RECLAMATION

Managing Water in the West

San Acacia Diversion Dam Field Exploration for Fish Passage Draft Environmental Assessment

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U.S. Department of the Interior
Bureau of Reclamation
Albuquerque Area Office

December 19, 2008

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Front Cover Photo: San Acacia Diversion Dam near Socorro, NM, August 2006

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ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
BiOp	Biological Opinion
CMP	Corrugated Metal Pipes
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GPR	Ground Penetrating Radar
ITA	Indian Trust Assets
LFCC	Low Flow Conveyance Channel
MBTA	Migratory Bird Treaty Act
MRG	Middle Rio Grande
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PVC	Polyvinyl Chloride
RGSM	Rio Grande Silvery Minnow
RPA	Reasonable and Prudent Alternative
SADD	San Acacia Diversion Dam
SAFPP	San Acacia Fish Passage Project
SHPO	State Historic Preservation Office
SWWF	Southwestern Willow Flycatcher
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

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Chapter 1 Purpose and Need for Action

1.1 Introduction

The Bureau of Reclamation (Reclamation) is planning to construct a fish passage facility at San Acacia Diversion Dam (SADD) to satisfy federal requirements under the *Biological and Conference Opinions on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande*, (2003 BiOp) that require fish passage to be implemented at the SADD (RPA element R). This operation of the San Acacia Fish Passage Project (SAFPP) is anticipated to contribute to alleviating jeopardy to the Rio Grande silvery minnow (RGSM) by addressing fragmentation concerns of the RGSM habitat and thus increasing genetic diversity in the Rio Grande by allowing movement of the species between reaches currently separated by diversion dams. Subsurface exploration is necessary at the SADD prior to construction of the SAFPP facility to determine geologic conditions in the area where the foundation of the fishway would be constructed.

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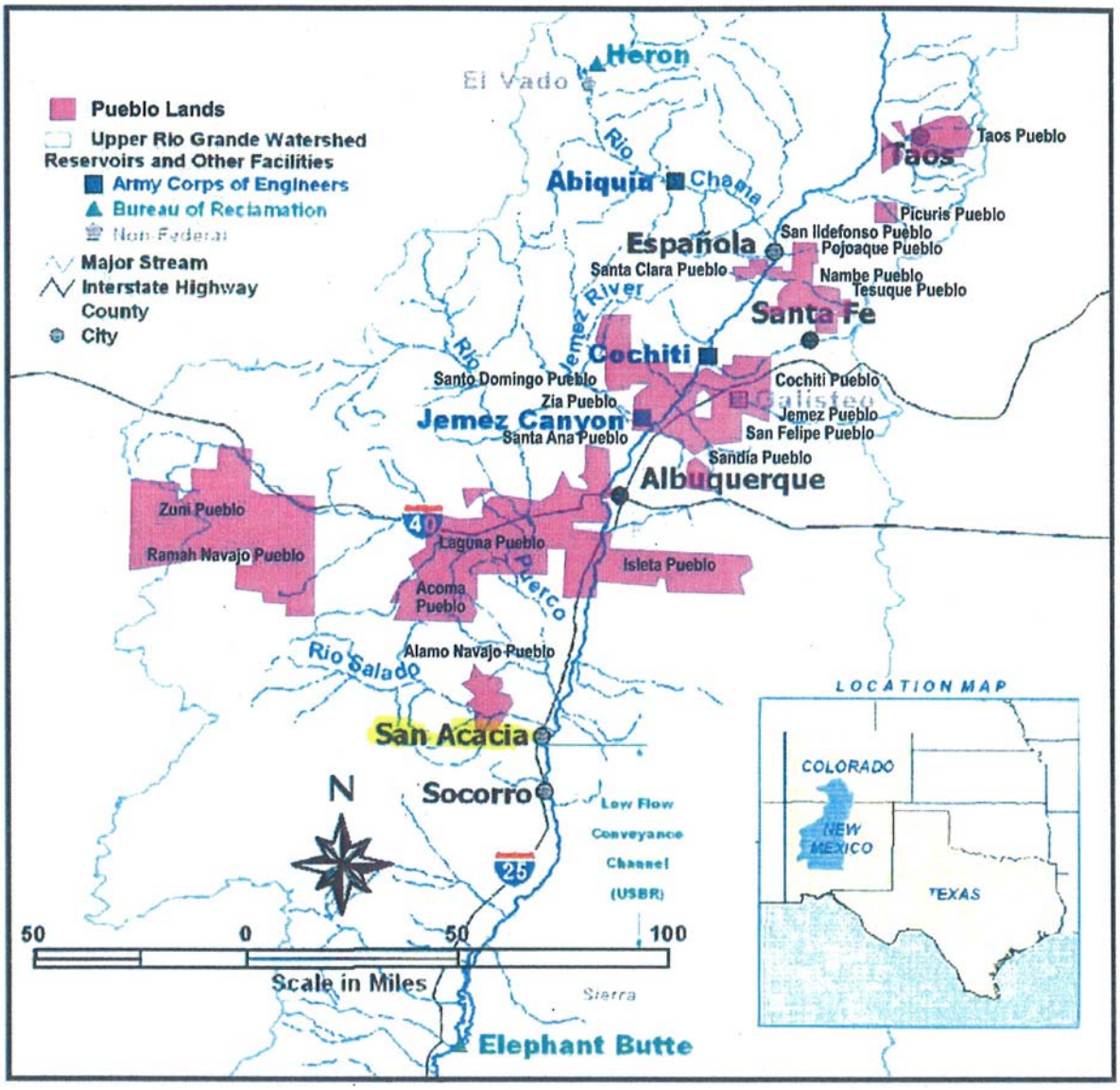

