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SUPPLEMENT TO STANDARD  
OPERATION AND MAINTENANCE  
MANUAL

LOWER SAN JOAQUIN RIVER AND  
TRIBUTARIES PROJECT, CALIFORNIA

UNIT NO. 13  
WEST LEVEE OF THE SAN JOAQUIN RIVER  
IN RECLAMATION DISTRICT NO. 1602



DEPARTMENT OF THE ARMY  
SACRAMENTO DISTRICT, CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA

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**CORPS OF ENGINEERS  
U. S. ARMY**

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OPERATION AND MAINTENANCE MANUAL  
LOWER SAN JOAQUIN RIVER AND TRIBUTARIES PROJECT**

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WEST LEVEE OF SAN JOAQUIN RIVER  
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**U. S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA  
APRIL 1964**

**SUPPLEMENT TO STANDARD  
OPERATION AND MAINTENANCE MANUAL  
SAN JOAQUIN RIVER FLOOD CONTROL PROJECT**

UNIT NO. 13

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<b>LOCATION</b>	<b>ADDITION OR REVISION</b>	<b>DATE</b>
1-04	Add subparagraph c	2 Nov 2007
2-01	Add to subparagraph d	2 Nov 2007
Exhibit B	Add drawing no. 7-04-1872	2 Nov 2007
Exhibit F	Add copy of letter transfer dated 2 Nov 2007	2 Nov 2007
Exhibit F	Add copy of letter of transfer dated 22 Sep 1972	25 May 2011
1-04	Add subparagraph d	25 May 2011
Exhibit F	Add copy of letter of transfer dated 11 Apr 2001	25 May 2011
Exhibit F	Add copy of letter of acceptance dated 19 Jun 2001	25 May 2011

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B	"As Constructed" Drawings	Unattached
C	Plates of Suggested Flood Fighting Methods (Contained in Standard Manual)	Unattached
D	Suggested Check List No. 1 - Levee Inspection Report (Contained in Standard Manual)	Unattached
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F	Letters of Acceptance by the State Reclamation Board	1 Sheet
G	Suggested Semi-Annual Report Form	Sheets 1 and 2

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SECTION I  
INTRODUCTION

1-01. Location - The improvement covered by this manual is a part of the Lower San Joaquin River and Tributaries Project Levee and channel located on the left bank of the San Joaquin River between the Merced and Tuolumne Rivers. The area lies about 13 miles southwesterly from Modesto and 5 miles southeasterly from Patterson, California. Location by levee mileage is from mile 0.00 at Fig Avenue to mile 5.90 at Moran Road of R.D. 1602. The area is located in Reclamation District No. 1602 in the County of Stanislaus, California, and in the general vicinity as shown on the Location Map, Exhibit A-1.

1-02. Project Works. - The project works covered by this manual is a part of the Lower San Joaquin River and Tributaries Project as authorized by the Flood Control Act of 22 December 1944, Public Law 534, 78th Congress, 2d Session, Section 10, and consists of the west levee channel of the San Joaquin River between river miles 100.0 and 106.5, a total distance of about 5.9 levee miles.

1-03. Protection Provided. - The levee of the San Joaquin River, as described in this unit, provides direct protection to adjacent agricultural land within Reclamation District No. 1602. Along the west levee of the San Joaquin River within this unit, the grade of the adopted flood plane varies from elevation 56.8 at the lower end to elevation 60.7 at the upper end. All elevations are referred to mean sea level datum (1929 adjustment). Levee grades within this unit provide for a freeboard of at least 3 feet above the adopted flood plane profile. Within this unit the project design flood for the San Joaquin River is 45,000 cubic feet per second.

1-04. Construction Data and Contractor. - Work required by the Corps of Engineers to bring levees of this unit to project standards was accomplished under the following contracts:

a. Levee construction and bank protection on the left bank of the San Joaquin River in R.D. 1602 was accomplished under Contract No. DACW05-72-C-0028 by Claude C. Wood Co. during the period from 27 November 1971 to 12 September 1972. Specification No. 4060, Drawing No. 7-4-1784.

b. Emergency levee repairs on the left bank of the San Joaquin River in R.D. 1602 were accomplished under Contract No. DACW05-70-C-0025 by John Delphia and were completed on 10 October 1969. Specification No. 3672, Drawing No. 7-4-1753.

c. Repairs consisted of construction of an 80-foot-wide by 440-foot-long underseepage berm. The berm was constructed of drain rock placed atop a 6-inch-deep filter layer of sand. The thickness of the drain rock varies from 5-feet at the levee and tapers down to 3-feet at the toe of the berm. The berm filled in and replaced an existing drainage ditch (relocated) and an existing steel catchment and 3 shallow well pipes which were removed. The berm was capped by a 12-inch-thick layer of native material. Geotextile was placed between the drain rock and the native material cap to prevent migration of fines into the drain rock. To accommodate the berm's construction, various appurtenances (i.e., fences, a drop inlet, a power pole, drainage ditch and an access ramp) were relocated as a part of this work. Construction was completed on 12 July 2007. Contract No. W91238-06-D-0008, Specification No. 1138E, Drawing No. 7-04-1872.

d. Emergency levee repairs on the west bank of the San Joaquin River at two locations, at Levee Mile 0.89 and from Levee Mile 5.47 to 5.71 in Reclamation District 1602 were completed on 10 October 1997 by Buddy's Contracting under Contract No. DACW05-97-C-0126. Specification No. 9892E.

