

*Mendocino County Russian River Flood Control  
& Water Conservation Improvement District*

**General Manager's Report for July 2024**

*Presented at Regular Meeting of Monday, August 5, 2024*

**Priority 1: Security ~ Ensure reliable, resilient, and available sources of water.**

(1: Improved river & reservoir operations. 2: Fair & reliable inter-basin. 3: Expanded water sources. 4: Increased storage capacity)

**2-Trans Basin Diversion future:** The Federal Energy Resources Commission (FERC) approved PG&E's Revised Schedule for Filing Surrender Application on July 1, 2024, issuing an acknowledgement and acceptance of PG&E's request to delay the submission of the Potter Valley Project decommissioning plan by six months.

The Round Valley Indian Tribes filed a motion to intervene regarding the ongoing development of the Final Draft Surrender Agreement and the Final Surrender Application and Decommissioning Plan by PG&E. "Despite ... extensive measures, the Tribe currently is not party to any of the major discussions or proceedings regarding the Project." "The Tribe has now chosen to move for intervention in an exhaustive effort to be fairly included in the conversations that determine the divestment of the facilities and waters on their ancestral lands."

More information can be found on the District's website: <https://www.rrfc.net/updates>

**2-Eel River flows & variance:** The Federal Energy Resources Commission (FERC) approved the 2024 flow variance submitted by PG&E in late June. PG&E has reconvened the Drought Working Group.

On July 4th, a request from the Round Valley Indian Tribes and the resource agencies was implemented, dropping the East Fork RR minimum flow requirement from 25 cfs to 5 cfs. However, due to the Potter Valley Irrigation District water supply contract with PG&E, there is currently closer to 40 cfs in the East Fork. The variance will end with Lake Pillsbury storage exceeds 36,000 acre feet after October 1 or is superseded by another variance/license change (which is being developed by PG&E.)

More information can be found on the District's website: <https://www.rrfc.net/updates>

**Priority 2: Collaboration ~ Work with partners to achieve aligned goals for a common benefit.**

(1: Trusted relationships with community partners for regional water security. 2: Improved diversity, equity, and inclusion in the stewardship of water resources. 3: Expanded relationships with non-traditional partners and stakeholders in pursuit of enhanced Environmental Stewardship.)

Nothing to note.

**Priority 3: Advocacy ~ Influence outreach, education, funding, regulation, and legislation in support of equitable water resource stewardship.**

(1: Improved public awareness and understanding of the importance of water issues. 2: State and Federal governmental policy and funding support for the region.)

Nothing to note.

*(Continued...)*

**Priority 4: Use ~ Ensure effective and beneficial use of water as a public resource.**

(1: Maximum beneficial use of water under District water right license. 2: Strategic use of water by customers.)

Nothing to note.

**Priority 5: Administration ~ Foster sustainable leadership and management of agency resources.**

(1: Capable and high quality executive leadership. 2: Engaged, diverse, and knowledgeable Board leadership. 3: Effective systems and human resources to execute the strategic plan. 4: Sound and sustainable management of District finances.)

Nothing to note.

**Community Meetings**

**Note: District Board members and GM will no longer be attending all community meetings and reporting here. Please contact the individual organizations for more information on public meetings and updates.**

**Local Agency Formation Commission (LAFCo) (7/1/24):** During the Work Plan agenda items, Executive Officer Hinman received questions regarding how the proposed annexation of the Redwood Valley County Water District into RRFC relates to the recently formed Ukiah Valley Water Authority JPA.

**Ukiah Valley Water Authority Special meeting (7/9/24):** A planning grant will be applied for through the SWRCB SAFER program, getting to 10% engineering design study, estimated to take 6 months. This information will be necessary to apply for the remaining funding from SAFER. An update was provided on the Master Tax Sharing Agreement between Mendocino County and the Cities of Fort Bragg, Point Arena, Ukiah, and Willits. This will be necessary at the LAFCo level at such time annexation, consolidation, and/or dissolution applications are filed. Consolidation of services is progressing including a consultant assisting with the combining of billing systems. Service teams are beginning to cross train. The next meeting is August 6, 2024 at 5 PM.

**City of Ukiah (7/17/24):** The Council approved to resubmit the amended Western Hills Annexation Application to LAFCo. The Council consideration of a contract for the Riverside Park Regeneration Project item was pulled by staff for further consideration. The approval of a proposal for the engineering services for the development of an additional municipal well and corresponding budget amendment was not heard and possibly held for a future meeting.

\* \* \* \*

Prepared and submitted to the Board of Trustees by: *Elizabeth Salomone, General Manager*

SARA PIERCE  
ACTING AUDITOR-CONTROLLER/  
TREASURER TAX-COLLECTOR



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June 27, 2024

Mendocino County Russian River Flood Control District  
PO Box 2104  
Ukiah, CA 95482

TO: District Board of Directors

RE: FY 2024-25 Estimated Tax Revenue

The following are this office's estimates of taxes to be paid to your district for the 2024-25 fiscal year. An estimated value increase of 1.5% has been applied, based on the Assessor's most recent report. The actual value fluctuation could be more or less.

Current Secured	48556.00
Current Unsecured	1969.00
Prior Unsecured	87.00
Homeowner Exemption	358.00
Timber Tax	0.00
SB813 Supplemental	566.00
Total Estimate	\$51536.00

Please contact the Auditor's Office with any questions you may have regarding the above estimates.

707-234-6874  
[auditortax@mendocinocounty.gov](mailto:auditortax@mendocinocounty.gov)

*Mendocino County Russian River Flood Control &  
Water Conservation Improvement District*

**STAFF REPORT**

**Agenda Item 13: Mendocino County Russian River Channel Maintenance  
Monday, August 5, 2024**

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**The Strategic Plan** relevant priority is **Administration** – engaged, diverse, and knowledgeable Board leadership.

**Background**

At its July 1, 2024 meeting, the Board received a report from Legal Counsel regarding investigation of maintenance obligations on Russian River and participation in an update of the 008 Biological Opinion. The Board directed Staff and Legal Counsel to continue researching the issue and to notify the National Marine Fisheries Service (NMFS) that the District wishes to be included in the Biological Opinion update. The **attached** report by Legal Counsel provides more detailed information.

**Discussion**

GM Salomone and Legal Counsel Lilly Selke met with United States Army Corp of Engineers (USACE) representatives on July 31, 2024 to discuss and clarify the District's maintenance obligations. A proposal for District action based on information gained will be developed and brought to the Board at a future meeting.

**Recommended Action:**

- None.

**Links:**

1965 USACE Channel Improvement Operations & Maintenance Manual and the District 1959 Resolutions regarding channel stabilization work:  
<https://www.rrfc.net/russian-river-channel-maintenance>

\* \* \* \*

Prepared and submitted to the Board of Trustees by: *Elizabeth Salomone, General Manager*

**Date:** July 17, 2024  
**To:** Elizabeth Salomone, RRFC Board of Trustees  
**From:** Lilliana Selke  
**Subject:** Russian River Channel Maintenance  
**File:** 3322-028

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## **BACKGROUND**

The National Marine Fisheries Service is in the process of producing an update to a 2008 Biological Opinion for operations and maintenance conducted by the U.S. Army Corps of Engineers (USACE), the Sonoma County Water Agency (SCWA), and the Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) in the Russian River Watershed (2008 BO).

NMFS reached out to staff at SCWA to determine the extent of RRFC's channel maintenance and annual reporting activities in order to include and cover those activities in the updated 2008 BO. SCWA staff stated neither SCWA nor USACE perform RRFC's maintenance obligations and put NMFS in contact with RRFC's General Manager.

At this time, RRFC is not aware of any channel maintenance activities *currently* being conducted, nor of any coordination with the USACE. The purpose of this memo is to discuss the apparent obligations of RRFC as written in the documentation provided in order to prepare for possible consultation with USACE to determine responsibilities going forward.

## **1959 RESOLUTION**

In 1959 the RRFC's Board of Trustees passed a resolution assuring USACE that, in consideration for channel stabilization work in the portion of the Russian River lying within Mendocino County, RRFC would:

- Furnish free of cost to the US all lands, easements and rights of way necessary for the construction of channel stabilization works;
- Make all necessary road and bridge revisions and utility alterations and relocations required for the channel stabilization works;
- Hold and save the US free from damages due to the said construction works;
- Maintain the channel stabilization works after completion in accordance with regulations prescribed the Secretary of the Army;
- Prevent any encroachment on the stream channel which would interfere with the proper functioning of the improvements or lessen their beneficial effects.

## **1965 OPERATION AND MAINTENANCE MANUAL FOR RUSSIAN RIVER CHANNEL IMPROVEMENT**

The purpose of the 1965 O+M manual is to assist the responsible local authorities in carrying out their obligations by providing information and advice as to operation and maintenance requirements of the project.

The manual details Section 208.10, Title 33 of the Code of Federal Regulations which contains rules for the maintenance and operation of local flood protection works by local agencies. In sum, these regulations require establishing a permanent committee headed by an official, called the “Superintendent,” who is responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods, and for continuous inspection and maintenance of the project works during periods of low water. The regulations require coordination between said Superintendent and the District Engineer and semi-annual reporting on behalf of the Superintendent.

The manual purports to include drawings of each improvement RRFC is responsible for. The plans include works at the following river miles: 94.2R, 93.9R, 93.6L, 93.6R, 93.3L, 92.8L, 91.9L, 91.6L, 90.4R, 89.5L, 87.6R, 87.3L, 87.1R, 86.5L, 86.2L, 85.8R, 85.6L, 84.9L, 83.5L. See maps attached as **EXHIBIT A**.

### **2008 BIOLOGICAL OPINION**

In 2008, the National Marine Fisheries Service issued a 15-year Biological Opinion for water supply, flood control operations, and channel maintenance conducted by USACE, SCWA, and RRFC in the Russian River watershed.

The BO states RRFC assumed the responsibility to perform stream bank maintenance consisting of obstacle removal, stream bank repair, and preventive maintenance over a 36-mile reach of the Russian River in Mendocino County from the county line north of Cloverdale upstream along the river north to the town of Calpella. RRFC also is responsible for any channel maintenance actions in the East Branch Russian below CVD downstream to the confluence with the Russian River, a one mile reach.

In general, RRFC’s maintenance activities include removing loose anchor jacks and large woody debris from the river, repairing and replacing loose grout or riprap, adding bank erosion protection at sites found to be eroding, and managing vegetation and removing flood debris to reduce blockage of the river channel that is causing bank erosion or preventing inspection of channel improvement sites.

The BO states RRFC is responsible for maintaining channel flood control improvements installed for the Coyote Valley Dam Project in Mendocino County and inspecting and maintaining channel flood control sites constructed between 1956 and 1963. This includes channel maintenance related to Federal sites and inspection of levees under Public Law 84-99 (nonfederal) sites.

The BO details the specific channel maintenance activities RRFC is authorized to perform in fulfilling its obligations, attached as **EXHIBIT B**. Further, the BO details the terms and conditions RRFC is required to comply with when conducting maintenance activities to avoid incidental take, attached as **EXHIBIT C**.