Figure 1 Vicinity Map

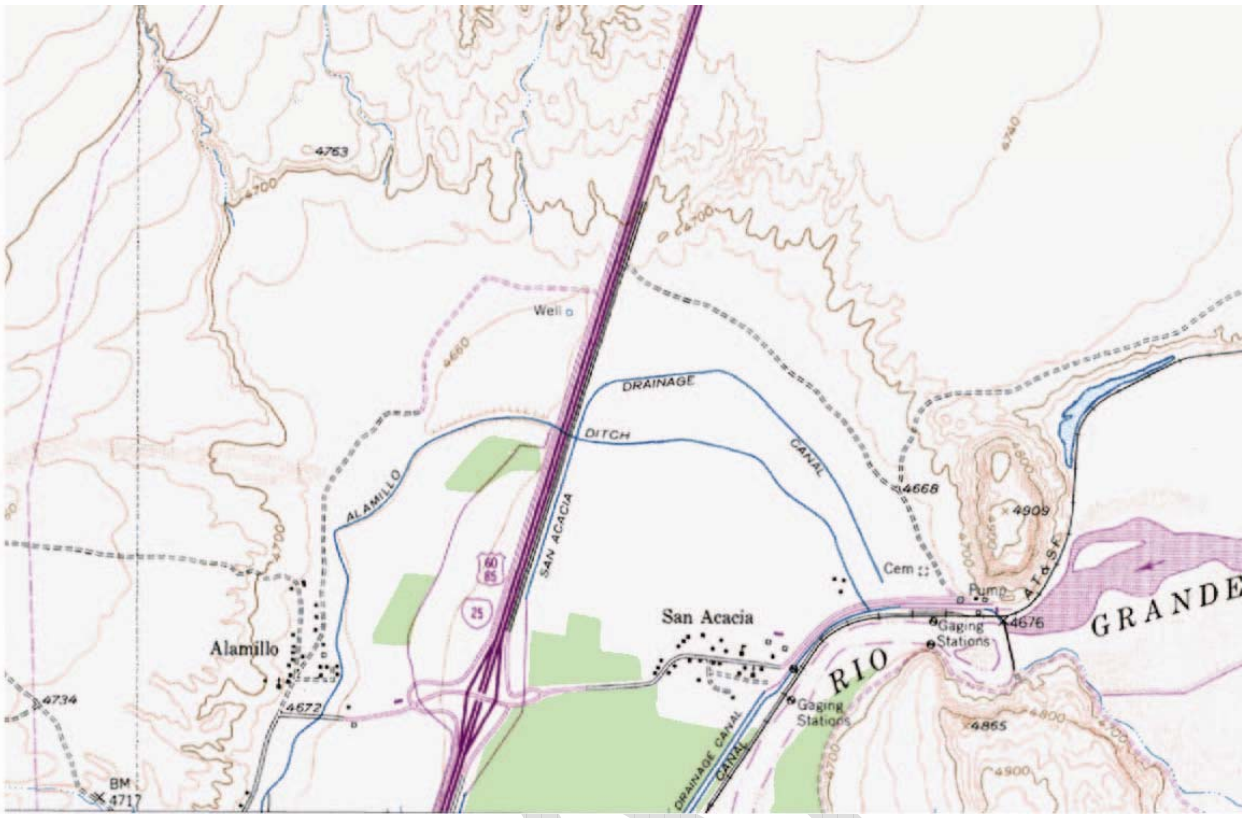

Figure 2 USGS Quad Interstate 25 and Exit to San Acacia, New Mexico

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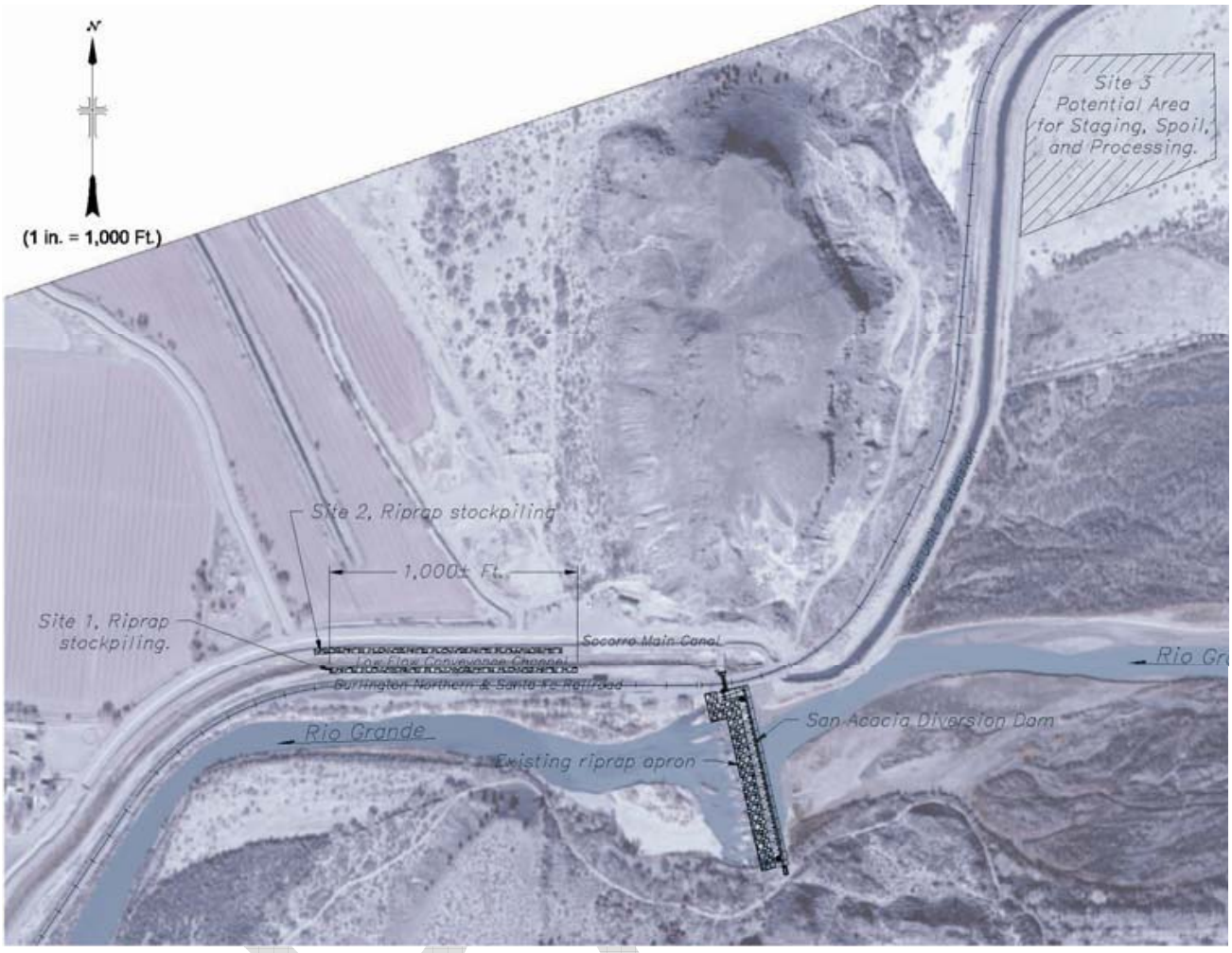

Figure 3 Project Area

1.2 Proposed Action

The Proposed Action would include field exploration studies, including foundation investigations and design data collection activities for the proposed fish passage facility to be located at the SADD, on the Rio Grande in Socorro County, New Mexico. Core drilling is required to characterize the geological and geotechnical site conditions. All of these activities are planned to be completed in about 2 months prior to the runoff season.

There would be five holes drilled; one within the river channel, one on the downstream concrete apron, and three along the left bank of the river, in order to identify geologic conditions beneath the proposed location for the fish passage facility. Data collected in this field exploration would be used to develop a geologic report of site conditions and to finalize the fish passage foundation design.

1.3 Purpose and Need

The need for Reclamation's Proposed Action is collection of subsurface data to finalize design of the fish passage facility at SADD, as required by RPA element R of the 2003 BiOp issued by the USFWS on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation and Non-Federal Actions on the Middle Rio Grande, New Mexico. Subsurface exploration is necessary at the SADD prior to finalizing foundation designs for the fish passage to determine geologic conditions in the area where the foundation of the fishway would be constructed.

1.4 Relevant Statutes, Regulations and Other Plans

Programmatic Biological Assessment (BA) of the Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation and Non-Federal Actions on the Middle Rio Grande, New Mexico, March 1, 2003- February 28, 2013 and the USFWS issued Biological and Conference Opinions (BiOp) on the Effects of Actions Associated with the Programmatic BA

The BA analyzes the effects of the above proposed actions on federally protected species occurring in or near the Rio Chama watershed and the Rio Grande, including all tributaries, from the Colorado/New Mexico state line downstream to the headwaters of Elephant Butte Reservoir. This BA, written in February 2003, focuses on the Rio Grande silvery minnow (Hybognathus amarus), the southwestern willow flycatcher (Empidonax traillii extimus), and the bald eagle (Haliaeetus leucocephalus). Reclamation and the Corps submitted the BA to the USFWS pursuant to Section 7(a)(2) of the Endangered Species Act (ESA).

After reviewing the current status of the RGSM and the SWWF, the environmental baseline for the action area, including current and expected drought conditions, the effects of the proposed water operations and river maintenance activities, and the cumulative effects, the USFWS concluded that water operations and river maintenance of the Middle Rio Grande, as proposed in the February 2003 BA, are likely to jeopardize the continued existence of the RGSM and the SWWF and adversely modify critical habitat of the RGSM.