1-05. Flood Flows. – For purposes of this manual, the term “flood” or “high water period” for the San Joaquin River shall refer to flows when the water surface in the San Joaquin River reaches or exceeds the reading of 63.0 on the U.S. Geological Survey gage on the left bank of the San Joaquin River at Hills Ferry Bridge, 3.5 miles northeast of Newman, or reading of 48.0 on the State Department of Water Resources gage near the left bank of the San Joaquin River on the downstream side of the Patterson highway bridge. Both gages are set on mean sea level datum (1929 adjustment).

1-06. Assurance Provided by Local Interests. – Assurance of cooperation by local interests is provided by State legislation as contained in Chapters 1 and 2, Part 4, Division 5 of the State Water Code. (See paragraph 2-02a of the Standard Manual).

1-07. Acceptance by the State Reclamation Board. – Responsibility for operating and maintaining this unit was officially accepted by the State Reclamation Board by letter dated 13 October 1972, as shown in the attached letter, Exhibit F.

1-08. Inspection Procedure. – Since the enactment by the State Legislation of Chapter 1528, Statutes of 1947, the Department of Water Resources, State of California, has made semi-annual inspections of all levees of authorized flood control projects in the Sacramento-San Joaquin Drainage basin pursuant to the Federal Regulations of 16 August 1944 (Title 33), and reports its findings to the local agency, the State Reclamation Board and the Sacramento District, Corps of Engineers, U.S. Army. This activity, initiated pursuant to Section 208.10(a) of the Federal Regulations, has in effect provided for transfer from the local agencies to the State Department of Water Resources the obligation of compliance with Sections 8371, 8372, and 8373 of the Water Code of the State of California. These sections of the Code require the local responsible agencies to submit a report to the State Department of Water Resources on or before 1 June of

each year on the condition of the levees within their jurisdiction. Supervisory powers and duties of the Department are applicable to all works of the Lower San Joaquin River and Tributaries Flood Control Project maintained and operated by the local agencies without regard to status of completion, or expenditure of Federal funds on the construction of such works.

The following procedure is used in inspecting the levees of the responsible maintaining agency:

The personnel of the State Department of Water Resources make a detailed inspection in the spring and fall of each year and make a report on any required maintenance. The inspection objectives are to determine if the following items, which are a condensation of Federal Regulations, are being adhered to:

- a. That all unauthorized brush, trees and wild growth other than sod are removed from the levee crown and slopes.
- b. That all weeds, grass and debris on the levee have been burned during the appropriate season, where not dangerous or impractical.
- c. That all grass and weeds on the levee have been mowed where removal by burning is dangerous or impracticable. This applies only on peat levees or where burning would constitute a hazard to improvements.
- d. That all burrowing animals have been exterminated.
- e. That all caves, sloughs, burrows, holes, slips or other damaged portions of the levee have been repaired.
- f. That all irrigation and drainage structures through the levee are in good working condition.
- g. That no revetment work or riprap have been displaced, washed out or removed.
- h. That the crown of the levee is well shaped and maintained and that unauthorized vehicular travel is restricted.
- i. That stock grazing on the levee is restricted to conditions and seasons when the levee would not be seriously scarred or otherwise damaged thereby.
- j. That encroachments are not being erected on the levee which would hinder travel by authorized patrol vehicles.
- k. Prevent the erection of structures on, additions to, or alterations of, the levee unless authorized by permit from the State Reclamation Board.

Following this detailed inspection a joint field inspection is made with representatives of the responsible maintaining agency and the State Department of Water Resources to review and discuss the inspection report.

Upon completion of the fall inspection, the State Department of Water Resources publishes an annual report entitled, "Status of Project Levee Maintenance" which indicates the degree of proficiency attained by each obligated local agency in providing required maintenance.

## SECTION II

### FEATURES OF THE PROJECT SUBJECT TO FLOOD CONTROL REGULATIONS

#### 2-01. Levees.

a. The levee described in this manual lie along the west side of the San Joaquin River and extend for a total distance of about 6.29 miles. The levee has been reconstructed to project standards with a minimum crown width of 12 feet along the San Joaquin River. The necessary drainage structures, road approaches, bank protection, and appurtenances were also included in the work. For more completed detail in construction of the above-mentioned levees, refer to the “As Constructed” drawings of Exhibit B.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements see the following:

- (1) Maintenance – paragraph 4-02 of the Standard Manual.
- (2) Suggested Check Lists – Exhibit E of this Supplement Manual.
- (3) Operation – paragraph 4-04 of the Standard Manual.
- (4) Special Instructions – paragraph 4-05 of the Standard Manual.

c. Environmental values. Trees preserved on the berm and existing levee slopes as a part of the contract listed in paragraph 1-04a shall not be removed as a part of normal maintenance as long as they remain in a healthy condition.

d. –

a. –

b. Inspection. The landside seepage berm should be visually inspected at the beginning and end of each flood season, and during and after each flood event. The inspector should note the presence of any of the following items:

- Changes in grade, depressions, erosion, “sinkholes”, or cracks in the top of the berm.
- Slumps or “raveling” of the berm side slopes
- Vegetation other than grasses or wildflowers growing on the berm
- Rodent activity
- Rutting by vehicle tires on the berm

If any of the above conditions are noted, especially if significant changes have occurred since the previous inspection, then the conditions should be repaired to the lines and grades shown on the contract drawings and any nonconforming vegetation removed as part of the normal levee maintenance program.

