500,000
		Switchyards Subtotal					\$1,500,000
		SUMMARY OF COSTS					
		Dam Structure					\$89,193,290
		Drilling and Grouting					\$1,436,833
		Spillway					\$3,160,020
		Outlet Works					\$6,880,675
		Pump Station					\$60,000,000
		Canal and Pipelines					\$311,500
		Tunnel					\$19,925,000
		Switchyards					\$1,500,000
		Mobilization - 5%					\$9,100,000
		Subtotal					\$191,507,318
		Unlisted Items - 15%					\$28,492,682
		Contract Cost					\$220,000,000
		Contingencies - 25%					\$60,000,000
		Field Cost					\$280,000,000
QUANTITIES			PRICES				
BY Don Crone		CHECKED Stephen Osgood 10/30/03		BY Don Crone		CHECKED Stephen Osgood 10/30/03	
DATE PREPARED 10/30/2003		APPROVED		DATE 10/30/03		PRICE LEVEL Appraisal 03	

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