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Book H

SUPPLEMENT TO STANDARD OPERATION AND MAINTENANCE MANUAL

SACRAMENTO RIVER FLOOD CONTROL PROJECT

UNIT NO. 129

SOUTH LEVEE OF TISDALE BY-PASS
FROM
THE EAST LEVEE OF SACRAMENTO RIVER
TO
THE WEST LEVEE OF SUTTER BY-PASS
AND
WEST LEVEE OF SUTTER BY-PASS
DOWNSTREAM TO EAST LEVEE OF SACRAMENTO RIVER

SACRAMENTO DISTRICT

CORPS OF ENGINEERS

U. S. ARMY

SACRAMENTO, CALIFORNIA

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Accompanying Map #4010

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CORPS OF ENGINEERS

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TO
THE WEST LEVEE OF SUTTER BY-PASS
AND
WEST LEVEE SUTTER BY-PASS
DOWNSTREAM TO EAST LEVEE OF SACRAMENTO RIVER

Prepared by the Sacramento District
Corps of Engineers, U. S. Army
Sacramento, California dated June 1954

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LOCATION	ADDITION OR REVISION	DATE
1-04 c.	Add description for Section III	Jul 1966
1-05	Add section III-contract No. 65-151	Jul 1966
Exhibit B	Add drawing No. 50-4-4021	Jul 1966
Exhibit F	Add copy of letter of acceptance dated 10 Feb 1966	Jul 1966
1-04 d.	Add description for Section IV	Dec 1968
1-05	Add section IV- contract no. DACW05-68-C-0077	Dec 1968
Exhibit B	Add drawing no. 50-4-4393	Dec 1968
Exhibit F	Add copy of letter of acceptance dated 24 Dec 1968	Dec 1968
1-04 e.	Add description for Section V	Mar 1971
1-05	Add Section V-contract no. DACW05-70-C-0008	Mar 1971
Exhibit B	Add drawing no. 50-4-4310	Mar 1971
Exhibit F	Add copy of letter of acceptance dated 2 Oct 1970	Mar 1971
1-04	Add subparagraph f.	Jan 1985
1-05	Add Section VI	Jan 1985
Section II, page 16	Add paragraph 2-05	Jan 1985
Exhibit B	Add drawing no. 50-4-5595	Jan 1985
Exhibit F	And copy of letters of transfer dated 19 Jun 1984 and 18 Oct 1984	Jan 1985
1-04	Add subparagraph g.	Jul 1985
1-05	Add Section VII	Jul 1985
Exhibit B	Add drawing no. 50-4-5722	Jul 1985
Exhibit F	Add copy of letter of transfer dated 28 Nov 1984	Jul 1985
1-04	Add subparagraph h.	Sep 1990
1-05	Add Section VIII	Sep 1990
Exhibit B	Add drawing no. 50-4-5798	Sep 1990
Exhibit F	Add transfer letter dated 22 Nov 1989	Sep 1990
Exhibit F	Add transfer letter dated 10 Jan 1990	Sep 1990
Exhibit F	Add copy of letter of transfer dated 13 Dec 1951	22 Dec 2010

LOCATION	ADDITION OR REVISION	DATE
Exhibit F	Add copy of letter of acceptance dated 18 Dec 1951	22 Dec 2010
Exhibit F	Add copy of letter of transfer dated 8 Dec 1951	22 Dec 2010
Exhibit F	Add copy of letter of acceptance dated 2 Jan 1952	22 Dec 2010
1-04	Add subparagraph i	22 Dec 2010
1-05	Add Section IX	22 Dec 2010
Exhibit B	Add drawing no. 50-4-5561	22 Dec 2010
Exhibit F	Add copy of letter of transfer dated 4 Nov 1980	22 Dec 2010
1-04	Add subparagraph j	22 Dec 2010
1-05	Add Section X	22 Dec 2010
Exhibit B	Add drawing no. FE-3-4-2	22 Dec 2010
Exhibit F	Add copy of letter of transfer dated 16 Jan 1987	22 Dec 2010
Exhibit F	Add copy of letter of transfer dated 17 Jan 1966	2 Feb 2011
Exhibit F	Add copy of letter of transfer dated 22 Nov 1968	2 Feb 2011
Exhibit F	Add copy of letter of acceptance dated 27 Mar 1990	8 Mar 2011
1-04	Add subparagraph k	Jan 2012
1-05	Add Section XI	Jan 2012
Exhibit B	Add drawing no. 50-04-6011	Jan 2012
Exhibit H	Add Project Cooperation Agreement as new Exhibit H	Jan 2012
1-04	Add subparagraph l	July 2017
Exhibit B	Add drawing no 50-04-6267	July 2017
2-06	Add Section 2-06	July 2017
Exhibit I	Add Exhibit I – RD1500 Relief Well Baseline Tests	July 2017
Exhibit F	Add copy of letter of transfer dated 13 July 2107	July 2017

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		* Added January 1985
A	Flood-Control Regulations	(Contained in Standard Manual)
A-1	Location Map	1 Sheet
B	"As Constructed" Drawings	Detached
C	Plates of Suggested Flood Fighting Methods	Unattached (Contained in Standard Manual)
D	Check List No. 1 – Levee Inspection Report	Unattached (Contained in Standard Manual)
E	Check Lists – Levee, Channels and Structures	Sheets 1 – 7
F	Letters of Transfer and Acceptance by State Recl. Board	
G	Suggested Semi-Annual Report Form	Sheets 1 & 2
H	Project Cooperation Agreement	Attached
I	RD 1500 Relief Well Baseline Test Results	Attached

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SECTION I - INTRODUCTION

1-01. Location. - The improvement covered by this manual is that part of the Sacramento River Flood-Control Project which includes the south levee of Tisdale Bypass from the east levee of the Sacramento River to the west levee of Sutter Bypass and the west levee of Sutter Bypass downstream to the east levee of the Sacramento River. Tisdale Bypass and Sutter Bypass are leveed floodways which convey excess flood waters from the Sacramento River. The levees of this unit are located in Reclamation District No. 1500, in Sutter County, in the general vicinity of the towns of Knights Landing and Meridian. The location of the completed unit covered by this manual is shown on Exhibit "A-1".

1-02. Protection provided. - Tisdale and Sutter Bypasses are essential features of the Sacramento River Flood-Control Project. Their primary function is to divert excessive overflow waters of the Sacramento River and its tributaries. The levees of this unit provide protection to adjacent agricultural lands against high water in the Sutter Bypass and Tisdale Bypass. The grade of the adopted flood plane in Tisdale Bypass varies from elevation 53.0 at the Sacramento River to 50.2 at the junction with Sutter Bypass. The grade of the adopted flood plane in Sutter Bypass varies from elevation 50.2 at its junction with Tisdale Bypass to elevation 40.8 at its junction with Sacramento River. (All elevations are referred to U.S.C.E. datum.) The levee grade provides

for a freeboard of 6 feet above the flood plane. The project design flood flow for Tisdale Bypass is 38,000 cubic feet per second and for Sutter Bypass it is 178,000 cubic feet per second above Tisdale Bypass and 216,500 cubic feet per second below Tisdale Bypass.

1-03. Project works. The Project works covered by this manual include the following:

a. The south levee of Tisdale Bypass and the west levee of the Sutter Bypass from Tisdale Bypass southerly (downstream) 14.2 miles as constructed by local interests or as enlarged by the Corps of Engineers.

b. The west levee of the Sutter Bypass from 1 mile above its mouth northerly (upstream) 5.8 miles as constructed by local interests or as enlarged by the Corps of Engineers.

1-04. Construction data. Unit No. 129 of the flood-control works described in this manual forms an integral part of the Sacramento River Flood-Control Project. The construction to bring this unit to project standards is described as follows:

a. Enlargement where necessary of the local interest levee on the south bank of Tisdale Bypass and the westerly levee of the Sutter Bypass from Tisdale Bypass southerly (downstream) 14.2 miles. Construction was started on 17 September 1942 and completed 6 October 1943.

b. Enlargement where necessary of the existing local interest levee on the westerly levee of Sutter Bypass from 1 mile above its mouth 5.8 miles northerly (upstream). Construction was started 25 September 1941, and completed 5 December 1942.

c. Levee revetment along west levee of Sutter Bypass from Karnak Pump to 6.0 Miles upstream. Construction was started on 7 July 1965 and completed on 24 December 1965.

d. Levee revetment along west levee of Sutter Bypass from Karnak Pump downstream for a distance of 5,432 feet (site 3). Construction was completed on 5 November 1968.

e. Bank revetment along left bank of the Sacramento River at Site Mile 83.45 (a portion of Unit 16, Sacramento River Bank Protection Project) was completed on 23 September 1970.

f. Emergency repairs to project levees on the Sutter Bypass – Reclamation District 1500 – were completed on 26 September 1983.

g. Emergency repairs to project levees on the Sutter Bypass right bank levee – Reclamation District No. 1500, were completed on November 2, 1984.

h. Bank sloping, stone protection and selective clearing on the right bank of the Sutter by-pass at Site Mile 64.0 (a portion of Contract 43) was accomplished on 14 November 1989.

i. Emergency repairs of project levees along the right bank of the Sacramento River, RD 1600 and Sutter Bypass, RD 1500 was completed on 21 October 1980.

j. Emergency repairs to project levees consisting of restoring portions of the left bank of the Sacramento River and the right bank of Sutter Bypass in R.D. 1500 was completed on 3 December 1986.

k. Stabilization of landside slope and crown by removing existing levee slope and crown (slope excavation) to a depth of 4 feet below existing surface and replacing it with compacted earth fill. The work was accomplished under Contract 1B, Contract No. DACW05-97-C-0109 by Contractor C.R. Jeffries Construction. Contract 1 B was awarded on 24 June 1997 and construction was completed on 15 November 1998. For Contract 1B the Drawing No. is 50-04-6011 and the Specification No. is 9803.

l. Emergency repairs under PL 84-99 were provided to a seepage site in Sutter County, CA, 25 miles NW of downtown Sacramento. Sand boils were located at two sites (400 feet total length) along the landward levee toe in the vicinity of an existing irrigation ditch (Site # 20051230-008-001). Six relief wells were installed at two locations along the west bank of the Sutter Bypass, Levee Unit 2, Levee Mile 18.25 where boils appeared in a nearby irrigation canal during the 2005-2006 New Years flood event. Additional construction occurred to rock line 10' on either side of the relief well discharge pipes. This involved removal of 2 feet of canal lining and replacing it with bedding material and quarry rock to match existing lines and grades. Construction was completed October 2007 under Contract No. W91238-04-D-0002, TO 0007, Specification No. 1137E, Drawing No. 50-4-6267.

1-05. Contractor. – The prime work was performed under the following contracts, record copies of which are on file with the Corps of Engineers, U.S. Army, Sacramento District, Sacramento, California.

Section I - Construction for levee enlargement as described in paragraph 1-04 a. above was performed under Contract No. W-1105-eng-3940, H. Earl Parker and N.M. Ball Sons, Inc., Contractors.

Section II – Construction for levee enlargement as described in paragraph 1-04 b. above was performed under Contract No. W-1105-eng-3249, N. M. Ball Sons, Inc., Contractors.

Section III – Stone protection as described in paragraph 1-04 c. above was performed under Contract No. DA-04-167-CIVENG-65-151 by Sutherland Construction, Inc. Specification No. 3131. Drawing No. 50-4-4021.

Section IV – Stone protection as described in paragraph 1-04 d. above was performed by Spike Voudouris under Contract No, DACW05-68-C-0077. Specification No. 3492. Drawing No. 50-4-4393.

Section V – Stone protection as described in paragraph 1-04 e. above was performed by H. Earl Parker under Contract No. DACW05-70-C-0008. Specification No. 3390, Drawing No. 50-4-4310.

Section VI – Emergency repairs as described in paragraph 1-04, subparagraph f, above were accomplished under Contract No. DACW05-84-C-0037 by Wayne L. Grist, Inc. Specification No. 6875, Drawing No. 5595.

Section VII – Emergency repairs as described in paragraph 1-04 g. above were performed by Sybon & Reid, Inc., under Contract No. DACW05-84-C-0127. Specification No. 7256, Drawing No. 50-4-5722.

Section VIII – Bank sloping, stone protection, and selective clearing as described in paragraph 1-04 h. above were accomplished under DACW05-88-B-0055 & DACW05-88-C-0063. Specification No. 8367, Drawing No. 50-4-5798.

Section IX – Emergency repairs as described in1-04 i. above were accomplished under Contract No. DACW05-80-C-0114. Specification No. 5954, Drawing No. 50-4-5561.

Section X – Emergency repairs as described in 1-04 j. above were accomplished under Contract No. DACW05-86-C-0108. Drawing FE-3-4-2.

Section XI – Stabilization of landside slope and crown as described in 1-04 k. above were accomplished under Contract No. DACW05-97-C-0109 by Contractor C.R. Jeffries Construction. Specification 9803, Drawing 50-4-6011.

1-06. Flood flows. For purposes of this manual, the term “flood” or “high water period” shall refer to flows when the water surface in Tisdale Bypass reaches or exceeds the reading of 48.0 on the cooperative U.S. Corps of Engineers and State of California continuous water stage recorder and staff gage, set on U.S. C.E. datum, located on the left bank of the Sacramento River at north end of Tisdale Weir; it also applies to floods in the Sutter Bypass rising above the reading of 36.0 on the continuous water stage recorder and staff gage set on U.S.C.E. datum, located on west levee of Sutter Bypass at Sacramento Slough at Reclamation District No. 1500 Pumping Plant.

1-07. Assurances provided by local interests. Assurances of cooperation by local interests is provided by state legislation, as contained in chapter 3, Part 2, Division 5 of the State Water Code (see paragraph 2-02a of the Standard Manual).

1-08. Acceptance by the State Reclamation Board. Responsibility for operating and maintaining the completed works was officially accepted by the Reclamation Board of the State of California on 18 December 1951, as shown on the attached letter of acceptance, Exhibit F.

1-09. Superintendent. The name and address of the Superintendent appointed by local interests to be responsible for the continuous inspection, operation, and maintenance of the project works shall be furnished by the District Engineer, and in case of any change of Superintendent, the District Engineer shall be so notified.

SECTION II FEATURES OF THE PROJECT SUBJECT TO FLOOD*CONTROL-REGULATIONS

2-01. Channels. -

a. Description - The principal structures consist of:

Channels or floodways - When flood discharge exceeds the carrying capacity of the Sacramento River along Butte Basin, water overflows into that basin through natural overflow channels at the upper end and over Moulton and Colusa Weirs farther downstream, which have crest lengths of 500 and 1650 feet, respectively. The overflow waters, after passing through Butte Basin, are concentrated in Sutter Bypass which has a width of 4,000 feet at its upper end, levees 18 to 20 feet in height and a project design capacity of 178,000 cubic feet per second above, and 216,500 cubic feet per second below Tisdale Bypass, with a freeboard of six feet. Flows in the Sacramento River are further relieved at Tisdale Weir, which has a crest of 1,155 feet over which waters are discharged through a leveed bypass (Tisdale Bypass) into Sutter Bypass. The Sutter Bypass increases in width to 7,000 feet and in capacity to 416,500 cubic feet per second below its confluence with Feather River. The discharge from Sutter Bypass crosses the Sacramento River Channel and enters Yolo Bypass over Fremont Weir, which has a crest length of 9,120 feet.

b. Inspection -

(1) Pertinent requirements of the Code of Federal Regulations - Flood-Control Regulations, paragraph 208.10 (g) (1) are quoted in part as follows:

"(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 occured;

"(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 ...."

(2) The purpose of the flood flow channel inspection is to insure that conditions which affect the channel capacity will remain the same, as far as possible, as those considered in the design assumptions and that no new conditions develop that may affect the stability of the project structures. At each inspection required by paragraph 208.10 (g) (1) of the Flood-Control Regulations, particular attention will, therefore, be given the following:

(a) Location, extent and size of vegetal growth.

(b) Unauthorized operations within the flood flow channel right-of-way, such as excavations, buildings and other structures, levees, bank protection, or training dikes.

(c) Rubbish and industrial waste disposal.

(d) Changes in the channel bed such as aggradation or degradation, which would interfere with free-flow from side drainage structures or induce local meanders that would scour the banks.

(e) Operations of any nature upstream from the project that would affect flow conditions within the limits of the flood-control project.

(f) Condition of project structure.

1. Channel walls:

a. Deviation from alignment and grade.

b. Development of cracks and spalls.

c. Mechanical injuries.

2. Fencing:

a. Injuries to posts, fencing or barbed wire.

b. Damage to galvanizing.

3. Earth Fills:

a. Settlement.

b. Erosion of levee slopes

c. Excessive seepage or saturation area back of fills.

d. Condition of bank protection - concrete or stone blanket.

4. Right-of-way:

a. Presence of dumped refuse.

b. Encroachment or trespass.

(3) No excavation within the limits of the Sutter Bypass or Tisdale Bypass will be permitted unless an excavation permit has been approved by the Reclamation Board, State of California.

(4) If any work is done to improve flow conditions in Sutter Bypass above the project, it should be coordinated with the District Engineer to insure that proper provisions are made for channel alignment and capacity to conform to the existing project.

