

**U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)**

OMB APPROVAL NO. 0710-0003
EXPIRES: 31 AUGUST 2012

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
--------------------	----------------------	------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Katherine Middle - F. Last - Kelly Company - California Department of Water Resources E-mail Address - kkelly@water.ca.gov	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Jacob Middle - Last - McQuirk Company - California Department of Water Resources E-mail Address - jacobmc@water.ca.gov
6. APPLICANT'S ADDRESS: Address- 1416 Ninth Street, Room 215-37 City - Sacramento State - CA Zip - 95814 Country -USA	9. AGENT'S ADDRESS: Address- 1416 Ninth Street, Room 215-23 City - Sacramento State - CA Zip - 95814 Country -USA
7. APPLICANT'S PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax (916) 653-1099	10. AGENTS PHONE NOS. w/AREA CODE a. Residence b. Business c. Fax (916) 653-9883 (916) 653-6077

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Jacob McQuirk to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.


 SIGNATURE OF APPLICANT 11/05/12
 DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) 2013-2017 South Delta Temporary Barriers Project (TBP)-Head of Old River (HOR) Barrier			
13. NAME OF WATERBODY, IF KNOWN (if applicable) San Joaquin River and Old River		14. PROJECT STREET ADDRESS (if applicable) Address	
15. LOCATION OF PROJECT Latitude: °N 37.8078 Longitude: °W 121.3307		City -	State- CA Zip-
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality San Joaquin County, CA Section - 32 Township - 1 South Range - 6 East			

17. DIRECTIONS TO THE SITE

To get to the HOR site, take I-5 South from Sacramento; exit onto SR-205 East. Exit MacArthur Drive and turn right. Follow the road through one 90 degree turn where the road turns into Delta Ave. Turn left at the end of Delta Ave onto Paradise Road. The road will continue up onto the top of the levee and the project site will be on the left.

18. Nature of Activity (Description of project, include all features)

See attached sheets for further information.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The primary purpose of the Spring HOR Rock Barrier is to improve migration conditions for salmonids originating in the San Joaquin River watershed during juvenile migrations by "blocking" migratory movements into the Old River channel from the mainstem San Joaquin River, which would expose them to State Water Project and Central Valley Project diversion operations and unscreened agricultural diversions. The primary purpose of the Fall HOR Rock Barrier is to improve migration conditions for adult salmonids by increasing dissolved oxygen levels in the Stockton Deepwater Shipping Channel.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

- 1) 3/4 " crushed rock would be discharged at Old River to create an underwater pad for the culverts
- 2) Six to eight 48-inch diameter culverts with slide gates secured within metal frames would be placed on the underwater rock pad.
- 3) Rock would be discharged over the culverts to reconstruct the rock barrier across Old River.
- 4) Clay would be placed on top of the spring rock barrier to form a four foot thick layer
- 5) Piles, Pier blocks, and anchors for spring Non-Physical Barrier
- 6) One scientific pile, up to 10 weighted stands and up to 50 railroad tie anchors for Temporary Barriers Project Fish Study

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

(See attached Tables 3 and 4)

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres (See attached Tables 3 and 4)

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Avoidance: DWR will continue implementation of all applicable monitoring, avoidance, minimization, and compensation measures required as part of the BOs issued for the TBP (US FWS 2008, 2009; NMFS 2008, 2009, 2011). See attached sheets for additional avoidance, minimization and compensation. Compensation for impacts to Waters of the US: DWR purchased 6.0 acres of shallow water habitat credits for the TBP. DWR utilized a credit of 1.25 acres left over from the Kimball Island Mitigation Bank and an additional 4.75 acres of shallow water habitat credits was purchased at the Liberty Island Conservation Bank.

24. Is Any Portion of the Work Already Complete? Yes No IF YES, DESCRIBE THE COMPLETED WORK

The spring and fall HOR rock barriers have been installed and removed annually since 1991, with periodic exceptions.

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See attached sheets for further information.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
CA DFG	1602 SAA	1600-2010-0375-R3		May 10, 2011	
CVRWQCB	Section 401 WQC	WDID#5B39CR0019		May 6, 2011	
CA DFG	ITP	2081-2011-019-03		May 25, 2011	
See Attached Sheets: Block 18					

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.


 SIGNATURE OF APPLICANT 11/05/12
 DATE


 SIGNATURE OF AGENT 11/5/12
 DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

Attachment to ENG 4345 Form
Temporary Barriers Project-Ag Barriers

Block 16. Other Location Descriptions

All three agricultural barriers are located in San Joaquin County. Additional location information is provided in the table below.

Project	Site	Quad Map	Latitude	Longitude	Section	Township	Range
TBP-Ag Barriers	Middle River Barrier	Holt	37.8857 N	121.4822 W	36	1N	4E
TBP-Ag Barriers	Old River near Tracy	Union Island	37.8103 N	121.5428 W	28	1S	4E
TBP-Ag Barriers	Grant Line Canal	Clifton Court Forebay	37.8199 N	121.4483 W	29	1S	5E

Block 17. Directions to the Sites

Approximate drive time to agricultural barriers from Sacramento varies from between an hour to an hour and fifteen minutes.

Middle River Barrier

- Take Interstate 5 (I-5) South from Sacramento.
- Take Highway 4 (Hwy 4) exit.
- Turn right at stop sign (heading west on Hwy 4).
- Turn left on Tracy Boulevard.
- Turn right on Clifton Court road.
- Turn right on Calpack Road.
- Turn right on Klein road.
- Follow Klein Road to the end and the barrier will be on the left.

Old River near Tracy Barrier

- Take I-5 South from Sacramento.
- Take Hwy 4 exit.
- Turn right at stop sign (heading west on Hwy 4).
- Turn left on Tracy Boulevard.
- Turn right on Finck Road and follow it to its end.
- Drive through the middle of a farmer's ranch.
- Once past the structures, follow the gravel road to the top of the levee.
- Continue on levee road until you see a clearing in the levee.

Grant Line Canal Barrier

- Take I-5 South from Sacramento.
- Take Hwy 4 exit.
- Turn right at stop sign (heading west on Hwy 4).
- Turn left on Tracy Boulevard.
- At Grant Line canal bridge turn left onto the levee road.

Block 18. Nature of Activity

Introduction

The California Department Water Resources (DWR) initiated the South Delta Temporary Barriers Project (TBP) in 1991. The TBP involves the seasonal installation of three rock barriers in Middle River near Victoria Canal (MR), Old River near Tracy (ORT), and Grant Line Canal near Tracy Boulevard Bridge (GLC). These rock barriers are designed to act as flow control structures, “trapping” tidal waters behind them following a high tide. These barriers improve water levels and circulation for local south Delta farmers and are collectively referred to as Agricultural Barriers (ag barriers).

The TBP was initiated with the intention that it would be a temporary program implemented only until permanent operable gates could be installed. However, the timing of implementation of permanent operable gates is uncertain and the TBP is proposed to continue until the permanent operable gates are implemented. Figures 1 and 2 are project vicinity and location maps.