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- Vegetation other than grasses or wildflowers growing on the berm
- Rodent activity
- Rutting by vehicle tires on the berm

If any of the above conditions are noted, especially if significant changes have occurred since the previous inspection, then the conditions should be repaired to the lines and grades shown on the contract drawings and any nonconforming vegetation removed as part of the normal levee maintenance program.

c. Seepage Berm General Maintenance. It is recommended that nothing other than grasses and wildflowers be allowed to grow on the berm for ease of inspection and maintenance. Vegetation on the berm should be controlled in the same manner as vegetation on the levee side slopes is controlled. The ground surface should be sloped to drain away from the berm for a minimum of 10-feet beyond the berm toe. If raveling of the berm side slopes becomes an ongoing problem, it can be minimized by the placement of a cobble layer (1-inch to 4-inch angular to subangular cobbles) on the side slopes. Vehicular traffic on the berm should be minimized. If damage to the berm by vehicle tires becomes an ongoing problem, then the berm may be modified to prevent such damage by stripping the surface organic material/topsoil, placement of a high-strength woven geotextile (grab strength of at least 300 pounds and a tensile elongation of about 15 percent) on top of the berm, and the placement of 6-inches of aggregate base course on top of the geotextile.

2-02. Drainage and Irrigation Structures. Drainage and irrigation structures which extend through the levees are listed as follows:

Levee Mile	Size of Pipe	Other Description	Feet Below Crown
0.58	16"	Slidegate, W.S.	11.3
0.78	30"	Slidegate & Flapgate, W.S.	14.4
1.01	2-16"	Pumps, L.S.	3.0
1.02	30"	Slidegate & Flapgate, W.S.	25.4
3.30	16"	Pump & Slidegate, W.S.	11.5
3.57	2-18"	Pumps, W.S.	3.7
3.57	1-20"	Pumps, L.S.	3.7
3.90	12 3/4"	Gasoline Crossing	3.0
4.51	18"	Slidegate, W.S.	10.0
5.23	24"	Slidegate & Flapgate, W.S.	11.6
5.27	2-36"	Slidegate, W.S.	9.8
5.28	30"	Slidegate, W.S.	8.9
5.50	12"	Flapgate, W.S.	6.9
5.76	30"	Slidegate & Flapgate, W.S.	9.0
6.28	18"	Standpipe, W.S.	5.0

Note on abbreviations: L.S. = Landside W.S. = Waterside

For pertinent Requirements of the Code of Federal Regulations and other requirements see the following:

- (1) Maintenance - paragraph 5-02 of the Standard Manual.
- (2) Suggested Check Lists - Exhibit E of this Supplement Manual.
- (3) Operation - paragraph 5-04 of the Standard Manual.
- (4) Additional Requirements - paragraph 5-05 of the Standard Manual.
- (5) Safety Requirements - paragraph 5-06 of the Standard Manual.

### 2-03. Channels.

a. Description. The main channels and floodways of the San Joaquin and Stanislaus Rivers for this unit lie adjacent to the levees as described in paragraph 1-02. The project design capacities of said channels are listed in paragraph 1-03 of this manual.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements, see the following:

- (1) Maintenance - paragraph 6-02 of the Standard Manual.
- (2) Suggested Check Lists - Exhibit E of this Supplement Manual.
- (3) Operation - paragraph 6-04 of the Standard Manual.
- (4) Safety Requirements - paragraph 6-05 of the Standard Manual.

It shall be the duty of the local agency responsible for maintenance to keep in contact with the State Department of Water Resources Flood Operation Center during all periods of flood danger, and to maintain a patrol of the project works in their area during periods of flood in excess of a reading of 63.0 on the gage located on the Hills Ferry Bridge, or a reading of 48.0 on the gage located on the downstream side of the Patterson highway bridge, as referred to in paragraph 1-05 of this manual.

The Flood Operation Center is responsible for Data Collection and issuance of a joint river forecast with the National Weather Service and coordinates with the Sacramento District Engineer and other agencies to keep apprised of the current situation in accordance with terms of the Memorandum of Understanding dated 1 November 1965, between the Division Engineer, US Army Engineer Division, South Pacific and the Director, Department of Water Resources, State of California, for cooperative action during flood emergencies.

2-04. Miscellaneous Facilities.

a. Description. Miscellaneous structures or facilities which were constructed as a part of, or in conjunction with, the protective works, and which might affect their functioning, include the following:

(1) Utility Relocation. Because of the nature of the construction of structures by local interests, records of utility relocations are not available.

(2) Hydrologic Facilities. Hydrologic facilities provided in the vicinity of this unit consist of the following:

(a) U.S. Geological Survey continuous water stage recorder and staff gage located on the left bank of the San Joaquin River at the Hills Ferry Bridge. This gage to be maintained by the U.S. Geological Survey.

(b) State Department of Water Resources continuous water stage recorder and staff gage located near the left bank of the San Joaquin River on the the downstream side of the Patterson highway bridge. This gage to be maintained by the Department of Water Resources.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements, see the following:

(1) Maintenance - paragraph 7-02 of the Standard Manual.

(2) Suggested Check Lists - paragraph 7-03 of the Standard Manual.

(3) Operation - paragraph 7-04 of the Standard Manual.