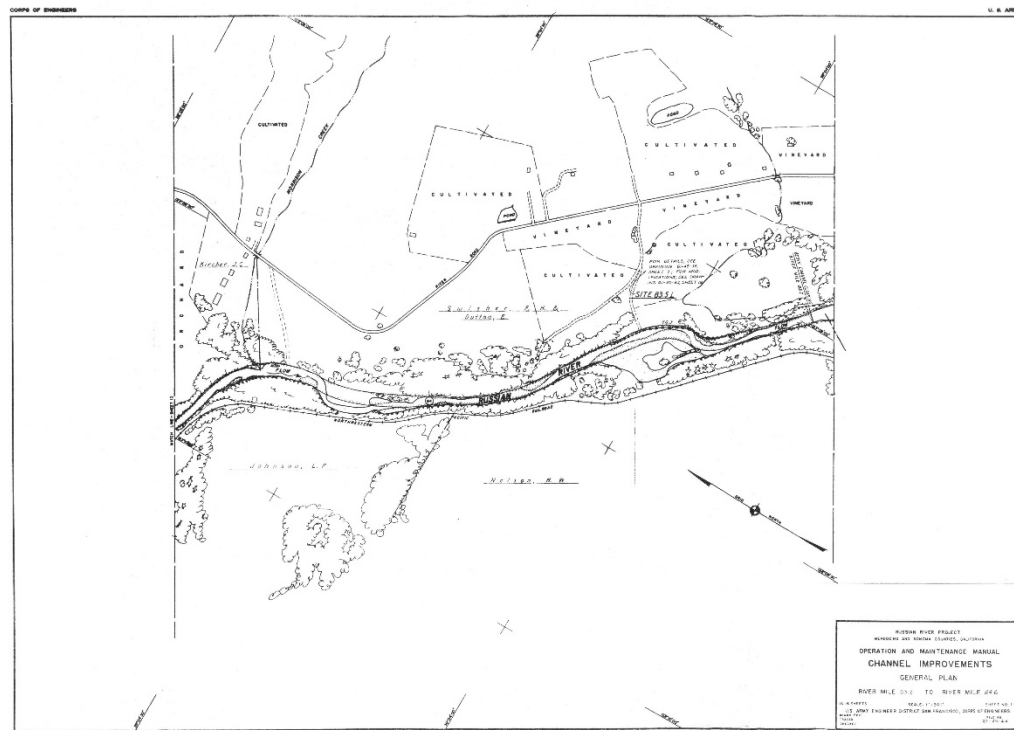
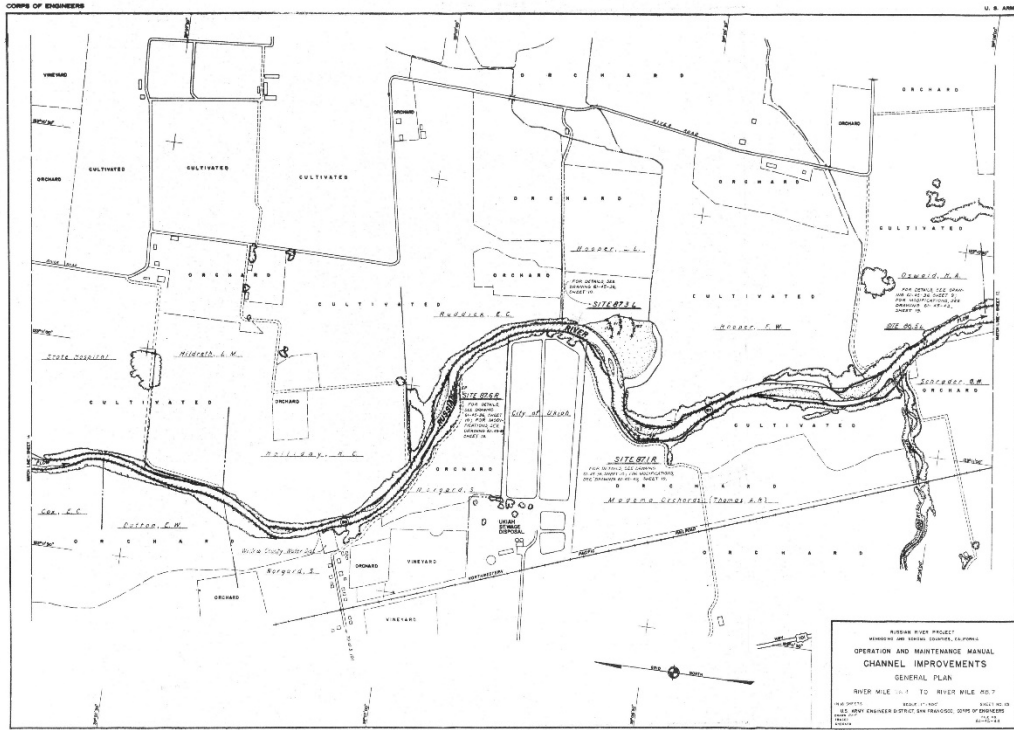
## **RECOMMENDATION**

Given the information above, it is clear RRFC assumed some obligation in the past for channel maintenance activities on a portion of the Russian River associated with the Coyote Valley Dam Project. However, at this time, the District is unclear on its current day obligations and which improvements those obligations extend to.

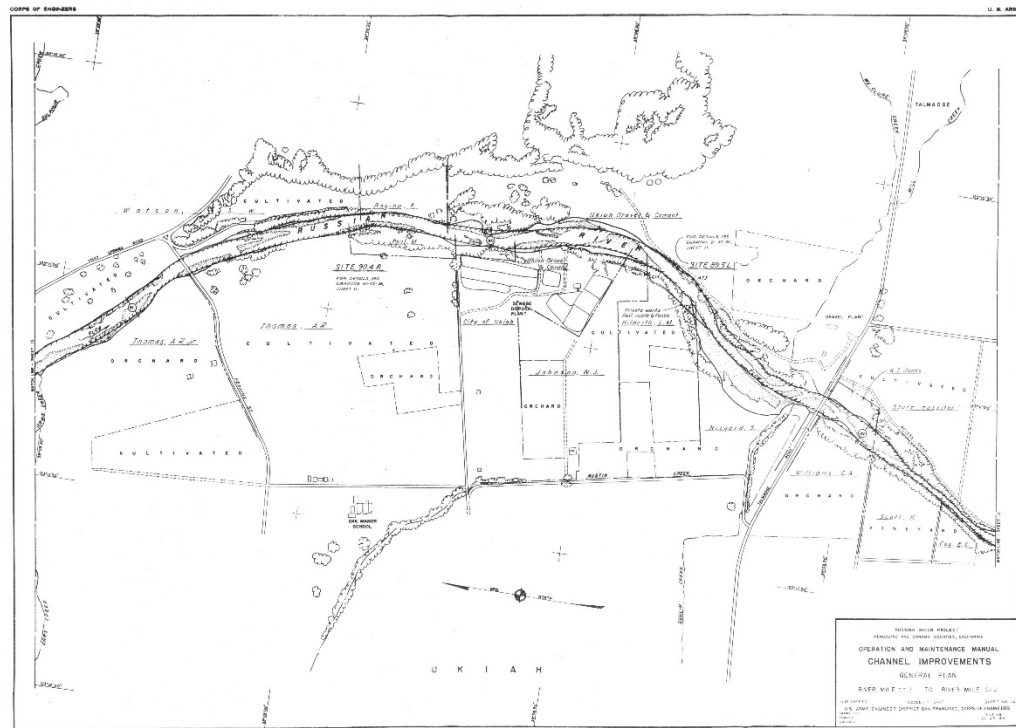
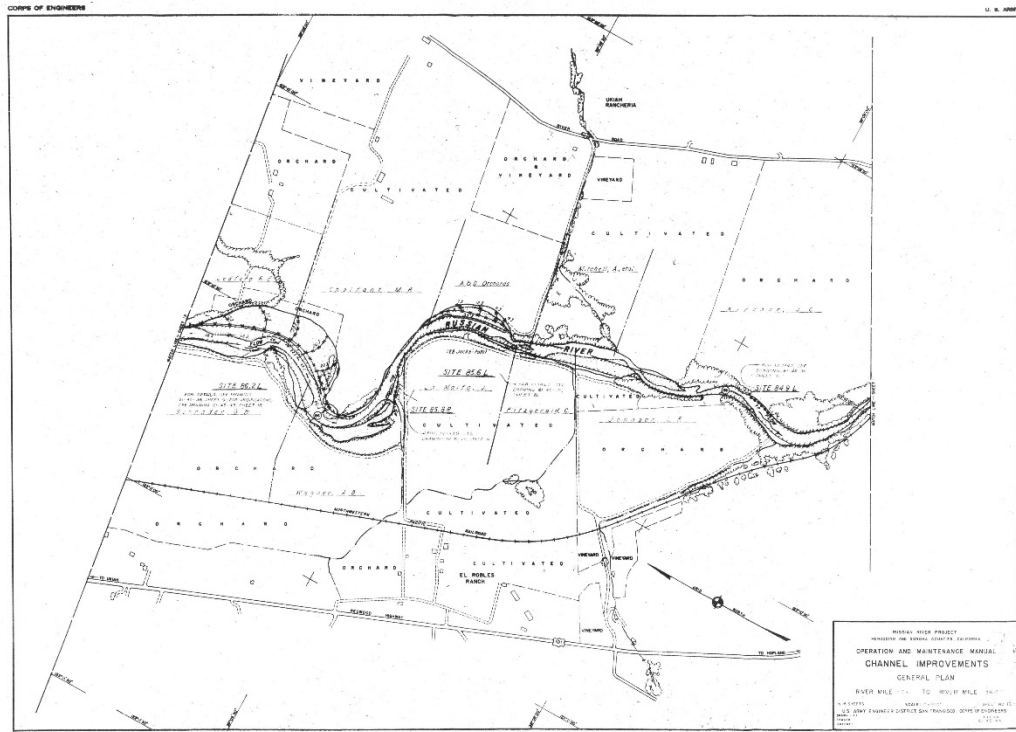
Without this knowledge, the District faces potential liability for failure to fulfill its maintenance obligations and potential liability for injuries sustained on improvements under RRFC's responsibility.