TBP Regulatory Compliance History

The regulatory permit history of the TBP begins in 1991 and includes many separate consultations, take authorizations, and permits from the U.S. Army Corps of Engineers (Corps), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Game (DFG), and the Regional Water Quality Control Board (RWQCB). DWR is pursuing two multi-year U.S. Clean Water Act, Section 404 / Rivers and Harbor Act, Section 10 permits from the Corps to cover the construction of the TBP through the end of 2017. The two projects of the TBP that will be subject to separate permit applications to the Corps are:

- TBP-Ag Barriers
- TBP-HOR Barrier

Below is the recent consultation history and environmental permits applicable to the TBP:

- In 2004, the USFWS issued a Programmatic Biological Opinion (BIOP) on the Issuance of Section 10 and 404 Permits for Projects with Relatively Small Effects on the delta smelt and its Critical Habitat within the Jurisdiction of the Sacramento Fish and Wildlife Office of the USFWS, CA (USFWS File# 1-1-04-F-0345). This non-expiring Programmatic BIOP is still valid and was used in 2009 and 2010 to cover the HOR NPB, which was authorized under the Corps’ Nationwide Permit 4.
- In 2008, the USFWS issued the Central Valley Project (CVP) and State Water Project (SWP) Operations Criteria and Plan (OCAP) BIOP which addressed the effects of operations (i.e., hydrodynamic effects) of the MR, ORT, GLC and HOR rock barriers on delta smelt (*Hypomesus transpacificus*) (USFWS File# 81420-2008-F-1481-5). This non-expiring BIOP is still valid and covers the TBP-Ag Barriers and HOR Rock Barriers.
- In 2008, the NMFS issued a BIOP for the construction of the TBP (NMFS # 2007/07586).
- In 2009, the USFWS issued a BIOP which addressed the effects of construction of the MR, ORT, GLC and HOR rock barriers on delta smelt and its designated critical habitat (USFWS File#

81420-2008-F-0522) (U.S. Fish and Wildlife Service 2008). This non-expiring BIOP is still valid and covers the TBP-Ag Barriers and HOR Rock Barriers.

- In 2009, the USFWS issued a BIOP which addressed the effects of construction and operation of the 2009 HOR NPB on delta smelt that appended the project covered under the Corps Nationwide Permit 4 to the 2004 Programmatic BIOP for delta smelt (USFWS File# 1-1-04-F-0345).
- In 2009, the NMFS issued a BIOP for the construction of the non-physical barrier at the HOR (NMFS # 2009/01239).
- In 2010, the USFWS provided concurrence to the Corps that the 2010 HOR NPB would not likely adversely affect delta smelt and amended the 2009 HOR NPB BIOP with the 2010 HOR NPB project description (USFWS File# 81410-2010-F-0004).
- In 2011, the Central Valley Regional Water Quality Control Board (RWQCB) issued Clean Water Act Section 401 Water Quality Certification for the construction and removal of the four rock barriers and construction and removal of the HOR NPB (WDID# 5B39CR00191). This permit covers all three TBP projects listed above through 2016.
- In 2011, the California Department of Fish and Game (DFG) issued a Final Lake or Streambed Alteration Agreement for the construction and removal of the four rock barriers and construction and removal of the HOR NPB (DFG tracking # 1600-2010-0375-R3). This permit covers all three TBP projects listed above through 2016.
- In 2011, DFG issued an incidental take permit for the construction and removal of the four rock barriers, construction and removal of the HOR NPB, implementation of the predator study, and implementation of the Fish Monitoring Project. (DFG tracking # 2081-2011-019-03). This permit covers all three TBP projects listed above through 2016.
- In 2011, the NMFS issued a BIOP which addressed the effects of construction of the four rock barriers and the HOR NPB (NMFS # 2010/06485). This BIOP expired on December 31, 2011.
- In 2012, the USFWS amended the 2009 HOR BIOP with the updated 2012 project description and schedule and amended the Effects Analysis (USFWS File # 08FBTD00-2012-F-0010).
- In 2012, the NMFS issued a BIOP for the 2012 Temporary Barriers Project (NMFS File # 2012/00152), which included the construction and removal of the four rock barriers.
- In 2012, DFG amended the 2011 Lake and Streambed Alteration Agreement with the updated 2012 project description and schedule (DFG tracking # 1600-2010-0375-R3).
- In 2012, DFG amended the 2011 Incidental Take Permit with the updated 2012 project description and schedule (DFG tracking # 2081-2011-019-03).
- **In 2012, the USACE modified the 2001 Temporary Barriers Project- Agricultural Barriers, Clean Water Act Section 404 permit (SPK # 200100121) with the updated 2012 schedule for the construction of the three agricultural barriers.**
- **In 2012, the USACE modified the 2000 Temporary Barriers Project- HOR Rock Barriers, Clean Water Act Section 404 permit (SPK # 200000696) with the updated 2012 project description and schedule for the construction of the spring and fall HOR rock barriers.**

- In 2012, the Central Valley Regional Water Quality Control Board (RWQCB) amended the Clean Water Act Section 401 Water Quality Certification for the construction and removal of the four rock barriers and construction and removal of the HOR NPB (WDID# 5B39CR00191).

TBP-Agricultural Barriers Project

The TBP-Agricultural Barriers (Ag Barriers) includes the annual construction, maintenance and removal of the MR, ORT, and GLC rock barriers. The design of the 2013–2017 Ag Barriers would be essentially the same as in years past. However, DWR may require modification of the weir height of the MR barrier (MRB) during some years of the permit, as was done in summer 2010 and 2012. If implemented, and after concerns for impacts to delta smelt in the south Delta have passed, the height of the MRB weir would be increased by 1 foot from the current design elevation of 3.3 feet to an elevation of 4.3 feet based on the North American Vertical Datum of 1988 (NAVD88).

Description of the Ag Barriers

Middle River Barrier

The MRB is located about a half mile south of the confluence of Middle River, Trapper Slough, and North Canal. The MRB is a rock barrier constructed with a center weir section that allows tidal flows to enter the Middle River upstream of the barrier by overtopping the weir crest and flowing through submerged culverts (Figure 3). The tidal flow is retained behind the barrier in part during the ebb tide by the barrier elevation and the closure of the flap-gates. This allows agricultural pumps to operate throughout each tidal cycle by maintaining a minimum water elevation of 2.6 feet (NAVD88) measured at the Howard Road Bridge station.

Each year the MRB weir section is reconstructed by placing approximately 2,300 cubic yards (cy) of rock between the two previously constructed abutments that are left in place year-round. Each abutment has three, 48-inch diameter culverts with tidally-operated flap-gates that are also left in place. Placement of rock completes the barrier that is 270-feet long and 50 feet-wide (0.31 acre). The rock weir section is 140-feet long and 18-feet wide at its crest. By September 15th, a 10 foot-wide notch (fall notch) is constructed in the weir for salmon passage. The notch allows a minimum depth of 6 inches of water to pass over the barrier during low-high tide events and shall remain in place until the barrier is removed.