### SECTION III

#### REPAIR OF DAMAGE TO PROJECT WORKS AND METHODS OF COMBATING FLOOD CONDITIONS

3-01. Repair of Damage. In the event of serious damage to the project works, whether due to flood conditions or other causes, and which may be beyond the capability of local interest to repair, the local agency responsible for maintenance will contact a representative of the Department of Water Resources, State of California, who coordinates maintenance of project works of the Lower San Joaquin River and Tributaries Flood Control Project. The State representative will give assistance or advise, or will determine appropriate action to be taken.

3-02. Applicable Methods of Combating Floods. For applicable methods of combating flood conditions, reference is made to Section VIII of the Standard Operation and Maintenance Manual, where the subject is fully covered.

EXHIBIT A

FEDERAL FLOOD CONTROL REGULATIONS

(SEE STANDARD MANUAL)

EXHIBIT A

CODE OF FEDERAL REGULATIONS (EXTRACT)

TITLE 33—NAVIGATION AND  
NAVIGABLE WATERS

Chapter II—Corps of Engineers,  
Department of the Army

PART 208—FLOOD CONTROL REGULATIONS

AUTHORITY: § 208.10 issued under Sec. 7,  
58 Stat. 890; 33 U.S.C. 709.

§ 208.10 *Local flood protection works; maintenance and operation of structures and facilities—(a) General.* (1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of the Army, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization 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, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the Department of the Army or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the Superintendent to submit a semiannual report to the District Engineer covering inspection, maintenance, and operation of the protective works.

(7) The District Engineer or his authorized representatives shall have ac-

cess at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The Department of the Army will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under this part.

(b) *Levees—(1) Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out and, further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drains are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken, such as burning grass and weeds during inappropriate seasons, which will retard or destroy the growth of sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days; and such intermediate times as may be necessary to insure the best possible care of the levee. Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accom-

plished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability of adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls.—(1) Maintenance.* Periodic inspections shall be made by the Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall and offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect the concrete and construction joints. Immediate steps shall be taken to correct any condition which endangers the stability of the wall.

(d) *Drainage structures.—(1) Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on drainage structures shall be examined, oiled, and trial operated at least once

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every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanism, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures and that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structure which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures in levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse condition.

(e) *Closure structures - (1) Maintenance.* Closure structures for traffic openings shall be inspected by the Superintendent every 90 days to be certain that:

(i) No parts are missing;

(ii) Metal parts are adequately covered with paint;

(iii) All movable parts are in satisfactory working order;

(iv) Proper closure can be made promptly when necessary;

(v) Sufficient materials are on hand for the erection of sand bag closures and that the location of such materials will be readily accessible in times of emergency.

Tools and parts shall not be removed for other use. Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each 3-year period. Trial erection of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure infeasible, rigorous inspection and drill of operating personnel may be substituted therefor. Trial erection of sand bag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(2) *Operation.* Erection of each movable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure sill. Information regarding the proper method of erecting each individual closure structure, together with an estimate

of the time required by an experienced crew to complete its erection will be given in the Operation and Maintenance Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(f) *Pumping plants - (1) Maintenance.* Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery. Adequate supplies of lubricants for all types of machines, fuel for gasoline or diesel powered equipment, and flash lights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trial operated and checked at least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subjected to undue dampness and otherwise at intervals not to exceed one year. A record shall be kept showing the results of such tests. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be promptly replaced. Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their serviceability in times of emergency. Only skilled electricians and mechanics shall be employed on tests and repairs. Operating personnel for the plant shall be present during tests. Any equipment removed from the station for repair or replacement shall be returned or replaced as soon as practicable and shall be trial operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) *Operation.* Competent operators shall be on duty at pumping plants whenever it appears that necessity for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above-mentioned "Operating Instructions" and care shall be exercised that proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pump house sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished the District Engineer following each flood.

(g) *Channels and floodways - (1) Maintenance.* Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;