(5) The intent of these inspections is to disclose all conditions which in any way affect the stability of the

structures and their functioning for the control of floods. Each inspection report should note and comment on any repair measures that have been taken since the last inspection. In making these inspections, the check sheets included as exhibit E shall be explicitly followed.

c. Maintenance.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10 (g) (1), are quoted in part as follows: ".... Immediate steps will be taken to remedy any adverse conditions disclosed by such inspection...."

(2) Shoaling or aggradation at the inlets or outlets of side drainage structures may render them inoperative. It is, therefore, imperative that all drains be kept open and unobstructed at all times.

(3) Dumped rock or other suitable types of protection should be placed at locations found by experience to be critical trouble points, with a view to stabilizing the channel alignment and preserving the general uniformity of the bank lines.

(4) Sediment and debris plugs or other obstructions should be removed from the channel to prevent any tendency for the flows to be deflected within the channel. The heavy material likely to accumulate in the new channel at the mouths of tributaries should be removed to keep the channel clear.

(5) The channel and right-of-way shall be kept reasonably clear of debris, refuse matter, or industrial wastes.

(6) Weeds and other vegetal growth in the channel shall be cut in advance of the flood season and, together with all debris, removed from the channel.

(7) All eroded concrete shall be repaired as soon as any reinforcing steel is exposed or erosion reaches a depth of 4-inches. For this purpose, it is recommended that the repair be made by thoroughly cleaning the surface by sandblasting

and building up the section with pneumatically placed Portland cement mortar. All evidence of settlement, uplift, or failure of concrete structures shall be referred to the District Engineer for analysis and remedial measures.

(8) All damage to fencing, whether resulting from accidental or willful injuries or from corrosion, shall be promptly repaired with new material in order to maintain satisfactory protection to the public.

(9) All subdrainage structures which have become cemented due to the evaporation of ground water or other causes, shall be thoroughly cleaned out and repacked with fresh gravel.

d. Operation.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10 (g) (2), are quoted in part as follows:

"(g) Channels and floodways. (2) Operation. Both banks of the channel shall be patroled during periods of high water ..... Appropriate measures shall be taken to prevent the formation of jams .... of 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 .... walls, drainage outlets or other flood control structures repaired."

(2) It shall be the duty of the Superintendent to maintain a patrol of the project works during all periods of flow in excess of a reading of 48.0 and 36.0 respectively, on the recording gages, as indicated in paragraph 1-06 of this manual. The Superintendent shall dispatch a message by the most suitable means to the District Engineer whenever the water surface in Tisdale and Sutter Bypasses reaches the

gage readings indicated above. The Superintendent shall also cause readings to be taken at the gages at intervals of one to two hours during the period when the water surface is above the flood-flow stage indicated above and record the time of the observations. One copy of the readings shall be forwarded to the District Engineer immediately following the flood, and a second copy transmitted as an inclosure to the semi-annual report in compliance with paragraph 3-03 c. of the standard manual.

2-02. Levees.

a. Description. The levees described in this manual are located along the southerly edge of Tisdale Bypass and the westerly edge of Sutter Bypass from Tisdale Bypass southerly to the east levee of the Sacramento River. The original levees were constructed by local interests. They were rebuilt where necessary by the Sacramento District to bring them to project standards. Crushed rock surfacing to provide a patrol road to the crown of the levee, as indicated on the drawings of Exhibit B. For more complete details of items included in construction or reconstruction of the above-mentioned levees, by the Sacramento District refer to the "as constructed" drawings of Exhibit B.

b. Inspection.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10 (b) (1), are quoted in part as follows:

"(b) Levees - (1) Maintenance .... Periodic inspection shall be made by the Superintendent .... 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 landside or the riverside of the levee which might effect 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; (see note (a) below)

(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 ...."

NOTE (a) Since the growth of sod on the slopes of the levees of this project is not practicable and as the nature of the levee growth warrants burning thereof to facilitate inspection, the provisions of subparagraph b (1) of the regulations inconsistent therewith shall not apply. In place of item (vii), the following will be observed: Weeds, grasses and debris on the levee shall be burned during appropriate seasons where not dangerous or impracticable, in order to permit the detection and extermination of burrowing

animals and that grass and weeds on levee slopes be mowed where removal by burning is dangerous or impracticable, such as on peat levees or where burning would constitute a hazard.

(2) To insure the taking of such maintenance measures as will be required for proper functioning of the levee, the following items shall be specifically covered in each inspection:

(a) Aggradation or degradation of the stream bed along the toe.

(b) Settlement of levee fill.

(c) Erosion of levee slopes; both sides of levees.

(d) Presence of seepage, saturated areas, or sand boils back of levee.

(e) Condition of access roads and roadway on levee.

c. Maintenance.

(1) Repairs to Levee Embankment. Methods used for repair or reconstruction of the levee fill will depend on the extent of the damaged section. If of small extent, the most suitable method will be to bring the levee back to line and grade by a fill made in 6-inch layers of dirt free from brush, roots, sod or other unsuitable matter. If of larger extent, the fill should be made in the same manner as the original construction, of selected material from the borrow pits approved for the project, placed in uniform layers of loose material and not more than 6 inches in depth and compacted in accordance with the specifications under which the work was completed.

(2) Depredations of Burrowing Animals. Dens and runways formed within the levee by burrowing animals are frequently the causes of levee failures during flood stages. Burrowing animals such as muskrats, ground hogs, ground squirrels, moles and gophers, found in the levee should be exterminated. The dens and runways should be opened up and thoroughly compacted as they are backfilled. Levees kept properly cleared are not seriously menaced by burrowing animals as they prefer areas where a protective cover, such as high grass, weeds, and brush, is found. Several methods of extermination are

found effective, such as trapping, baiting, and poison gases, depending on the type of animal present and the time of year the work is done. Advice concerning the best methods in each locality can be obtained from the County Agricultural Agent.

(3) Access Roads. Access Roads to the levees shall be maintained in such condition that they will be accessible at all times to trucks used to transport equipment and supplies for maintenance or flood fighting.

d. Operation.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations paragraph 208.10 (b) (2) are quoted in part as follows:

"(2) Operation. During flood periods, the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope 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 structures.

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."

2-03. Drainage and Irrigation Structures.

a. Description. Drainage and Irrigation Structures provided in the project works are located and described as follows:

(1) Reinforced concrete pipes or conduits extending through the levees to drain the areas adjacent to the Tisdale and Sutter Bypasses are as listed in the following table:

See Drwg. No. 50-4-1940-2, sheet 3 of Exhibit B

Location Station	Bank	Concrete Conduits	Gate Model No. (a)	Description
1224+75 Pumping Plant 1	Right	3-78"	100	(b)
1226+00 Pumping Plant 2	Right	3-4'x4'	100	(b)
1227+00 Pumping Plant 3	Right	4-6'x7'	100	(b)

(2) Concrete and corrugated metal pipes extending through the levees to irrigate the areas adjacent to the Tisdale and Sutter Bypasses are as listed in the following table:

See Drwg.No. 50-4-1992-1, sheets 1 and 3 of Exhibit B

Location Station	Bank	Concrete & C.M.P.	Gate Model No. (a)	Description
61+25	Right	54" Conc.	101	(c)
299+44	Right	20" I.P.		

Notes pertaining to tables: (a) Gate Model No. 100 is a Calco automatic drainage gate on outlet end of pipe. It closes against face pressure and opens automatically to permit outflow when pressure is released.

Gate Model 101 is a Calco slide gate which operates by handscrew on a steel frame.

Gate Model No. 1001 is a combination gate which includes the features of gates No. 100 and 101.

(b) With concrete cut-off walls and reinforced concrete headwall.

(c) With concrete cut-off walls only.

b. Inspection.

(1) Pertinent Requirements of the Code of Federal Regulations. Flood Control Regulations, paragraph 208.10 (d) (1), are quoted in part as follows:

"(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 structure..... ...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 occuring adjacent to the structures 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 inspection."

(2) At each inspection required by paragraph 4-02 (b) (2) of the Standard Manual, the following items, if applicable, shall be particularly noted:

(a) Debris or other obstructions to flow.

(b) Condition of pipes and gates.

(c) Damage or settlement of pipe.

(d) Condition of concrete - cracks, spalls, erosion.

c. Maintenance -

(1) All eroded concrete shall be repaired as soon as any reinforcing steel is exposed or erosion reaches a depth of 4 inches. For this purpose it is recommended that the repair be made by thoroughly cleaning the surface by sandblasting and building up the concrete to its original section with pneumatically placed Portland cement mortar. All evidences of settlement, uplift, or failure of concrete structures should be referred to the State Engineer for analysis and recommendation of remedial measures.

(2) If the inspection shows that the automatic drainage structures have been jammed in an open position by debris or other obstructions, they shall be thoroughly cleaned so that they swing freely to a true closure. If any parts of the gates have been damaged or broken, they shall be replaced by new parts.

(3) Compliance with the provisions prescribed above pertaining to drainage structures is essential for proper maintenance of the levee system covered by this manual. Levee failures caused by neglected drainage structures are of common occurrence; it is, therefore, of utmost importance that these structures always be kept in perfect working condition in accordance with the regulations.

(4) Care should be taken not to bury any of the side drainage inlets in the event that it becomes necessary to fill any of the low-lying pockets in back of the levee. Plans for the maintenance of drainage facilities at any such points should be submitted to the State Engineer for approval before such work is started.

d. Operation -

(1) Pertinent Requirements of the Code of Federal Regulations - Flood-Control Regulations, paragraph 208.10 (d) (2), are quoted in part as follows:

"(2) Operation. Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and objects 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 .... All drainage structures in the 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 conditions."

(2) The outlets of side drainage structures inundate at relatively low river stages. They should, therefore, be inspected at the first sign of a rise in the river to make certain that the gates are not jammed in an open position and thus allow flood waters to enter behind the levee.

2-04. Miscellaneous facilities. -

a. Description - No miscellaneous structures or facilities were constructed as a part of, or in conjunction with, the protective works.

(1) Utility relocations - No miscellaneous utilities interfered with the project works and, therefore, no utility relocations were necessary.

* 2-05. Environment Protection.

a. Vegetation preserved as a part of selective clearing on the waterside berm or slope above the bank protection during prosecution of the contract shall not be removedas a part of normal maintenance. Dead trees with wildlife value will be retained except where they constitute a hazard to existing flood control works.

* JAN 1985

2-06 Relief Wells

a. Description. Six relief wells were drilled, and of these only five could be developed at two locations along the west bank of the Sutter Bypass, Levee Unit 2, Levee Mile 18.25 where boils appeared in a nearby irrigation canal during the 2005-2006 flood event.

b. Inspection. The relief wells will only flow during flood events during the flood season, normally between November 1 and April 30. During the dry season, it is recommended that the relief wells be inspected and the water levels within the wells be recorded every 3 months. The water level in the Sutter Bypass should also be recorded at the same time for comparison purposes.

(1) The following items are a guideline for what should be noted during relief well inspection, regardless of season:

(a) Unusual settlement, sloughing, or material loss of grade of the ground or embankment in the area of the wells

(b) Outside manhole is present and clearly marked with the relief well number

(c) Caving or erosion under or near the concrete pads due to rodents or surface runoff

(d) Seepage, saturated or green areas in the vicinity

(e) Rodent activity or debris in the relief well chamber and the discharge pipe

(f) Bending or other damage to the discharge pipe

(2) If any of the above items are noted, corrective action should be taken to prevent potential damage to and/or loss of efficiency of the wells. Settlement, sloughing, caving erosion, or saturated areas should be evaluated further to determine the cause.

(3) The wells should be sounded for depth once a year, preferably right before flood season. Comparison of depth readings over multiple years will indicate the amount and rate of siltation

(4) During the flood season, it is recommended that the relief wells be inspected and the water levels in the wells and the Sutter Bypass be recorded monthly.

(5) During flood events, it is recommended that the relief wells be inspected and the water levels in the wells and the Sutter Bypass be recorded daily.

(a) When the relief wells are flowing, the flow rate should be recorded in lieu of the water level. The preferred method is to record the amount of time it takes to fill up a container of known volume.

(b) Alternatively, the height of water within the discharge pipe may be measured. A flow volume can then be calculated using the radius of the discharge pipe.

(6) All water level and flow data for the relief wells and the Sutter Bypass should be recorded on a spreadsheet and/or plotted. Plotting the data facilitates observation of patterns in how the water level or flow rate in the relief wells compares with the water level in the Sutter Bypass. A major change in relief well water levels or flow rates in relation to Sutter Bypass water levels should be investigated.

(7) Every five years the relief wells should be re-developed to remove accumulated sediment. Each relief well should be pump tested following redevelopment to determine the specific capacities and efficiencies of the wells. The baseline pump test data is located in Exhibit I.

(a) If the pumping tests indicate that the specific capacity of a relief well is less than 80 percent of that determined at the time of installation, then corrective measures should be employed in accordance with USACE Engineering Manual EM-1110-2-1914 (29 May 1992).

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 interests to repair, the Superintendent will contact a representative of the Division of Water Resources, State of California who coordinates maintenance of project works of the Sacramento River Flood Control Project. The State representative will give assistance or advice, 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 V of the Standard Manual, where the subject is fully covered.

SPKGE 8 June 1954

SUBJECT: Operation and Maintenance Manuals

MEMORANDUM TO: CHIEF, CONSTRUCTION-OPERATIONS DIVISION

1. A supplement to the Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project, Unit No. 129, entitled, "South Levee of Tisdale Bypass from the East Levee of the Sacramento River to the West Levee of Sutter Bypass and the West Levee of Sutter Bypass Downstream to the East Levee of the Sacramento River," dated June 1954 is submitted herewith.

2. Copies of the supplement have also been furnished the Division Engineer, the State Reclamation Board and the State Division of Water Resources.

1 Incl
1. O&M Manual

F. KOCHIS
Chief, Engineering Division

cc: Levees

EXHIBIT A

FLOOD CONTROL REGULATIONS

(See Standard Manual)

CORPS OF ENGINEERS, U.S. ARMY

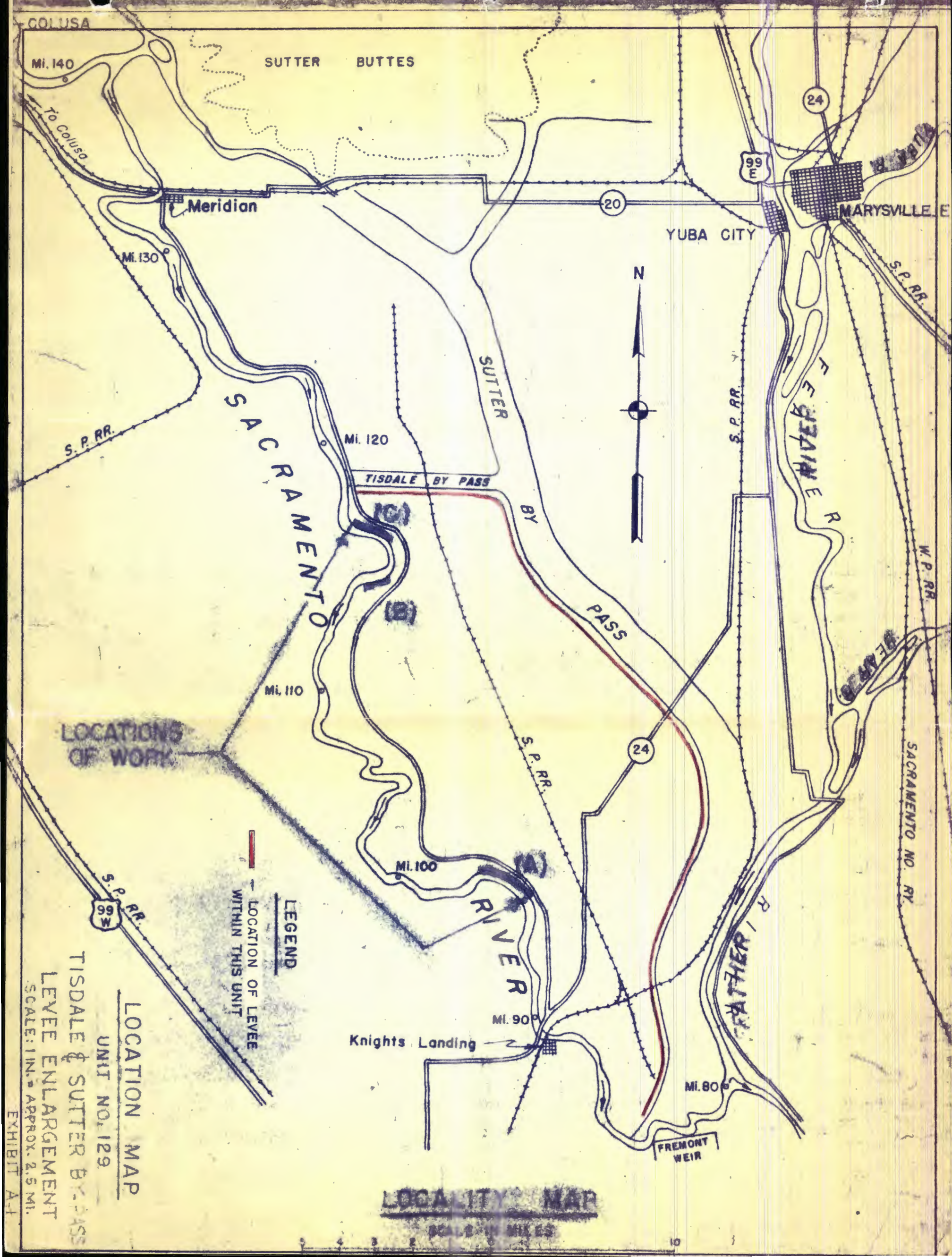


EXHIBIT "B"

"AS CONSTRUCTED DRAWINGS"

(See separate folder for the following drawings)

Drawing No.	
50-04-1940-1	Sheets 1 to 5, incl.
50-04-1992	Sheets 1 to 11, incl.
50-06-3168	Clearing Sutter By-Pass-Fremont Weir to Nelson Bend Sheets 1 and 2.
50-04-4021	Bypass Levee Revetment, West Levee Sutter Bypass from Karnak Pump to 6.0 miles Upstream, in 16 sheets.
50-04-4393	Bypass Levee Revetment Yolo and Sutter Bypass Levees, in 7 sheets.
50-04-4310	Bank Protection, Various Locations Right and Left Banks Sacramento River between Tisdale Weir and Sacramento, in 26 sheets.
50-04-5595	Emergency Levee Repairs, Colusa Basin Drain, RD 108, and Sutter Bypass, RD 1500, in 2 sheets.
50-04-5722	Emergency Levee Repairs, West Bank RD 1500, East Bank RD 1600, in one sheet.
50-04-5798	Bank Protection, Contract 43, Right and Left Banks, Feather River, Colusa Basin Drain, Yolo and Sutter Bypass, in 35 sheets.
50-04-5561	Emergency repairs, Sacramento River RD 1600 and Sutter Bypass RD 1500
FE-3-4-2	Emergency repairs, Sacramento River and Sutter Bypass RD 1500
50-04-6011	Sacramento River Flood Control Project, Mid-Valley Area Phase III, Levee Reconstruction – Contract 1B, Reclamation District 1500, Right Bank Sutter Bypass and Left Bank Sacramento River (construction drawings.
50-04-6267	PL 84-99 Relief Wells Project SN 8 / RD 1500, in 4 sheets

Additional drawings of cross-sections, structures, and miscellaneous facilities are available in the Office of the District Engineer.