Decision 1641 (D-1641), which was issued from the SWRCB, set defined salinity standards in the Delta. Raising the MRB would allow the barrier to trap more of the fresh water found below the barrier, thereby raising water quality levels above the barrier. The CVRWQCB issued a *Water Quality Control Plan for the Sacramento and San Joaquin River* (Basin Plan; revised in 2011) which set defined DO standards for the Delta. Raising the MRB in conjunction with tying open the ORT barrier culvert flapgates is intended to create net circular flow up MR and down OR which would decrease zones of stagnant water. In an effort to maintain these water quality standards DWR retains the option to raise the height of the MRB during peak irrigation months. The height of the weir may be increased from 3.3 (typical) to 4.3 feet (NAVD88). Raising the barrier height one foot will require an additional 100 cy of rock and will reduce the width of the crest to 15 feet. However, it is expected that this will result in little, if any, disturbance to the riverbed or channel and there will be no change in the footprint of the MRB. The MRB will only be raised when risks to delta smelt have passed and full barrier operations are allowed by the USFWS and DFG. DWR proposes to continue optionally raising the MRB weir because it will:

- Decrease salinity levels in the south Delta by using the tidal cycles to add additional fresh Sacramento River water into south Delta channels system via Middle River;
- Increase the circulation upstream of the barriers thereby improving water quality and agricultural diversions for crops; and
- Reduce null zones where stagnant water creates low DO levels and algae blooms.

The center weir section of the MRB is removed during the non-irrigation season (December through March). The flap-gates are tied open when the center weir section is removed. The fall notch in the MRB will remain the same elevation regardless of the 1 foot increase in weir height. The notch will be 10 feet wide and at an elevation of 2.6 feet (NAVD88).

While the culverts are left in place for most years, periodic culvert replacement (every 10-15 years) may occur in order to ensure their functionality.

Old River Tracy Barrier

The ORT barrier is located near the CVP's Tracy fish screen facility on Old River, approximately 0.5 miles east of the CVP's inlet. The structure allows tidal flows to enter the channel upstream of the barrier by overtopping the weir crest and flowing through the submerged culverts. The tidal flow is then partially retained during the ebb tide by the barrier elevation and the closure of tidal flap-gates on the upstream side of each culvert.

Each year construction of the ORT barrier begins with placement of a rock and gravel pad followed by the placement of three metal culvert frames each containing three 48-inch diameter culverts (nine culverts total) with flap-gates on the prepared pad. The culverts are then covered with approximately 5,000 cy of rock to form a 250-foot long berm that is 60 feet wide at its base (0.34 acre) (Figures 4a and 4b). The center of the barrier has a 75-foot wide weir with a crest elevation of 4.4 feet based on the NAVD88. Beneath the weir, are the nine culverts, each 60 feet long and 1 foot apart, with tidally activated flap-gates on the upstream ends. During summer months, some of the flap-gates may be tied to the open position to improve circulation in this area. Tying the flap gates open in conjunction with the Middle River raise is intended to increase net downstream flow and reduces stagnant zones in Old River. A temporary boat ramp will be constructed with riprap at the base, followed by crushed rock, and topped with articulated concrete mats. Because much of the boat ramp structure will be underwater, divers will aid in the positioning of the concrete mats. Similarly to the MRB, a 10 foot-wide notch is constructed by September 15 each fall to allow adult salmon passage.

Grant Line Canal Barrier

Each year the GLC barrier is constructed with approximately 12,600 cy of rock that is placed between the existing south abutment and the north canal bank to create a 300-foot long barrier that is up to 100 feet wide at its base (0.34 acre) (Figures 5a and 5b). The center of the barrier has a weir section with a crest at 3.3 feet elevation (NAVD88) that is 125 feet long and 24 feet wide. The existing south abutment contains six 48-inch diameter, 60-foot long culverts with flap-gates on the upstream end. A catwalk structure is affixed to the top of each culvert with a winch and hand crank allowing access to and operation of the flap-gates attached to the upstream end of each culvert. A 10 foot wide flashboard structure is also built at the south abutment, which can be adjusted to allow delta smelt passage in spring and salmon passage in the fall. Similarly to the ORT barrier, a ramped boat portage facility is also provided at the north levee. The boat ramp is constructed with riprap at

the base, followed by crushed rock, and topped with articulated concrete mats. Because much of the boat ramp structure will be underwater, divers will aid in the positioning of the concrete mats.

While the culverts are left in place for most years, periodic culvert replacement (every 10-15 years) may occur in order to ensure their functionality.

Construction and Removal

Construction activities for all of the barriers would begin as early as March 1 and removal would be completed no later than November 30 of each year. Any rock barrier operating on or after September 15 will be notched beginning September 15 to allow for passage of adult salmon. At the GLC barrier, flashboards will be removed to create the notch in the barrier. Approximate construction durations are included in Table 1 below.

Table 1: Construction and removal requirements for each of the temporary barriers.

		Construction (Days)	Removal (Days)
Ag Barriers	MR	5 (+5 if culverts are replaced)	5 (+5 if culverts are replaced)
	ORT	20	20
	GLC	24 (+10 if culverts are replaced)	21 (+10 if culverts are replaced)

Construction of the ag barriers entails the placement of rock barriers in the spring within the channels of the Middle River, Old River, and Grant Line Canal. At the ORT barrier, quarry rock is stockpiled about ½ mile upstream of the barrier site on the land side of the levee crown. The rock materials for MR are stockpiled adjacent to the barrier site on the water side of the levee crown and rock for the GLC barrier is stockpiled offsite (2.0 miles) at the Howard Road storage area. Each spring, heavy construction equipment is mobilized to move the stockpiled rock from its storage location into the channel to form the barriers. Large front loaders, dump trucks, off-road haulers, cranes, long reach excavators and drag lines are used to move and place the materials. Typically, machinery works from one or both banks of the channel to place the rock, as well as any additional materials such as culverts, articulating concrete mats, or other structures. Depending on the individual design of each barrier, the 48-inch diameter steel pipes used as culverts are placed by crane after the gravel pad of the barrier is constructed. At the MR and GLC barriers the abutments and the culverts remain in place over the winter. As the rock barrier is extended into the channel, machinery can utilize the crown of the barrier to move farther into the channel on top of the barrier to place additional materials. Each of the barriers is adequately marked with navigational aids and warning signs approved for placement by the U.S. Coast Guard (Private Aids Permit #s 2832-2839).

Barrier installation, including in-water work, and associated construction activities such as mobilization and site clean-up, typically takes approximately 5 working days for the MRB, 20 working days for the ORT barrier and 24 working days for the GLC barrier. However, extreme weather, tide and river flow conditions may impact the barriers construction schedules.

While the culverts are left in place for most years at MR and GLC, periodic culvert replacement may occur in order to ensure their functionality. Removal of the culverts would occur during the fall barrier removal. The removal of the culverts and the abutments at MR and GLC would add approximately 10 days for GLC and 5 days for MR to the removal schedule. The culverts and their associated structures would then be repaired or replaced and reset into the normal position using

similar techniques to the culvert placement at ORT. The replacement would occur the following spring adding approximately 10 days of work for GLC and 5 days for MR. The normally permanent rock abutments in each of these locations would be rebuilt as they have been previously constructed. The culverts at MR and GLC barriers have been replaced in recent years and are not likely to be replaced during the 2013-2017 period.