(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

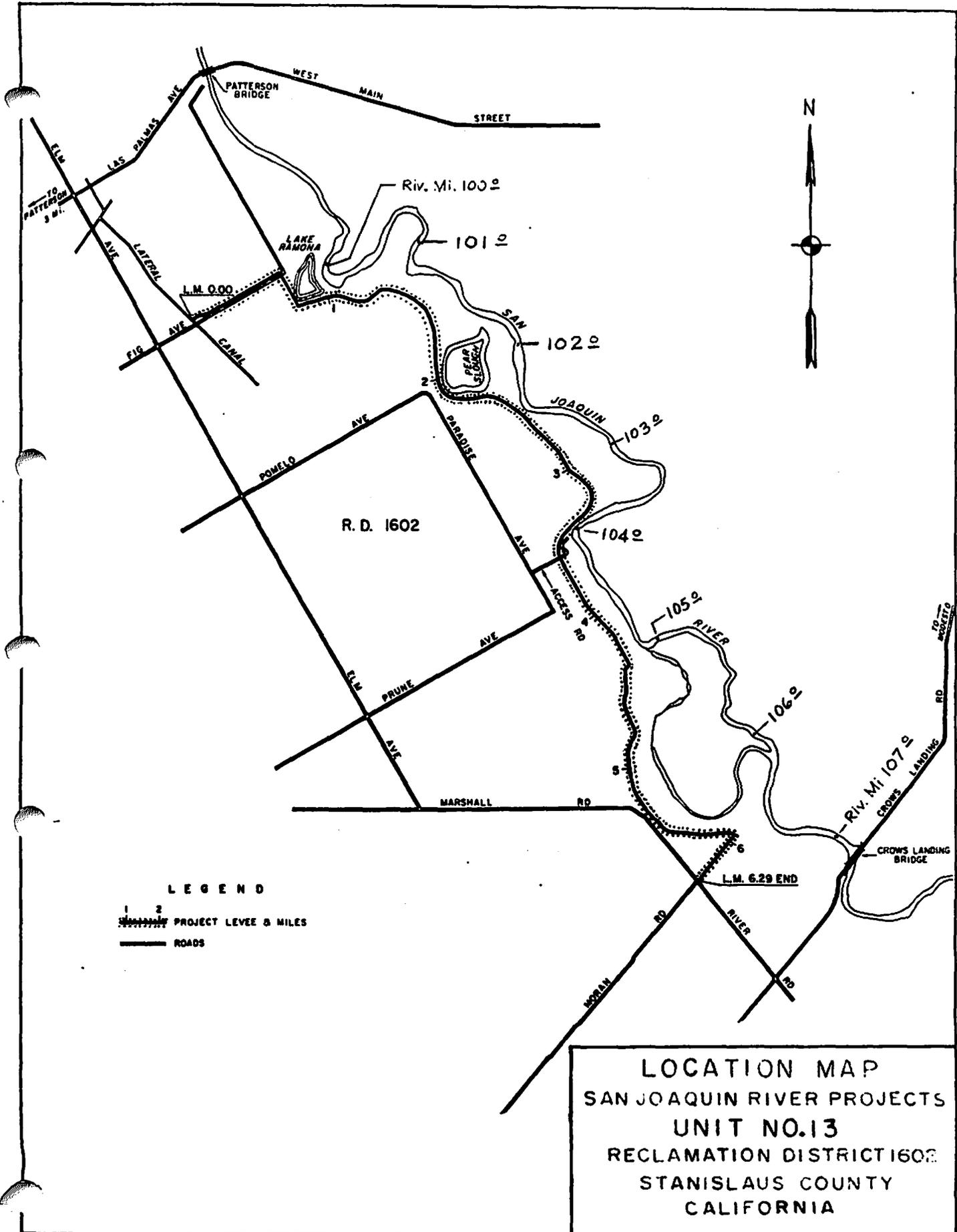
(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

(2) *Operation.* Both banks of the channel shall be patrolled during periods of high water, and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to banks, riprap, deflection dikes and walls, drainage outlets, or other flood control structures repaired.

(h) *Miscellaneous facilities - (1) Maintenance.* Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior run-off during flood periods shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where practicable, shall provide for temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as a part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefor. (Sec. 3, 49 Stat. 1571, as amended; 33 U.S.C. 701C) [9 F.R. 9999, Aug. 17, 1944; 9 F.R. 10203, Aug. 22, 1944]



**LEGEND**

1 2  
 PROJECT LEVEE & MILES

ROADS

**LOCATION MAP**  
**SAN JOAQUIN RIVER PROJECTS**  
**UNIT NO. 13**  
**RECLAMATION DISTRICT 1602**  
**STANISLAUS COUNTY**  
**CALIFORNIA**

**EXHIBIT AI**

EXHIBIT B

“AS CONSTRUCTED”  
DRAWINGS

(See separate folder for the following drawings)

<u>File No.</u>	<u>Title</u>
7-4-1753	Emergency levee repairs on the Left Bank of the San Joaquin River in R.D. 1602, in one sheet.
7-4-1784	Levee Construction and Stone Protection on the Left Bank of the San Joaquin River in R.D. 1602, in 14 sheets.
7-4-1872	PL 84-99 Levee Rehabilitation Program SN 7/RD 1602, Stanislaus County, California, in 3 sheets.

EXHIBIT C

PLATES OF SUGGESTED FLOOD FIGHTING METHODS

(SEE STANDARD MANUAL)

EXHIBIT C  
Unattached

EXHIBIT D

SUGGESTED CHECK LIST NO. 1

LEVEE INSPECTION REPORT

(SEE STANDARD MANUAL)

EXHIBIT D

EXHIBIT E

SUGGESTED CHECK LISTS OF LEVEES,

CHANNELS AND STRUCTURES

For definition of "flood" or "high water period", see paragraph 1-05 of this manual.

**SUGGESTED CHECK LIST NO. 2  
UNIT NO. 13  
SAN JOAQUIN RIVER**

Inspector's Report Sheet No. \_\_\_\_\_ Inspector \_\_\_\_\_

Date \_\_\_\_\_ Superintendent \_\_\_\_\_

Item	Remarks
(a) Location by Station	
(b) Settlement, sloughing, or loss of grade	
(c) Erosion of both levee slopes	
(d) Condition of roadways, including ramps	
(e) Evidence of seepage	
(f) Condition of farm gates and fencing	
(g) Maintenance measures taken since last inspection	
(h) Comments	

INSTRUCTIONS FOR COMPLETING SHEET 2, EXHIBIT E

- Item (a) Indicate levee station of observance, obtained by pacing from nearest reference point; indicate right or left bank.
- Item (b) If sufficient settlement of earthwork has taken place to be noticeable by visual observation, indicate amount of settlement in tenths of a foot. If sloughing has caused a change in slope of the embankment sections, determine the new slope. Note areas where erosion or gulying of the section has occurred.
- Item (c) If sufficient erosion or gulying of back face of back toe of levee has taken place to be noticeable by visual inspection, indicate area affected and depth.
- Item (d) Note any natural change in any section of roadway or ramps. Indicate any inadequacy in surface drainage system.
- Item (e) Indicate any evidence of seepage through the embankment section.
- Item (f) Indicate the serviceability of all farm gates across the embankments and roadway, and indicate if repainting is required.
- Item (g) Indicate maintenance measures that have been performed since last inspection and their condition at the time of this inspection.
- Item (h) Record opinion, if any, of contributory causes for conditions observed and also any observations not covered under other columns.