EXHIBIT C

PLATES OF SUGGESTED FLOOD FIGHTING METHODS

(See Standard Manual)

EXHIBIT D

CHECK LIST NO. 1

LEVEE INSPECTION REPORT

(See Standard Manual)

EXHIBIT E

CHECK LISTS OF LEVEES,

CHANNEL AND STRUCTURES

For definition of "flood" or "high water period", see paragraph 1-06 of this manual

CHECK LIST NO. 2

SOUTH LEVEE OF TISDALE BYPASS

AND WEST LEVEE SUTTER BYPASS

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 slopes of levee	
(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
(To be printed on back of sheet 2)

Item (a) Indicated levee station of observation, obtained by pacing from nearest reference point; indicate right or left bank.

Item (b) If sufficient settlement of earth work 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 gullying of the section has occurred.

Item (c) If sufficient erosion or gullying 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 grade and section of roadway or ramps. Indicated any inadequacy in surface drainage system.

Item (e) Indicated 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.

CHECK LIST NO. 3

CHANNEL AND RIGHT-OF-WAY

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 aggradation or degradation	
(f) Condition of riprapped section	
(g) Condition of bridges	
(h) Measures taken since last inspection	
(i) Comments	

Instructions for Completing Sheet 4, Exhibit E
(To be printed on the back of sheet 4)

Item (a) Indicated station of observation obtained by pacing from nearest reference point.

Item (b) Note nature, extent, and size of vegetal growth within the limits of the flood flow channel.

Item (c) Note nature and extent of debris and refuse that might cause clogging of the conduits of the irrigation intake works, or fouling of the bridges over the channel.

Item (d) Report any construction along the diversion channel or above the diversion 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, 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.

CHECK LIST NO. 4
DRAINAGE AND IRRIGATION STRUCTURES

Inspector's Report Sheet No._____ Inspector_____

Date_____ Superintendent_____

(a) Location by Station	(b) Bank	(c) Debris or other obstruction to flow	(d) Damage or Settlement of pipe or conduit	(e) Condition of concrete headwall or invert paving	(f) Condition of right-of-way adjacent to structure	(g) Repair measures taken since last inspection	(h) Comments
1221+75 (Pumping Plant No. 1)	Right						
1226+00 (Pumping Plant No. 2)	Right						
1227+00 (Pumping Plant No. 3)	Right						
61+25	Right						
299+45	Right						

Instructions For Completing Sheet 6, Exhibit E
(To be printed on back of sheet 6)

(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 of the 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, and 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

LETTER OF ACCEPTANCE

BY STATE RECLAMATION BOARD

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

Executive Office

JUL 13 2017

Ms. Leslie M. Gallagher
Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 170
Sacramento, CA 95821

Dear Ms. Gallagher:

The U.S. Army Corps of Engineers completed a portion of work performed under the PL 84-99, Flood Control and Coastal Emergencies (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Repairs were made to rehabilitate 400 feet of sand boils on the landside levee toe along the west bank of Sutter Bypass located within Reclamation District No. 1500 by installing relief wells. In October 2007, portions of the irrigation canal adjacent to the relief well discharge pipes were rock lined to reduce erosion. Additional information about the repairs and location of the sites may be found in the document titled, *Project Information Report for PL 84-99 Levee Rehabilitation, Reclamation District 1500,* dated August 2006.

This work meets the requirements of the existing Operation and Maintenance Manuals (O&M) for the PL 84-99 Rehabilitation Program. The flood risk management work is transferred as of the date of this letter to the State of California for operation, maintenance, repair, replacement, and rehabilitation. The repairs were completed in accordance with Specification No. 1137E, Drawing No. 50-04-6267 under Contract Number W91238-04-D-0002, TO 0007. As-constructed drawings and revisions to the O&M manual are enclosed.

If you have any questions regarding this project, please contact Ms. Paige Caldwell, at (916) 557-6919.

Sincerely,

David G. Ray, P.E.
Colonel, U.S. Army
District Commander

Enclosures

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

NOV 29 2016

Ms. Leslie M. Gallagher
Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 151
Sacramento, CA 95821

Dear Ms. Gallagher:

The purpose of this letter is to notify the Central Valley Flood Protection Board of the completion of an effort to update the Operation and Maintenance Manual Supplements for the Sacramento River Flood Control Project and the Lower San Joaquin River Levees and Lower San Joaquin River and Tributaries Project. These updates are a compilation of revisions made to the project over time and where we had record of a transfer letter to the Board. These updated supplements are the most current version and should be utilized as the baseline version for any future project modifications.

This process and the compiled updates have been coordinated with the Central Valley Flood Protection Board and Department of Water Resources staffs for review and comment. All comments have been addressed or incorporated into the manuals.

The Board staff has been provided a copy of the manuals in electronic format. Future updates will include entire unit supplements so updates can be seen in context with the entire unit supplement. The list of completed supplements, by the unit number and title, are attached. If you have any questions regarding this transmittal, please contact Gary Kamei at 916-557-6845.

Sincerely,

David G. Ray, P.E.
Colonel, U.S. Army
District Commander

Enclosures

Standard O&M Manual Sacramento River Flood Control Project	
Unit No.	**Project Name**
101	RD 341 Sherman Island
102	E. Levee of Sac River, Isleton to Threemile Slough & N. Levee of Threemile Slough from Sac River to SJ River
103	Both Levees of Georgiana Slough & E. Levee of Sac River from Walnut Grove to Isleton
104	Levees around Grand Island
105	Levees Around Reyer Island
106	S. Levee Lindsey Slough & W. Levee of Yolo BP from Lindsey Slough to Watson Hollow and N. Levee of Watson Hollow Drain
107	Levees Around Hastings Tract
108	Levees Around Peters Tract
109	West Levee of Yolo Bypass & E. Levee of Cache Slough
110	Levees Around Sutter Island
111	E. Levee of Sac River from Freeport to Walnut Grove
112	Levees Around Merritt Island
113	E. Levee Yolo Bypass, N. Levee Miner Slough, W. Levees Sutter Slough, Elkhorn Slough & Sac River, All Bordering RD 999
114	W. Levee of Sac River from Northern Boundary of RD 765 to Southern Boundary of RD 307
115	E. Levee of Sac River from Sutterville Rd to Northern Boundary of RD 744
116	W. Levee of Sac River from Sac Weir to Mi 51.2 & S. Levee of Sac Bypass & E. Levee of Yolo Bypass from Sac Bypass to Southern Boundary of RD 900
117	E. Levee Sac River through City of Sac from Tower Bridge to Sutterville Rd
118.1	E. Levee of Sac River from American River to Tower Bridge & S. Levee of American River from Mayhews Downstream to Sac River
118.2	N. Levee American River, E. Levee Natomas Canal, Both Levees Arcade Creek, S. Levee Linda Creek, & Magpie Creek Diversion Channel
118.2 Sup	Vegetation on Mitigation Sites E. Levee of Sac River from American River to Tower Bridge & S. Levee of American River from Mayhews Downstream to Sac River
119	Putah Creek Channel & Levees & W. Levee of Yolo Bypass from Yolo Causeway Downstream 3 mi. Includes O&M manual for the Yolo Basin wetlands, and South Fork Putah Creek Preserve Restoration Section 1135 Authorization.
120	Relocated Willow Slough Channel & Levees & W. Levee Yolo Bypass from mouth of Relocated Willow Slough to Yolo Causeway
121	R. Levee of Yolo Bypass from Willow Slough Bypass to Woodland Rd RD2035
122.1	W. Levee of Sac River from Mi 70.8 to Sac Weir & N. Levee of Sac Bypass & E. Levee of Yolo Bypass from Woodland Hwy to Sac Bypass
123	W. Levee of Sac River from East End of Fremont Weir to Mi 70.8 & E. Levee of Yolo Bypass from East End Fremont Weir to Woodland Hwy RD 1600

124	N. Levee of American River from Natomas E. Canal to Sac River & E. Levee of Sac River from Natomas Cross Canal to American River. Includes supplement, Vegetation on Mitigation Sites.
125	Back Levee of RD 1000
126	Cache Creek Levees & Settling Basin Yolo Bypass to High Ground
127	Knights Landing Ridge Cut & Sac River & Yolo BP Levees of RD's 730 and 819 & S. Levee of Sycamore Slough
128	E. Levee of Sac River from Sutter Bypass to Tisdale Weir all within RD 1500
129	S. Levee of Tisdale By-Pass from E. Levee Sac River to W. Levee Sutter BP & W. Levee of Sutter BP Downstream to E. Levee of Sac River
130	W. Levee Sac River from Sycamore Slough to Wilkins Slough (Mi. 89.9 to Mi. 117.8)
131	W. Levee Sac River from Wilkins Slough to Colusa (Mi. 117.8 to Mi. 143.5)
132	Back Levees of RD 108
133	E. Levee of Sac River from Winship School to Tisdale BP & N. Levee of Tisdale BP & W. Levee of Sutter BP from Long Bridge to Tisdale BP
134	Levees of RD 70, E. Levee of Sac River from Butte Slough Outfall Gates to Winship School & W. Levee of Sutter BP from Butte Slough Outfall Gates to Long Bridge
135	E. Levee of Sutter BP from Sutter Buttes Southerly to Junction with Feather River & E. & W. Levees of Wadsworth Canal & Levee of Intercepting Canals
136	E. Levee of Sac River from Butte Slough Outfall Gates to the Princeton-Afton Rd (Mi. 138.3 to Mi. 164.4)
137	W. Levee of Sac River from North End of Princeton Warehouse to Colusa Bridge
138	E. Levee of Sac River from Parrott-Grant Line to Princeton-Afton Rd
139	W. Levee of Sac River from N. Boundary of LD 2 to North End of Princeton Warehouse
140	W. Levee of Sac River in LD 1 (Mi. 170.5 to Mi. 184.7). Includes mitigation site O&M manual, Yuba County
141.1	E. Levee of Feather River from Bear River to Natomas CC & S. Levee of Bear River & Both Levees of Yankee Slough. Parts 1 and 2
141.2	E. Levee of Feather River from Bear River to Natomas CC & S. Levee of Bear River & Both Levees of Yankee Slough. Parts 1 and 2
142	Back Levee of RD 1001
143	W. Levee of Feather River from North Boundary of RD 823 to E. Levee of Sutter Bypass
144	W. Levee of Feather River from North Boundary of LD 1 to North Boundary of RD 823
145	E. Levee of Feather River, S. Levee of Yuba River, Both Levees of WPRR Intercepting Channel, W. Levee of South Dry Creek & N. Levee of Bear River
146	N. Levee of Bear River & S. Levee of South Dry Creek RD 817 & Vicinity of Wheatland
147	Levee Around the City of Marysville & N. Levee of Yuba River to a Point 1.8 Mi. Upstream from Marysville

148	W. Levee of Feather River from North Boundary of RD 777 to North Boundary of LD 1
149	S. Levee of Yuba River Maintenance Area No. 8
151	E. Levee Feather River from Honcut Creek to Marysville & S. Levee of Honcut Creek & E. Levee of RD 10
152	W. Levee of Feather River from N. Boundary of RD 777 to Western Canal Intake (Levee of Drainage District No. 1)
153	Lower Butte Creek Channel Improvement, Colusa, Glenn & Butte Counties
154	Moulton Weir & Training Levee Sacramento River
155	Colusa Weir & Training Levee Sacramento River
156	Tisdale Weir & Bypass
157	Fremont Weir, Sacramento River
158	Sacramento Weir, Sacramento River
159	Pumping Plants No. 1, 2 & 3, Sutter Bypass
160	Sutter Butte Canal Headgate
161	Butte Slough Outfall Gates
162	Knights Landing Outfall Gates, Sacramento River

Standard O&M Manual San Joaquin River	
Unit No.	**Project Name**
1	Right Bank Levee of the San Joaquin River & French Camp Slough within RD 404
2	Right Bank Levee of the San Joaquin River & French Camp Slough within RD 17
3	North Levee of Stanislaus River & East Levee of the San Joaquin River within RD 2064, 2075, 2094 and 2096
4	East Levee of San Joaquin River within RD 2031
5	East Levee of the San Joaquin River Within RD No. 2092
6	East Levee of the San Joaquin River in RD Nos. 2063 & 2091
7	West Levee of San Joaquin River & North Levee of Old River RD Nos. 524 & 544
8	Right Banks of Old River & Salmon Slough Within RD No. 1 & RD No. 2089
9	Levees Around RD No. 2062 & San Joaquin County Flood Control District Area No.2
10	West Levee of Paradise Cut RD No. 2058 & SJ County Flood Control District, Area No.2
11	West Levee of San Joaquin River from Durham Bridge to Paradise Dam Within RD No. 2085 & 2095
12	West Levee of San Joaquin River From Opposite Mouth of Tuolumne River Downstream to Stanislaus County Line Within RD Nos. 2099, 2100, 2101, & 2102
13	West Levee of the San Joaquin River in RD No. 1602

DEPARTMENT OF THE ARMY
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

REPLY TO
ATTENTION OF

Flood Protection and Navigation Section

FEB 15 2012

Mr. Jay Punia
Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 151
Sacramento, California 95821

Dear Mr. Punia:

This letter is to transfer a portion of work along the right (west) bank of Sutter Bypass to the Central Valley Flood Protection Board for Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R). The completed work is located in Sutter County within Reclamation District (RD) 1500 and includes site number 3 on the right (west) bank of Sutter Bypass. The site was repaired as a result of damage sustained during the Flood of 1986 under Contract 1B. The location of site 3 is shown in Enclosure 1. A description of the repairs is included in Enclosure 2 titled, "Supplement to Standard Operation and Maintenance Manual, Sacramento River Flood Control Project, Unit Number 129, South Levee of Tisdale By-Pass from the East Levee of Sacramento River to the West Levee of Sutter Bypass and West Levee of Sutter Bypass Downstream to East Levee of Sacramento River, paragraph 1-04 k."

The work was performed under the Energy and Water Development Appropriation Act, 1987 (Public Law 99-591). The repair was completed in accordance with Specification Number 9803 and Drawing File Number 50-04-6011 for Contract 1B. The As-Built drawings for this work are not available. The Construction drawings included with this package are the most accurate record of the work completed. The drawings are titled "Sacramento River Flood Control Project, Mid-Valley Area Phase III, Levee Reconstruction – Contract 1B, Reclamation District 1500."