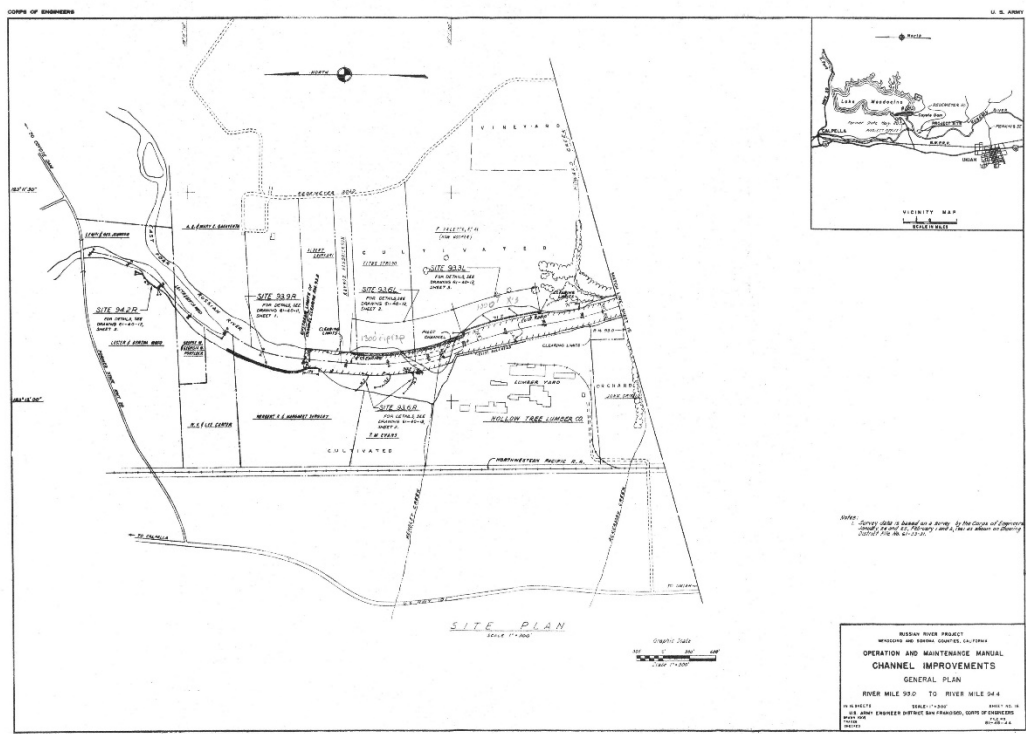
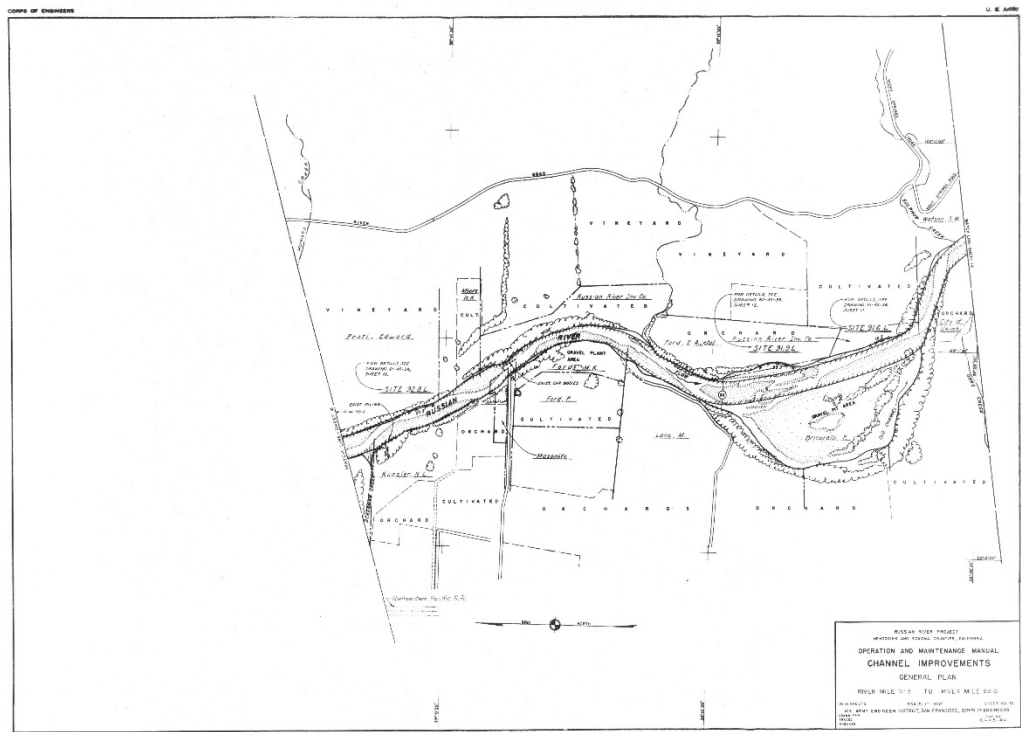
As a result, at this time we would recommend consultation with USACE to determine if they can provide a list of improvements and river miles RRFC is directly responsible for maintaining and whether an updated MOU can be produced to clarify RRFC's obligations both with regard to operation and maintenance and reporting and coordination. If they cannot, we would likely recommend that an engineering firm be hired to inventory the River in relation to the originally listed improvements to determine which are still in place, and what condition they are in.

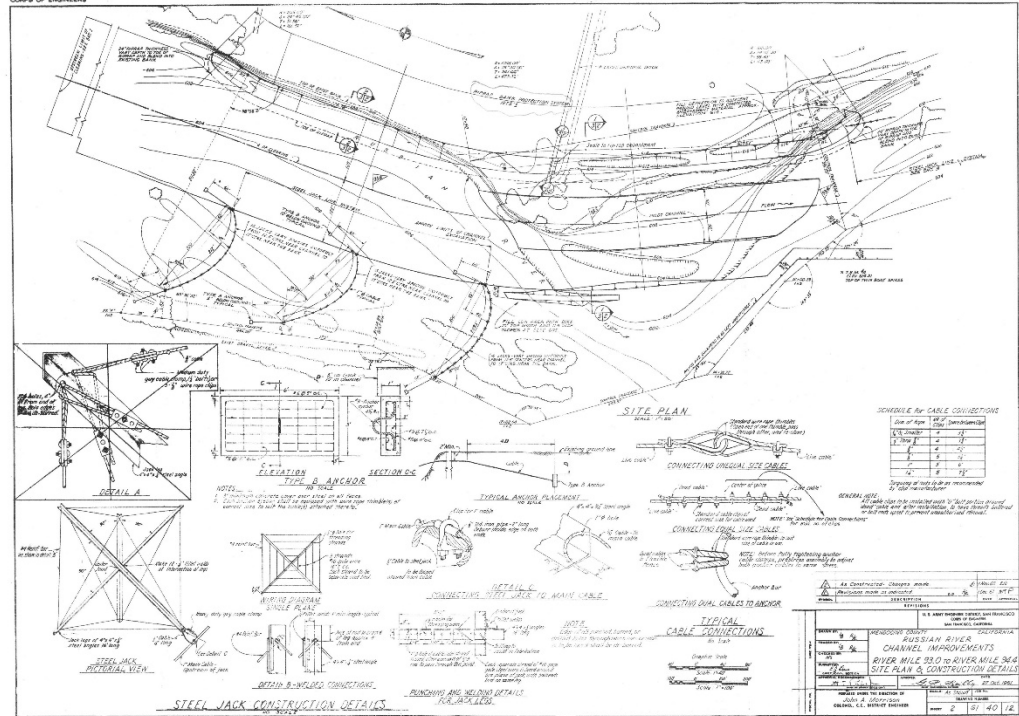
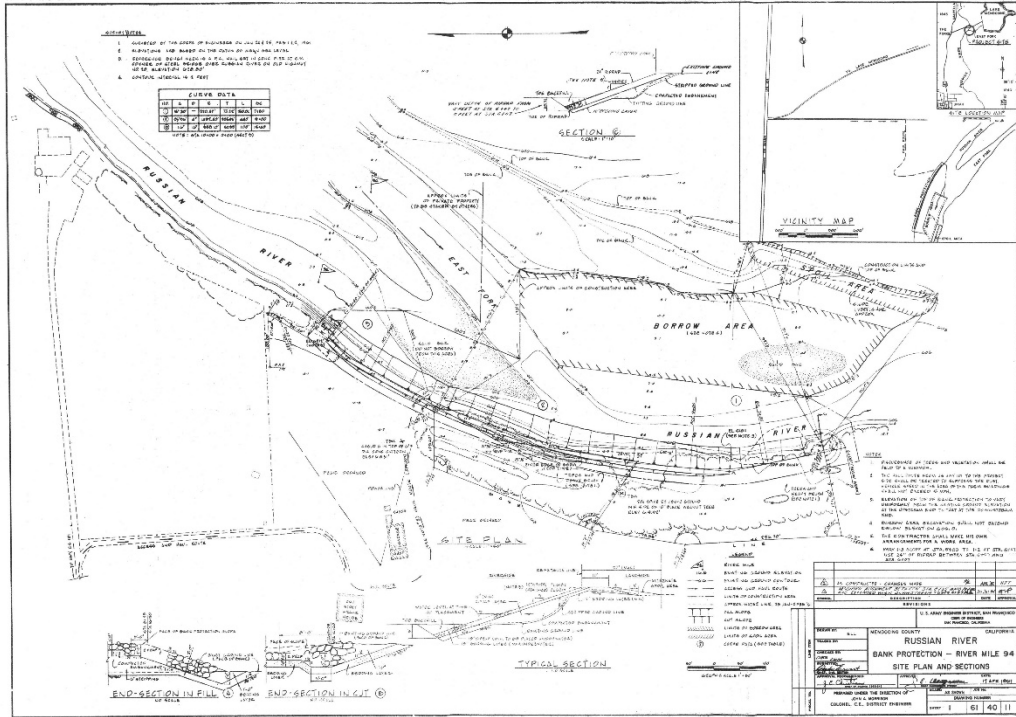
# EXHIBIT A MAPS FROM 1965 O+M MANUAL