Removal of the barriers will occur in the fall and the installation procedure is reversed. Barrier removal, including in-water work, and associated construction activities such as mobilization and site clean-up, typically takes approximately 5 working days for the MRB, 20 working days for the ORT barrier and 21 working days for the GLC barrier. The rock barriers will be removed with an excavator and a dragline. An excavator will remove the majority of the rock down to the underwater pad of the culvert frames. Because the culvert pad is longer and wider than the “reach” of the excavator, a dragline with a bucket will be necessary to remove the remainder of the underwater rock associated with the barriers. The removed rock is stockpiled outside of the waterway until used again. At the barrier sites, the channel bottom is restored to pre-project conditions after the barriers are removed. Confirmation that the channel bottom has been restored to pre-project conditions is accomplished via bathymetric surveys which are conducted each year before construction (pre-project) and after removal. The barrier culverts and abutments at MR will remain in place throughout the year, as will the culverts and south barrier abutment at GLC.

Installation and Operation of the Ag Barriers

The ag barriers are installed and operated based on the spring HOR barrier installation. If the spring HOR barrier is not installed the ag barriers will be installed and operated following **Table 2**. If the spring HOR barrier is installed the ag barriers will be installed and operated following **Table 3**.

Table 2: Agricultural Barrier installation and operation schedule, for years when the Spring HORB is not installed

	MR	ORT	GLC
May 1	Installation may begin.	Installation may begin.	Installation may begin.
May 15 to May 31	<p>Full operation and closure may occur if:</p> <ul style="list-style-type: none"> the need for MR full operation is clearly demonstrated by DWR through forecasting water levels by delta modeling and by actual stage data collected in the field (such data shall be provided to the DFG, NMFS and USFWS one week in advance of closing the flapgates). 	<p>Full operation and closure may occur if:</p> <ul style="list-style-type: none"> the need for ORT full operation is clearly demonstrated by DWR through forecasting water levels by delta modeling and by actual stage data collected in the field (such data shall be provided to the DFG, NMFS and USFWS one week in advance of closing the flapgates). 	<p>Full operation and closure may occur if:</p> <ol style="list-style-type: none"> the need for GLC full operation is clearly demonstrated by DWR through forecasting water levels by delta modeling and by actual stage data collected in the field (such data shall be provided to the DFG, NMFS and USFWS two weeks in advance of closing the flapgates and center sections of the barrier). <p>AND:</p> <ol style="list-style-type: none"> the incidental take concern level for delta smelt at the SWP/CVP facilities has not been reached. <p>If the incidental take concern limit is reached at the SWP/CVP facilities and if reductions in project exports are determined to be inadequate to protect delta smelt, the DFG, NMFS and USFWS may require the flap gates to be tied in the open position and the center section to be removed.</p>
June 1 to November 30	<p>Full operation and closure may occur.</p> <p>Barrier elevation can be raised from 3.3 feet NAVD to 4.3 feet NAVD with DFG and USFWS approval.</p>	<p>Full operation and closure may occur.</p>	<p>Full operation and closure may occur.</p> <p>If the incidental take concern limit is reached at the SWP/CVP facilities and if reductions in project exports are determined to be inadequate to protect delta smelt, the DFG, NMFS and USFWS may require the flap gates to be tied in the open position and the center section to be removed.</p>
September 15	Barrier must be notched to allow passage of adult salmon.	Barrier must be notched to allow passage of adult salmon.	Barrier must have enough flashboards removed to allow passage of adult salmon.
November 30	Barrier must be completely removed.	Barrier must be completely removed.	Barrier must be completely removed.

Table 3: Agricultural Barrier installation and operation schedule, for years when the Spring HORB is installed

	MR	ORT	GLC
March 1	Installation may begin.	Installation may begin.	Installation may begin.
April 1 to May 31, after HORB is fully operational	<p>Full operation and closure may occur.</p> <p>If HORB is breached, flap gates must be tied in open position.</p>	<p>Full operation and closure may occur.</p> <p>If HORB is breached, flap gates must be tied in open position.</p>	<p>Full operation and closure may occur if:</p> <ol style="list-style-type: none"> 1) the need for GLC full operation is clearly demonstrated by DWR through forecasting water levels by delta modeling and by actual stage data collected in the field (such data shall be provided to the DFG, NMFS and USFWS two weeks in advance of closing the flap gates and center sections of the barrier). <p>AND:</p> <ol style="list-style-type: none"> 2) the DFG, NMFS and USFWS, in coordination with DWR, approves closure. <p>If HORB is breached, flap gates must be tied in open position.</p> <p>If HORB is breached due to Delta Smelt concerns, flap gates must be tied in the open position and the center section shall be removed until concerns have passed.</p>
June 1 to November 30	<p>Full operation and closure may occur .</p> <p>Barrier elevation can be raised from 3.3 feet NAVD to 4.3 feet NAVD with DFG and USFWS approval.</p>	<p>Full operation and closure may occur.</p>	<p>Full operation and closure may occur if:</p> <ol style="list-style-type: none"> 2) the need for GLC full operation is clearly demonstrated by DWR through forecasting water levels by delta modeling and by actual stage data collected in the field (such data shall be provided to the DFG and USFWS two weeks in advance of closing the flap gates and center sections of the barrier). <p>AND:</p> <ol style="list-style-type: none"> 3) the incidental take concern level for delta smelt at the SWP/CVP facilities has not been reached. <p>If the incidental take concern limit is reached at the SWP/CVP facilities and if reductions in project exports are determined to be inadequate to protect delta smelt, the DFG and USFWS may require the flap gates to be tied in the open position and the center section to be removed.</p>
September 15	Barrier must be notched to allow passage of adult salmon.	Barrier must be notched to allow passage of adult salmon.	Barrier must have enough flashboards removed to allow passage of adult salmon.
November 30	Barrier must be	Barrier must be	Barrier must be completely removed.

	completely removed.	completely removed.	
--	---------------------	---------------------	--

Block 19. Project Purpose

The primary purpose of implementing the TBP ag barriers project is to provide an adequate agricultural water supply in terms of quantity, quality, and channel water levels to meet the reasonable and beneficial needs of water users in the South Delta Water Agency boundary.

Continued installation of the barriers will allow DWR to perform further monitoring, if required, to determine potential hydraulic effects on south Delta channels as well as the biological effects on vegetation and fisheries within the south Delta. The data collected from this monitoring will be used to assist the development of long-term solutions to SDWA’s reasonable and beneficial uses according to provisions of the draft south Delta settlement agreement, applicable CALFED programs, and environmental laws. Using temporary barriers will also allow DWR to improve barrier designs and review alternative timing operations for the permanent barriers.

Further information about the project can be found in the 2000 Initial Study and the 2000 Action Specific Implementation Plan (DWR 2000).

Block 21. Types of Materials Being Discharged

The Ag Barriers involve the discharge of rock that is clean, hard, dense, durable, and free from cracks, seams and other defects that will tend to foster deterioration from natural causes. The ORT culverts are installed annually. The material quantities and impacts for each barrier are listed in Table 4 below.