NOTE: One copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion, and one copy is to be attached to and submitted with the Superintendent's semi-annual report.

SUGGESTED CHECK LIST NO. 3  
CHANNEL AND RIGHT-OF-WAY  
UNIT NO. 13  
SAN JOAQUIN RIVER

Inspector's Report Sheet No. \_\_\_\_\_ Inspector \_\_\_\_\_

Date \_\_\_\_\_ Superintendent \_\_\_\_\_

Item	Remarks
(a) Name of Channel and Location by Stations	
(b) Vegetal growth in channel	
(c) Debris and refuse in channel	
(d) New construction within right-of-way	
(e) Extent of a aggradation or degradation	
(f) Condition or riprapped section	
(g) Condition of bridges	
(h) Measures taken since last inspection	
(i) Comments	

INSTRUCTIONS FOR COMPLETING SHEET 4, EXHIBIT E

- Item (a) Indicate station of observation obtained by pacing from nearest reference point.
- Item (b) Note nature, extent, and size of vegetal growth within the limits of floodflow channel.
- Item (c) Note nature and extent of debris and refuse that might cause clogging of the conduits of the irrigation intake works, fouling of the tainter gates, or the bridges over the channel.
- Item (d) Report any construction along the improved channel or above the project works that has come to the attention of the inspector and that might affect the functioning of the project.
- Item (e) Indicate any change in grade or alignment of the channels, either by deposition of sediment or scour, that is noticeable by visual inspection. Estimate amount and extent.
- Item (f) Indicate any change that has taken place in the riprap such as disintegration of the rock, erosion, or movement of the rock. Note the presence of vegetal growth through the riprap.
- Item (g) Note any damage or settlement of the footings of the bridges. Indicate condition of wooden structures and if repainting is required. Indicate condition of bridge approaches, headwalls, and other appurtenances.
- Item (h) Indicate maintenance measures that have been performed since the last inspection and their condition at time of this inspection.
- Item (i) Record opinion, if any, of contributory causes for conditions observed, also any observations not covered under other columns.

**NOTE:** One copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion, and one copy is to be attached to and submitted with the Superintendent's semi-annual report.

SUGGESTED CHECK LIST NO. 4  
DRAINAGE AND IRRIGATION STRUCTURES  
UNIT NO. 13  
SAN JOAQUIN RIVER

Inspector's Report Sheet No. \_\_\_\_\_ Inspector \_\_\_\_\_

Date \_\_\_\_\_ Superintendent \_\_\_\_\_

(a)	Location by Levee Mileage						
(b)	Bank						
(c)	Debris or other obstruction to flow						
(d)	Damage or Settlement of Pipe or conduit	<u>San Joaquin River - Left Bank</u> <u>(As listed in Paragraph 2-02)</u>					
(e)	Condition of concrete head- wall or invert paving						
(f)	Condition of right-of-way adjacent to structure						
(g)	Repair Measures taken since last inspection						
(h)	Comments						

INSTRUCTIONS FOR COMPLETING SHEET 6, EXHIBIT E

- (1) Enter station of all structures under Column (a) for check list.
- (2) Inspect inlet, barrel, and outlet for accumulation of sediment, rubbish, and vegetal matter. Note condition under Column (c).
- (3) If any settlement or damage to the pipe, barrel, or invert of the drain has occurred, estimate the location and amount. Note particularly if any backfill has come into the pipe or been disturbed. Record observations under Column (d).
- (4) Inspect the concrete portions of the structures for evidence of settlement, cracks, "pop-outs", spaces, abrasive wear, or other deterioration. Record conditions under Column (e).
- (5) Inspect backfill area adjacent to structure for evidence of erosion caused by overflow of the drainage structure and note conditions in Column (f).
- (6) Under Column (g) indicate physical measures that have been taken to correct conditions reported in last inspection, and their condition at time of this inspection.
- (7) Under Column (h) record opinion, if any, of contributory causes for conditions observed, also any observations not covered under other columns.
- (8) A copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion, and a record copy shall be attached to the Superintendent's semi-annual report.

EXHIBIT F

LETTERS OF ACCEPTANCE BY  
THE STATE RECLAMATION BOARD

EXHIBIT F

22 September 1972



The Reclamation Board  
 State of California  
 1416 - 9th Street, Room 1333  
 Sacramento, California 95814

Gentlemen:

Reference is made to the joint inspection on Work Unit No. 83, 12 September 1972, held for the purpose of transferring a completed portion of flood control work on the Lower San Joaquin River and Tributaries Project, to the State of California for operation and maintenance.

The completed flood control work consists of levee construction, levee setback, levee enlargement and stone protection on the left bank of the San Joaquin River between River Miles 100.0 to 106.5. The work, as shown on the attached inclosure, was completed on 12 September 1972, in accordance with Specification No. 4050, Contract No. DACW05-72-C-0028, and Drawing No. 7-4-1784.