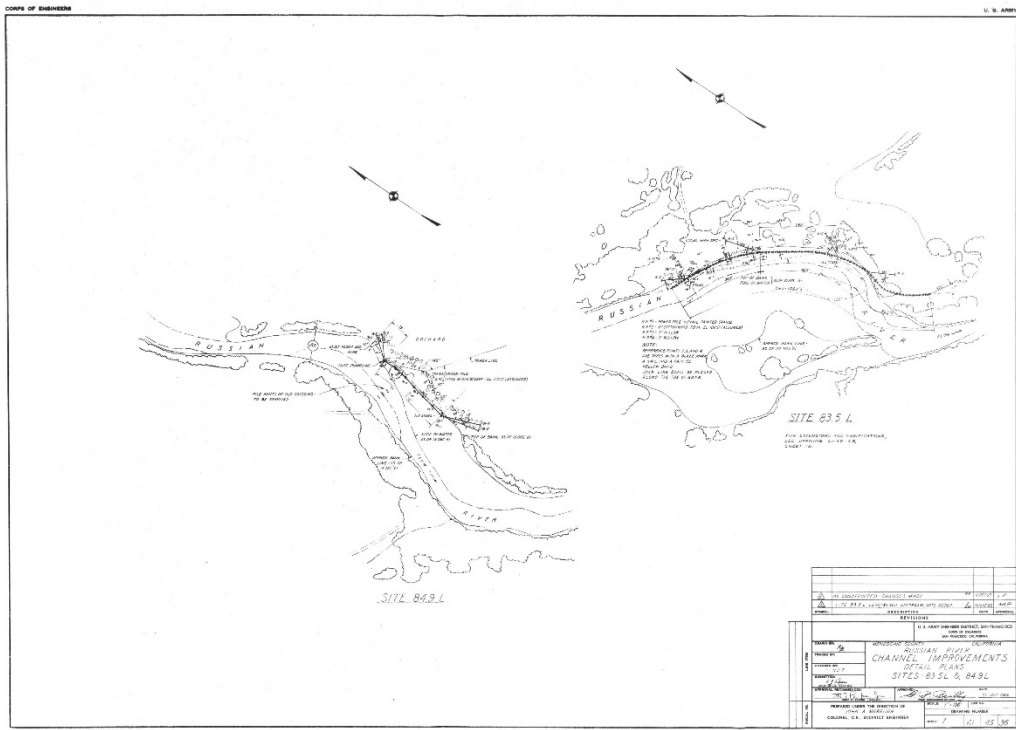
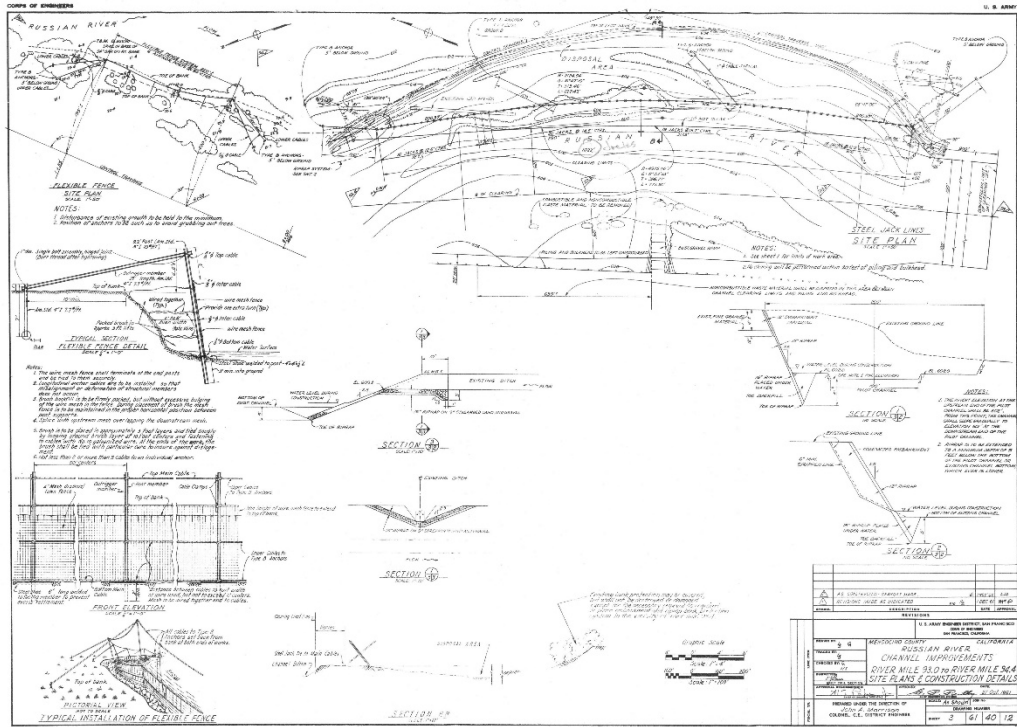


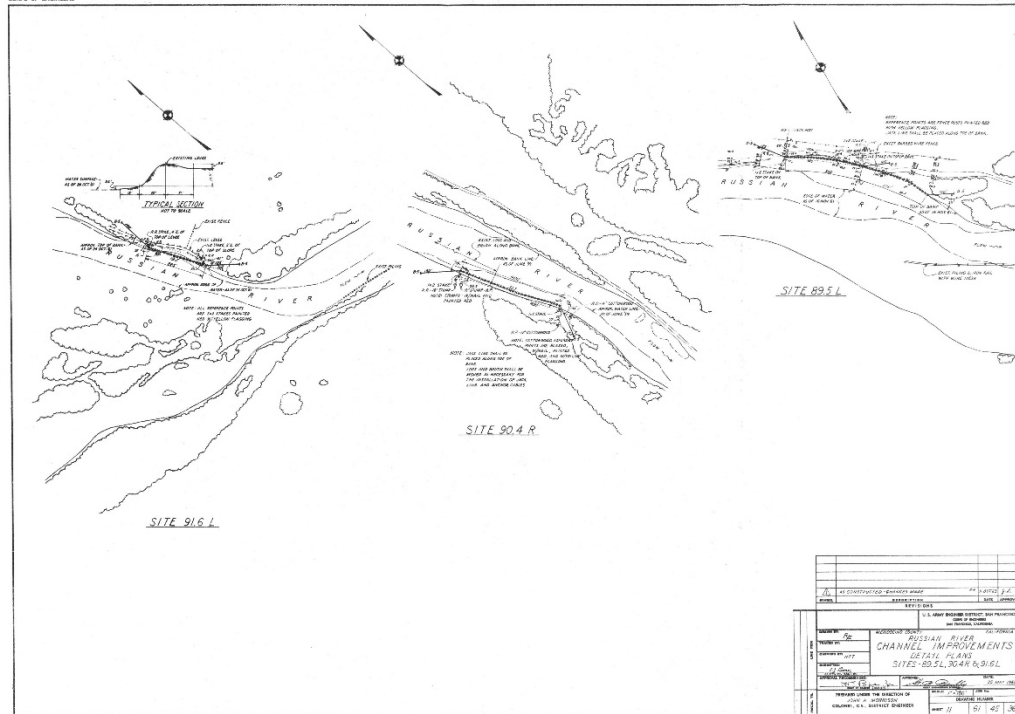


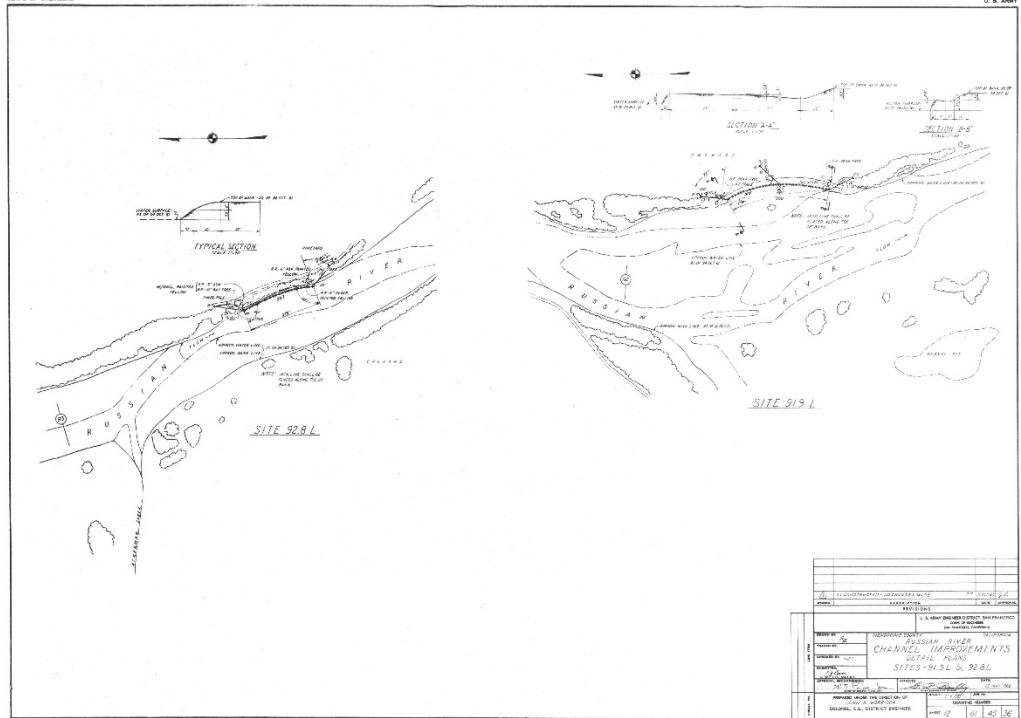
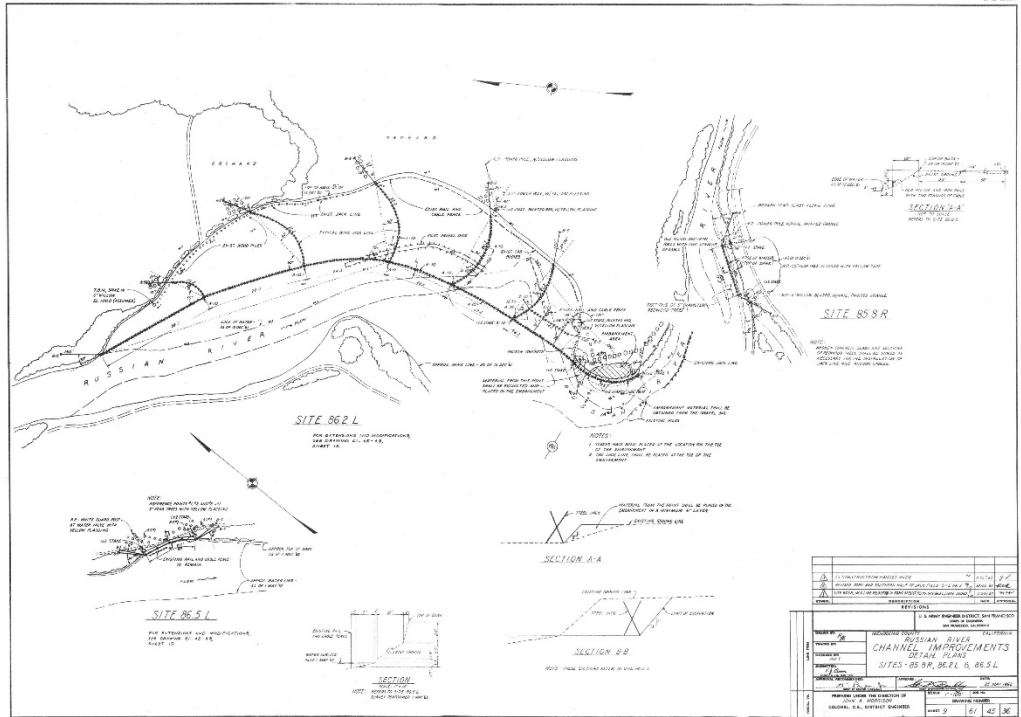