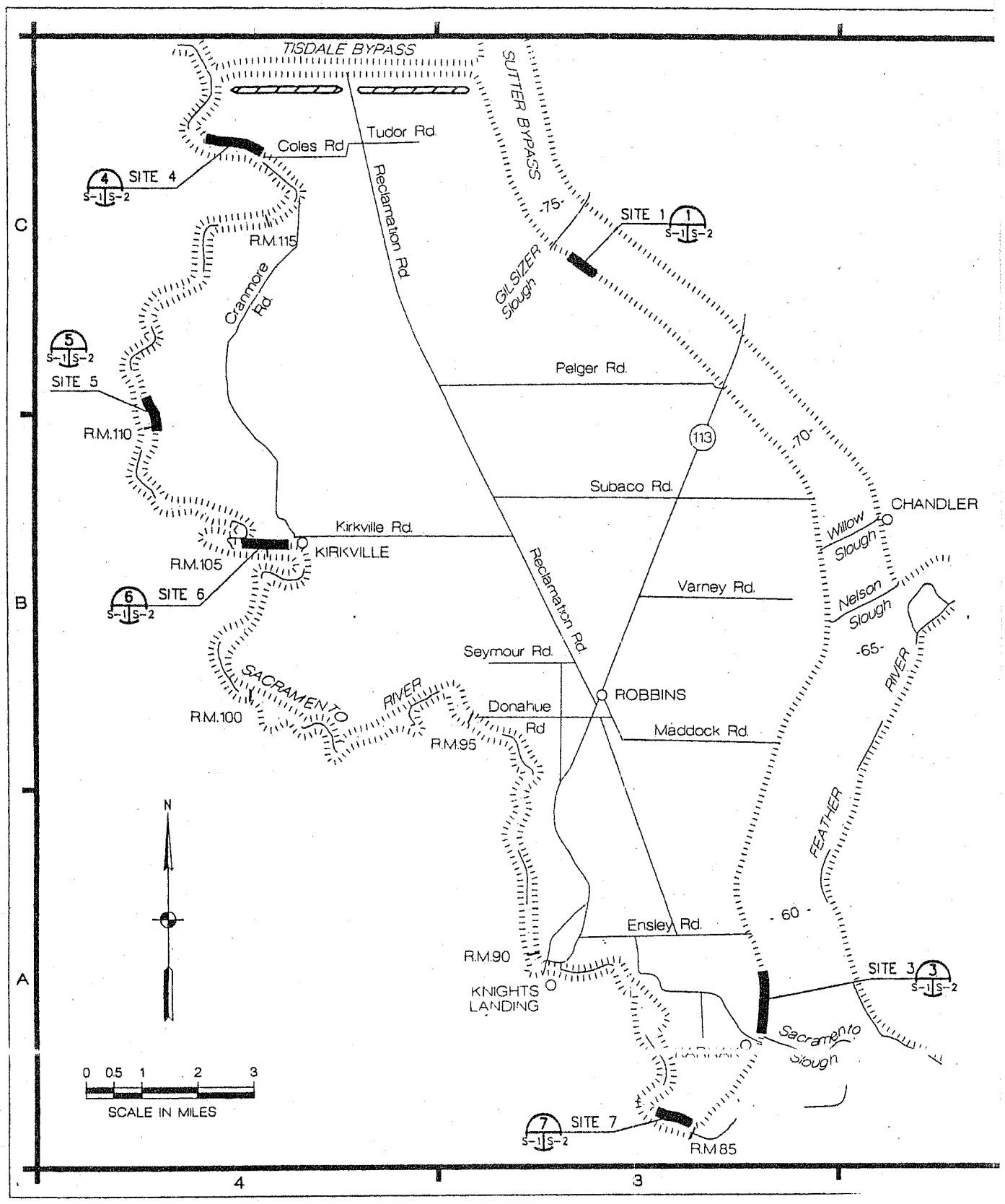
The completed work shall be operated and maintained in accordance with the Project Cooperation Agreement between the Department of Army and the State of California dated September 12, 1996 (encl 3). This portion of work will be by amendment to the Operation and Maintenance Manual, Unit Number 129, Sacramento River Flood Control Project. Said work is transferred as of the date of this letter to the Central Valley Flood Protection Board for OMRR&R. Both, hard copies and electronic versions (CD) are provided.

A copy of the letter is being furnished to Reclamation District 1500, P.O. Box 93, Robins, CA 95676. If you have any question regarding this project, please contact Mr. Charles Austin of the Programs and Project Management Division at (916) 557-7550. If you have any question regarding this transfer, please contact Mr. Ryan Larson, Flood Protection and Navigation Section at (916) 557-7568.

Sincerely,

William J. Leady, P.E.
Colonel, U.S. Army
District Commander

Enclosures


TISDALE BYPASS
SUTTER BYPASS
Tudor Rd.
Coles Rd
SITE 4
4
S-1 S-2
Reclamation Rd.
-75-
SITE 1
1
S-1 S-2
GILSIZER Slough
R.M.115
Cranmore Rd.
5
S-1 S-2
SITE 5
Pelger Rd.
R.M.110
113
-70-
Subaco Rd.
CHANDLER
Willow Slough
Kirkville Rd.
KIRKVILLE
R.M.105
Reclamation Rd.
Varney Rd.
6
S-1 S-2
SITE 6
Nelson Slough
Seymour Rd.
-65-
SACRAMENTO RIVER
ROBBINS
Donahue Rd
Maddock Rd.
R.M.100
R.M.95
RIVER
FEATHER
N
Ensley Rd.
-60-
R.M.90
SITE 3
3
S-1 S-2
KNIGHTS LANDING
Sacramento Slough
0 0.5 1 2 3
SCALE IN MILES
7
S-1 S-2
SITE 7
R.M.85
C
B
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4
3

ENCLOSURE 1

STATE OF CALIFORNIA–RESOURCES AGENCY

GEORGE DEUKMEJIAN, *Governor*

THE RECLAMATION BOARD
1416 Ninth Street, Room 455-6
Sacramento, CA 95814
(916) 445-9454

MAR 2 7 1990

Colonel Jack A. Le Cuyer
District Engineer
Sacramento District
U. S. Army Corps of Engineers
650 Capitol Mall
Sacramento, CA 95814-4794

Dear Colonel Le Cuyer:

Reference is made to your letter of November 22, 1989, concerning the transfer of a portion of the Sacramento River Bank Protection Project in Contract 43 to the State of California for operation and maintenance.

The flood control work consisted of selective clearing, bank sloping, placement of stone bank protection, and such miscellaneous work as necessary to complete the construction at the following sites:

1. Site Mile 51.1, Right Bank, Feather River.
2. Site Mile 8.5, Left Bank, Colusa Basin Drain
3. Site Mile 54.1, Left Bank, Yolo Bypass
4. Site Mile 64.0, Right Bank, Sutter Bypass

The sites were completed on November 14, 1989. The work was constructed in a workmanlike manner and in conformance with Drawing No. 50-4-5798, Specification No. 8367, and Contract No. DACW 05-88-C-0063, insofar as could be determined visually.

The Reclamation Board, at its regular meeting of December 15, 1989, formally accepted the completed work on the above referenced sites from the District Engineer for operation and maintenance.

If you have any questions concerning the above, please contact me at the above address or call Richard Goodnight at (916) 445-9335.

Sincerely,

RAYMOND E. BARSCH
General Manager

UW 15 123, 129, 132, 152

Copies to VRO
C.D. Nolan

C CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 10, 1990

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 - 9th Street, Room 455-6
Sacramento, California 95814

Members of the Board:

This is in regard to the joint inspection of January 5, 1990, made for the purpose of transferring a portion of the Sacramento River Bank Protection Project (Unit 43) to the State of California for operation and maintenance. The flood control work consists of bank sloping, placement of stone protection and miscellaneous work on the Feather River left bank at Site Miles 0.9, 1.5, 5.6, 5.9 and 6.4.

The sites were completed on December 8, 1989, in accordance with Contract Number DACW05-88-C-0063, Specification Number 8367 and Drawing Number 50-4-5798.

The work was performed under general authority of the Flood Control Act of 1960, 86th Congress, 2nd Session (PL 86-645, July 14, 1960), Section 2304(a), Title 10, and the Water Resources Development Act of 1986 (PL 99-662,October 17,1986), and now meets the requirements of the Sacramento River Bank Protection Project. Therefore, said work together with the waterway bank contiguous thereto is transferred as of January 5, 1990 to the State of California for operation and maintenance.

This portion of the work will be added by amendment to the Operation and Maintenance Manual, Supplement Number 141, Part Number 1, Sacramento River Flood Control Project. Copies will be furnished to your office at a later date.

Sincerely,

Jack A. Le Cuyer
Colonel, Corps of Engineers
District Engineer

cc:
C-O Div; Fld Cntrl Unit; Central Valley Sec; Prog Dev; F&A Br; Valley Res Ofc; Reading

Copies Furnished:

DWR, ATTN: G. Snow; DWR, ATTN: G. Qualley; Cdr, SPD, ATTN: CESPD-O; Cdr, USACE, ATTN: DAEN-CECW-OM

ROMPALA/mt
KELLY
A.SMITH
HELM
FAST
DENNIS
MASON
Le CUYER

PC#UNIT43-90

Unit 141.1

'C CERTIFIED MAIL - RETURN RECEIPT REQUESTED

November 22, 1989

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 - 9th Street, Room 455-6
Sacramento, California 95814

done

Members of the Board:

This is in regard to the joint inspection of November 14, 1989, made for the purpose of transferring a portion of the Sacramento River Bank Protection Project (Unit 43) to the State of California for operation and maintenance. The flood control work consists of bank sloping, placement of stone protection and miscellaneous work on the Feather River right bank at Site Mile 51.1; Colusa Basin Drain left bank at Site Miles 8.5; Sutter Bypass right bank at Site Mile 64.0 and Yolo Bypass left bank at Site Mile 54.1.

The sites were completed on November 14, 1989, in accordance with Contract Number DACW05-88-C-0063, Specification Number 8367 and Drawing Number 50-4-5798.

The work was performed under general authority of the Flood Control Act of 1960, 86th Congress, 2nd Session (PL 86-645, July 14, 1960), Section 2304(a), Title 10, and the Water Resources Development Act of 1986 (PL 99-662,October 17,1986), and now meets the requirements of the Sacramento River Bank Protection Project. Therefore, said work together with the waterway bank contiguous thereto is transferred as of November 14, 1989 to the State of California for operation and maintenance.

This portion of the work will be added by amendment to the Operation and Maintenance Manual, Supplement Numbers 123, 129, 132 and 152, Sacramento River Flood Control Project. Copies will be furnished to your office at a later date.

Sincerely,

Jack A. Le Cuyer
Colonel, Corps of Engineers
District Engineer

cc:
C-O Div; Fld Cntrl Unit;
Central Valley Sec; Prog
Dev; F&A Br; Valley Res
Ofc; Reading
Copies Furnished:

DWR, ATTN: G. Snow; DWR, ATTN: G. Qualley; Cdr, SPD, ATTN: CESPD-O;
Cdr, USACE, ATTN: DAEN-CECW-OM

ROMPALA/mt
KELLY
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PC#LTRUNIT43

Units 123, 129, 132, 152

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

January 16, 1987

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 - 9th Street, Room 455-6
Sacramento, California 95814

Members of the Board:

You are hereby notified that the Corps of Engineers has completed emergency repairs to project levees under authority of Section 5 of the Flood Control Act of August 18, 1941, as amended (Public Law 99, 84th Congress, 1st Session). The work was completed on December 3, 1986, and consisted of restoring portions of the Sacramento River left bank levee and the Sutter Bypass right bank levee in Reclamation District 1500, in accordance with Contract Number DACW05-86-C-0108 and Drawing Number PG-J-4-2. This work shall be maintained in accordance with the assurances which your Board provided for the Sacramento River Flood Control Project. This portion of the work will be added by amendment to the Operation and Maintenance Manual, Supplement Numbers 128 and 129, Sacramento River Flood Control Project. Copies will be furnished to your office at a later date.

Sincerely,

Wayne J. Schell
Colonel, Corps of Engineers
District Engineer

cc:
E.M. (Garrett)
>Ops Br
Engr Div (Civ Des Sec D - Pahl)
Valley Res Ofc (Cameron)

Copies furnished:

Commander, South Pacific Division, ATTN: SPDCO-O
PWR, ATTN: J. Angel
DWR, ATTN: G. Snow

Chuck's 128/129

SUTTER BYPASS R.B. & SACTO R. L.B.

1-20
ROMPALA/th
KELLY
A. SMITH
FAST
DENNIS
McCOLLAM
SCHOLL
WANG #6287a

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

November 28, 1984

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 - 9th Street, Room 455-6
Sacramento, California 95814

Members of the Board:

You are hereby notified that the Corps of Engineers has completed emergency repairs to project levees under authority of Section 5 of the Flood Control Act of August 18, 1941, as amended (Public Law 99, 84th Congress, 1st Session). The work was completed on November 2, 1984, and consisted of restoring the Yolo Bypass left bank levee in Reclamation District 1600, and the Sutter Bypass right bank levee in Reclamation District 1500, in accordance with Contract Number DACW05-84-C-0127 and Drawing Number 50-4-5722. This work shall be maintained in accordance with the assurances which your Board provided for the Sacramento River Flood Control Project. This portion of the work will be added by amendment to the Operation and Maintenance Manual, Supplement Numbers 123 and 129, Sacramento River Flood Control Project. Copies will be furnished to your office at a later date.

Sincerely,

Albert E. McCollam, Jr.
Lieutenant Colonel, Corps of Engineers
Acting District Engineer

Copies Furnished:

Commander, South Pacific Division, ATTN: SPDCO-O
DWR, ATTN: M. Luttropp

EXHIBIT F

C-O-P-Y

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

June 19, 1984

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 - 9th Street, Room 455-6
Sacramento, California 95814

Members of the Board:

You are hereby notified that the Corps of Engineers has completed emergency repairs on two project levees under authority of Section 5 of the Flood Control Act of August 18, 1941, as amended (Public Law 99, 84th Congress, 1st Session). The work was completed on May 29, 1984 and consisted of repairing project levees along the Colusa Basin drain left bank R.D. 108 and along the Sutter Bypass right bank R.D. 1500 in accordance with Contract Number DACW05-83-C-0037 and Drawing Number 50-4-5595. Additional work will be accomplished in R.D. 1500 to repair a slide area in and adjacent to the repaired site this year. This work shall be maintained in accordance with the assurances which your Board provided for the Sacramento River Flood Control Project. This portion of the work will be added by amendment to the Operation and Maintenance Manual, Supplement Numbers 129 and 132, Sacramento River Flood Control Project. Copies will be furnished your office at a later date.

Sincerely,

Arthur E. Williams
Colonel, Corps of Engineers
District Engineer

Copy Furnished:
Commander, South Pacific Division, ATTN: SPDCO-C

C-O-P-Y C-O-P-Y

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

October 18, 1984

Navigation and Flood Control Unit

The Reclamation Board
State of California
1416 Ninth Street, Room 455-6
Sacramento, California 95814

Members of the Board:

Reference is made to our letter to you, dated June 19, 1984, notifying you of the completion of emergency repairs on project levees in Reclamation District 108 (left bank of Colusa Basin Drain) and Reclamation District 1500 (right bank of Sutter Bypass) and the need to accomplish additional work in Reclamation District 1500 to repair additional damage. This is to advise you that the additional work in Reclamation District 1500 has been completed. This work shall be maintained in accordance with the assurances which your Board provided for the Sacramento River Flood Control Project. This portion of the work will be added by amendment to the Operation and Maintenance Manual, Supplement Number 129, Sacramento River Flood Control Project. Copies will be furnished your office at a later date.

Sincerely,

Albert E. McCollam, Jr.
Lieutenant Colonel, Corps of Engineers
Acting District Engineer

Copy Furnished:

Commander, South Pacific Division, ATTN: SPDCO-C

TRANSFER FILE #13D
AC RIVER FLOOD CONTROL PROJECT

CERTIFIED - RETURN RECEIPT REQUESTED

SPKCO-O

4 November 1980

The Reclamation Board
1416-Ninth Street, Room 335-18
Sacramento, CA 95814

Gentlemen:

You are hereby notified that the Corps of Engineers has completed emergency repairs on two project levees under authority of Section 5 of the Flood Control Act of 18 August 1941, as amended (Public Law 99, 84th Congress, 1st Session). The work was completed on 21 October 1980 and consisted of repair of the project levees along the right bank of the Sacramento River, R.D. 1600 and Sutter Bypass, R.D. 1500 in accordance with Contract No. DACW05-80-C-0114, Drawing No. 50-4-5561 and Specification No. 5954. This work shall be maintained in accordance with the assurances which your Board provided for the Sacramento River Flood Control Project. This portion of the work will be added by amendment to the Operation and Maintenance Manual, Supplement Numbers 123 and 129, Sacramento River Flood Control Project. Copies will be furnished your office at a later date.

Sincerely,

PAUL F. KAVANAUGH
Colonel, CE
District Engineer

Copy furnished:
DWR, ATTN: R. Franson

cc:
Ops Br
SPDCO-O
Engineering Division (Levees & Channels - Nolan)
Valley Res. Office

JL 4 NOV
ROMPALA/bc
McBRIDE
A. SMITH
PROBASCO
KAVANAUGH

Units 123, 129

C
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DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

C
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Y

October 2, 1970

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

Subject: 4130.60.204
Your Contract 70-C-0008
Sacramento River Bank Protection
Project, Unit No. 16

Dear Sir:

Reference is made to the precompletion inspection of a portion of the above referenced project made on September 23, 1970.

The work sites inspected were as follows:

Site Mile 61.0, Left Bank, Sacramento River
Site Mile 70.4, Right Bank, Sacramento River
Site Mile 71.5, Right Bank, Sacramento River
Site Mile 71.9, Right Bank, Sacramento River
Site Mile 77.0, Right Bank, Sacramento River
Site Mile 77.85, Right Bank, Sacramento River
Site Mile 84.5, Right Bank, Sacramento River
Site Mile 96.8, Right Bank, Sacramento River
Site Mile 83.45, Left Bank, Sacramento River
Site Mile 89.6, Left Bank, Sacramento River
Site Mile 95.4, Left Bank, Sacramento River
Site Mile 95.6, Left Bank, Sacramento River

The work appeared to be completed in an acceptable manner and, insofar as could be determined visually, in conformance with the plans and specifications for the project. No deficiencies were noted.