Block 22. Surface Areas of Waters Filled

Fill material discharged at the agricultural barriers is temporary but impacts are being considered permanent because they occur every year. The material quantities and impacts for each barrier are listed in Table 4 below.

Table 4. Summary of Types and Amounts of Material Discharged to Waters of the U.S. and Affected Surface Areas for the TBP

Type of Discharge	Amount of Fill Discharged	Total Surface Area Affected
MR Barrier		
Rock	2,300 to 2,400 CY (T)	13,500 square feet (0.31 acre) (P); 270 lf
ORT Barrier		
Nine, 48 inch diameter culverts in metal frames		15,000 square feet (0.34 acre) (P); 250 lf
Rock, including rip rap, and crushed rock	5,000 CY (T)	
Articulated concrete mats	15 CY (T)	
GLC Barrier		
Rock, including rip rap, and crushed rock	12,600 CY (T)	15,000 square feet (0.34 acre) (P); 300 lf
Articulated concrete mats	15 CY (T)	

(T) = temporary, (P) = permanent, CY = cubic yards, lf = linear feet.

When the barriers are removed at the end of the irrigation season, the abutments and culverts at the MRB and GLC will remain in place.

Block 23. Description of Avoidance, Minimization, and Compensation

The following measures will be implemented as part of the project to minimize and avoid impacts to waters of the United States:

- Construction personnel will participate in a worker environmental awareness program that has been reviewed by NMFS, USFWS, and CDFG. As part of this program, workers will be informed of the best management practices that will be employed to protect water quality and about the presence of special status species in the area, which are protected under the federal Endangered Species Act (ESA), Migratory Bird Treaty Act, and/or California Endangered Species Act (CESA), and the habitats associated with the species occurring in the area.
- DWR will use staging and channel access areas that are limited to only the area necessary to construct the barrier and accommodate land-based barrier operation equipment.
- Construction impacts will be confined to the minimum area necessary to complete installation and operation of the barriers.
- DWR will monitor turbidity levels during ground-disturbing activities, including pile driving according to the Section 401 Water Quality Certification issued for the project by the Central Valley Regional Water Quality Control Board.
- Stockpiling of construction materials will be restricted to designated construction staging areas and exclusive of the riparian areas.
- All areas disturbed by project activities will be protected from washout or erosion. An effective combination of erosion and sediment control Best Management Practices (BMPs) will be implemented and adequately working during all phases of construction.

- Erosion and sediment control structures will be monitored for effectiveness and will be repaired or replaced as needed.
- DWR will have readily available plastic sheeting or Visqueen and will cover exposed spoil piles and exposed areas to prevent these areas from losing loose soil into the river. The covering materials will be applied when it is evident rainy conditions threaten to erode loose soils into the stream.
- All heavy equipment will be fueled, maintained, and stored at a safe distance from any adjacent waterways. Standard construction best management practices (BMPs), as described in the current California Department of Transportation Construction Site Best Management Practices Manual, will be implemented so that no oil, grease, fuel or other fluids contaminate the waterways around the work sites.
- Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily to prevent leaks.
- Stationary equipment such as motors, pumps, generators, and welders located within or adjacent to the stream will be positioned over drip pans.
- Following the completion of the study, temporary fills will be removed and the riverbed will be returned to pre-construction contours.
- All previously vegetated, exposed/disturbed areas and access points within the stream zone left barren of vegetation as a result of the construction activities will be restored by seeding with a blend of locally collected native erosion control grass seeds. Seeded areas will be mulched. All other areas of disturbed soil which drain toward the stream channel will be seeded with erosion control grass seeds. Revegetation will be completed as soon as possible after project activities in those areas cease. Seeding placed after October 15 will be covered with broadcast straw, coconut fiber blanket or similar erosion control blanket.
- DWR purchased 6.0 acres of shallow water habitat credits for the TBP. DWR utilized a credit of 1.25 acres left over from the Kimball Island Mitigation Bank and an additional 4.75 acres of shallow water habitat credits was purchased at the Liberty Island Conservation Bank.

Block 24. Previously Completed Work

The culvert structure and associated abutments of the MR and GLC barriers are currently in place. The abutments and culverts remain in place year-round. All three barriers have been installed and removed annually since 1991, with periodic exceptions.

25. Addresses of Adjoining Property Owners

	APN	Property Owner	Address
Old River Tracy	258-020-35 258-030-01 258-40-01	SHEA MOUNTAIN HOUSE LLC	2580 Shea Center Dr Livermore, CA 94550
	189-050-43	Main Stone Corp	2930 White Corporation Merced, CA 95340
Grant Line Canal	189-050-43	Main Stone Corp.	2930 White Corporation Merced, CA 95340
	189-240-20	BIANCHI DONALD L & JOYCE C	1850 Chester Dr Tracy CA 95304
	189-170-03 189-170-07	Yamada Brothers	15406 S Tracy Blvd Stockton CA 95206
Middle River	189-250-34	Arnaudo Brothers, Partnership	16505 Tracy Boulevard Tracy, CA 95304
	189-250-22 189-250-32	Jack Klein Partnership	Post Office Box 7424 Stockton, CA 95207
	189-250-21	Mary Karen McGurk	49 Egret View Drive San Rafael, CA 94901
	131-120-04	Herbert and Joyce Speckman	Post Office Box 415 Holt, CA 95234-0415

References

California Department of Water Resources 2000. South Delta Temporary Barriers Project Action Specific Implementation Plan

National Marine Fisheries Service. 2008. Biological opinion on the construction and operation of the South Delta Temporary Barriers Program for 2008, 2009, and 2010. May 2008. National Marine Fisheries Service, Southwest Region. Long Beach, CA.