The USFWS developed the Reasonable and Prudent Alternative (RPA) to the March 1, 2003, through February 28, 2013, water operations and river maintenance proposed action that they believed would avoid jeopardy to the RGSM and the SWWF and also avoid adverse modification to RGSM critical habitat. RPA Element R requires Fish Passage to be implemented at the SADD.

Middle Rio Grande Endangered Species Collaborative Program Long Term Plan

The Middle Rio Grande Endangered Species Collaborative Program (Program) has been in existence as an interim program since 2000. Projects have been funded since 2001 through the present to benefit endangered species in the Middle Rio Grande, including habitat restoration,

science research, and water management activities, some of which are related to the SAFPP. Plans and or issue papers for each of the major categories of activities have been completed and are available to the general public. In addition, the design costs including the proposed subsurface exploration activities for the SAFPP would be funded by the Program.

Rio Grande Silvery Minnow Critical Habitat Designation

In February 2003, the USFWS designated 157 river miles as critical habitat for the endangered RGSM along the last remaining inhabited portion of its range in New Mexico. The Middle Rio Grande from Cochiti Dam to the utility line in Socorro County, marked on the USGS Paraje Well 7.5 minute quadrangle (1980), east of the Bosque Well is considered crucial habitat to the survival of the RGSM. The 300-foot riparian zone on both sides of the river is included except when the river is bounded by levees; then the designation also includes the levee. A portion of the tributary Jemez River that runs from Jemez Canyon Reservoir to its confluence with the Rio Grande was also designated.

Southwestern Willow Flycatcher Critical Habitat Designation

Critical habitat for the flycatcher was designated in October 2005 (Fish and Wildlife Service 2005) and includes the following river reaches in the Middle Rio Grande: from Taos Junction Bridge (State Road 520) in Taos County, downstream for 45.9 km (28.5 mi.) to the upstream boundary of the San Juan Pueblo in Rio Arriba County; from the southern boundary of the Pueblo of Isleta in Valencia County, downstream to the overhead powerline crossing of the Rio Grande near Milligan Gulch, immediately north of the pool of Elephant Butte Reservoir in Socorro County, excluding lands within the Sevilleta and Bosque del Apache National Wildlife Refuges.

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Chapter 2 Alternatives

2.1 Introduction

This chapter describes the two alternatives analyzed in the Draft EA, the No action alternative and the Proposed Action alternative. An analysis of alternatives considered but eliminated from further study is presented in this chapter.

2.2 Description of the Alternatives

2.2.1 Alternative A: No Action

The No Action alternative for this Draft EA is defined as no subsurface exploration, which means that field exploration activities would not be performed for the planned San Acacia Fish Passage Project (SAFPP). Although, this No Action option would result in the saving of monetary resources, it would not meet the purpose and need as it would not provide critical information for the design of the SAFPP. Without this information, there may be adverse impacts to the SADD and/or unexpected site conditions could be encountered during construction of the fish passage facility which would increase the overall cost of the SAFPP.

2.2.2 Alternative B: Proposed Action

General Description of Work

This Proposed Action would entail the performance of field exploration activities, including foundation investigations and design data collection at the SADD, on the Rio Grande in Socorro County, New Mexico. Core drilling is required to determine the geological and geotechnical site conditions.

There would be five holes drilled; one within the river channel, one on the downstream concrete apron, and three along the left bank of the river, in order to identify geologic conditions beneath the proposed location for the fish passage facility. Data collected in this field exploration would be used to develop a geologic report of site conditions and to finalize the fish passage foundation design.

Heavy equipment access to the site would be provided by either A) the downstream concrete apron of the SADD or B) construction of a temporary access road across the riprap apron adjacent to the downstream concrete apron of the dam. Either of these options would require the construction of access ramps on the right and left banks of the river. If option A is available, then a turbidity curtain or inflatable bladder dam would be installed prior to constructing the right-hand ramp, and if option B is required, then a turbidity curtain or inflatable bladder dam would be installed prior to installing the right-hand ramp and constructing the temporary access route across the riprap apron.

Field Exploration Access Options

There are two potential access options available to perform the necessary field exploration. The first is by using the existing downstream concrete apron of the SADD, and the second is by developing a temporary road access by temporarily repairing the existing riprap apron adjacent to the concrete apron. The first option, Option A, is the preferred access route if the results of the ground penetrating radar (GPR) survey performed during the first week of November, 2008 indicate the concrete apron can bear the weight of the drill rig. Regardless of the option selected, access ramps would need to be constructed from the right and left banks to allow the heavy equipment to reach the river level. During construction, any woody debris that must be removed from the temporary road access route would be placed in the river channel directly below the riprap apron and behind the turbidity curtains or inflatable bladder dams.

Option A: If the downstream concrete apron is capable of supporting the heavy equipment necessary for performing the core drilling, access would be gained by driving equipment from the right to the left side of the dam across the downstream concrete apron. Because of uncertainties associated with the condition of the concrete apron, including the capacity to bear heavy equipment loads across the dam, and the potential presence of voids beneath the apron, this option may not be available.

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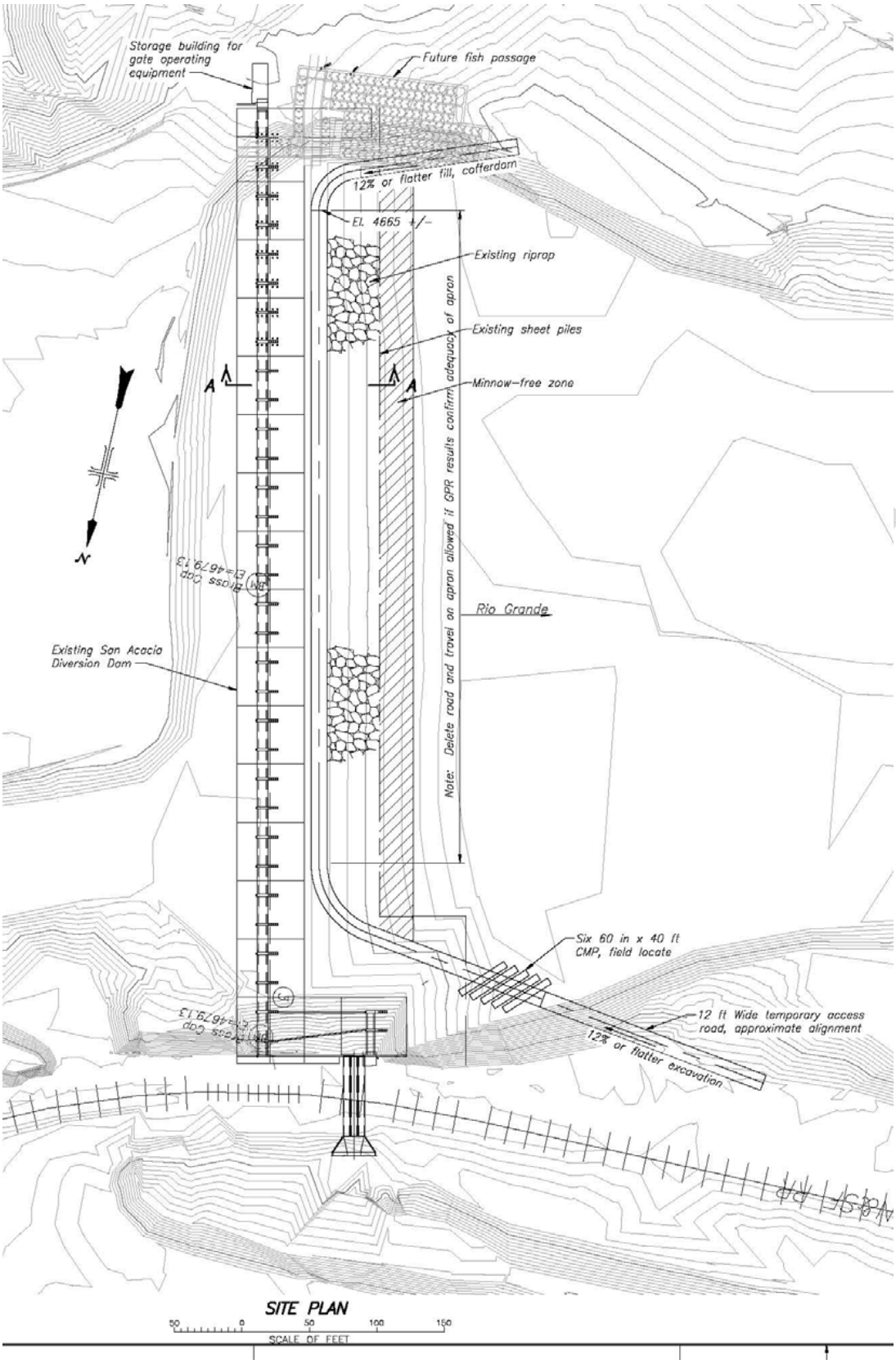