Sincerely yours,

/s/ Clyde E. Shields
Clyde E. Shields, Chief
Construction Branch
Division of Design and Construction

EXHIBIT F

C
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THE RECLAMATION BOARD
STATE OF CALIFORNIA

DEC 24 1968

4130.55.605

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

Dear Sir:

Reference is made to your letter of November 22, 1968 concerning transfer to the State of California of the Sutter and Yolo Bypass Levee Revetment Project, Sites 1, 2, 3 and 4 for maintenance and operation.

This work was constructed in accordance with Specification No. 3492, Contract No. DACW05-C-0077, Drawing No. 50-4-4393.

The Reclamation Board, at its meeting of December 20, 1968, 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

SPKCO-O

22 November 1968

The Reclamation Board
State of California
1416 - 9th Street, Room 1335
Sacramento, California 95814

Gentlemen:

Reference is made to the joint inspection of 21 November 1968, made for the purpose of transferring four completed rock revetment sites to the State of California for operation and maintenance. This work consists of two sites on the Yolo Bypass east levee and one site each on the Sutter Bypass east and west levees, as delineated on the attached inclosure. The work was constructed as part of the Sacramento River Major and Minor Tributaries Flood Control Project and completed on 5 November 1968, in accordance with Specification No. 3492, Contract No. DACW05-68-C-0077, Drawing No. 50-4-4393.

The work was performed under the general authority of the Flood Control Act of 22 December 1944 (Public Law 534, 78th Congress, 2nd Session) and now meets the requirements of the Sacramento River Major and Minor Tributaries Flood Control Project. Therefore, said work, together with waterway banks contiguous thereto, is transferred 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, Supplement Nos. 122, 129 and 135, Sacramento River Major and Minor Tributaries Flood Control Project, and furnished to your office at a later date.

Sincerely yours,

CRAWFORD YOUNG
Colonel, CE
District Engineer

1 Incl
As stated

Units 122, 129, 135

ROMPALA/jmc
COLEMAN
HENSON
HART
YOUNG

22

CF:
DWR
OCE
SPD

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

cc: Engrg Div (Lev & Chan); Engrg Div (Prog Dev); Valley; F&A(Cordano)

Copies to Jensen & Huber 25 NOV 68 K

SUMMARY OF SACRAMENTO RIVER MAJOR & MINOR TRIBUTARIES PROJECT
CONTRACT NO. 68-C-0077

YOLO BYPASS LEFT BANK:

SITE	STONE PROTECTION STATION	LINEAL FEET	DESCRIPTION
1.	102+00 to 116+00	1400 feet	1.8 mile upstream from Sacramento Bypass
2.	254+00 to 316+00	*6030 feet	Downstream from State Highway 16
SUTTER BYPASS RIGHT BANK:			
3.	426+43 to 481+50	5507 feet	Downstream from Karnak Pump
SUTTER BYPASS LEFT BANK:			
4.	0+00 to 3+60	360 feet	Near Gilsizer Slough

*170 feet by others

Units 122, 129, 135

C
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THE STATE RECLAMATION BOARD
State of California
February 10, 1966

C
O
P
Y

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

Dear Sir:

Reference is made to your letter of January 17, 1966 concerning transfer to the State of California of the rock revetment on the west levee of Sutter Bypass from Karnak Pump to six miles upstream, in accordance with Specification No. 3131.

The Reclamation Board, at its meeting of February 3, 1966, formally accepted the above referred to work for operation and maintenance.

Sincerely yours,

A. E. McCOLLAM
General Manager

EXHIBIT F

SPKKO-F 17 January 1966

The Reclamation Board
State of California
1416 - 9th Street, Room 1335
Sacramento, California 95814

Gentlemen:

Reference is made to the joint inspection of 12 January 1966, on the flood control project on Sutter Bypass Levee Revetment work. This portion of work is a part of the Sacramento River Major and Minor Tributaries Flood Control Project and was inspected for the purpose of transferring it, upon completion, to the State of California for operation and maintenance.

The flood control work consists of 7.03 miles of levee bank sloping and 6.39 miles of stone revetment on the waterside slope of the west levee of Sutter Bypass, beginning near Karnak Pump and running upstream 7.03 miles. The work was completed on 24 December 1965, in accordance with Specification No. 3131, Contract No. DA-04-167-CIVENG-65-151 and Drawing No. 50-4-4021.

This work was performed under the general authority of the Sacramento River Major and Minor Tributaries Flood Control Project, which was authorized by the Flood Control Act of 22 December 1944 (Public Law 534, 78th Congress, 2nd Session).

The above flood control work now meets the requirements of the Sacramento River Major and Minor Tributaries Flood Control Project. Therefore, said flood control work is hereby transferred to the State of California for operation and maintenance.

This portion of the project work will be added by amendment to the Operation & Maintenance Manual, Supplement No. 129, Sacramento River Flood Control Project, and furnished to your office at a later date.

Sincerely yours,

ROBERT E. MATHE
Colonel, CE
District Engineer

OPERATIONS BRANCH
FLOOD CONTROL SECTION

COLEMAN/p
HENSON
HART
MATHE

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Copy furnished:
Dept Water Resources
O.C.E. AND S.P.D.

cc: Engr Div-Lev&Chan; Engr Div-Prog Dev;
F&A (Cordano); Valley Res Ofc

Jan. 2, 1952

The Board accepted the transfer from the Corps of Engineers, in letters as listed below, the following reaches of levees and their contiguous waterway banks, where applicable, for flood control operation and maintenance, as complete and meeting the requirements of the Sacramento River Flood Control Project:

	No.	Date of Letter	Levee Location	Remarks
Unit No. 80A = 322	1	13 Dec. 1951	a. Left Bank Sacramento River Mile 94.0 to 96.6	Completed contract. Spec. No. 1485. Maintained by R. D. No. 1500
Unit No. 81A 323			b. Left Bank Sacramento River Mile 114.2 to 115.6	Do
Unit No. 82A 324			c. Left Bank Sacramento River Mile 116.1 to 117.0	Do
Unit No 86A 325	2	19 Dec. 1951	Part A, Site 1 - Right Bank Sacramento River, Spec. No. 1515, Grand Island Mile 30.25 to 30.5	Completed contract. Maintained by R. D. No. 3
	3	13 Dec. 1951	199 a(1) Sherman Island Levee Bridge to Sacramento River	Completed contract. Maintained by R. D. No. 341. 101
			200 a(2) Sherman Island Levee Bridge East 1300 ft.	Do 101
			203 b. Plug across Seven Mile Slough	Constructed and maintained by R.D. Nos. 1601 and 2067.
			204 c. Brannan Island levee of Seven Mile Slough plug and along Three Mile Slough to Sacramento River	Spoil area owned by S. & S.J.D.D. 102 No maintenance required.
			218 d(14) East levee Sacramento River Mile 18.5 to 21.5	Completed contract. Maintained by R.D. No. 407. 103
			219 d(15) East levee Sacramento River Mile 21.6 to 26.3	Completed contract. Maintained by R.D. No. 556.
			220 d(16) East levee Sacramento River Mile 26.4 to Georgiana Sl.	Completed contract. 103 Maintained by R. D. No. 556.
			221 d(17) East levee Sacramento River Mile 26.5 to 27.55	Completed contract. Maintained by R.D. No. 554. 111 No liability for Delta Cross Channel.

Units No. 80A - 81A - 82A and 86A, and Items 199 to 295

1005

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No.	Date of Letter	Levee Location	Remarks
3	13 Dec. 1951	d(28) East levee Sacramento River Mile 35.38 to 35.74	Completed contract. Maintained by R.D. No. 755.
		d(44) East levee Sacramento River Mile 44.5 to 45.3	Constructed by Assessment No. 5.
		d(46) East levee Sacramento River Mile 56.1 to American River	Constructed and maintained by City of Sacramento.
		d(50) East levee Sacramento River Mile 92.9 to 94.0	Completed contract. Maintained by R.D. No. 1500.
		d(52) East levee Sacramento River Mile 97.5 to 97.7	Completed contract. Maintained by R. D. No. 1500.
		d(54) East levee Sacramento River Mile 99.9 to 102.5	Do
		d(57),(58) East levee Sacramento River Mile 104.2 to 105.65	Do
		d(59) East levee Sacramento River Mile 110.9 to 111.5	Do
		d(61) East bank Sacramento River at Tisdale Weir	Maintained by State under Section 8361 Water Code.
		h(3) West levee Sacramento River Mile 133.1 to 133.3	Completed contract. Maintained by Sacramento River West Side Levee District.
		h(5) West levee Sacramento River Mile 134.3 to 140.6	Do
		h(7) West levee Sacramento River Mile 141.3 to 142.0	Do
		h(9) West levee Sacramento River Mile 142.3 to 142.7	Do
		i. East levee Georgiana Slough from S.P.R.R. upstream 22,500 ft.	Completed contract. Maintained by Tyler Island District.
		j. North levee American River from Jibboom St. Bridge to El Camino Avenue	Constructed by and maintained by R. D. No. 1000.

Items 199 to 295

No.	Date of Letter	Levee Location	Remarks
3	13 Dec. 1951	288 l. Back levee R.D. No. 2068	Completed contract. Maintained by R.D. No.2068. 109
		289 m. S. levee North Dry Creek to W.P.R.R. Interceptor	Completed contract.
		290 n. E. levee W.P.R.R. Interceptor from North Dry Creek to Bear River	Do
		291 o. N. levee Bear River from W.P.R.R. Interceptor to South Dry Creek	Completed contract. Maintained by R. D. No. 784.
		292 p. N. levee South Dry Creek from Bear River to high ground	Completed contract. Maintained by R. D. No. 817.
		293 q. South levee Bear River from W.P.R.R. easterly to 5,400 feet east of Carlin Bridge	Completed contract. Maintained by R. D. No. 1001. 141.1
		294 r. South levee of South Dry Creek from Bear River easterly 1.86 miles	Completed contract. Maintained by R. D. No. 817.
		295 s. North levee Bear River from South Dry Creek easterly to 4,000 feet easterly from Carlin Bridge	Completed contract. Maintained by R. D. No. 817.

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Items 199 to 295

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This copy was furnished on 24 Feb. 1953 b de A.

Accepted items

December 18, 1951

The Board accepted the transfer from the Corps of Engineers, in letters of dates listed below, the following reaches of levees and their contiguous waterway banks where applicable for flood control operation and maintenance, as complete and meeting the requirements of the Sacramento River Flood Control Project.

	No.	Date of Letter	Levee Location	Remarks
1-2	1	1 Dec.1951	N. and S. Training* Levees Moulton Weir*	Maintained by State
3-4	1	Do	N. and S. Training* Levees Colusa Weir*	Maintained by State
6	2	3 Dec.1951	W. Levee Sacramento River, Mile 177.5 Mile 174.1	Maintained as Maintenance Area No. 2
9	3	4 Dec.1951	E. Levee Yolo By-pass Fremont* Weir to Miner Slough*	N. 2 mi. maintained by State. Remainder by local districts. Conditioned upon completion of levee section and no acceptance of banks of Sacramento Deep Water Channel.
10 11	3	Do	N.&S. Levees Sacramento By-pass*	Maintained by State. Waterward slopes on 4 to 1 not required.
21a	4	6 Dec.1951	Back levee Egbert District*	Maintained by R. D. No. 536
22	4	6 Dec.1951	W. Levee Yolo By-pass Lindsey* Slough to Watson Hollow Drain*	Maintained by R. D. No. 536
24	4	Do	N.Levee Watson Hollow Drain*	Do
16	5	6 Dec.1951	W.Levee Sacramento River Mile 59.0 to Lake Washington Barge Canal	Maintained by R. D. No. 900
18	5	Do	W. Levee Sacramento Riv.Mile 50.8 to 50.5	Bank protection contract. Maintained by R. D. No. 765

Copy to USED.

1

3

Accepted Items

No.	Date of Letter	Levee Location	Remarks
6 (12)-(13)-(14)-(15)	6 Dec.1951	Levees of Wadsworth Canal* South levees of E. and W. Intercepting Canals.	Maintained by State. Waterward slopes on 4 to 1 not required.
7 = 329 (87-A)	7 Dec.1951	Site 2 Part A. W.Levee Sacramento River-Mile 28.5 -Grand Island.	Maintained by R.D. No. 3. Completed contract.
= 331 (89-A)		Site 1,Part B. E. levee Sacramento River-Mile 15.0 Brannan Island.	Maintained by R.D.No. 2067 Completed contract.
8 (51)-(52)-(53)-(54)-(55)-(56)-(57)	8 Dec.1951	W. levee Sacramento River Mile 163.8 to Mile 143.5 except 320 ft. at Colusa Warehouse & Mile 146.1 to Mile 146.4.	Maintained as Maintenance Area No. 1.
8 (58)-(59)-(60)-(61)-(62)-(63)	Do	E. levee Sacramento River, Mile 153.3 to Mile 152.7; Mile 149.9 to Mile 149.7; Mile 149.4 to Mile 149.0; at Colusa Weir; Mile 143.3 to Mile 140.2;Mile 139.3 to Mile 138.2.	Maintained by State Separate completed contracts.
8 (64)-(65)-(66)-(67)-(68)-(69)-(70)	Do	E. levee Sacramento River Mile 138.2 to Mile 137.9; Mile 136.9 to Mile 133.8; Mile 133.2 to Mile 132.3; Mile 131.8 to Mile 125.9; Mile 125.8 to Mile 123.1; Mile 122.6 to Mile 122.0.	Maintained by R.D.No. 70, Completed contracts.
(71)-(72)-(73) 8	Do	West levee,Sutter By-pass*	Maintained by R.D.Nos. 70, 1660, 1500.Condition upon completion of remaining part to standard section.
(74) 8	Do	North levee Tisdale By-pass*	Maintained by R.D.No. 1660. Waterward slope of 4 to 1 not required.
(75) 8	Do	South levee Tisdale By-pass*	Maintained by R.D.No.1500. Waterward slope of 4 to 1 not required.
(76) 8	Do	East levee Sutter By-pass*.	Maintained by State.
(81) 9	Do	W. levee Sacramento River Mile 35.15 to 35.86.	Maintained by R.D.No. 150 (Merritt Island).Completed contract bank protection.

4

Accepted Items

	No.	Date of Letter	Levee Location	Remarks
91	10	8 Dec. 1951	Cross levee Steamboat Slough to Sacramento River.*	Maintained by R.D. No. 3 (along U.S.spoil bank).
140	11	Do	N. levee American River from Jibboom St.Bridge to Sacramento River.	Maintained by R.D. No. 1000.
141	11	Do	E. levee Sacramento River American River to Natomas Cut.	Maintained by R.D.No. 1000.
142	11	Do	E. bank Sacramento River At Moulton Weir.	Maintained by State.
143	11	Do	E. Levee Sacramento River Mile 158.5 to Mile 164.4.	Maintained partly by State; remainder by Levee District.No. 3, Glenn County, Completed Contract.
146	11	Do	W. levee Sacramento River Mile 61.8 to Mile 62.65.	Maintained by Maintenance Area No. 4. Completed contract.
147	11	Do	W. Levee Sacramento River Mile 62.65 to Mile 63.1.	Maintained by R.D. No. 537 Completed contract.
148	11	Do	Sacramento Weir.	Maintained by State.
152	11	Do	Fremont Weir.	Maintained by State.
153 156 157	11	Do	W. Levee Sacramento River Mile 87.6 to Mile 88.4; Mile 89.2 to Sycamore Slough	Maintained by R.D. No. 730 Completed contracts.
158	11	Do	W. Levee Sacramento River Mile 100.6 to Mile 101.4	Maintained by Sacramento River West Side Levee District. Completed contract.
160 161 162 163	11	Do	W. Levee Feather River except: 3.31 Mi. North from Nicolaus Bridge; 1400 ft. in Yuba City; from Sta.774+80 to Sta. 1188+00 of "Y.C.H.B" Traverse.	Maintained by Maintenance Area No. 3, Levee Dist. Nos. 1 & 9 of Sutter Co. Recl. Dist.No. 777 and State.
164	11	Do	E. Levee Sacramento River, Natomas Cut to Feather River	Maintained by Recl.Dist.No.1001.
165 166 167 168 169 170	11	Do	E. Levee Feather River from mouth to Mile 26.5,except from 2.37 miles of Nicolaus Bridge to Bear River	Maintained by R.D. Nos. 1001 and 784.