The work was performed under the general authority of the Flood Control Act of 1944, 78th Congress, 2nd Session, and now meets the requirements of the Lower San Joaquin River and Tributaries Project. Therefore, said flood control work together with the waterway banks contiguous thereto, are transferred as of 22 September 1972, to the State of California for operation and maintenance.

The maintenance work required under the provisions of the Lower San Joaquin River and Tributaries Project shall be performed in accordance with the inclosed Flood Control Regulations. These regulations have been prescribed by the Secretary of the Army pursuant to Section 3 of the Act of Congress approved 22 June 1936, as amended and supplemented by a Standard Operation and Maintenance Manual for the Lower San Joaquin River and Tributaries Project. As provided under Paragraph 208.10(10) of these regulations, a

Unit 13

Copy to  
 Osborn  
 17/9/72  
 28/9/72  
 gm

*Clark*  
*RMB file*

SPKCO-0  
The Reclamation Board

22 September 1972

supplement to the Standard Operation and Maintenance Manual covering the above work will be furnished to you upon completion.

Sincerely yours,

2 Incls  
As stated

JAMES C. DONOVAN  
Colonel, CE  
District Engineer

Copy furnished:  
DWR, APTN: John Wright, C. King

HQDA (DAEN-CWO) ✓  
SSPD ✓

cc:  
Engr (Lev & Chan) ✓  
Engr (Prog Dev) ✓  
Valley Res Ofc ✓  
F & A (Jones) ✓

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itel/kg

*PC*  
COLEMAN

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HENSON

*JK*  
MCKINSEY

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DONOVAN

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*Unit 13*

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THE RECLAMATION BOARD  
STATE OF CALIFORNIA

C  
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Y

October 13, 1972

District Engineer  
Corps of Engineers  
U. S. Army  
650 Capitol Mall  
Sacramento, CA 95814

Refer to: 4130.37.503

Dear Sir:

Reference is made to your letter of September 22, 1972, concerning transfer to the State of California of the Levee Construction, Left Bank San Joaquin River, Reclamation District 1602 in accordance with Specification No. 4060.

The Reclamation Board, at its meeting of October 13, 1972, formally accepted the above referred to work for operation and maintenance.

Sincerely yours,

/s/ A. E. McCollam  
A. E. McCOLLAM  
Chief Engineer and  
General Manager

EXHIBIT F

APR 11 2001

Navigation and Flood Control Unit

Mr. Peter D. Rabbon, General Manager  
The Reclamation Board  
State of California  
1416 - 9<sup>th</sup> Street, Room 1601  
Sacramento, California 95814

Dear Mr. Rabbon:

This letter is to transfer a portion of work on the west bank of the San Joaquin River from L.M. 0.00, Fig Avenue intersection with Lateral Canal, to L.M. 6.29, intersection of Marshall River Road and Moran Road, in RD 1602, to the State of California for operation and maintenance.

The work consisted of restoring the west levee of the San Joaquin River damaged by the January 1997 Flood by restoring the levee section with compacted levee fill material at two locations, at Levee Mile 0.89 at Lake Ramona and from Levee Mile 5.47 to Levee Mile 5.71. The work as listed in the enclosure was completed on October 10, 1997 in accordance with Specification No. 9892E, Contract No. DACW05-97-C-0126.

The work was performed under the general authority of 33 U.S.C. 701n (69 Stat. 186) PL 84-99 and now meets the requirements of the Operations and Maintenance Manual for the San Joaquin River Flood Control System in RD 1602. Therefore, said flood control work, together with the waterway banks contiguous thereto, are transferred as of the date of this letter to the State of California for operation and maintenance.

This portion of the project work will be added by amendment to the Operation and Maintenance Manual, San Joaquin River Flood Control Project, which is being transferred under separate cover.

Sincerely,

Michael J. Walsh  
Colonel, Corps of Engineers  
District Engineer

Enclosure

cc:  
CESPK-CO-E  
CESPK-ED  
CESPK-ED-D  
CESPK-PM  
CESPK-CO-RV

*Unit 13*

*JM*  
MINTON/dd

*TS*  
TAVANA

*SA*  
SANDNER

*WR*  
WINTON

*KDR*  
DURHAM-AGUIERA

*DO*  
DOYLE

*KAT*  
KORMAN

*for*  
CHARLTON

*OB*  
O'BRIEN

*MC*  
WALSH

**THE RECLAMATION BOARD**

1416 NINTH STREET, ROOM 1601  
SACRAMENTO, CA 95814  
(916) 653-5434 FAX: (916) 653-5805  
Permits: (916) 653-5726 FAX: (916) 653-5805



JUN 19 2001

Colonel Michael J. Walsh  
District Engineer  
Sacramento District  
U.S. Army Corps of Engineers  
1325 J Street  
Sacramento, California 95814-2922

Dear Colonel Walsh:

In your April 11, 2001 letter to The Reclamation Board, the U.S. Army Corps of Engineers transferred the repaired west levee of the San Joaquin River at Levee Mile 0.89 and from LM 5.47 to LM 5.71 (in Reclamation District No. 1602) to the State of California for operation and maintenance. You advised the Board that the completed repairs would be added by amendment to the Operation and Maintenance Manual, San Joaquin River Flood Control Project. We understand that the repairs were completed in accordance with the original plans and specifications, and any deviations from them were minor. We acknowledge receipt of as-designed drawings and will forward a copy to RD 1602,

The Board, on behalf of the State of California, accepted the completed repairs at its June 15, 2001 meeting and transferred the San Joaquin River levee repairs to RD 1602. Until the Corps provides the O&M Manual amendment, RD 1602 will perform operation and maintenance according to the current manual.