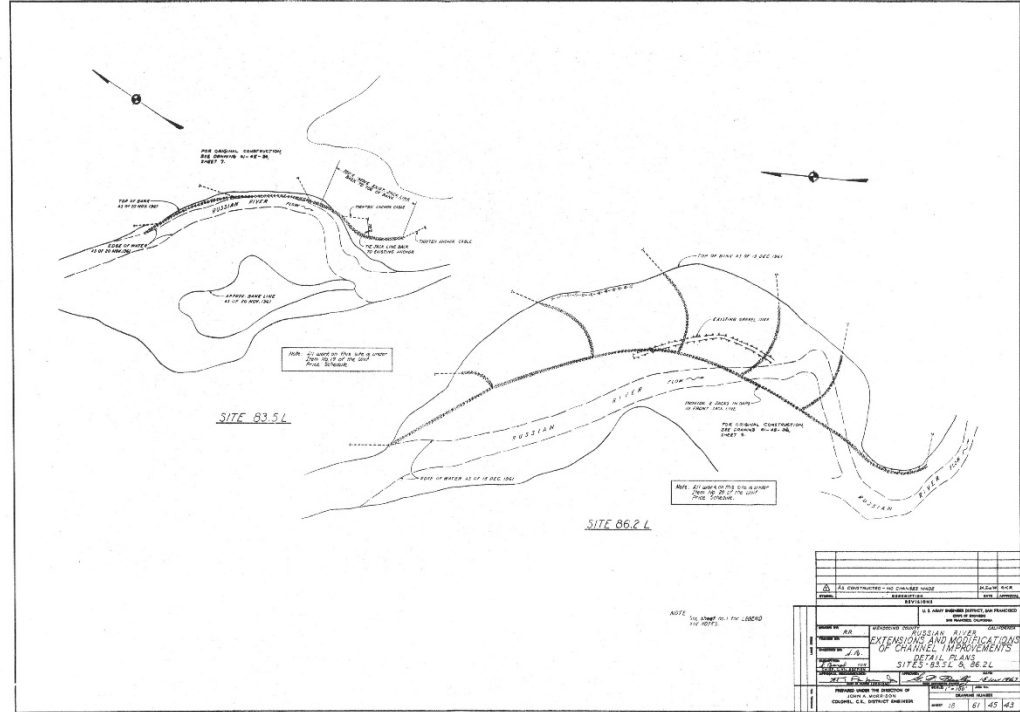
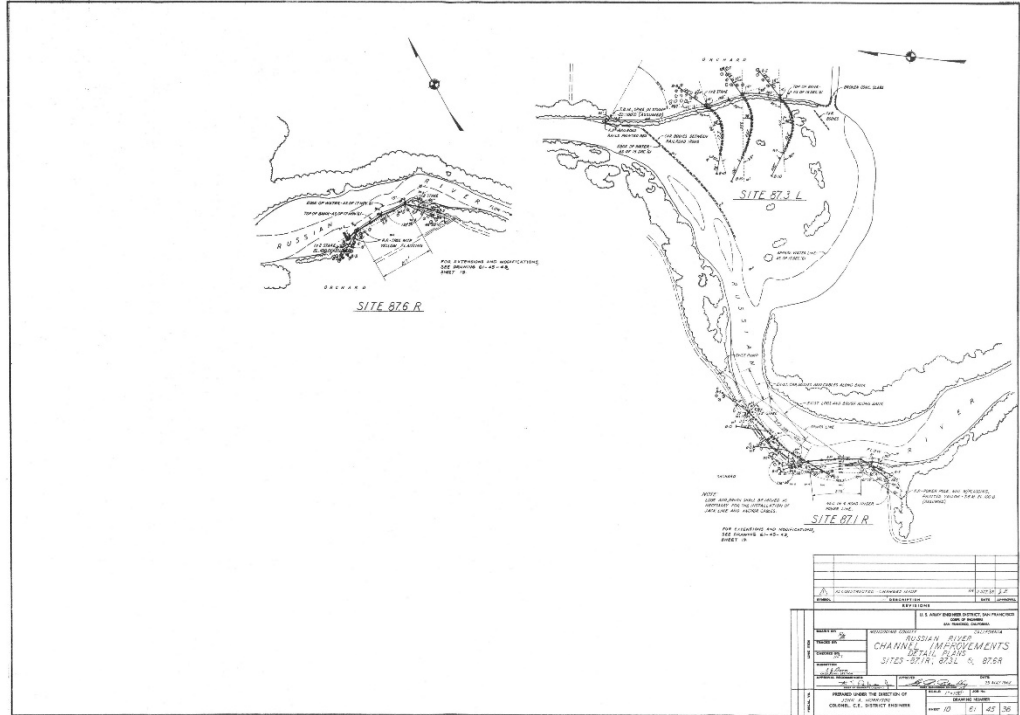


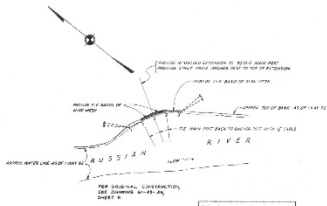






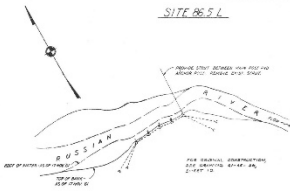






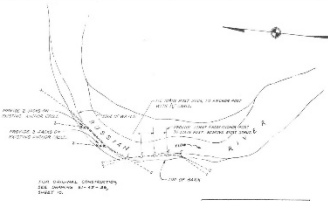
SCALE: AS SHOWN ON SHEET 61-42-43  
DATE: 61-42-43

SITE B55L



SCALE: AS SHOWN ON SHEET 61-42-43  
DATE: 61-42-43

SITE B75R



SCALE: AS SHOWN ON SHEET 61-42-43  
DATE: 61-42-43

SITE B7LR

NOTE: SEE SHEET 61-42-43 FOR DETAILS AND ELEVATIONS

NO.	DESCRIPTION	DATE	BY	CHECKED BY
1	AS SHOWN ON SHEET 61-42-43			
2	AS SHOWN ON SHEET 61-42-43			
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RUSSIAN RIVER  
EXTENSIVE AND OCCASIONAL  
OF CHANNEL IMPROVEMENTS  
DETAILS  
SITES B55L, B75R & B7LR  
DATE: 61-42-43  
SCALE: AS SHOWN ON SHEET 61-42-43  
DATE: 61-42-43



## **EXHIBIT B**

### **2008 BO CHANNEL MAINTENANCE ACTIVITIES APPROVED**

#### *(1). Gravel Bar and Overflow Channel Maintenance in the Main stem Russian River*

Certain conditions may warrant some degree of gravel bar grading. Grading activities may be conducted if one or more of these conditions exist:

- Occurrence of severe bank erosion.
- Recent substantial changes in channel morphology likely to lead to severe bank erosion.
- Evidence of weakened levees.
- Threats of flooding to infrastructure or private property.

SCWA and MCRRFCD will implement protocols described in the BA (Corps and SCWA 2004) to limit the potential for negative effects on salmonids or their habitat. For example:

- Gravel bar grading will only occur between July 1 and October 1.
- A buffer of at least 25 feet or 10 percent of the maximum bar width, whichever is less, will be maintained along the edge of the low flow channel, whether vegetation is present or not.
- The elevation of post graded bars will be at least 1.5 feet higher than the elevation of the edge of the low flow channel
- Sediment will be contoured to create a slope that runs up and away from the centerline of the main low-flow channel that is at least a 2 percent grade from the water surface elevation at low flow, or baseline elevation at the water surface, whichever is higher.
- Large woody debris removed or extracted will be placed either on the upstream buffer area or along the low flow channel buffer where it can be redistributed in the high flows of the next rainy season. If it poses a risk to property, it may be anchored or placed elsewhere in the river.

#### *(2) Vegetation Maintenance in the Mainstem Russian River*

Under the proposed Project, MCRRFCD will continue to perform vegetation maintenance to control bank erosion. Vegetation can be removed from river banks, levees, or gravel bars that contribute to bank erosion, consistent with protocols described in the BA (Corps and SCWA 2004) that limit the potential for negative effects on salmonids or their habitat. For example:

- Vegetation removal will occur outside of a 25 foot buffer zone next to the low-flow channel.
- Vegetation within the buffer will be cropped (mowed).
- In channels that are wider than 200 feet, a vegetated buffer of no less than 50 feet will be maintained.
- All vegetation removal work will occur during low flows, between July 1 and October 1.
- Native vegetation that is removed will be relocated to the extent possible.

Vegetation maintenance work may be conducted if one or more of these conditions exist:

- Encroachment by Giant Reed (*Arundo donax*) or other exotic pest plant species.

- Occurrence of severe bank erosion.
- Recent substantial changes in channel morphology that are likely to lead to severe bank erosion.
- Evidence of weakened levees.
- Threats of flooding to infrastructure or private property.

SCWA manages vegetation on the bed or banks of the Russian River from the Mendocino County line downstream to just above the confluence with Brooks Creek several miles upstream of the City of Headsburg, and several miles of the lower river just upstream from the estuary (as shown on Figure 3-5 in Corps and SCWA (2004). In these locations, SCWA manages the Russian River mainstem as a natural waterway. This management approach is described below in the Zone 1A description.

*(3) Site-Specific Bank Stabilization in the Russian River.*

Past channel maintenance areas, including those identified in the Corps Maintenance Manual for Dry Creek and Mainstem Channel Improvements, where frequent and/or extensive channel maintenance actions are required to prevent bank erosion will be identified. These sites may be candidates for bank stabilization projects by SCWA and MCRRFCD during the next fifteen years.

In addition, SCWA will conduct bank stabilization projects in the Mirabel or Riverfront Park sites in response to flood damage. SCWA anticipates flood damage may occur two to three times during the 15 year duration of the BO. When needed, this bank work will be included in the amount of work per year anticipated above (*i.e.*, the length of banks worked for these projects will be subtracted from 2,000 feet, leaving a smaller length of other bank work that may be done that year). Unless damage necessitates emergency repairs, remediation of bank failures will entail isolation and dewatering of the site using coffer dams. To avoid impacts to listed salmonids, fish would be removed from the site and construction would occur between July 1 and August 15.

Bank stabilization techniques employed by SCWA will favor a bioengineering approach with rock rip-rap placed only at the toe of banks upslope to the ordinary high water line. Any such project would heavily feature native vegetation re-planted on fill that is protected by erosion control fabric. Bank stabilization activities conducted by MCRRFCD will follow the methods described below for Dry Creek (*Methods 5 - 15*).

***Dry Creek.*** SCWA Channel maintenance activities on Dry Creek are mostly limited to maintaining Corps channel flood control improvements at 15 locations that were installed to prevent bank erosion following construction of WSD. The total length of these sites is 5,800 feet and includes rock banks (3180 feet) and board fences (1600 feet). Other sites include concrete weirs, concrete sills and one rock sill and bank. There were no lengths provided for these other sites (Table 1).

Under the proposed project, SCWA will continue to maintain these 15 channel flood control improvement sites. Maintenance work associated with these sites can involve incidental

sediment removal, vegetation removal, removal of debris, and bank stabilization. Vegetation removal will only occur to improve bank stability if trees are leaning or otherwise directing high flows against the bank, causing erosion, and/or to visually inspect a bank stabilization structure. Bank stabilization work typically will involve replacing lost riprap and, if necessary, regrading the bank slope to its previous contours in order to provide a stable base for the riprap. SCWA anticipates that bank stabilization work will be limited to 10% per year of the total length of the 15 sites (Ron Benkert, SCWA, personal communication, 2-5-2008). Riparian vegetation on the channel banks and bars will be left in place, if not threatening bank stability, to maintain shade for aquatic habitat. The BMPs used in natural waterways described below (in *b. Zone 1A*) will apply to maintenance practices on Dry Creek as well.