21

3

5

Accepted Items

No.	Date of Letter	Levee Location	Remarks
11 (171) (172)	8 Dec.1951	Marysville levees from W.P.R.R. at Simmerly Slough E.to Yuba River and from D St. Bridge on Yuba River upstream to Valley Meat Co.	Maintained by Marysville Levee Commission.
11 (173) (174)	Do	N.Levee Simmerly Slough from W.P.R.R. to S.P.R.R. and E. Levee Feather River from Simmerly Slough upstream 4.8 miles	Maintained by R.D. No. 10 Completed contract.
(175) 11	Do	N. Levee Yuba River from back levee of Marysville upstream 1.8 miles	Maintained by Marysville Levee Commission.
(176) 11	Do	S.Levee Yuba River from S.N.R.R. to S.P.R.R.	Maintained by R.D. No. 784.
(177) 11	Do	N.Levee Bear River from Feather River to W.P.R.R. Interceptor	Maintained by R.D. No. 784.
(178) 11	Do	E. Levee R.D.784 (W.Levee W.P.R.R.Interceptor) Bear River to intersection with W.P.R.R. in S½ Sec.17, T.14 N.,R. 4 E.	Maintained by R.D. No. 784.
11 (179) (180)	Do	S. Levee American River from 16th St.Bridge to Mayhew except from S.N.R.R. to a point 800 ft. E. of W.P.R.R.	Maintained by American River Flood Control District.
11 (181) (182) (183) (184) (185) (186) (187) (188)	Do	W. Levee Yolo By-pass from Sacramento River to Putah Creek except from N.line Cache Cr.Settling Basin to S.N.R.R. & from old Willow Slough pipes south 1.48 mi.*	Maintained by State and R. D. #2035.
(190) 11	Do	N.&S. levees Willow Slough Interceptor*	Maintained by State and R. D. No. 2035.
(191) (192) 11	Do	N.&S. levees of Putah Creek	Maintained by State.
11 (197) (198)	Do	N.&S. levees Sycamore Slough from Sacramento River to Knights Landing Outfall Gates	Maintained by R.D. 730 and Sacramento River West Side Levee District.

21

6

Accepted Items

No.	Date of Letter	Levee Location	Remarks
12	8 Dec.1951	Five reaches of Ryer Island levee along Miner Slough as follows: a. Junction Miner and Sutter Sloughs westerly 5000 feet. (38) b. From State Highway Bridge West. 3035 ft. (79A) Covered by letter dated 16 Nov. 1951 321 c. Spec. 1473, Sta. 53+00 to 64+00 about one mi. No. of Ryde Road. Mile 29.4 to 29.6 (53A) 303 Covered by letter dated 17 Nov. 1951 d. Spec. 1473, Sta. 0+00 to 12+00 being 600 ft. each side of Ryde Road. Mile 30.4 to 30.6 (54A) 304 e. Ryer Island cut-off levee beginning at east bank of Cache Slough and extending upstream 3,300 feet at junction of Cache and Miner Sloughs. (28) (50)	Maintained by R.D. No. 501. All are completed separate contracts.

*No waterway banks contiguous to these levees.

C. de ARRIETA

REGISTERED MAIL
Return Receipt
Requested

Letter No. 13

(1)

(13)

13 DEC 1951

SPEKA 824.3(Sac.Riv. F.C.P.)

Accepted by the Recl. Board:
Completed by Contract by C. of E.
Const. by Local Interests 203-248-250-285
No maint. is required. 204

Not Accepted

No capable of separate maint.

The Reclamation Board
State of California
1100 "O" Street
Sacramento 14, California

Gentlemen:

Reference is made to your letter of 2 July 1951 acknowledging that certain reaches of the levees of the Sacramento River Flood Control Project and the waterway bank contiguous to said levee reaches meet the requirements of the project as authorized prior to the Flood Control Act of 1944.

The levee reaches in question are located as follows:

a. Sherman Island levee of Three Mile Slough.

199 (1) State Highway Bridge to Sacramento River. 101

200 (2) From the State Highway Bridge, 1300 feet toward the San Joaquin River. 101

201 (3) From a point 3900 feet toward the San Joaquin River from the State Highway Bridge to a point 6900 feet toward the San Joaquin River from the State Highway Bridge. 101

202 (4) From a point 10,500 feet toward the San Joaquin River from the State Highway Bridge to the San Joaquin River. 101

203 b. Plug across Seven Mile Slough near Three Mile Slough. 102

204 c. Bramman Island levee of Seven Mile Slough and Three Mile Slough from the Plug across Seven Mile Slough southwesterly to Sacramento River. 102

Items 199 to 295

(13)

Letter No. 13

(13)

SPKKA 824.3(Sac.Riv.F.C.P.)
The Reclamation Board

d. Easterly levee of the Sacramento River.

Reach 19

205 (1) From a point 23,650 feet, measured along the Sherman Island levee, downstream from Three Mile Slough to a point 21,950 feet downstream from Three Mile Slough. 101

206 (2) From a point 14,850 feet, measured along the Sherman Island levee, downstream from Three Mile Slough to a point 7,700 feet downstream from Three Mile Slough. 101

207 (3) From a point 6,300 feet, measured along the Sherman Island levee, downstream from Three Mile Slough to a point 3,450 feet downstream from Three Mile Slough. 101

208 (4) From a point 3,300 feet, measured along the Sherman Island levee, downstream from Three Mile Slough to a point 700 feet downstream from Three Mile Slough. 101

2. 209 (5) From a point 500 feet, measured along the Sherman Island levee, downstream from Three Mile Slough to Three Mile Slough. 101

210 (6) Three Mile Slough to Mile 10.58. 102

211 (7) Mile 10.71 to Mile 13.1. 102

212 (8) Mile 13.59 to Mile 14.5 (Junction Point). 102

213 (9) Mile 14.5 (Junction Point) to Mile 15.0. 102

214 (10) Mile 15.1 to Mile 16.9. 102

215 (11) Mile 16.95 to Mile 17.5. Brannan 102

216 (12) Mile 17.6 to Mile 18.0. Andras 103

217 (13) Mile 18.15 to Mile 18.5. " 103

218 (14) Mile 18.5 to Mile 21.5. ✓ ○ " 103

219 (15) Mile 21.6 to Mile 26.3. ✓ ○ " 103

Reach 19

220 (16) Mile 26.4 to Georgiana Slough. ✓ ○ 103

221 (17) Mile 26.5 to Mile 27.55. ✓ ○ 111

222 (18) Mile 27.7 to Mile 28.5. 111

(13)

Letter No. 13

(13)

SPKKA 824.3(Sac.Riv.F.C.P.)
The Reclamation Board

d. Easterly levee of the Sacramento River. (cont'd)

223 (19) Mile 28.6 to Mile 28.9.
224 (20) Mile 29.1 to Mile 29.9.
225 (21) Mile 30.25 to Mile 30.55.
226 (22) Mile 30.75 to Mile 31.3.
227 (23) Mile 31.8 to Mile 32.2.
228 (24) Mile 32.4 to Mile 33.0.
229 (25) Mile 33.1 to Mile 34.45.
230 (26) Mile 34.55 to Mile 34.95.
231 (27) Mile 35.1 to Mile 35.38.
232 (28) Mile 35.38 to Mile 35.74.
233 (29) Mile 35.85 to Mile 36.35.
234 (30) Mile 36.5 to Mile 36.75.
235 (31) Mile 36.85 to Mile 37.15.
236 (32) Mile 37.3 to Mile 37.85.
237 (33) Mile 38.0 to Mile 38.3.
238 (34) Mile 38.5 to Mile 39.15.
239 (35) Mile 39.75 to Mile 39.9.
240 (36) Mile 40.0 to Mile 40.15.
241 (37) Mile 40.25 to Mile 40.35.
242 (38) Mile 40.5 to Mile 40.8.
243 (39) Mile 41.2 to Mile 41.6.
244 (40) Mile 41.75 to Mile 42.35.
245 (41) Mile 42.5 to Mile 43.05.

111

Reach 17

(13)

Letter No. 13

(13)

SPKKA 824.3(Sac.Riv.F.C.P.)
The Reclamation Board

d. Easterly levee of the Sacramento River. (cont'd)

Reach 17

246 (42) Mile 43.3 to Mile 43.55.
247 (43) Mile 43.85 to Mile 44.2. } 111
248 (44) Mile 44.5 to Mile 45.3. x D 115
249 (45) Mile 55.4 to Mile 55.5. 115
250 (46) Mile 56.1 to American River. x D 118.1
251 (47) West levee of Sutter Bypass 84.5 to Mile 87.5.
252 (48) Mile 91.4 to Mile 92.1.
253 (49) Mile 92.6 to Mile 92.7.
254 (50) Mile 92.9 to Mile 94.0. ✓ o
255 (51) Mile 96.6 to Mile 97.4.
256 (52) Mile 97.5 to Mile 97.7. - o
257 (53) Mile 97.7 to Mile 97.8.
258 (54) Mile 99.9 to Mile 102.5. ✓ o
259 (55) Mile 103.45 to Mile 103.7.
260 (56) Mile 103.8 to Mile 104.2.
261 (57) Mile 104.2 to Mile 104.7. - o
262 (58) Mile 104.7 to Mile 105.65.
263 (59) Mile 110.9 to Mile 111.5. ✓ o
264 (60) Mile 118.4 to Mile 118.6 (South End Tisdale Weir).
265 (61) At Tisdale Weir. ✓ o 156

Reach 14

129

266 e. Northerly levee of Miner Slough from a point 1,200 feet easterly from the easterly levee of Yolo Bypass to a point 4,400 feet easterly from the easterly levee of Yolo Bypass.

(13)

Letter No. 13

(13)

SPKKA 824.3(Sac.Riv.F.C.P.)
The Reclamation Board

f. Westerly levee of Sutter Slough. 113

Reach 36

267 (1) Mile 26.3 to Mile 26.7.

268 (2) Mile 27.05 to Mile 27.2.

269 (3) Mile 27.3 to Elkhorn Slough.

g. Westerly levee of Elkhorn Slough. 113

270 (1) Sutter Slough to Station "A" 431+00.

271 (2) Station "A" 429+50 to Station "A" 405+00.

272 (3) Station "A" 403+60 to Station "A" 344+75.

273 (4) Station "A" 340+75 to Station "A" 326+00.

274 (5) Station "A" 70+50 to Station "A" 60+50.

h. Westerly levee of the Sacramento River. 131

275 (1) Mile 119.2 to Mile 119.7.

276 (2) Mile 131.4 to Mile 131.8.

277 (3) Mile 133.1 to Mile 133.3.

Reach 3

278 (4) Mile 134.0 (Meridian Bridge) to Mile 134.3.

279 (5) Mile 134.3 to Mile 140.6.

280 (6) Mile 140.6 to Mile 141.3.

281 (7) Mile 141.3 to Mile 142.0.

282 (8) Mile 142.0 to Mile 142.3.

283 (9) Mile 142.3 to Mile 142.7 (Union Oil Co. Wharf).

AA 284 i. Easterly levee of Georgiana Slough from the S.P.R.R. sp- 103
stream 22,500 feet.

48 285 j. Northerly levee of the American River and the back levee
of Reclamation District No. 1000 from Jibboom Street Bridge to El Camino
Avenue. 125

(13)

Letter No. 13

(13)

SPKKA 824.3(Sac.Riv.F.C.P.)
The Reclamation Board

k. Northerly levee of Natomas Cut.

286 (1) From Sacramento River easterly to a point 1,550 feet easterly from the Garden Highway Bridge. 142

287 (2) From a point 2,550 feet easterly from the Garden Highway Bridge to a point 3,250 feet easterly from the Garden Highway Bridge. 142

Reach No. 30

288 l. Back levee of Reclamation District No. 2068 along the S.N.R.R. from the County Road northeasterly 7,200 feet to high ground. 109

289 m. Southerly levee of North Dry Creek near Wheatland from high ground to the W.P.R.R. Interceptor. 145

290 n. Easterly levee of the W. P. R. R. Interceptor from North Dry Creek southerly to Bear River. 145

291 o. Northerly levee of Bear River from the W. P. R. R. Interceptor easterly to South Dry Creek. 145

292 p. Northerly levee of South Dry Creek near Wheatland from Bear River easterly to high ground, including the Singh saddle closure levee. 145

293 q. Southerly levee of Bear River from the W.P.R.R. easterly to a point 5,400 feet easterly from Carlin Bridge. 141.1

294 r. Southerly levee of South Dry Creek near Wheatland from Bear River easterly 1.86 miles. 146

295 s. Northerly levee of Bear River from South Dry Creek easterly to a point 4,000 feet easterly from Carlin Bridge. 146

The records of this office show that your Board has accepted the levees and/or works covered by Items d.(14), d.(15), d.(16), d.(28), d.(50), d.(52), d.(54), d.(57), d.(59), d.(61), h.(3), h.(5), h.(7), h.(9), i., m., n., o., p., q., r., and s., above, as complete. Accordingly the waterway bank contiguous to said Items is hereby transferred to the State of California for maintenance and operation.

The levee covered by Items a. to c., inclusive, d.(1) to d.(13), inclusive, d.(17), to d.(27), inclusive, d.(29), to d.(49), inclusive, d.(51), d.(53), d.(55), d.(56), d.(58), d.(60), e., f., g., h.(1), h.(2), h.(4), h.(6), h.(8) and j. to l., inclusive, above, although complete has not been formally transferred as contemplated by the Project documents.

(13)

Letter No. 13 (13)

SPKKA 824.3(Sac.Riv.F.C.P.)
The Reclamation Board

Accordingly the levee covered by said Items, together with the waterway bank contiguous thereto, is hereby transferred to the State of California for maintenance and operation.

The maintenance work required under the provisions of the Sacramento River Flood Control Project shall be performed in accordance with existing Flood Control Regulations which 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. As provided under paragraph 208.10(10) of these regulations, a maintenance manual covering these works is in process of preparation and will be furnished your Board upon completion.

A copy of this letter is being transmitted to the State Engineer.

FOR THE DISTRICT ENGINEER:

Sincerely yours,

H. R. Reifsnyder
Lt. Colonel, Corps of Engineers
Executive Officer

Copy Furnished:
Office. Chief of Engrs.
So.Pac.Div. Engr.
State Engineer
Engr. Div. (2)
C. de Arrieta

(13)

TYPED COPY

REGISTERED MAIL
RETURN RECEIPT
REQUESTED

TYPED COPY

SPKKA 824.3(Sac. Riv. F.C.P.)

8 Dec 1951

The Reclamation Board
State of California
1100 "O" Street
Sacramento 14, California

Gentlemen:

Reference is made to your letter of 4 May 1951 acknowledging that certain reaches of the levees of the Sacramento River Flood Control Project and the waterway bank contiguous to said levee reaches meet the requirements of the project as authorized prior to the Flood Control Act of 1944.

The levee reaches in question are located as follows:

a. Westerly levee of the Sacramento River.

(51) (1) Mile 163.8 (Princeton) to Mile 155.3.

(52) (2) Mile 155.3 to Mile 154.3.

(53) (3) Mile 154.3 to Mile 152.1.

(54) (4) Mile 152.1 to Mile 151.3.

(55) (5) Mile 151.3 to Mile 146.4.

(56) (6) Mile 146.1 to Upstream outskirts of Colusa.

(57) (7) Upstream outskirts of Colusa to Mile 143.5 (Colusa Bridge), excepting 320 lin. ft. at Colusa Warehouse Mile 144.2.

b. Easterly levee of the Sacramento River.

(58) (1) Mile 153.3 (Terrill's Landing) to Mile 152.7 (South Line Bogg's Ranch).

SPKKA 824.3(Sac.Riv.F.C.P.)
The Reclamation Board

(59) (2) Mile 149.9 to Mile 149.7 (Graham's Ranch).

(60) (3) Mile 149.4 (Farnsworth Pump) to Mile 149.0 (Sailor Bend).

(61) (4) At Colusa Weir.

(62) (5) Mile 143.3 (Arnold's) to Mile 140.2.

(63) (6) Mile 139.3 to Mile 138.2 (Butte Slough Outfall Gates).

(64) (7) Mile 138.2 (Butte Slough Outfall Gates) to Mile 137.9 (Marty's Pump).

(65) (8) Mile 136.9 (Opposite Steidelmayer's Pump) to Mile 134.0 (Meridian Bridge).

(66) (9) Mile 134.0 (Meridian Bridge) to Mile 133.0.

(67) (10) Mile 133.2 to 132.3.

(68) (11) Mile 131.8 to Mile 125.9.

(69) (12) Mile 125.8 to Mile 123.1.

(70) (13) Mile 122.6 to Mile 122.0.

c. Westerly levee of the Sutter Bypass.

(71) (1) Butte Slough Outfall Gates to Tisdale Bypass.

(72) (2) Tisdale Bypass to a point 5.8 miles northerly from Sacramento River.

(73) (3) From a point 5.3 miles northerly from Sacramento River to Sacramento River.

(74) d. Northerly levee of Tisdale Bypass.

(75) e. Southerly levee of Tisdale Bypass.

(76) f. Easterly levee of the Sutter Bypass from high ground near Longbridge to Feather River.

The records of this office show that your Board has accepted the levees covered by Items a.(1), a.(3), a.(5), a.(6), b.(4), b.(5), b.(6), b.(7), b.(8), b.(9), b.(10), b.(11), b.(12), b.(13), c.(1), c.(2), d. and e., above as complete. Accordingly the waterway bank contiguous to

SPKKA 824.3(Sac.Riv. F.C.P.)
The Reclamation Board

said Items is hereby transferred to the State of California for maintenance and operation.

The levee covered by Items a.(2), a.(4), a.(7), b.(1), b.(2), b.(3), c.(3) and f. above, although complete, has not been formally transferred as contemplated by the Project documents. Accordingly the levee covered by said Items, together with the waterway bank contiguous thereto, is hereby transferred to the State of California for maintenance and operation.