Figure 4 Temporary Access Road Detail

Figure 5 SADD Downstream Concrete Apron and Adjacent Riprap Apron

Option B: If the apron is not capable of supporting the heavy equipment necessary for performing the core drilling, a portion of the riprap apron adjacent to the downstream side of the SADD would be repaired and upgraded as a temporary access road between the two ramps to allow the necessary heavy equipment to drive across to the left side of the river. Riprap would be added to fill in holes and voids in the existing riprap. The width of this repair and improvement would range from 10 to 14 feet.

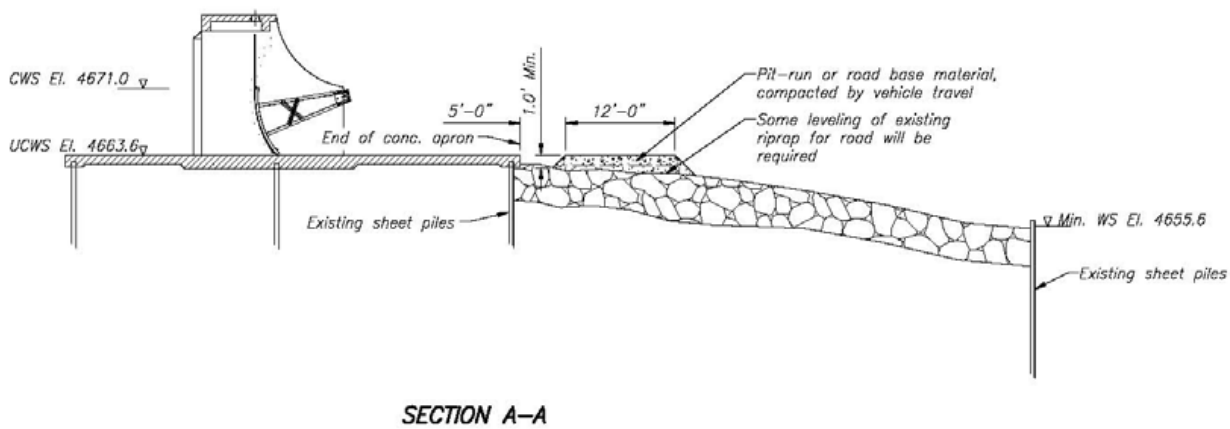

Figure 6 Typical Cross Section of Road on Riprap Apron

This option would be implemented only if the GPR testing completed in November 2008 shows that the concrete apron is not structurally able to support the weight of the drill rig. Figure 4 is a photograph showing the diversion dam's downstream existing riprap and concrete aprons.

As the roadway is constructed, existing materials on the riprap apron would be moved, relocated, shifted, piled, adjusted, etc. and waste rock would be added to create a drivable final road surface. In order to build the temporary access road, first the right gates would need to be closed, then the left gates to allow work to be performed in as dry condition as possible.

The roadway would have a drivable surface width ranging from 10 to 14 feet. The depth of fill to construct the ramp would range between 2 to 3 feet depending upon the existing ground profile. The slope of the temporary access ramps would range from 1(H):1(V) to 2(H):1(V). It is estimated that ±600 cubic yards of waste rock would be required to construct the roadway. See Figures 4 and 5 for Site Plan and Typical Section of the roadway. It is estimated that constructing the temporary access road would take 5 to 10 days. This time period includes the installation of an inflatable bladder dam.

Inflatable Bladder Dam Installation

Prior to constructing the temporary access ramps and roadway an inflatable bladder dam would be installed to exclude fish/minnows from the construction and access areas. It is estimated that 150 linear feet of bladder dam would be installed for the right bank ramp for construction of Option A. The bladder dam installed as in Option A, plus an additional 550 linear feet, would be installed for the roadway construction if temporary access route option B is used, for a total of approximately 700 linear feet of bladder dam.

Several days before the construction of the temporary access road begins, all gates on the right hand side of San Acacia dam would be closed, river flows would bypass the dam through the left-most gates, and the water would drain off the right hand side of the rip-rap apron. Since February flows are relatively low and the gates are not checked up for irrigation operations, relatively little leakage is expected from the right-hand gates of the dam.
The Contractor would use an excavator to create a rough ramp from the right-hand floodplain to the river by removing materials and stockpiling earth behind the ramp location. All this work

would be performed in the dry. The ramp would allow personnel to access the river below the sluiceway where the first section of the inflatable dam would be installed.

The inflatable bladder dam would be installed downstream of the SADD where the right-hand ramp would be constructed and across the right half of the dam, below the riprap apron. The location of the inflatable bladder dam would be approximately 50 to 75 feet downstream of the sheet pile to provide a smooth river bed to install the structure. The sections of inflatable bladder dam would be hand-carried down the ramp and installed per manufacturers recommendations. The bottom of the bladder dam would be installed to make positive contact with the river bed and then inflated to create a barrier. See figure 6 for a picture of a typical bladder dam installation.

The first section of the bladder dam would be secured to the river bed then it would be filled with water from a water truck hauled in from off-site, and raised to a height of 4 feet above the river bed. The raised bladder dam would prevent RGSM from moving upstream into the area where the right-hand ramp would be built. It would also prevent any degradation in water quality below the bladder dam due to construction activities. See figure 6 for typical installation of a bladder dam. The inflatable bladder dam would be installed per manufacturer's instructions.

Any remaining pools of water, in the area where the right-hand ramp would be constructed, would be seined or electrofished to remove RGSM.

After the barrier is in place and minnows removed from behind the bladder dam, the Contractor would install the culverts and begin construction of the temporary roadway. Culverts would be placed into the river bed below the sluiceway and rock and backfill material would be used to create the right-hand ramp, as depicted in figure 3. This ramp would be used to stage materials to build the next section of the bladder dam. The Contractor would haul the materials to the end of the constructed ramp and continue installing additional bladder dam sections as described above.

The base of the bladder dam would be in contact with the river bed, thus preventing:
(a) RGSM from moving upstream onto the rip-rap apron, and (b) any degradation of water quality below the bladder dam due to construction activities. This section of the bladder dam would reach across approximately half of the dam. At the end point, the bladder dam would be temporarily connected to the concrete cap of the downstream sheetpiles (see figure 7 for the location of the cap).