**Table 1.** Channel improvement sites on Dry Creek. Source: Corps and SCWA 2004.

<b>Site</b>	<b>Type</b>	<b>Length (feet)</b>
1	Rock Bank	600
2	Rock Bank	750
3	Board Fence	700
4	Rock Bank	200
5	Concrete Weir	
6	Rock Bank	450
7	Board Fence	900
8	Rock Bank	480
9	Concrete Weir	
10	½ Rock Sill and Bank	
11	Rock Bank	200
12	Concrete Sill	
13	Concrete Sill	
14	Concrete Sill	
15	Rock Bank	500

Some of these sites only require annual inspections while others may require repair. The methods of repair for these sites are described below.

The following is the Corps and SCWA (2004) description of the methods of bank repair in Dry Creek:

“Standardized maintenance methods and BMPs have been developed in conjunction with the Bay Area Storm Water Management Agencies Association (BASMAA) to minimize negative environmental effects (SCWA 1996b). (Method numbers not discussed in this section apply to sediment and debris removal, vegetation control, or activities in constructed channels).”

“*Method 5:* A dump truck, or excavator with an extended arm, is used to repair rock riprap or place rock in areas of slope undercutting, scour hole or bank slope erosion. Rock is dumped directly on the bank from a dump truck. If the face of the slope has eroded, the excavator digs a 2- to 3-foot-deep trench at the toe of the bank for the width of the eroded area. The excavating

equipment places 2 to 3 feet of rock into the toe, and rock riprap is placed up the bank from the toe. Smaller rock may be dumped to fill voids in the larger riprap.

*Method 6* is used to repair large and long erosion areas. In addition to activities in Method 5, the excavating equipment may fill the area farthest from the channel slope with native soil or road-base shale and then compact the area. Rock riprap is placed up the bank from the toe. Smaller rock may be dumped to fill the voids.

*Method 7:* Erosion areas around culverts are repaired by excavating the trench containing the culvert with excavating equipment, dumping sand, or native soil on the bank, and then using the excavating equipment to place the material into the trench. Portable compactors compact the fill. Six inches of road base is dumped into the excavated area and compacted using a roller/compactor.

*Method 9:* Dirt or rock access roads are repaired by dumping dirt or rock from a dump truck over the areas of road, spreading the material with a grader, and using a roller/compactor to compact the surface.

*Method 10:* Undercut pipe outfalls are repaired by replacing rock in scour holes below the pipe and reshaping the channel to direct flows away from the affected areas. If the erosion is deep, Method 6 is applied.

*Method 11:* Grouted rock is repaired by clearing the area of broken or damaged material with an excavator with an extended arm or a backhoe operated from the service road. Bank disturbance is kept to a minimum because equipment is not operated on the bank. Deeply eroded areas are repaired if necessary with Method 6. Rock riprap is placed on the bank of the stream channel bottom with Method 5 and grouted with ready-mix concrete from a shoot or a concrete pump.

*Method 12:* Minor underlining of a lined channel is repaired by accessing the area behind the lining from the top of the bank using hand tools or a backhoe to open a small access. A concrete/sand slurry ready mix would be distributed using a shoot or a concrete pumper.

*Method 13:* Major undermining repair would be contracted out. Historically, significant undermining has not occurred.

*Method 15:* When drop structures or check dams are repaired, water is diverted around the affected area. Isolation from flow would minimize sediment input and direct injury to fish. If the diversion is large, a dozer with a blade brings in or moves on-site material for construction of a berm or diversion dam.

#### *b. Zone 1A*

There are two types of channels managed by the SCWA in Zone 1A: constructed flood control channels and natural waterways. Most of the creeks in this zone are managed as both constructed flood control channels and natural waterways (Table 2). The upper portions of the creeks are usually managed as natural waterways and the lower portions, found in the more

urban areas, are typically constructed flood control channels. The activities implemented by SCWA for flood control purposes in the Zone 1A area (see Figure 3) include sediment removal, channel debris clearing, vegetation maintenance, and bank stabilization (on natural waterways only).

Constructed flood control channels (many of which are part of the Central Sonoma Watershed Project) are channels that have been altered (mainly by widening and straightening) based on flood control criteria. The purpose of the alterations is to increase hydraulic capacity. These channels have been straightened and in some places lined with concrete or riprap, converting the channel shape to a trapezoid. Also, these streams have been disconnected from their floodplains.

Natural waterways are waterways that have not recently been modified for flood control purposes by SCWA or USACE. Between 1958 and 1983 some of the natural waterways were straightened, shaped and stabilized. Regular maintenance on natural channels was historically performed with the objective of maximizing the hydraulic capacity without enlarging the channels. In the 1980's, SCWA staff would use heavy equipment and hand crews with chainsaws to clear vegetation from the bottom of natural channels. The use of heavy equipment ended in 1987, with clearing continuing to be performed by four-man crews using hand labor.

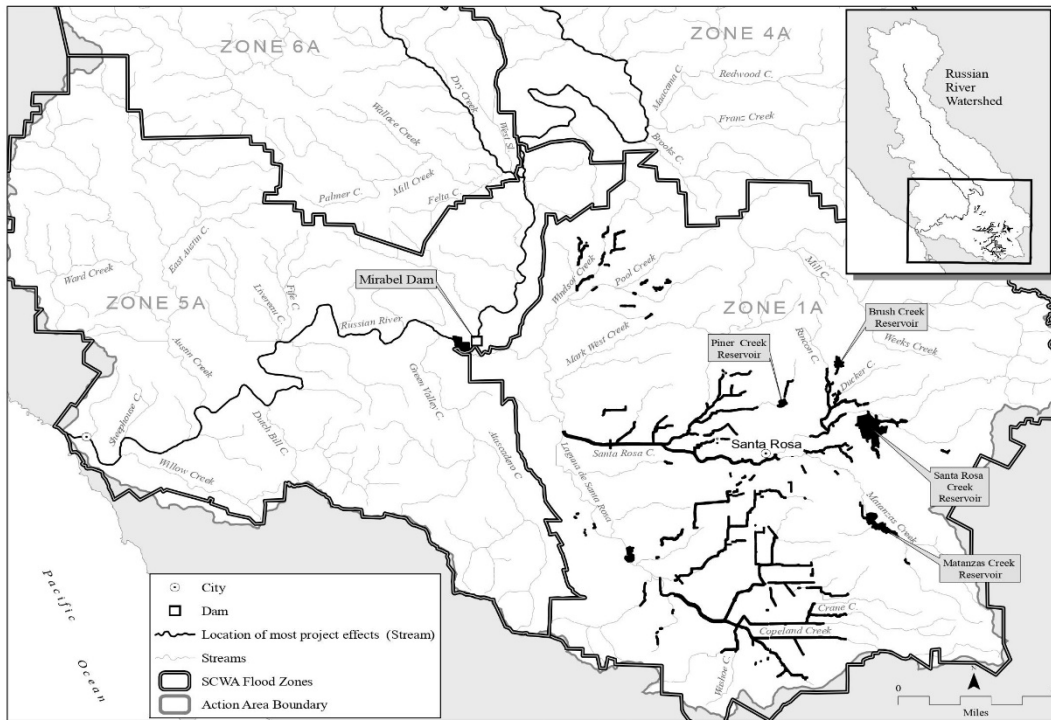


Figure 3. Detail of Action Area for Lower Russian River and Zone 1A

Table 2. Streams in Zone 1A where SCWA has proposed channel maintenance activities. F = flood control channels; N = natural waterways; S = known to contain steelhead (Corps and SCWA 2004, NMFS 2005d, CDFG 2006d). Streams are placed in three geographic groups: Rohnert Park – Cotati area streams, Santa Rosa Creek and its tributaries, and tributaries of Mark West Creek downstream of the confluence with the Laguna de Santa Rosa. Note: some streams have both channel types. Source: Modified from Corps and SCWA 2004.

Rohnert Park-Cotati Area		Santa Rosa Creek		Mark West Creek	
Blucher Creek	N, S	Austin Creek	F,S	Airport Creek	F
Coleman Creek	F, N, S	Brush Creek	F, S	Faught Creek	F
Colgan Creek	F, N	College Creek	F	Redwood Creek	F
Copeland Creek	F, N, S	Ducker Creek	F	Starr Creek	F
Cook Creek	F	Forestview Creek	F	Windsor Creek	F, N, S
Cotati Creek	F	Fountain Grove	N		
Crane Creek	F, N, S	Hood Mountain	N		
Five Creek	F	Indian Creek	F		
Gossage Creek	F, N	Lornadell Creek	F		
Hessel Creek	N	Matanzas Creek	N, S		
Hinebaugh Creek	F, S	Oakmont Creek	F, S		
Hunter Lane Channel	F	Paulin Creek	F, N, S		
Kawana Creek	F	Peterson Creek	F, S		
Laguna de Santa Rosa	F, N, S	Piner Creek	F, N, S		
Moorland Creek	F	Rinconada Creek	F, S		
Roseland Creek	F, N	Russel Creek	F		
Spivok Creek	F	Santa Rosa Creek	F, N, S		
Todd Creek	N	Sierra Park Creek	F, S		
Washoe Creek	N	Spring Creek	F, N, S		
Wilfred Creek	F, N	Steele Creek	F, N		
		Wendell Creek	F		

In addition to constructed flood control channels and natural waterways (discussed in the following section), SCWA maintains four flood control reservoirs built in the late 1960s to reduce flooding in the Santa Rosa area. Part of the Central Sonoma Watershed Project, these four flood control reservoirs are located on Santa Rosa, Brush, Paulin, and Matanzas creeks. The Santa Rosa Creek Reservoir (Spring Lake) is located off-stream. A diversion structure at the inlet allows relatively low flows to bypass the reservoir, routing the flow downstream into Santa Rosa Creek, while a portion of the higher flows are diverted into the reservoir. A diversion structure on Spring Creek also diverts water to Spring Lake. Spring Lake drains back to Santa Rosa Creek through a stand pipe when water levels become too high. Other than the Santa Rosa Creek Reservoir, the other flood control reservoirs are situated on-stream and are equipped with facilities (low-flow bypass and principal spillway) that allow minimum streamflows to be released. All of these reservoirs operate passively and are not equipped with flood control gates.

Facilities are not provided for anadromous fish passage above the in-stream flood control reservoirs or the diversion on Spring Creek. However, a fish ladder and vortex weir are located on Santa Rosa Creek to assist anadromous fish passage around Spring Lake.

Sediment removal and vegetation removal activities are necessary to maintain channel capacity and control stream bank erosion. Many of the constructed flood control channels maintained by the SCWA were designed to provide 100-year-flood capacity. The original design capacity assumed that stream banks will be predominantly grass, with little or no tree growth, and the streambed will be maintained clear of vegetation and sediment.