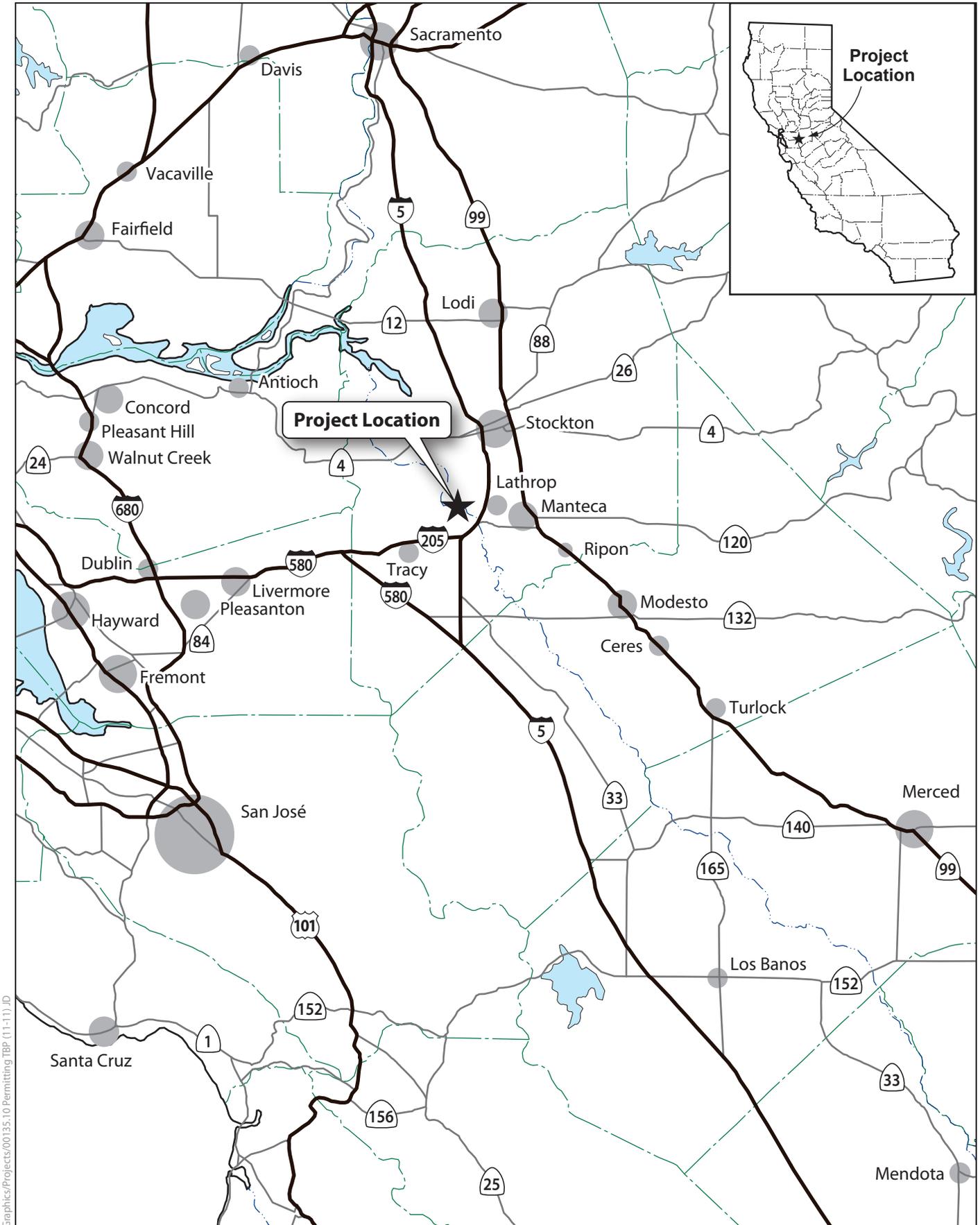
National Marine Fisheries Service. 2009. Biological and conference opinion on the reinitiation of formal consultation for the South Delta Temporary Barriers Project. April 3. National Marine Fisheries Service, Southwest Region. Long Beach, CA.

National Marine Fisheries Service. 2011. Biological opinion on the construction and operation of the South Delta Temporary Barriers Program for 2011. May 2013. National Marine Fisheries Service, Southwest Region. Long Beach, CA.

U.S. Fish and Wildlife Service. 2008. Formal endangered species act consultation on the proposed coordinated operations of the Central Valley Project (CVP) and State Water Project (SWP). December 15, 2008. Sacramento, CA.

U.S. Fish and Wildlife Service. 2009. Biological opinion on the effects of the construction of the Temporary Barriers Program. April. Sacramento, CA.

APPENDIX A: FIGURES



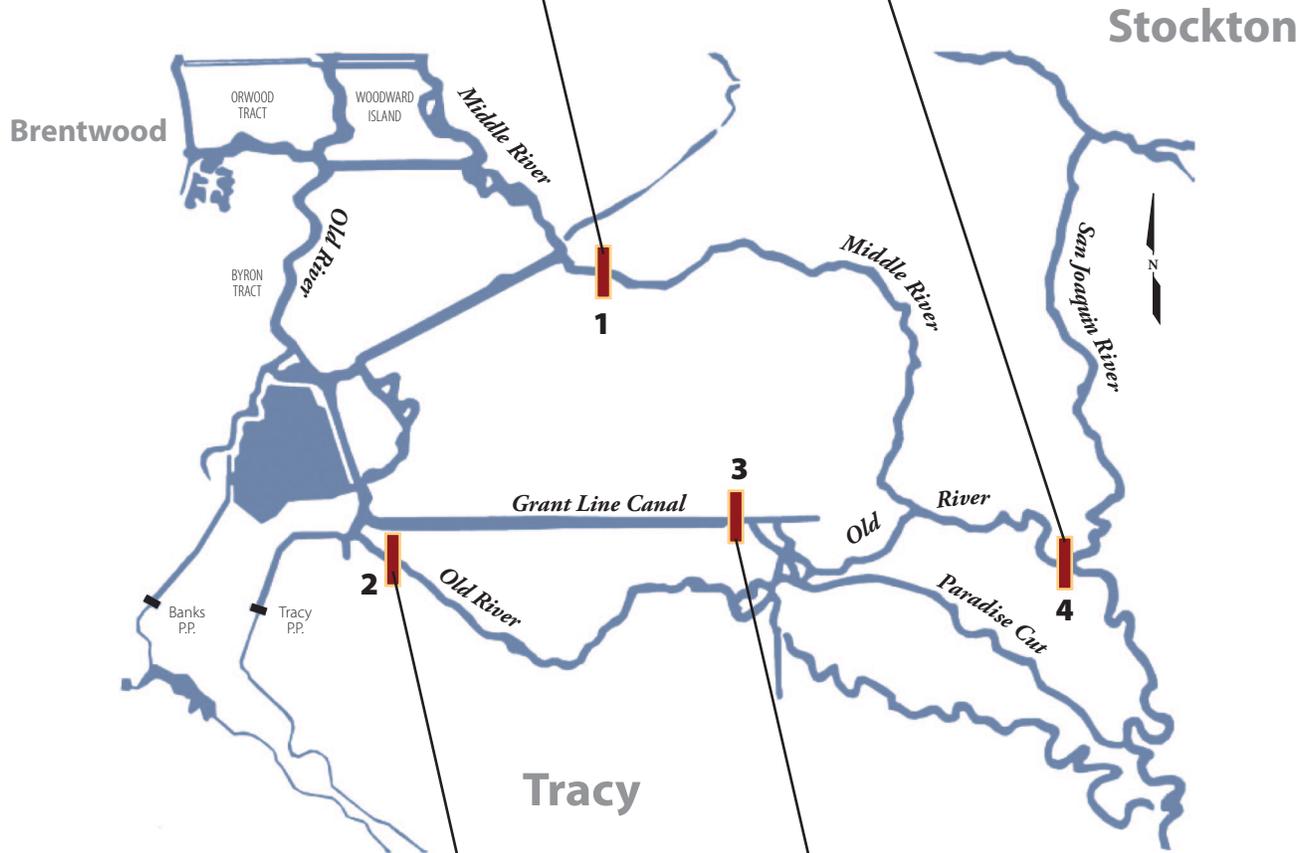
Graphics/Projects/00135.10 Permitting TBP (11-11).JD