Once the right-hand ramp and culverts are installed, the 150-foot segment of bladder dam would be deflated and water would be returned to the right hand of the dam by opening the sluice way gates and closing the left hand dam gates. At this point the river flows would be bypassing the dam through the sluice way gates and installed culverts and only minimal leakage through the other bays of the dam is expected.

If Option B is necessary, then construction of the temporary road would continue on the riprap apron, crossing the right-hand half of the dam. Installation of the turbidity curtain or bladder dam would continue across the remaining (left hand) half of the dam, with the contractor utilizing either the concrete apron or the temporary road to stage the bladder dam installation

materials. Materials would be hand-carried from the access route to the installation site at the base of the rip-rap apron.

After the last section of the bladder dam is connected to the endpoint where it would be anchored, any isolated pools in the area between the concrete apron and bladder dam would be seined and/or electrofished to remove RGSM.

At this point, construction of the temporary access road across the remaining half of the rip-rap apron would continue and the left-hand ramp would be built.

Figure 7 Typical Inflatable Bladder Dam Installation

The inflatable bladder dam consists of two basic components: two watertight inner polyethylene tubes which contain the water, and an outer or "master tube" made of a heavy duty geotextile woven polypropylene which holds the two inner tubes in contact when filled. To install the dam, onsite water is pumped into the two inner tubes. The durable woven outer tube confines the water-inflated inner tubes and prevents them from moving away from each other. The counter friction / hydraulic pressure between the inner tube and the outer tube, along with the mass and weight of the water, creates pressure and stabilizes the bladder dam, even when lateral water pressure is exerted against it. Due to the inherent flexibility of the materials used in their construction, the bladder dam will conform to most surfaces, providing an excellent seal and keeping water seepage to a minimum.

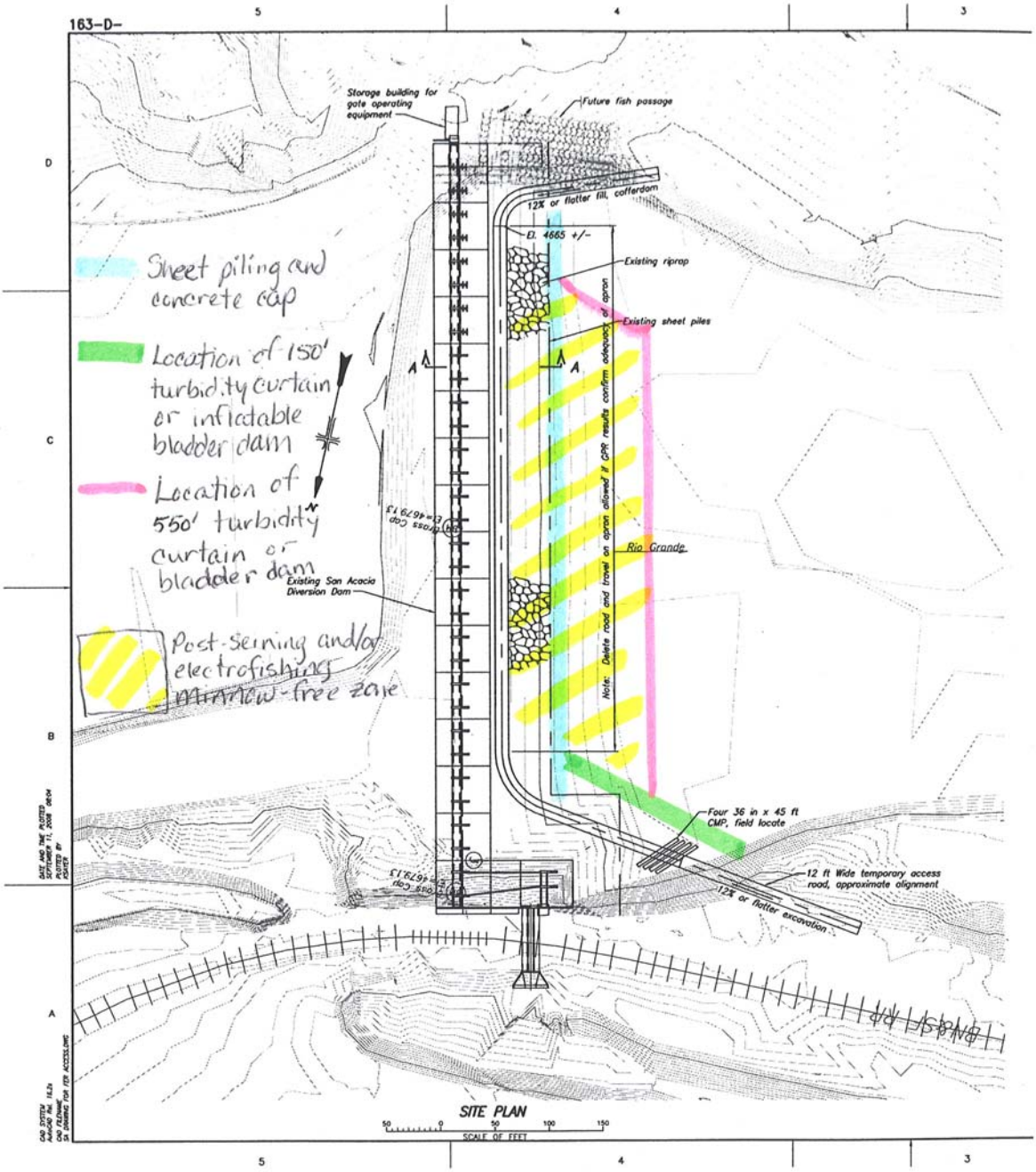

Figure 8 Inflatable Bladder Dam Placement

Ramp Construction

Two ramps, one on the right side and one on the left side of the river, would be constructed to allow access down to the river and back up to the adjacent banks. A small amount of vegetation would need to be removed in the process of constructing both ramps, which consists of a mixture of coyote willow (Salix exigua), Russian olive (Eleaegnus angustifolius) and saltcedar (Tamarix sp.).

For Option A, this work consists of constructing an access ramp from the downstream, right river embankment to the diversion dam's concrete apron and then constructing an access ramp from the diversion dam's concrete apron up the left river embankment. See Figures 4, 8 and 9 for ramp locations on access route site plan and photographs of the existing site conditions for ramp placement.

If the diversion dam's downstream concrete apron is structurally able to support travel by the drill rig, access between the two ramps for personnel and equipment would be across the concrete apron. See Figure 4 for photograph of diversion dam's downstream concrete apron.

The right ramp would be constructed by cutting the river embankment and placing fill materials into the river channel. The installation of 6 CMP culverts (60-inch diameter and a length of 40 feet) would allow sluiceway flows to pass under the right ramp without damaging the road surface. During construction of the right ramp, all river flows would be discharge through the diversion dam's far left radial gates. After construction of the right ramp, the SADD gates would be closed and river flows would be by-passed through the sluice gates, allowing the area where the left ramp would be placed to dry.

The left ramp would be constructed by cutting the river embankment and placing fill materials into the dry river channel and across the riprap apron. The installations of culverts are not required under the left ramp. The left ramp location would be used as a base for the drill rig to take core samples and provide area for personnel to work around the rig.

As the ramps are constructed existing materials on the riprap apron would be moved, relocated, shifted, piled, adjusted, etc. and waste rock would be added within the foot print of the project to create a drivable final road surface.

Both ramps would have a drivable surface width ranging from 10 to 14 feet. The depth of fill to construct the ramps would range between 2 to 7 feet depending upon the existing ground profile. The side slopes of the ramps would range from 1(H):1(V) to 2(H):1(V). It is estimated that the right ramp would have a length of 200 linear feet and would require ±600 cubic yards of waste rock. The left ramp would have a length of 150 linear feet and require ±300 cubic yards of waste rock. The ramp's grade would not exceed 12%.