The maintenance work required under the provisions of the Sacramento River Flood Control Project shall be performed in accordance with existing Flood Control Regulations which 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. As provided under paragraph 208.10(10) of these regulations, a maintenance manual covering these works is in process of preparation and will be furnished your Board upon completion.

A copy of this letter is being transmitted to the State Engineer.

FOR THE DISTRICT ENGINEER:

Sincerely yours,

H.R. REIFSNYDER
Lt. Colonel, Corps of Engineers
Executive Officer

Copy Furnished
Office, Chief of Engineers.
So.Pac.Div. Engineer
State Engineer.
Engr. Div. (2)
C. deArrieta

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STATE RECLAMATION BOARD LETTERHEAD

April 2, 1952

District Engineer
Sacramento District
Corps of Engineers, U. S. Army
P. O. Box 1739
Sacramento 8, California

Dear Sir:

1. Reference is made to your letter of 8 December 1951, File SPKKA 824.3 (Sac. Riv. F.C.P.), transferring to The Reclamation Board for operation and maintenance of levees and their contiguous waterway banks as follows:

a. ———————————————

b. ———————————————

c. Westerly levee of the Sutter Bypass.

1. ———————————————

2. and 3. - From Tisdale Bypass to Sacramento River.

d. ———————————————

e. South levee of Tisdale Bypass

f. ———————————————

———————————————

———————————————

2. There are no contiguous waterway banks other than the adjacent bypass areas under Items "c", "d", "e", and "f". On December 18, 1951, The Reclamation Board formally accepted the levees covered by these items together with their contiguous bypass areas subject to the provision that the portion of Item "c-1" now having waterward slopes of three horizontal to one vertical would

EXHIBIT F
Sheet 1 of 2

C
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be rectified by Federal construction. All other levees of the Sutter Bypass are now constructed to waterward slopes of four horizontal to one vertical. The Flood-Control Act of December 22, 1944, calls for construction of waterward slopes of four horizontal to one vertical on the Tisdale Bypass levees. The existing section of these levees is ample.

Yours very truly,

THE RECLAMATION BOARD

BY /s/ A. M. Barton
A. M. BARTON

Chief Engineer and General Manager

C
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P
Y

NOTE: Only items pertaining to Operation and Maintenance Manual No. 129 are included in the above copy.

EXHIBIT G

SUGGESTED SEMI-ANNUAL REPORT FORM

(1 May 19__)
(1 Nov 19__)

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

Dear Sir:

The semi-annual report for the period (1 May 19__ to 31 October 19__) (1 November 19__ to 30 April 19__) on the south levee of Tisdale Bypass from the east levee Sacramento River to the west levee of Sutter Bypass and west levee of Sutter Bypass downstream to the east levee of Sacramento River Unit No. 129 of the Sacramento River Flood Control Project, is as follows:

a. The physical condition of the protective works is indicate by the inspector's reports, copies of which are inclosed, and may be sum marized as follows:

(Superintendent's summary of conditons)

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 48.0 on staff gage on left bank of Sacramento River at north en of Tisdale Weir and 36.0 on staff gage on west levee of Sutter Bypass at Sacramento Slough at Reclamation District No. 1500 Pumping Plant) occurred on the following dates:

Dates	Maximum Elevation
_____	_____
_____	_____
_____	_____

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 in excess thereof (dates) - _____, it was necessary to organize and carry out flood operations as follows:

(See Maintenance Manual_____)

EXHIBIT "G"
Sheet 1 of 2

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

Action or prosecution for abatement of these encroachments or trespasses is summarized as follows: (or state none has been necessary).

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

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

e. The status of maintenance measures, indicated in the previous semiannual 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:

	Labor	Material	Equipment	Overhead	Total
1. Inspection					
2. Maintenance					
3. Flood fighting operations					
TOTAL					

Respectfully submitted,

_____
Superintendent of Works

EXHIBIT H

PROJECT COOPERATION AGREEMENT

PROJECT COOPERATION AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE STATE OF CALIFORNIA
FOR CONSTRUCTION OF THE
SEPARABLE ELEMENT, RECLAMATION DISTRICT 1500, OF THE
MID-VALLEY AREA - PHASE III LEVEE RECONSTRUCTION PROJECT, CALIFORNIA

THIS AGREEMENT is entered into this 12th day of September 1996, by and between the DEPARTMENT OF THE ARMY (hereinafter the "Government"), represented by the Assistant Secretary of the Army (Civil Works), and the State of California (hereinafter the "Non-Federal Sponsor"), represented by the President of The Reclamation Board

WITNESSETH, THAT:

WHEREAS, construction of the Mid-Valley Area - Phase III Levee Reconstruction Project at Reclamation District No. 1500, located about 30 miles northwest of Sacramento, California, at an area bounded to the north by the Tisdale Weir and Bypass, to the south and west by the Sacramento River from about River Mile 84 to River Mile 118, and to the east by the Sutter Bypass River Mile from about River Mile 56 to River Mile 76, was authorized by the Flood Control Acts of 1917, 1928, and 1941 as well as the Rivers and Harbors Act of 1937;

WHEREAS, the Government and the Non-Federal Sponsor desire to enter into a Project Cooperation Agreement for construction of the Mid-Valley Area - Phase III Levee Reconstruction Project at Reclamation District No. 1500, California (hereinafter the "Project", as defined in Article I.A. of this Agreement);

WHEREAS, Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, specifies the cost-sharing requirements applicable to the Project;

WHEREAS, Section 221 of the Flood Control Act of 1970, Public Law 91-611, as amended, and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, provide that the Secretary of the Army shall not commence construction of any water resources project, or separable element thereof, until each non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element;

WHEREAS, the Non-Federal Sponsor does not qualify for a reduction of the maximum non-Federal cost share pursuant to the guidelines that implement Section 103(m) of the Water Resources Development Act of 1986, Public Law 99-662, as amended;

WHEREAS, the Government and Non-Federal Sponsor have the full authority and capability to perform as hereinafter set forth and intend to cooperate in cost-sharing and financing of the construction of the Project in accordance with the terms of this Agreement.

NOW, THEREFORE, the Government and the Non-Federal Sponsor agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this Agreement:

A. The term "Project" shall mean the reconstruction of the existing Sacramento River Flood Control Project levees at Reclamation District No. 1500 and the establishment of a mitigation site(s) on approximately ten acres of land. The project consists of 6.28 miles of levee reconstruction at the following locations: Site 1 on the right bank of the Sutter Bypass from Levee Mile 17.9 to 18.6, Site 2 on the right bank of the Sutter Bypass from Levee Mile 13.75 - 14.75, Sites 2-1 through 2-10 on the right bank of the Sutter Bypass from Levee Mile 4.22 to 17.14, Site 3 on the right bank of the Sutter Bypass from Levee Mile 2.0 to 3.0, Site 4 on the left bank of the Sacramento River from River Mile 116.2 to 117.2, Site 5 on the left bank of the Sacramento River from River Mile 109.9 to 110.5, Site 6 on the left bank of the Sacramento River from River Mile 104.8 to 105.7, Site 7 on the left bank of the Sacramento River from River Mile 85.2 to 85.9. The above levee reconstruction in Reclamation District 1500 is as generally described in the Sacramento River Flood Control Project, California, Mid-Valley Area, Phase III, Design Memorandum, dated March 1996 and approved by the Chief of Engineers on 16 August , 1996.

B. The term "total project costs" shall mean all costs incurred by the Non-Federal Sponsor and the Government in accordance with the terms of this Agreement directly related to construction of the Project. Subject to the provisions of this Agreement, the term shall include, but is not necessarily limited to: continuing planning and engineering costs incurred after October 1, 1985; advanced engineering and design costs; preconstruction engineering and design costs; engineering and design costs during construction; the costs of investigations to identify the existence and extent of hazardous substances in accordance with Article XV.A. of this Agreement; costs of historic preservation activities in accordance with Article XVIII.A. of this Agreement; actual construction costs, including the costs of alteration, lowering, raising, or replacement and attendant removal of existing railroad bridges and approaches thereto; supervision and administration costs; costs of participation in the Project Coordination Team in accordance with Article V of this Agreement; costs of contract dispute settlements or awards; the value of lands, easements, rights-of-way, relocations, and suitable borrow and dredged or excavated material disposal areas for which the Government affords credit in accordance with Article IV of this Agreement; and costs of audit in accordance with Article X of this Agreement. The term does not include any costs for operation, maintenance, repair, replacement, or rehabilitation; any costs due to betterments; or any costs of dispute resolution under Article VII of this Agreement.

C. The term "financial obligation for construction" shall mean a financial obligation of the Government, other than an obligation pertaining to the provision of lands, easements, rights-of-way, relocations, and borrow and dredged or excavated material disposal areas, that results or would result in a cost that is or would be included in total project costs.

D. The term "non-Federal proportionate share" shall mean the ratio of the Non-Federal Sponsor's total cash contribution required in accordance with Articles II.D.1. and II.D.3. of this Agreement to total financial obligations for construction, as projected by the Government.

E. The term "period of construction" shall mean the time from the date the Government first notifies the Non-Federal Sponsor in writing, in accordance with Article VI.B. of this Agreement, of the scheduled date for issuance of the solicitation for the first construction contract to the date that the U.S. Army Engineer for the Sacramento District (hereinafter the "District Engineer") notifies the Non-Federal Sponsor in writing of the Government's determination that construction of the Project is complete.

F. The term "highway" shall mean any public highway, roadway, street, or way, including any bridge thereof.

G. The term "relocation" shall mean providing a functionally equivalent facility to the owner of an existing utility, cemetery, highway or other public facility, or railroad (excluding existing railroad bridges and approaches thereto) when such action is authorized in accordance with applicable legal principles of just compensation or as otherwise provided in the authorizing legislation for the Project or any report referenced therein. Providing a functionally equivalent facility may take the form of alteration, lowering, raising, or replacement and attendant removal of the affected facility or part thereof.

H. The term "fiscal year" shall mean one fiscal year of the Government. The Government fiscal year begins on October 1 and ends on September 30.

I. The term "functional portion of the Project" shall mean a portion of the Project that is suitable for tender to the Non-Federal Sponsor to operate and maintain in advance of completion of the entire Project. For a portion of the Project to be suitable for tender, the District Engineer must notify the Non-Federal Sponsor in writing of the Government's determination that the portion of the Project is complete and can function independently and for a useful purpose, although the balance of the Project is not complete.

J. The term "betterment" shall mean a change in the design and construction of an element of the Project resulting from the application of standards that the

Government determines exceed those that the Government would otherwise apply for accomplishing the design and construction of that element.

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND THE Non-Federal Sponsor

A. The Government, subject to receiving funds appropriated by the Congress of the United States (hereinafter, the "Congress") and using those funds and funds provided by the Non-Federal Sponsor, shall expeditiously construct the Project (including alteration, lowering, raising, or replacement and attendant removal of existing railroad bridges and approaches thereto), applying those procedures usually applied to Federal projects, pursuant to Federal laws, regulations, and policies.

1. The Government shall afford the Non-Federal Sponsor the opportunity to review and comment on the solicitations for all contracts, including relevant plans and specifications, prior to the Government's issuance of such solicitations. The Government shall not issue the solicitation for the first construction contract until the Non-Federal Sponsor has confirmed in writing its willingness to proceed with the Project. To the extent possible, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on all contract modifications, including change orders, prior to the issuance to the contractor of a Notice to Proceed. In any instance where providing the Non-Federal Sponsor with notification of a contract modification or change order is not possible prior to issuance of the Notice to Proceed, the Government shall provide such notification in writing at the earliest date possible. To the extent possible, the Government also shall afford the Non-Federal Sponsor the opportunity to review and comment on all contract claims prior to resolution thereof. The Government shall consider in good faith the comments of the Non-Federal Sponsor, but the contents of solicitations, award of contracts, execution of contract modifications, issuance of change orders, resolution of contract claims, and performance of all work on the Project (whether the work is performed under contract or by Government personnel), shall be exclusively within the control of the Government.

2. Throughout the period of construction, the District Engineer shall furnish the Non-Federal Sponsor with a copy of the Government's Written Notice of Acceptance of Completed Work for each contract for the Project.

3. Notwithstanding paragraph A.1. of this Article, if, upon the award of any contract for construction of the Project, cumulative financial obligations for construction would exceed $11,700,000, the Government and the Non-Federal Sponsor agree to defer award of that contract and all subsequent contracts for construction of the Project until such time as the Government and the Non-Federal Sponsor agree to proceed with further contract awards for the Project, but in no event shall the award of contracts be deferred for more than three years. Notwithstanding this general provision for deferral of contract awards, the Government, after consultation with the Non-Federal Sponsor, may award a contract or contracts after the

Assistant Secretary of the Army (Civil Works) makes a written determination that the award of such contract or contracts must proceed in order to comply with law or to protect life or property from imminent and substantial harm.

B. The Non-Federal Sponsor may request the Government to accomplish betterments. Such requests shall be in writing and shall describe the betterments requested to be accomplished. If the Government in its sole discretion elects to accomplish the requested betterments or any portion thereof, it shall so notify the Non-Federal Sponsor in a writing that sets forth any applicable terms and conditions, which must be consistent with this Agreement. In the event of conflict between such a writing and this Agreement, this Agreement shall control. The Non-Federal Sponsor shall be solely responsible for all costs due to the requested betterments and shall pay all such costs in accordance with Article VI.C. of this Agreement.

C. When the District Engineer determines that the entire Project is complete or that a portion of the Project has become a functional portion of the Project, the District Engineer shall so notify the Non-Federal Sponsor in writing and furnish the Non-Federal Sponsor with an Operation, Maintenance, Repair, Replacement, and Rehabilitation Manual (hereinafter the "OMRR&R Manual") and with copies of all of the Government's Written Notices of Acceptance of Completed Work for all contracts for the Project or the functional portion of the Project that have not been provided previously. Upon such notification, the Non-Federal Sponsor shall operate, maintain, repair, replace, and rehabilitate the entire Project or the functional portion of the Project in accordance with Article VIII of this Agreement.

D. The Non-Federal Sponsor shall contribute a minimum of 25 percent, but not to exceed 50 percent, of total project costs in accordance with the provisions of this paragraph.

1. The Non-Federal Sponsor shall provide a cash contribution equal to 5 percent of total project costs in accordance with Article VI.B. of this Agreement.

2. In accordance with Article III of this Agreement, the Non-Federal Sponsor shall provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas that the Government determines the Non-Federal Sponsor must provide for the construction, operation, and maintenance of the Project, and shall perform or ensure performance of all relocations that the Government determines to be necessary for the construction, operation, and maintenance of the Project.

3. If the Government projects that the value of the Non-Federal Sponsor's contributions under paragraphs D.1. and D.2. of this Article and Articles V, X, and XV.A. of this Agreement will be less than 25 percent of total project costs, the Non-Federal Sponsor shall provide an additional cash contribution, in accordance with

Article VI.B. of this Agreement, in the amount necessary to make the Non-Federal Sponsor's total contribution equal to 25 percent of total project costs.

4. If the Government determines that the value of the Non-Federal Sponsor's contributions provided under paragraphs D.2. and D.3. of this Article and Articles V, X, and XV.A. of this Agreement has exceeded 45 percent of total project costs, the Government, subject to the availability of funds, shall reimburse the Non-Federal Sponsor for any such value in excess of 45 percent of total project costs. After such a determination, the Government, in its sole discretion, may provide any remaining Project lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas and perform any remaining Project relocations on behalf of the Non-Federal Sponsor.

E. The Non-Federal Sponsor may request the Government to provide lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas or perform relocations on behalf of the Non-Federal Sponsor. Such requests shall be in writing and shall describe the services requested to be performed. If in its sole discretion the Government elects to perform the requested services or any portion thereof, it shall so notify the Non-Federal Sponsor in a writing that sets forth any applicable terms and conditions, which must be consistent with this Agreement. In the event of conflict between such a writing and this Agreement, this Agreement shall control. The Non-Federal Sponsor shall be solely responsible for all costs of the requested services and shall pay all such costs in accordance with Article VI.C of this Agreement. Notwithstanding the provision of lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas or performance of relocations by the Government, the Non-Federal Sponsor shall be responsible, as between the Government and the Non-Federal Sponsor, for the costs of cleanup and response in accordance with Article XV.C of this Agreement.

F. The Government shall perform a final accounting in accordance with Article VI.D. of this Agreement to determine the contributions provided by the Non-Federal Sponsor in accordance with paragraphs B., D., and E. of this Article and Articles V, X, and XV.A. of this Agreement and to determine whether the Non-Federal Sponsor has met its obligations under paragraphs B., D., and E. of this Article.

G. The Non-Federal Sponsor shall not use Federal funds to meet the Non-Federal Sponsor's share of total project costs under this Agreement unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

H. The Non-Federal Sponsor agrees to participate in and comply with applicable Federal floodplain management and flood insurance programs.

I. Not less than once each year the Non-Federal Sponsor shall inform affected interests of the extent of protection afforded by the Project.

J. The Non-Federal Sponsor shall publicize flood plain information in the area concerned and shall provide this information to zoning and other regulatory agencies for their use in preventing unwise future development in the flood plain and in adopting such regulations as may be necessary to prevent unwise future development and to ensue compatibility with protection levels provided by the Project.