Under the proposed project, SCWA will continue to conduct channel maintenance activities within constructed flood control channels and natural waterways in Zone 1A, and maintain the four flood control reservoirs described above. Because emergency channel maintenance actions may occur when adult and smolt salmonids are in streams, and because the frequency and magnitude of these actions cannot be reliably estimated, NMFS is not addressing emergency actions in this biological opinion that occur during times when adult and smolt salmonids may be present in streams (November 1 through June 14). These emergency actions will need to be addressed by the Corps and SCWA through the separate emergency consultation procedures available under section 7 of the ESA.

***Constructed Flood Control Channels in Zone 1A.*** Excessive sediments tend to be deposited during winter and spring flows at locations where the channel gradient significantly decreases and as the channel traverses from the steep gradient headwaters to the low-gradient valley plain. In these areas, and others, vegetation can also reduce channel capacity. Sediment and vegetation removal are conducted on an as-needed basis. For example, some of the constructed flood control channels require annual sediment removal, some require sediment removal less frequently, and some have never required sediment removal. Culverts (box culverts and metal culverts), culvert outfalls, and bridges also may require sediment removal.

These channels generally have service roads to facilitate maintenance access. SCWA will schedule stream sediment removal when field inspections indicate that the invert elevation of outfall structures is generally less than 12 inches above the streambed elevation. Sediment removal will be performed during summer or fall months until October 31. Only segments of constructed flood control channels that have become hydraulically impaired will have sediment removed. Sediment removal will consist of 1) excavation of bars that have accumulated bed material and have become enlarged by deposition over time, and 2) removal of sediment at road crossings and culvert outfalls.

A hydraulic assessment of selected Zone 1A constructed flood control channels was performed in 2000 to identify flood capacity under various vegetation management scenarios (Entrix 2002). The hydraulic assessment showed that for many of the channels, moderately dense shrubby vegetative growth with young developing willows (approximately 5 years old) on portions of the stream bank, and tule growth on the streambed, will cause impairment of hydraulic capacity, so that the 100-year flood might not be contained. To maintain original-design-flood capacity in these channels, SCWA will keep vegetation from growing into a dense brushy stage. Should the amount of vegetation in these channels be greater than that described above, these channels will likely not be able to accommodate the flows necessary to prevent floods.

Since the early 1990s, access roads have been cleared with aquatic contact herbicides (which are effective only at the time of application [*i.e.*, early spring]) and mowing. SCWA uses a truck

mounted tank and spray bar to apply Aquamaster® (EPA Reg. No. 524-343). The spray bar is eight feet wide and set one foot above the road surface to minimize drift. For road applications, the surfactant Agri-Dex®, Cal. Reg No. 5905-50094-AA, is added to the herbicide. The concentration is 1.5 gallons of Aquamaster® per 100 gallons of water. The concentration of Agri-Dex® is 0.5 gallons per 100 gallons of water. Spraying occurs during the early morning hours and is discontinued if wind speed exceeds 5 mph (SCWA 2008a).

*(1) Sediment Maintenance and Channel Debris Clearing Practices.* Sediment removal will be conducted with excavators with extended arms, and in some areas, with bulldozers and front-end loaders as well. Excavating equipment with a reach appropriate for the channel being cleared will be used. The equipment will be driven along the access road, and sediment removal will be done perpendicular to the channel length. Bulldozers will be used in high width/depth ratio channels where excavators cannot reach the channel bottom from the service road. A bulldozer will stockpile sediment to a closer area and then stockpiles will be removed with an excavator.

Before large woody debris is to be removed, it will be evaluated by SCWA staff. If it is determined to be stable (*i.e.*, not likely to be dislodged, washed downstream, and threaten the integrity of a structure), it will be left in place. For example, a piece of large woody debris was left in place on Brush Creek recently because it was downstream of the Highway 12 bridge and was not in a position to float downstream and cause a debris jam at any bridges. Loose pieces of large woody debris may be anchored in place if found in an area where they are not likely to pose a threat. If large woody debris appears in a constructed channel in downtown Santa Rosa, particularly if it is 20 feet or longer, it is likely to become lodged at a bridge and create a blockage. Large woody debris presenting this kind of threat to infrastructure will be removed. If large woody debris is determined to pose a hazard, it will be removed in consultation with CDFG and NMFS. Large woody debris will be removed with a winch from the top of the bank, cut up with chain saws, and transported away. Brush will be chipped and put on landscaped areas.

*(2) Sediment removal at road crossings and culvert outfalls.* Removing sediment from culverts (metal and concrete box), under bridges, and transition areas near these road crossings will typically be accomplished with small sized construction equipment (a Bobcat or powershovel, for example) working within the structure or channel. The in-channel equipment will move material to an excavator positioned at the top of the bank. Sediment will then be transferred to a dump truck for offsite disposal. Transition areas will typically extend 25-50 feet upstream and downstream from the structure, depending on the volume of material being removed.

Removing sediment at culvert outfalls will involve the use of a backhoe at the top of a channel bank to extract accumulated sediment within 5 to 10 feet adjacent to the outfall. Similar to sediment removal at road crossings, sediment removed from outfalls will be disposed off-site. Sediment removal at road crossings and culvert outfalls will be done during the summers when streambeds are dry.

*(3) Vegetation Maintenance Zones.* To manage vegetation in constructed flood control channels, SCWA has apportioned the vegetation maintenance activities into five “zones”: top-of-bank, upper channel bank, middle channel bank, lower channel bank, and the channel bottom. Maintenance activities in top-of-bank and upper channel are consistent among all constructed



flood control channels. Maintenance activities in the lower three zones (middle, lower channel bank and channel bottom) will vary depending on channel capacity and flood risk.

- **Top-of-Bank.** The top-of-bank zone maintenance includes:
  - landscape maintenance
  - fence/gate maintenance
  - V-ditch and drop inlet maintenance
  - service road maintenance
- **Upper, Middle, and Lower Banks.** The upper and middle channel bank zones typically consist of the upper two-thirds of the channel bank (which is generally everything above 5 feet higher than the channel bed). The lower channel bank zone comprises the area in the lower third of the channel bank (typically lower than approximately 5 feet above the channel bed), including the toe of the channel.

### (3) *Vegetation Maintenance Levels*

The level of vegetation maintenance applied will depend on the hydraulic capacity required in the constructed flood control channel. One of three vegetation management practices will be applied, maintenance of the original design capacity, intermediate vegetation maintenance, or mature riparian vegetation maintenance.

- **Original Design Capacity Maintenance.** In site-specific areas where the hydraulic assessment (Entrix 2002) indicates that simulated flows are near or just over-bank, vegetation will be maintained at the original-design-capacity scenario. Vegetation maintenance practices may include limiting vegetation on stream banks to predominantly grass with little or no woody stem growth; maintaining the channel bottom clear of vegetation; and frequent maintenance.
- **Intermediate Vegetation Maintenance.** Channel maintenance practices in the lower channel zone will consist of the removal of understory vegetation. Understory vegetation removal (*e.g.*, blackberries) will be accomplished by hand-clearing and use of aquatic herbicides. Small, mechanized equipment may be used to transport the cut vegetation to the top-of-bank so that it may be efficiently removed from the channel. Removal of plants will be selective, based on the species present, with an emphasis on protecting native riparian species wherever possible. Native trees (typically willows) that are growing along the lower one-third of the bank, including the toe of the bank where it intersects the channel bed, will be allowed to colonize as young trees. Herbicides are applied directly to cut stumps below top of bank. A 100% concentration of Aquamaster® mixed with Turf Mark®, a blue dye spray indicator, is applied using a paint brush.
- **Mature Riparian Vegetation Maintenance.** In some channels, complete canopy cover could be achieved by allowing the development of mature, single-trunk trees with most of the canopy above the floodway elevation. Native trees will be

maintained (*i.e.*, thinning or pruning) or planted. Vegetation at the channel toe and in the lower third of the bank will be maintained parallel with the flow and spaced 15 to 25 feet, depending on the species. Lower limbs will be pruned to maintain channel capacity. To achieve a mature canopy cover, adequate flood capacity must exist in the channel both during the period when young trees are growing within the floodway and at later mature stages when these trees have canopies that rise above the floodway elevation.

- **Channel Bottom.** The channel bottom of constructed flood control channels will be cleared of vegetation through the use of spray aquatic contact herbicides and hand clearing. Future selected vegetation clearing from the channel banks may be necessary to allow access to the channel bottoms for silt removal operations. Small, mechanized equipment may be used to transport the cut vegetation to the top-of-bank so that it may be efficiently removed from the channel. SCWA will utilize backpack sprayers containing Aquamaster® without a surfactant to control invasive non-native species. Backpack spraying would also help control established nuisance species such as cattails (*Typha sp.*) and blackberry (*Rubus sp.*) that compromise channel hydraulic capacity.

#### *(4) Application of Vegetation Maintenance Levels in Constructed Flood Control Channels*

Portions of some channels with potential salmonid habitat will require design-capacity maintenance practices. An adaptive management approach will be implemented to assess which channels may in the future have maintenance protocols that allow more vegetation to grow.

For bridges and culverts that do not have the capacity to pass the 100-year discharge under intermediate maintenance, it will be necessary to implement design capacity vegetation maintenance practices near the bridge structures. These may include removing all vegetation except grasses within approximately a distance equal to the channel top-width both upstream and downstream from the bridge.

**Natural Waterways in Zone 1A.** SCWA has hydraulic maintenance easements that are permissive, and SCWA will continue to access various natural creeks to remove debris (LWD and trash) or vegetation to restore hydraulic capacity. SCWA will not perform routine sediment removal activities in natural waterways. In addition, SCWA will not perform any flood control maintenance activities in the Mark West Creek mainstem or tributaries of Mark West Creek upstream of the confluence with its largest tributary, the Laguna de Santa Rosa. This latter area is the only portion of Zone 1A with high potential to support coho salmon.

SCWA has developed BMPs and other guidelines for planning and implementing sediment removal and bank stabilization work performed in natural waterways to protect listed species and to minimize the potential for significant habitat alterations. SCWA will continue to use the BMPs and guidelines summarized below:

- Bank stabilization projects are not to exceed 1,000 feet in length for any single project.
- Projects cannot occur within 1,000 feet of a previously armored site.
- Construction will occur during the summer to avoid salmonid spawning and incubation periods.

- A qualified fisheries biologist will consult on the project design prior to implementation to consider all feasible alternatives. Habitat and biological resources in the area will be evaluated.
- Projects will develop in consultation with CDFG.
- Bio-engineering bank stabilization methods will be given priority where they will provide effective erosion control.
- Where bio-engineering bank stabilization methods are not deemed to be practical, priority will be given to incorporating vegetative plantings into the hard-armoring techniques that are implemented.
- Fish habitat restoration elements (such as native material revetments) will be incorporated into bank stabilization practices where they are feasible with the intention of replacing lost habitat.
- Large woody debris will be removed from the channel only if it threatens to de-stabilize a section of stream bank.