Equipment that could be used to construct the ramps include: Excavator with Thumb or Bucket, Dozer, Motorgrader, Loader, Compactor, Tandem/Articulated Dump Trucks, and Service/Refueling Vehicles. Although it is anticipated that the equipment listed above would be utilized for this project, it is possible that additional equipment not listed above would be used to complete the work under this project to maintain the construction schedule.

Figure 9 Right Ramp Location

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Figure 10 Left Ramp Location

Staging Area

There would be two temporary staging areas, about 3 acres in total area, used during this project. One would be north of the SADD, located between the railroad tracks and Low Flow Conveyance Channel (LFCC). This site would be used for materials storage during the project (see Figure 2). The other staging area would be adjacent to the core drilling site on the south, or left side of the dam (see Figure 10).

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Figure 11 Left Bank Staging Area

Core Drilling Holes

Approximately 5 drill holes are proposed to sample the fish ladder foundation, as shown in Figure 11, and any exploration would remain within the boundary shown. These locations are approximate. Standard exploration procedures dictate that if unusual foundation conditions are encountered, the location of proposed holes may be shifted or additional holes may be added.

Three of the drill holes are on the bank, one is located in the channel which is expected to have no flowing water at the time of drilling, and one hole is located through the downstream apron. All of the gates on the left side and most of the other gates would be closed to minimize flows on the left side during drilling.

Water needed for drilling would be pumped from the river, with a protected inlet so small fish cannot be sucked into the intake. The intake screen would include a 1/4 inch or smaller mesh. Drilling fluid would be water only, without any additives. No drilling fluids are expected to return to the surface due to the highly permeable gravel and sand alluvial foundation. Any drilling fluids that may surface would be re-circulated and treated to remove sediment and re-used.

Drilling can probably be accomplished in 20 days or less, not including road building activities. Sampling would be primarily Standard Penetration Testing. Clean out would be with standard

coring operations using diamond-impregnated bits. The drilling schedule would be 8 days in a row, Wednesday through Wednesday, with four days off between each 8-day work period.

Drill holes would be approximately 70 feet deep, and approximately 4 inches in width. The holes are expected to collapse when the drill stem and bit are extracted, so no backfilling is anticipated. If some backfilling is necessary, natural material would be pushed into the top of the hole.

The preferred drilling rig is a Gus Pech 300 CHR with a total weight of 60,000 pounds. This rig requires about 55 feet by 14 feet to set up. A CME -75 drill rig is also available, which is about half the length and weight of the Gus Pech. This needs about 30 feet length and 12 foot width to set up and the rigs would be cleaned to assure no contamination of soil or waterways. All equipment would be checked for leaks to assure no oil or hydraulic fluids would be released ad would have spill kits on board.

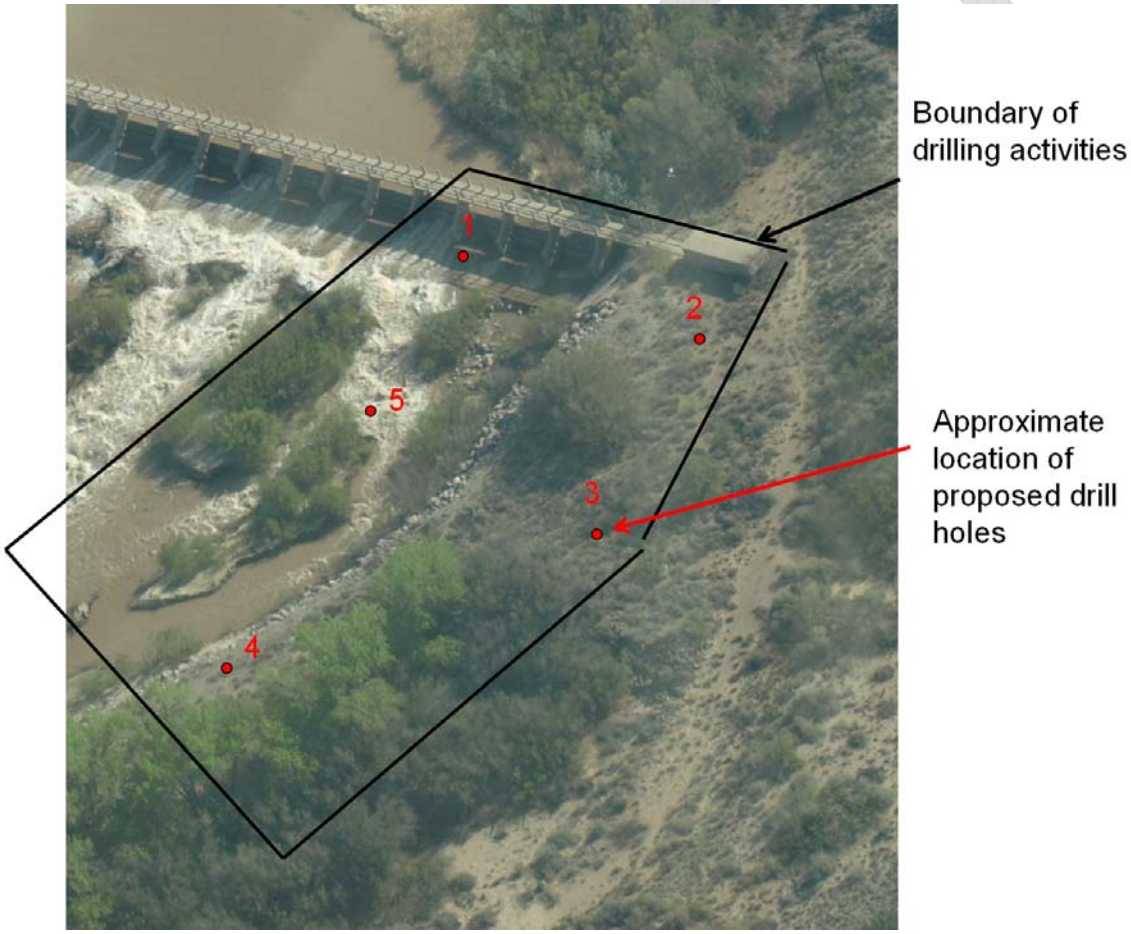

Figure 12 Approximate Locations of Proposed Drill Holes

Removal of Ramp, Culverts and Bladder Dam

After the coring is completed, the left ramp and roadway would be left in place to provide access to the left embankment during construction of the fish passage facility. The corrugated metal pipes (CMP) culverts installed in the right ramp and bladder dam would be removed. The

bladder dam and CMP culverts would be stored at SADD or transported to the Socorro Field Division or San Marcial Yard. The waste rock used to construct the right ramp would be removed and would be used to reshape the right river embankment. Any excess waste rock materials would be stockpiled. See Figure 2 – Project Area for locations of stockpiling materials. It is estimated that after Field Exploration Core Drilling is completed, it would take 3 to 5 days to remove the bladder dam and downstream right ramp including the CMP.

Schedule and Timeline

It has been determined that construction of the temporary access road at SADD should start no later than January 19, 2009. If construction starts after January 19, 2009, the potential risk of the temporary access road being washed out and safety risks to personnel conducting the field exploration would increase from the higher flows that occur after March 15th in the Rio Grande. Construction of the temporary access ramps and road will take from 5 to 10 work-days.

Areas of Disturbance

Disturbance areas are presented below. Wetted area acreages are estimated in Table 1.