If you have any questions, you may contact Peter Rabbon, General Manager of The Reclamation Board, at (916) 653-5434, or your staff may contact Debbie Carlisle, Chief of the Department of Water Resources' System Integrity Section of the Division of Flood Management, at (916) 574-0364.

Sincerely,

A handwritten signature in cursive script that reads "Betsy A. Marchand".

Betsy Marchand  
President

cc: Mr. Kell Cloward, Chief  
Readiness Branch  
Sacramento District  
U.S. Army Corps of Engineers  
1325 J Street  
Sacramento, California 95814-2922

Mr. Mark Brooks, Manager  
Reclamation District No. 1602  
2012 Apple Avenue  
Patterson, California 95363

Unit 13





DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

JCAR  
3  
file

REPLY TO  
ATTENTION OF

Flood Protection and Navigation Section

NOV 02 2007

Mr. Jay Punia, General Manager  
The Reclamation Board  
State of California  
3310 El Camino Avenue, Room LL40  
Sacramento, California 95821

Dear Mr. Punia:

This letter is to transfer the U.S. Army Corps of Engineers (Corps) recently completed portion of work performed under the PL 84-99, Flood Control and Coastal Emergencies (FCCE) (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Emergency repairs were made to rehabilitate seepage and sand boil areas with a 440-foot-long underseepage berm placed along the west levee of the San Joaquin River located in Reclamation District 1602 near Levee Mile 8.15. Additional information about the repair and its location may be found in the document titled, *Project Information Report for PL 84-99 Levee Rehabilitation, Reclamation District 1602 (Amendment 1)*, dated February 2007.

This work meets the requirements of the existing Operation and Maintenance Manuals (O&M) for the PL 84-99 Rehabilitation and Inspection Program (RIP); and therefore, said flood control work is transferred as of the date of this letter to the State of California for operation, maintenance, repair, replacement, and rehabilitation (OMRR&R).

The repairs were completed by Wood Brothers, Inc, in accordance with Specification Number 1138E, Design File Number 7-04-1872, Contract Number W91238-06-D-0008, and Task Order Number 0002. As-designed drawings and revisions to the Operation and Maintenance Manual are enclosed.

If you have any questions regarding this project, please contact the Project Manager, Mr. Lester Schmittner, at (916) 557-7812. If you have any questions regarding this transfer, please contact Ms. Meegan Nagy at (916) 557-7257 or Mr. Robert Murakami at (916) 557-6738, Flood Protection and Navigation Section.

Sincerely,

  
Thomas C. Chapman, P.E.  
Colonel, U.S. Army  
District Engineer

Enclosure

CF:

Mr. Doug Dalton, Manager, Lower San Joaquin Levee District, 2012 Apple Avenue, Patterson, CA 95363

EXHIBIT G

SUGGESTED SEMI-ANNUAL REPORT FORM

EXHIBIT G

TO: The District Engineer  
Sacramento District  
Corps of Engineers  
1209 - 8th Street  
Sacramento, California

(1 May 19\_\_)  
(1 Nov 19\_\_)

Dear Sir:

The semi-annual report for the period (1 May 19\_\_ to 31 October 19\_\_) (1 November 19\_\_ to 30 April 19\_\_) Unit No. 13 of the San Joaquin River Tributaries Project is as follows:

a. The physical condition of the protective works is indicated by the inspector's report, copies of which are inclosed, and may be summarized as follows:

(Superintendent's summary of conditions)

It is our intention to perform the following maintenance work in order to repair or correct the conditions indicated:

(Outline the anticipated maintenance operations for the following 6 months.)

b. During this report period, major high water periods (water level at 63.0 on the gage at the Hills Ferry Bridge across the San Joaquin River and 48.0 on the gage at the Patterson highway bridge across the San Joaquin River) occurred on the following dates:

<u>Dates</u>	<u>Maximum Elevation</u>
_____	_____
_____	_____
_____	_____

Comments on the behavior of the protective works during such high water periods are as follows:

(Superintendent's log of flood observations)

During the high water stages when the water level reached a height of \_\_\_\_\_, on the gage or excess thereof (dates) \_\_\_\_\_, it was necessary to organize and carry out flood operations as follows:

(See Maintenance Manual \_\_\_\_\_.)

c. The inspections have indicated (no) or (the following) encroachments or trespasses upon the project right-of-way.

d. (no) ( \_\_\_\_\_ ) permits have been issued for (the following) improvements or construction within the project right-of-way.

Executed copies of the permit documents issued are transmitted for your files.

e. The status of maintenance measures, indicated in the previous semi-annual report as being required or as suggested by the representatives of the District Engineer, is as follows:

(Statement of maintenance operations, item by item with percent completion.)

f. The fiscal statement of the Superintendent's operations for the current report period is as follows:

	<u>Labor</u>	<u>Material</u>	<u>Equipment</u>	<u>Overhead</u>	<u>Total</u>
1. Inspection					
2. Maintenance					
3. Flood fighting operations					

TOTAL

Respectfully submitted,

\_\_\_\_\_  
Superintendent of Works