*(1). Vegetation Management Practices in Natural Waterways*

For the natural channels within Zone 1A where vegetation removal may occur, SCWA does not have routine or regularly implemented maintenance obligations. Maintenance on natural waterways (Table 2) will consist of clearing vegetation from the bottom of natural waterways to restore hydraulic capacity. Hand labor is the typical clearing method. Heavy equipment will only be used to lift out or clear debris jams not accessible to hand crews.

***Flood Control Reservoirs.*** Flood control reservoirs are designed to impound water during the rainy season to reduce the potential for flooding in downstream urbanizing areas. Brush Creek Reservoir (130-AF capacity), Piner Creek Reservoir (230-AF capacity), and Spring Creek diversion (negligible capacity) are relatively small reservoirs. Both Brush Creek Reservoir and Spring Creek reservoir typically dry up by the summer (B. Oller, SCWA, personal communication 2001). Matanzas and Spring Lake reservoirs have larger capacities (1,500 AF and 3,500 AF, respectively). Spring Lake is located offstream of Santa Rosa Creek and does not dry up or release water downstream during the summer. Matanzas Creek Reservoir is a flow through reservoir that does not impound water in the summer.

Maintenance activities in the flood control reservoirs include desiltation and removal of noxious pondweeds. Desiltation, debris removal, and vegetation removal will also be performed at the inlets and outfalls to the reservoirs. Sediments will be excavated to restore the flood control capacity.

## **Exhibit C**

### **2008 BO Terms and Conditions**

**RPM 5: Undertake measures to ensure that harm and mortality to listed salmonids resulting from Dry Creek and tributary habitat enhancements and channel maintenance activities in the mainstem Russian River, Dry Creek, and Zone 1A, are low.**

Purpose:

The purpose of the following terms and conditions are to provide additional measures to reduce take of listed salmonids from direct losses due to in-channel construction and fish relocation, and indirect harm and mortality due to reduction in habitat complexity from removal of sediment, thermal cover, and hiding cover. The proposed channel maintenance and enhancement activities are likely to result in injury and mortalities to listed salmonids due to construction equipment working in flowing water in some areas, fish relocation, and, in-channel maintenance areas, reductions in hiding cover and thermal cover in some of these waters. In Zone 1A constructed channels, migration opportunities will be more limited, resulting in loss of a small number of salmonid migrants.

Objective:

Reduce harm and mortality to listed salmonids from crushing by construction equipment, relocation efforts, and loss of habitat elements important to salmonid survival.

Terms and Conditions:

- A. The Corps, SCWA, or MCRRFCD shall isolate work areas located in aquatic habitat from the flowing stream and relocate listed salmonids prior to proceeding with in-channel work for flood control maintenance or habitat enhancement:

(1) The Corps, SCWA, MCRRFCD or their designees shall retain a qualified biologist with expertise in the areas of anadromous salmonid biology, including the handling, collecting, and relocating salmonids, salmonid/habitat relationships, and biological monitoring of salmonids. The Corps, SCWA, or MCRRFCD shall ensure that all biologists working on their projects are qualified to conduct fish collections in a manner that minimizes all potential risks to ESA-listed salmonids. Electrofishing, if used, shall be performed by a qualified biologist and conducted according to NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.

(2) The biologist shall be on site during all dewatering events to capture, handle, and safely relocate ESA-listed salmonids. The biologist shall notify NMFS biologist Tom Daugherty at 707-468-4057 or Tom.Daugherty@noaa.gov one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities.

(3) ESA-listed fish shall be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish shall not be removed from this water except when released. To avoid predation, the biologist shall have at least two containers and segregate young-of-year fish from larger age-classes and other potential aquatic predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which suitable habitat conditions are present to allow for adequate survival of transported fish and fish already present.

(4) If any salmonids are found dead or injured, the biologist shall contact NMFS biologist Tom Daugherty by phone immediately at (707) 468-4057 or the NMFS Santa Rosa Area Office at TTY 866-327-8877 (enter number 707-578-8555). The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All salmonid mortalities shall be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location of collection, fork length, and be frozen as soon as possible. Frozen samples shall be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS Santa Rosa Area Office without obtaining prior written approval from the NMFS Santa Rosa Area Office, Supervisor of the Protected Resources Division. Any such transfer will be subject to such conditions as NMFS deems appropriate.

(5) The Corps, SCWA, and MCRRFCD shall allow any NMFS employee(s) or any other person(s) designated by NMFS, to accompany field personnel to visit the project site during activities described in this opinion.

B. At all channel maintenance sites in Dry Creek, the mainstem, and Zone 1A, and at all instream enhancement sites in the Dry Creek watershed: the Corps, SCWA, or MCRRFCD shall:

- (1) Check construction equipment used within the creek channel each day prior to work within the creek channel (top of bank to top of bank) and, if necessary, take action to prevent fluid leaks. If leaks occur during work in the channel (top of bank to top of bank), the Corps, SCWA, MCRRFCD or their designee will contain the spill and remove the affected soils.
- (2) Ensure that if coffer dams are used to isolate work areas, fill material for cofferdams will be fully confined with the use of plastic sheeting, sheetpiles, sandbags, or with other non-porous containment methods, such that sediment does not come in contact with stream flow or in direct contact with the natural streambed. All loose fill material for cofferdams shall be completely removed from the channel by October 31. Alternatively, clean gravel or clean crushed stone may be used without plastic sheeting, sandbags, etc. to separate worksites from aquatic habitat.
- (3) Ensure that all pumps used to divert live stream flow, outside the dewatered work area<sup>91</sup>, will be screened and maintained throughout the construction period to comply with NMFS' and CDFG's Fish Screening Criteria for Anadromous Salmonids. See: <http://swr.ucsd.edu/hcd/fishscrn.pdf>.
- (4) Ensure that coffer dams are constructed as close as practicable to the size of the work area. If coffer dams are across the channel such that they impound the channels flow, flows shall be diverted through a suitably-sized pipe from upstream of the upstream coffer dam and discharged downstream of the downstream coffer dam. Cofferdams and the stream diversion system shall remain in place and functional throughout the construction period. Normal flows shall be restored to the affected stream immediately upon completion of work at that location.
- (5) Ensure that once construction is completed, all project introduced material (pipe, gravel, cofferdam, etc.) is removed, leaving the creek as it was before construction (except for the channel maintenance work). Excess materials will be disposed of at an approved disposal site.

C. For all channel maintenance and instream enhancement construction activities described in the preceding biological opinion and RPA, the Corps, SCWA, or MCRRFCD shall provide NMFS and DFG reports by February 15 of the year following construction. The report shall be submitted to NMFS Santa Rosa Area Office, Attention: Supervisor of Protected Resources Division, 777 Sonoma Avenue, Room 325, Santa Rosa, California, 95404 6528. The report will be submitted to the Regional Manager for

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<sup>91</sup> Pumps used in the area to be dewatered must be screened as described until salmonids are relocated.

CDFG Region 3, headquartered in Yountville, CA. The report shall contain, at a minimum, the following information:

(1) Construction related activities -- The report shall include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, a description of any and all measures taken to minimize those unanticipated effects and a statement as to whether or not the unanticipated effects had any affect on ESA-listed fish; the number of salmonids killed or injured during the project action; and photographs taken before, during, and after the activity from photo reference points.

(2) Fish Relocation -- If fish relocation was necessary, the report shall include a description of the location from which fish were removed and the release site including photographs; the date and time of the relocation effort; a description of the equipment and methods used to collect, hold, and transport salmonids; if an electrofisher was used for fish collection, a copy of the logbook must be included; the number of fish relocated by species; the number of fish injured or killed by species and a brief narrative of the circumstances surrounding ESA-listed fish injuries or mortalities; and a description of any problems which may have arisen during the relocation activities and a statement as to whether or not the activities had any unforeseen effects.

D. The Corps, SCWA, or MCRRFCD shall implement the following measures to reduce the impacts of channel maintenance on habitat complexity at their respective channel maintenance sites:

- (1) Because the project description provided to NMFS does not provide specific work windows for Dry Creek and Natural Waterway bank stabilization, all work within the stream/riparian corridor in Dry Creek and in Natural waterways shall be confined to the period June 15 to October 15. Revegetation work is not confined to this time period.
- (2) No phase of the project may be started if that phase and its associated erosion control measures cannot be completed prior to the onset of a storm event if that construction phase may cause the introduction of sediments into the stream. Seventy-two (72) hour weather forecasts from the National Weather Service shall be consulted prior to start up of any phase of the project that may result in sediment run-off to the stream.
- (4) Vehicles may be driven on the dry stream/lake bed to traverse the distance to the work site from the access point and in the immediate vicinity (within 50 feet) of the work area, and only as necessary to accomplish authorized work.
- (5) All exposed/disturbed areas on upper stream banks or adjacent uplands within the project site shall be stabilized. Erosion measures such as silt fences, straw hale bales, gravel or rock lined ditches, water check bars, and broadcasted straw shall be used wherever silt laden water has the potential to leave the work site.

- (6) Erosion control measures shall ensure that run-off from steep, erodable upland surfaces will be diverted into stable areas with little erosion potential or contained behind erosion control structures.
- (7) All new riprap shall be planted with willows or other native tree species, spaced appropriately to provide improved thermal cover for listed salmonids.
- (8) No grouted riprap shall be installed at channel maintenance sites to avoid complete loss of hiding cover in riprap areas.
- (9) Bioengineering techniques shall be incorporated into all bank protection projects to reduce the amount of riprap used and provide better hiding and thermal cover for listed salmonids.
- (10) LWD in the mainstem shall not be disturbed unless it spans the mainstem and is causing bank erosion. LWD that spans and causes bank erosion can be cut and cabled to the banks.
- (11) When grading gravel bars in the mainstem, a buffer of at least 25 feet or 10 percent of the maximum bar width, whichever is greater, shall be maintained along the edge of the low flow channel, whether vegetation is present or not.
- (12) In the mainstem, gravel bar vegetation removal shall only occur outside of a 25 foot buffer zone next to the low-flow channel. On banks and levees, vegetation removal shall only occur on the upper portion of the bank outside of 25 foot buffer zone next to the channel. Vegetation within the buffers shall not be disturbed, unless it is non-native (non-native vegetation may be removed).
- (13) At sediment removal sites in Zone 1(A), SCWA shall construct a low flow channel to provide enhanced migration habitat through sediment removal areas.

Sediment removal project designs will be transmitted to NMFS and CDFG 60 days prior to implementation for approval. NMFS and CDFG shall respond within 30 days with either project approval, or a list of changes needed.

The low flow channel shall be monitored at least two times in-between large storms during the winter period to assess its function as a migration corridor and impact on stream stability.

**RPM 6: Undertake measures to ensure that harm and mortality to listed salmonids from diversion operations, maintenance, and fish screen replacement at Wohler and Mirabel are low.**

Purpose:

The purpose of the following terms and conditions are to provide additional measures to reduce take of listed salmonids from direct losses due to inflation and deflation of the rubber dam at Wohler, entrapment of salmonids in water infiltration ponds, and installation of new fish screens at Mirabel. These activities are expected to result in entrapment, injury, and loss of salmonids as described above. Injury and loss due to stranding and entrapment can be minimized by rescuing