Disturbance (under dry conditions)	Anticipated
Right Ramp construction	5,600 sq. ft
Left Ramp construction	2,100 sq ft
Selective removal of vegetation for ramp construction	< 0.25 ac

Activity	Maximum Disturbance Area (sq. ft.-days)	Maximum Number of Days	Disturbance Area (Wetted Acres)
Installation of 150’ inflatable bladder dam	2,250	3	0.15
Deflation of 150’ bladder dam	2,250	1	0.05
Installation of 550’ inflatable bladder dam and seining of isolated pools of water between the diversion dam concrete apron and bladder dam	7,700	5	0.9
Area between concrete apron and inflatable bladder dam that may require seining and/or electrofishing	66,000	n/a	1.5
Re-inflation of bladder dam	2,250	1	0.15

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Removal of 550’ bladder dam	7,700	3	0.54
Removal of 150’ bladder dam	2,250	1	0.05
Total			3.34 ac

Table 1 Total Area (Wetted) for Potential Incidental Take of RGSM

2.3 Alternatives Considered but Eliminated from Further Study

The use of the access road present on the left abutment of the dam was considered but was eliminated due to: (1) the condition of the adjoining road, i.e. extensive repairs would be required, (2) the cost to obtain an easement to the road, and (3) the proximity of Native American artifacts.

Smaller drill rigs were considered, but it was decided that they could not provide the quality of sampling in the coarse material that would be needed for the design of the facility foundation.

Also, the performance of subsurface exploration activities during the construction phase was considered which would result in alternative designs to implement, pending the results. The contractual issues of alternate designs and the cost of developing two or more designs would have been prohibitive.

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Chapter 3 Affected Environment and Environmental Consequences

3.1 Introduction

Resources and related topics in this chapter include water resources and hydraulics, fish and wildlife threatened and endangered species, air quality and noise, environmental justice, cultural resources and Indian Trust Assets, irretrievable commitment of resources and cumulative impacts. Affected environment information for the resources contained in this chapter is incorporated by reference, where applicable from the River Mile 111 Priority Site Project Environmental Assessment, March 2008, prepared by Reclamation. Also, included is a table of environmental consequences of the No Action alternative and the various components of the proposed action alternative.

3.2 Description of Relevant Affected Resources and the Associated Environmental Consequences

3.2.1 Water Resources and Hydraulics

Flows in the river at SADD are anticipated to be relatively low during the winter months when the construction of the ramps, temporary access road, and subsurface activities are scheduled. Historically, the majority of the flows pass through the left-most gates of the SADD. In addition, movement of water through different location of the dam is part of routine management of the SADD. Therefore, no impacts to water resources would be attributable to the Action alternative.

There would be no impacts to water resources as a result of the No Action alternative.

3.2.2 Threatened, Endangered and Special Status Species

Rio Grande Silvery Minnow (*Hybognathus Amarus*)

The decline of the RGSM has been attributed to dewatering of portions of the Middle Rio Grande below Cochiti Dam through water-regulation activities, the construction of main stem dams, the introduction of non-native competitor/predator species, and degradation of water quality (USFWS 1999, 2006). Recent studies (Porter and Massong 2004, 2005) have linked successful spawning and recruitment with channel morphology and spring hydrograph. Habitat degradation following the closure of Cochiti Dam and intermittency in populated reaches are major factors in the decline of the RGSM (Platania and Altenbach 1998; Porter and Massong 2004; Dudley *et al*. 2005a).

Water flow would be managed by opening and closing gates in the SADD to move water flow away from construction activities to the largest extent possible. Inflatable bladder dams would be installed for this project as a barrier to keep RGSM away from construction activities. Areas behind these barriers would be seined or electrofished to remove RGSM. Construction of the access road and ramps would begin in January 2009, when flows are expected to be low. Movement of water flow through different gates and locations of the dam would be managed to minimize the formation of isolated pools and other effects on RGSM during construction.

Movement of water through different locations of the dam is part of regular management of the dam, and is not expected to have any effect on RGSM or its critical habitat. Installation of inflatable bladder dam (150' and 550' sections) may affect, and is likely to adversely affect individual RGSM only while it is being installed and during seining/electrofishing to remove RGSM. It is likely, although unknown to what extent, that RGSMs may be isolated in the area upstream of turbidity curtains or bladder dams. Reclamation would continue to coordinate with the Service on the potential need for rescue seining or electrofishing behind the installed bladder dams. Installation of bladder dams may affect, but is not likely to adversely affect RGSM critical habitat.

Construction of the ramps is expected to have no effect on RGSM, as bladder dams would be installed prior to construction, and construction is expected to take place under dry conditions. Removal of the right side ramp and culverts would have no effects on RGSM or its critical habitat because this would take place behind the bladder dam, and RGSM are excluded from the area. Deflation of the 150' section of the bladder dam following construction of the right side access ramp may affect, but is not likely to adversely affect RGSM or its critical habitat. The existence of the left bank ramp may affect, but is not likely to affect RGSM critical habitat, since it would remain in place following the proposed field exploration, by slightly reducing the amount of river channel available to RGSM.

Removal of woody debris from the riprap apron and other construction sites, followed by placement of the woody debris in the active river channel may affect, but is not likely to adversely affect RGSM or its critical habitat during removal from the apron and placement in the river channel because this action would take place behind the bladder dam after the RGSM have been removed.

Construction of the temporary access road by placing additional riprap on/in the existing structure may affect, and is likely to adversely affect individual RGSM during construction activities only, as some RGSM may remain in isolated pools within the riprap apron even following attempted seining or electrofishing RGSM removal activities. This is expected to have no effect on RGSM critical habitat because the existing riprap apron is already highly modified and is separated from the river below by sheetpiling. Construction of the temporary access road within the riprap apron by placing additional riprap on/in the existing structure may affect, but is not likely to adversely affect RGSM or the critical habitat during high flows because the riprap apron may occasionally experience loss or movement of riprap downstream during high flow events, however, other debris and materials are regularly carried or moved within the water column during high flows.

Drilling of bore holes on the left bank is expected to have no effects on RGSM or its habitat. Holes are expected to collapse on their own following drilling, and since work is to be performed in the dry, there should be no effects. Re-installation or re-inflation of the 150' turbidity curtain or bladder dam may affect, and is likely to adversely affect RGSM only during installation or inflation, and may affect but is not likely to adversely affect RGSM critical habitat. Subsequent removal of all turbidity curtains or bladder dams may affect, and is likely to adversely affect RGSM and the critical habitat only during removal activities.

Removal of woody debris from the riprap apron and other construction sites, followed by placement of the woody debris in the active river channel may actually be beneficial to RGSM and the habitat by providing additional habitat downstream once woody debris ultimately

become lodged in the river channel downstream. The long term effects from the subsequent construction of the fish passage structure are anticipated to be beneficial by allowing RGSM to move upstream past the SADD, encouraging movement of RGSM between reaches.

No impacts to the RGSM are anticipated as a result of the No Action Alternative.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

There are no potential direct effects to flycatchers in the vicinity of the field exploration because the proposed project would occur either a) where all the required primary constituent elements of SWWF critical habitat are not present, or b) would be outside of flycatcher critical habitat. The nearest flycatcher territory recorded in 2008 surveys is approximately 1700 feet from the subsurface exploration activity area. In addition, the Proposed Action would be performed outside of the SWWF breeding season. All proposed activities would have "no effect" on flycatchers or flycatcher critical habitat within the project area.

There would be no impacts attributable to the No Action alternative.

3.2.3 Air Quality and Noise

Although dust and noise would be generated from the use of the heavy equipment listed in the Proposed Action, the impacts would be considered minor and of temporary duration as the potential receptors are several hundred feet away, i.e. private residences in San Acacia on the opposite side of the SADD.

No impacts are anticipated from the No Action alternative.