Middle River Barrier



Head of Old River Barrier



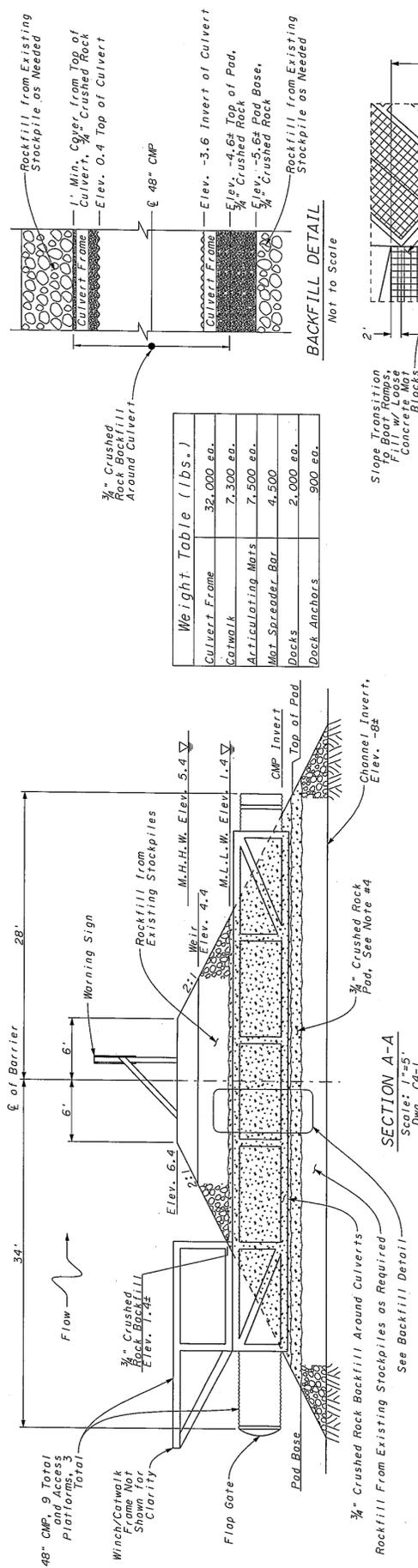
Old River at Tracy Barrier



Grant Line Barrier

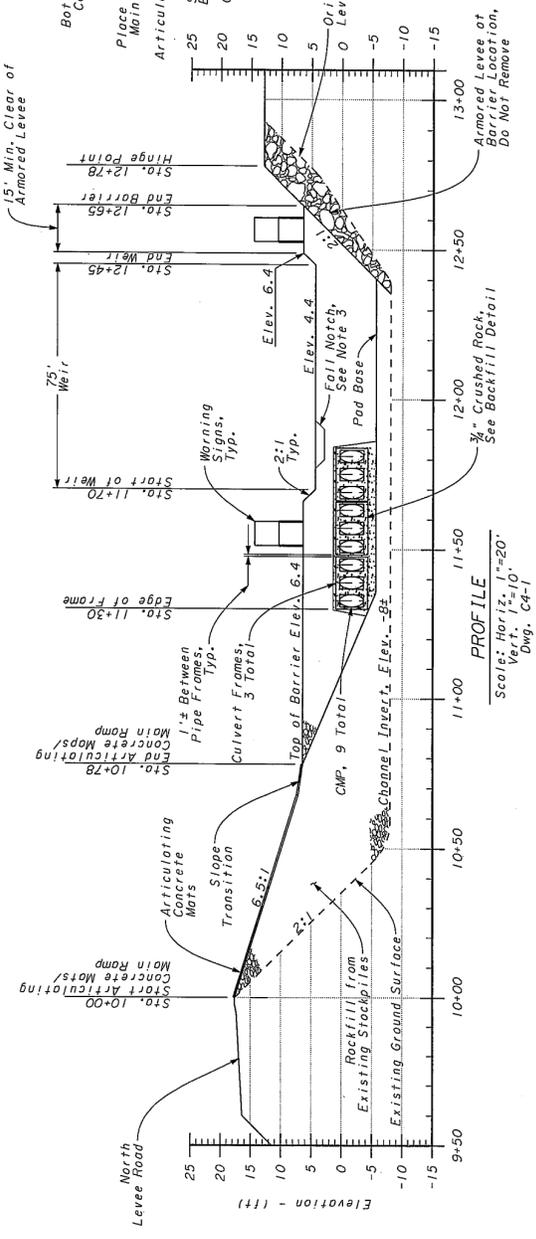
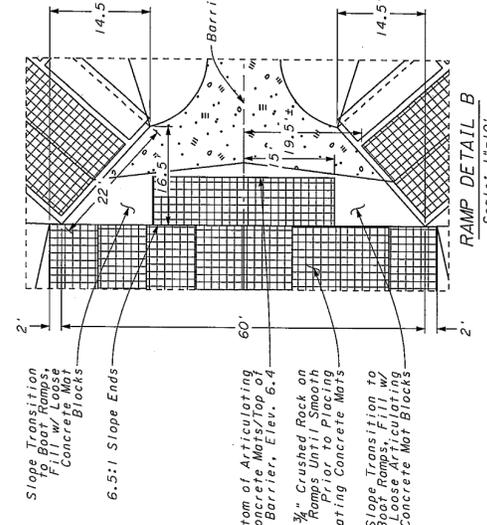
Graphics/Projects/00135.10 Permitting TBP (11-11)JD

Figure 2
Project Location Map



Weight Table (lbs.)

Culvert Frame	32,000 ea.
Cartwalk	7,500 ea.
Articulating Mats	7,500 ea.
Mat Spreader Bar	4,500
Docks	2,000 ea.
Dock Anchors	900 ea.



- NOTES**
- All elevations are in feet and refer to NAVD88.
 - Abbreviations:
M.H.H.W. - Mean High High Water
M.L.L.W. - Mean Low Low Water.
 - Fall Notch 10' wide, Elev. 2.9', Install as directed.
 - 3/4" crushed rock pad to be leveled and tamped with an excavator bucket.