3.2.4 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994)*, directs federal agencies (as well as State agencies receiving federal funds) to assess the effects of their actions on minority and/or low-income populations within their region of influence. The order requires agencies to develop strategies to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

The U.S. Environmental Protection Agency (EPA) published the *Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses (1998)*, which indicates that a minority population exists when either:

- The minority population of the affected area is greater than fifty percent of the affected area's general population, or
- The minority population percentage of the affected area is meaningfully greater than the population percentage in the general population or other appropriate unit of geographic analysis.

An environmental justice screening analysis must determine whether any significant impacts of the Proposed Action (if any) would disproportionately adversely affect local low-income and/or minority populations. If a disproportionate impact is determined, mitigation measures must be implemented to reduce the adversity of the impact to a less-than-significant level. According to the federal guidelines, the environmental justice screening analysis assesses whether "the potentially affected community includes minority and/or low income populations." The guidelines indicate that a minority population exists when the minority population is 50 percent or more of the affected area's total population. The 50 percent threshold is also used to determine the presence of low-income populations in the study area.

For the purposes of this analysis, the area affected is defined as the Middle Rio Grande basin in the state of New Mexico. As reported in the 2004 U.S. Census, none of the jurisdictions in the affected area have low-income populations of greater than 50 percent, however some of the counties in the project area have Hispanic/Latino populations that are over 50 per cent of their population.

No adverse effects on minority or low-income populations are anticipated as a result of the Proposed Action or the No Action alternative.

3.2.5 Cultural Resources

The SADD, constructed in 1934 is eligible for listing on the National Register of Historic Places (NRHP). Also, the prehistoric site, LA 1999 is located on a bench directly upstream of the SADD on the south side of the Rio Grande and is eligible. LA 1999, Pueblo San Acacia, dates from A.D. 1300-1400, and consists of a series of room blocks that are arranged around a central plaza area. There is also a ceramic and lithic scatter, and there are petroglyphs on large boulders to the south as well as on a basalt bench edge along the north. The site sits at an elevation of 4720 feet. The site is stable and has not been subjected to erosion. Two petroglyphs were located approximately 40 and 70 meters respectively northeast from the nearest bore hole location at the dam by the Reclamation Area Office Archaeologist. Several Pueblos and Tribes have been contacted concerning the Proposed Action and the proximity to the petroglyphs. Presently, the New Mexico State Historic Preservation Office (SHPO) has been consulted and a Memorandum of Agreement between Reclamation, SHPO, and the Advisory Council is being drafted for the construction of the San Acacia Fish Passage Project which would include the subsurface exploration phase.

Although subsurface exploration would be performed directly within the dam structure itself and heavy equipment may traverse the concrete apron (Option A), no material adverse effects are anticipated from the Proposed Action. No vehicles of any kind would be allowed within 300 feet of the upstream petroglyphs and these areas would be fenced for avoidance. In addition, seismic monitoring equipment would be placed at the two closest petroglyphs directly upstream of the SADD. No adverse impacts to the petroglyphs or other features are anticipated from the Proposed Action.

No impacts to cultural resources are anticipated for the No Action Alternative.

3.2.6 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in assets held in trust by the United States Government for Indian tribes or for Indian individuals. Some examples of ITAs are lands, minerals, water rights, hunting and fishing rights, titles, and money. ITAs cannot be sold, leased, or alienated without the express approval of the United States government. The United States has a trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or individuals by treaties, statues, Executive Orders, and rights further interpreted by the courts. This trust responsibility requires that all Federal agencies take all actions reasonably necessary to protect such trust assets.

There are no ITAs identified that would potentially be adversely affected due to the Proposed Action or the No Action alternative.

3.2.7 Irretrievable Commitment of Resources

The implementation of the project would result in the commitment of resources such as fossil fuels, construction materials, and labor.

3.2.8 Cumulative Impacts

The National Environmental Policy Act (NEPA) defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (42 U.S.C. 4331-4335). Cumulative environmental impacts associated with the following projects have been evaluated for the following projects relative to the Proposed Action.

<u>Middle Rio Grande Endangered Species Act Collaborative Program</u>

The Middle Rio Grande Endangered Species Act Collaborative Program has solicited and funded multiple habitat restoration projects, RGSM augmentation projects, water acquisition planning, and various science research projects. RGSM augmentation funded by the Collaborative Program should provide positive interactions with the eventual implementation of the SAFPP, and the various habitat restoration projects should also experience some positive cumulative impacts to the RGSM and SWWF as well as their associated habitats as a result of the subsequent construction of the SAFPP.

<u>Routine Maintenance Work</u>
The USACE routinely conducts maintenance on the levees in the San Acacia Reach for the purpose of flood control. The MRGCD also performs maintenance on irrigation canals and ditches throughout the MRG. In addition, Reclamation conducts maintenance activities in the San Acacia Reach, as required. The cumulative impacts should be minimal as movement of water through different locations of the dam is part of the regular management of the SADD.

Bureau of Reclamation Drain Unit 7 Extension River Maintenance Project
The Drain Unit 7 Extension River Maintenance Project is a planned project to strengthen an area approximately 500 feet upstream of San Acacia dam. This project will strengthen the streambank on the western side of the river. This project is located directly upstream from the SADD and the cumulative impacts should be minimal as described above.

3.2.9 Summary of Effects to Each Resource

As documented in the table below, no adverse impacts most resources from the Proposed Action except for threatened and endangered species and air quality and noise. No impacts to the resources would result from the No Action alternative.

Table 3.1 Environmental Consequences of Proposed Action and No Action Alternatives

Environmental Resources	Proposed Action	No Action
Water Resources and Hydraulics	No adverse effects are anticipated	No change in existing conditions
Threatened, Endangered, and Special Status Species	Positive long term impacts to the RGSM and its critical habitat from the subsequent SAFPP are anticipated. Short term impacts are anticipated for the RGSM and its critical habitat. All proposed activities would have no effect on flycatchers or flycatcher critical habitat within the project area.	No impacts to the RGSM or SWWF are anticipated due to the No Action alternative
Air Quality and Noise	Minor temporary air quality and noise impacts are anticipated	No change in existing conditions
Environmental Justice	No disproportionate effects are anticipated	No change in existing conditions
Cultural Resources	No adverse effects are anticipated	No change to cultural resources
Indian Trust Assets	No impairment of ITAs are anticipated	No change to any existing ITAs

Table 2 Environmental Consequences of Proposed Action and No Action Alternatives

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Chapter 4 Environmental Commitments

Appropriate ESA compliance as documented in the upcoming Biological Opinion to be issued by the USFWS.

Clean Water Act (CWA) compliance is anticipated for the placement of fill to construct the temporary ramps in the Rio Grande riverbed. State water quality certification permits under Section 401 of the CWA would also be obtained, as required.

Appropriate NHPA compliance as per the SHPO consultation.

Seismic monitoring equipment would be located at the two closest petroglyph sites, upstream of the exploration work area.

Standard Best Management Practices (BMPs) shall be employed as appropriate to include the following elements:

1) All equipment would be cleaned equipment outside the floodplain prior to entering the Rio Grande or its tributaries and prior to cleaning, areas would be identified for cleaning equipment.
2) Equipment would be fueled on existing roadways or upland staging areas, and in a manner such that spilled fuel would not reach the river.
3) Hazardous spill kits would be located onsite. Any spilled fuel would be contained and removed. There would be no storage of fuel at the site.

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Chapter 5 Consultation and Coordination

In preparation of this EA, formal or informal coordination was conducted with the following entities:

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- New Mexico State Historic Preservation Office
- New Mexico Environment Department
- Middle Rio Grande Conservancy District

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Chapter 7 References

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