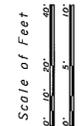


Figure 4b
Old River Near Tracy Barrier
Profile, Section and Details

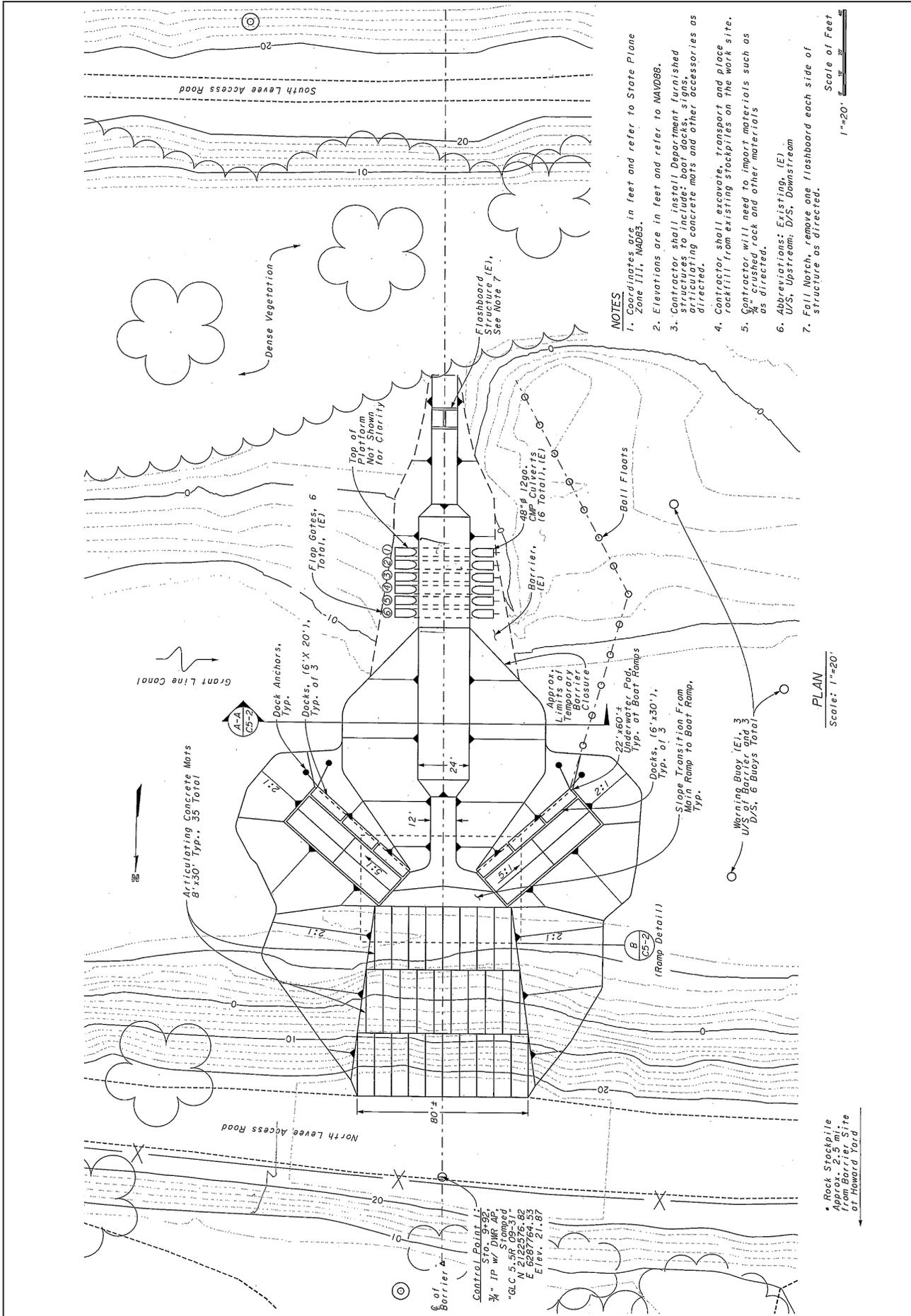
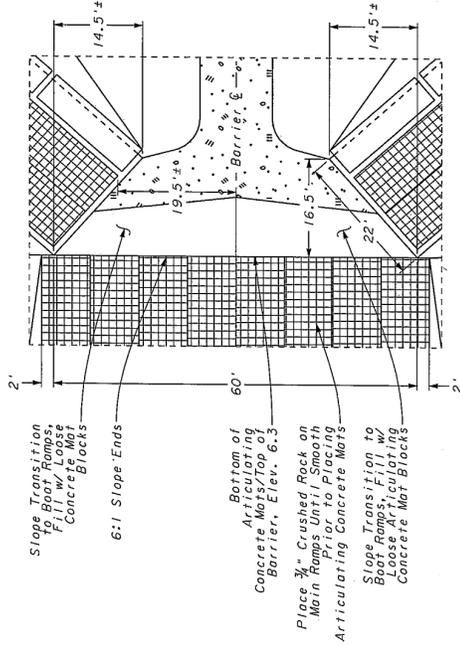


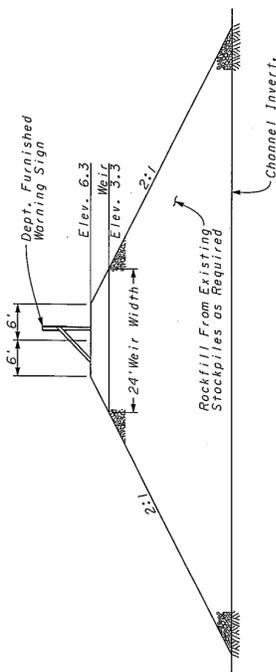
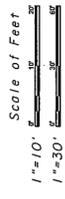
Figure 5a
Grant Line Canal Barrier
Plan



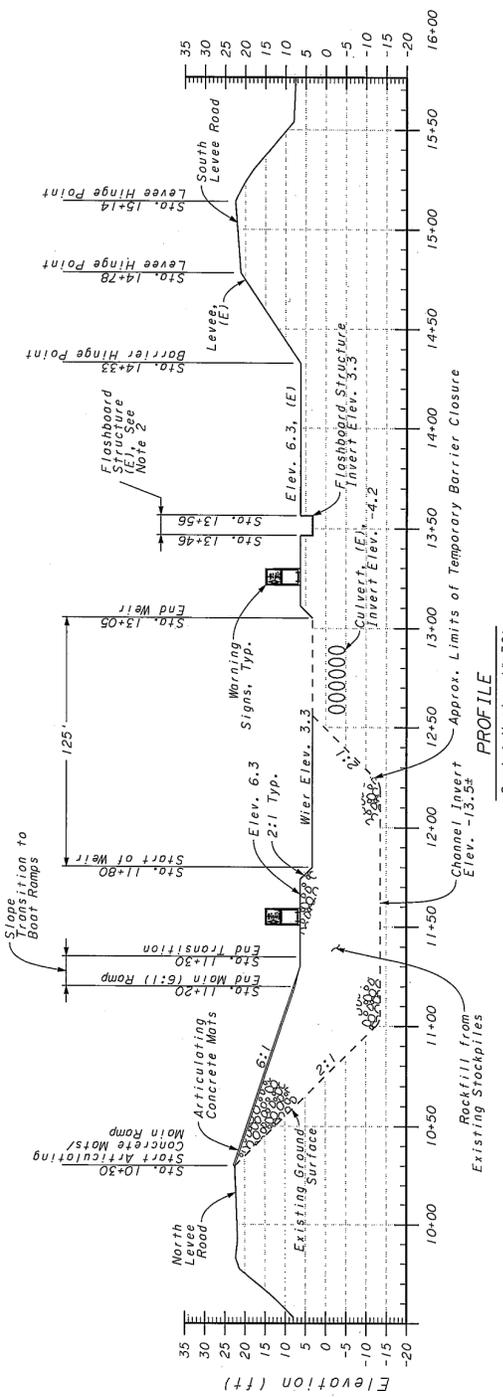
RAMP DETAIL B
Scale: 1"=10'
Dwg. C5-1

- NOTES
1. All elevations are in feet and refer to MVD88.
 2. Fall Notch, remove one flashboard each side, as directed.

Weight Table (lbs.)	
Articulating Mats	7,500 ea.
Mat Spreader Bar	4,500
Dock Sections	2,000 ea.
Dock Anchors	900 ea.



SECTION A-A
Scale: 1"=10'
Dwg. C5-1



PROFILE
Scale: Horiz. 1"=30'
Vert. 1"=15'
Dwg. C5-1

Figure 5b
Grant Line Canal Barrier
Profile, Section and Details