ARTICLE III - LANDS, RELOCATIONS, DISPOSAL AREAS, AND PUBLIC LAW 91-646 COMPLIANCE

A. The Government, after consultation with the Non-Federal Sponsor, shall determine the lands, easements, and rights-of-way required for the construction, operation, and maintenance of the Project, including those required for relocations, borrow materials, and dredged or excavated material disposal. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of the lands, easements, and rights-of-way that the Government determines the Non-Federal Sponsor must provide, in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with acquisition of such lands, easements, and rights-of-way. Prior to the end of the period of construction, the Non-Federal Sponsor shall acquire all lands, easements, and rights-of-way set forth in such descriptions. Furthermore, prior to issuance of the solicitation for each construction contract, the Non-Federal Sponsor shall provide the Government with authorization for entry to all lands, easements, and rights-of-way the Government determines the Non-Federal Sponsor must provide for that contract. For so long as the Project remains authorized, the Non-Federal Sponsor shall ensure that lands, easements, and rights-of-way that the Government determines to be required for the operation and maintenance of the Project and that were provided by the Non-Federal Sponsor are retained in public ownership for uses compatible with the authorized purposes of the Project.

B. The Government, after consultation with the Non-Federal Sponsor, shall determine the improvements required on lands, easements, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the construction, operation, and maintenance of the Project. Such improvements may include, but are not necessarily limited to, retaining dikes, wasteweirs, bulkheads, embankments, monitoring features, stilling basins, and de-watering pumps and pipes. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions of such improvements in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with construction of such improvements. Prior to the end of the period of construction, the Non-Federal Sponsor

shall provide all improvements set forth in such descriptions. Furthermore, prior to issuance of the solicitation for each Government construction contract, the Non-Federal Sponsor shall prepare plans and specifications for all improvements the Government determines to be required for the proper disposal of dredged or excavated material under that contract, submit such plans and specifications to the Government for approval, and provide such improvements in accordance with the approved plans and specifications.

C. The Government, after consultation with the Non-Federal Sponsor, shall determine the relocations necessary for the construction, operation, and maintenance of the Project, including those necessary to enable the removal of borrow materials and the proper disposal of dredged or excavated material. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of such relocations in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with such relocations. Prior to the end of the period of construction, the Non-Federal Sponsor shall perform or ensure the performance of all relocations as set forth in such descriptions. Furthermore, prior to issuance of the solicitation for each Government construction contract, the Non-Federal Sponsor shall prepare or ensure the preparation of plans and specifications for, and perform or ensure the performance of, all relocations the Government determines to be necessary for that contract.

D. The Non-Federal Sponsor in a timely manner shall provide the Government with such documents as are sufficient to enable the Government to determine the value of any contribution provided pursuant to paragraphs A., B., or C. of this Article. Upon receipt of such documents the Government, in accordance with Article IV of this Agreement and in a timely manner, shall determine the value of such contribution, include such value in total project costs, and afford credit for such value toward the Non-Federal Sponsor's share of total project costs.

E. The Non-Federal Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements, and rights-of-way required for the construction, operation, and maintenance of the Project, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - CREDIT FOR VALUE OF LANDS, RELOCATIONS, AND DISPOSAL AREAS

A. The Non-Federal Sponsor shall receive credit toward its share of total project costs for the value of the lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas that the Non-Federal Sponsor must provide pursuant to Article III of this Agreement, and for the value of the relocations that the Non-Federal Sponsor must perform or for which it must ensure performance pursuant to Article III of this Agreement. However, the Non-Federal Sponsor shall not receive credit for the value of any lands, easements, rights-of-way, relocations, or borrow and dredged or excavated material disposal areas that have been provided previously as an item of cooperation for another Federal project. The Non-Federal Sponsor also shall not receive credit for the value of lands, easements, rights-of-way, relocations, or borrow and dredged or excavated material disposal areas to the extent that such items are provided using Federal funds unless the Federal granting agency verifies in writing that such credit is expressly authorized by statute.

B. For the sole purpose of affording credit in accordance with this Agreement, the value of lands, easements, and rights-of-way, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, shall be the fair market value of the real property interests, plus certain incidental costs of acquiring those interests, as determined in accordance with the provisions of this paragraph.

1. Date of Valuation. The fair market value of lands, easements, or rights-of-way owned by the Non-Federal Sponsor on the effective date of this Agreement shall be the fair market value of such real property interests as of the date the Non-Federal Sponsor provides the Government with authorization for entry thereto. The fair market value of lands, easements, or rights-of-way acquired by the Non-Federal Sponsor after the effective date of this Agreement shall be the fair market value of such real property interests at the time the interests are acquired.

2. General Valuation Procedure. Except as provided in paragraph B.3. of this Article, the fair market value of lands, easements, or rights-of-way shall be determined in accordance with paragraph B.2.a. of this Article, unless thereafter a different amount is determined to represent fair market value in accordance with paragraph B.2.b. of this Article.

a. The Non-Federal Sponsor shall obtain, for each real property interest, an appraisal that is prepared by a qualified appraiser who is acceptable to the Non-Federal Sponsor and the Government. The appraisal must be prepared in accordance with the applicable rules of just compensation, as specified by the Government. The fair market value shall be the amount set forth in the Non-Federal Sponsor's appraisal, if such appraisal is approved by the Government. In the event the Government does not approve the Non-Federal Sponsor's appraisal, the Non-Federal Sponsor may obtain a second appraisal, and the fair market value shall be the amount set forth in the Non-Federal Sponsor's second appraisal, if such appraisal is approved by the Government. In the event the Government does not approve the Non-Federal

Sponsor's second appraisal, or the Non-Federal Sponsor chooses not to obtain a second appraisal, the Government shall obtain an appraisal, and the fair market value shall be the amount set forth in the Government's appraisal, if such appraisal is approved by the Non-Federal Sponsor. In the event the Non-Federal Sponsor does not approve the Government's appraisal, the Government, after consultation with the Non-Federal Sponsor, shall consider the Government's and the Non-Federal Sponsor's appraisals and determine an amount based thereon, which shall be deemed to be the fair market value.

b. Where the amount paid or proposed to be paid by the Non-Federal Sponsor for the real property interest exceeds the amount determined pursuant to paragraph B.2.a. of this Article, the Government, at the request of the Non-Federal Sponsor, shall consider all factors relevant to determining fair market value and, in its sole discretion, after consultation with the Non-Federal Sponsor, may approve in writing an amount greater than the amount determined pursuant to paragraph B.2.a. of this Article, but not to exceed the amount actually paid or proposed to be paid. If the Government approves such an amount, the fair market value shall be the lesser of the approved amount or the amount paid by the Non-Federal Sponsor, but no less than the amount determined pursuant to paragraph B.2.a. of this Article.

3. Eminent Domain Valuation Procedure. For lands, easements, or rights-of-way acquired by eminent domain proceedings instituted after the effective date of this Agreement, the Non-Federal Sponsor shall, prior to instituting such proceedings, submit to the Government notification in writing of its intent to institute such proceedings and an appraisal of the specific real property interests to be acquired in such proceedings. The Government shall have 60 days after receipt of such a notice and appraisal within which to review the appraisal, if not previously approved by the Government in writing.

a. If the Government previously has approved the appraisal in writing, or if the Government provides written approval of, or takes no action on, the appraisal within such 60-day period, the Non-Federal Sponsor shall use the amount set forth in such appraisal as the estimate of just compensation for the purpose of instituting the eminent domain proceeding.

b. If the Government provides written disapproval of the appraisal, including the reasons for disapproval, within such 60-day period, the Government and the Non-Federal Sponsor shall consult in good faith to promptly resolve the issues or areas of disagreement that are identified in the Government's written disapproval. If, after such good faith consultation, the Government and the Non-Federal Sponsor agree as to an appropriate amount, then the Non-Federal Sponsor shall use that amount as the estimate of just compensation for the purpose of instituting the eminent domain proceeding. If, after such good faith consultation, the Government and the Non-Federal Sponsor cannot agree as to an appropriate amount, then the Non-Federal

Sponsor may use the amount set forth in its appraisal as the estimate of just compensation for the purpose of instituting the eminent domain proceeding.

c. For lands, easements, or rights-of-way acquired by eminent domain proceedings instituted in accordance with sub-paragraph B.3. of this Article, fair market value shall be either the amount of the court award for the real property interests taken, to the extent the Government determined such interests are required for the construction, operation, and maintenance of the Project, or the amount of any stipulated settlement or portion thereof that the Government approves in writing.

4. Incidental Costs. For lands, easements, or rights-of-way acquired by the Non-Federal Sponsor within a five-year period preceding the effective date of this Agreement, or at any time after the effective date of this Agreement, the value of the interest shall include the documented incidental costs of acquiring the interest, as determined by the Government, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs. Such incidental costs shall include, but not necessarily be limited to, closing and title costs, appraisal costs, survey costs, attorney's fees, plat maps, and mapping costs, as well as the actual amounts expended for payment of any Public Law 91-646 relocation assistance benefits provided in accordance with Article III.E. of this Agreement.

C. After consultation with the Non-Federal Sponsor, the Government shall determine the value of relocations in accordance with the provisions of this paragraph.

1. For a relocation other than a highway, the value shall be only that portion of relocation costs that the Government determines is necessary to provide a functionally equivalent facility, reduced by depreciation, as applicable, and by the salvage value of any removed items.

2. For a relocation of a highway, the value shall be only that portion of relocation costs that would be necessary to accomplish the relocation in accordance with the design standard that the State of California would apply under similar conditions of geography and traffic load, reduced by the salvage value of any removed items.

3. Relocation costs shall include, but not necessarily be limited to, actual costs of performing the relocation; planning, engineering and design costs; supervision and administration costs; and documented incidental costs associated with performance of the relocation, but shall not include any costs due to betterments, as determined by the Government, nor any additional cost of using new material when suitable used material is available. Relocation costs shall be subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs.

D. The value of the improvements made to lands, easements, and rights-of-way for the proper disposal of dredged or excavated material shall be the costs of the improvements, as determined by the Government, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs. Such costs shall include, but not necessarily be limited to, actual costs of providing the improvements; planning, engineering and design costs; supervision and administration costs; and documented incidental costs associated with providing the improvements, but shall not include any costs due to betterments, as determined by the Government.

ARTICLE V - PROJECT COORDINATION TEAM

A. To provide for consistent and effective communication, the Non-Federal Sponsor and the Government, not later than 30 days after the effective date of this Agreement, shall appoint named senior representatives to a Project Coordination Team. Thereafter, the Project Coordination Team shall meet regularly until the end of the period of construction. The Government's Project Manager and a counterpart named by the Non-Federal Sponsor shall co-chair the Project Coordination Team.

B. The Government's Project Manager and the Non-Federal Sponsor's counterpart shall keep the Project Coordination Team informed of the progress of construction and of significant pending issues and actions, and shall seek the views of the Project Coordination Team on matters that the Project Coordination Team generally oversees.

C. Until the end of the period of construction, the Project Coordination Team shall generally oversee the Project, including issues related to design; plans and specifications; scheduling; real property and relocation requirements; real property acquisition; contract awards and modifications; contract costs; the Government's cost projections; final inspection of the entire Project or functional portions of the Project; preparation of the proposed OMRR&R Manual; anticipated requirements and needed capabilities for performance of operation, maintenance, repair, replacement, and rehabilitation of the Project; and other related matters. This oversight shall be consistent with a project management plan developed by the Government after consultation with the Non-Federal Sponsor.

D. The Project Coordination Team may make recommendations that it deems warranted to the District Engineer on matters that the Project Coordination Team generally oversees, including suggestions to avoid potential sources of dispute. The Government in good faith shall consider the recommendations of the Project Coordination Team. The Government, having the legal authority and responsibility for construction of the Project, has the discretion to accept, reject, or modify the Project Coordination Team's recommendations.

E. The costs of participation in the Project Coordination Team shall be included in total project costs and cost shared in accordance with the provisions of this Agreement.

ARTICLE VI - METHOD OF PAYMENT

A. The Government shall maintain current records of contributions provided by the parties and current projections of total project costs and costs due to betterments. By April 1 of each year and at least quarterly thereafter, the Government shall provide the Non-Federal Sponsor with a report setting forth all contributions provided to date and the current projections of total project costs, of total costs due to betterments, of the components of total project costs, of each party's share of total project costs, of the Non-Federal Sponsor's total cash contributions required in accordance with Articles II.B., II.D., and II.E. of this Agreement, of the Non-Federal Sponsor's proportionate share, and of the funds the Government projects to be required from the Non-Federal Sponsor for the upcoming fiscal year. On the effective date of this Agreement, total project costs are projected to be $10,600,000, and the Non-Federal Sponsor's cash contribution required under Article II.D. of this Agreement is projected to be $1,620,000. Such amounts are estimates subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

B. The Non-Federal Sponsor shall provide the cash contribution required under Articles II.D.1. and II.D.3. of this Agreement in accordance with the provisions of this paragraph.

1. Not less than 60 calendar days prior to the scheduled date for issuance of the solicitation for the first construction contract, the Government shall notify the Non-Federal Sponsor in writing of such scheduled date and the funds the Government determines to be required from the Non-Federal Sponsor to meet the non-Federal proportionate share of projected financial obligations for construction through the first fiscal year of construction, including the non-Federal proportionate share of financial obligations for construction incurred prior to the commencement of the period of construction. Not later than such scheduled date, the Non-Federal Sponsor shall provide the Government with the full amount of the required funds by delivering a check payable to "FAO, USAED, Sacramento District" to the District Engineer.

2. For the second and subsequent fiscal years of construction, the Government shall notify the Non-Federal Sponsor in writing, no later than 60 calendar days prior to the beginning of that fiscal year, of the funds the Government determines to be required from the Non-Federal Sponsor to meet the non-Federal proportionate share of projected financial obligations for construction for that fiscal year. No later than 30 calendar days prior to the beginning of the fiscal year, the Non-Federal Sponsor shall make the full amount of the required funds for that fiscal year available to

the Government through the funding mechanism specified in Article VI.B.1. of this Agreement.

3. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover: (a) the non-Federal proportionate share of financial obligations for construction incurred prior to the commencement of the period of construction; and (b) the non-Federal proportionate share of financial obligations for construction as they are incurred during the period of construction.

4. If at any time during the period of construction the Government determines that additional funds will be needed from the Non-Federal Sponsor to cover the non-Federal proportionate share of projected financial obligations for construction for the current fiscal year, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required, and the Non-Federal Sponsor, no later than 60 calendar days from receipt of such notice, shall make the additional required funds available through the payment mechanism specified in Article VI.B.1. of this Agreement.

C. In advance of the Government incurring any financial obligation associated with additional work under Article II.B. or II.E. of this Agreement, the Non-Federal Sponsor shall provide the Government with the full amount of the funds required to pay for such additional work by delivering a check payable to "FAO, USAED, Sacramento District" to the District Engineer. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover the Government's financial obligations for such additional work as they are incurred. In the event the Government determines that the Non-Federal Sponsor must provide additional funds to meet its cash contribution, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required. Within 30 calendar days thereafter, the Non-Federal Sponsor shall provide the Government with a check for the full amount of the additional required funds.

D. Upon completion of the Project or termination of this Agreement, and upon resolution of all relevant claims and appeals, the Government shall conduct a final accounting and furnish the Non-Federal Sponsor with the results of the final accounting. The final accounting shall determine total project costs, each party's contribution provided thereto, and each party's required share thereof. The final accounting also shall determine costs due to betterments and the Non-Federal Sponsor's cash contribution provided pursuant to Article II.B. of this Agreement.

1. In the event the final accounting shows that the total contribution provided by the Non-Federal Sponsor is less than its required share of total project costs plus costs due to any betterments provided in accordance with Article II.B. of this Agreement, the Non-Federal Sponsor shall, no later than 90 calendar days after receipt

of written notice, make a cash payment to the Government of whatever sum is required to meet the Non-Federal Sponsor's required share of total project costs plus costs due to any betterments provided in accordance with Article II.B. of this Agreement.

2. In the event the final accounting shows that the total contribution provided by the Non-Federal Sponsor exceeds its required share of total project costs plus costs due to any betterments provided in accordance with Article II.B. of this Agreement, the Government shall, subject to the availability of funds, refund the excess to the Non-Federal Sponsor no later than 90 calendar days after the final accounting is complete; however, the Non-Federal Sponsor shall not be entitled to any refund of the 5 percent cash contribution required pursuant to Article II.D.1. of this Agreement. In the event existing funds are not available to refund the excess to the Non-Federal Sponsor, the Government shall seek such appropriations as are necessary to make the refund.

ARTICLE VII - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to both parties. The parties shall each pay 50 percent of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VIII - OPERATION, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION (OMRR&R)

A. Upon notification in accordance with Article II.C. of this Agreement and for so long as the Project remains authorized, the Non-Federal Sponsor shall operate, maintain, repair, replace, and rehabilitate the entire Project or the functional portion of the Project, at no cost to the Government, in a manner compatible with the Project's authorized purposes and in accordance with applicable Federal and State laws as provided in Article XI of this Agreement and specific directions prescribed by the Government in the OMRR&R Manual and any subsequent amendments thereto.

B. The Non-Federal Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon property that the Non-Federal Sponsor owns or controls for access to the Project for the purpose of inspection and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project. If an inspection shows that the Non-Federal Sponsor for any reason is failing to perform its obligations under this Agreement, the Government shall send a written notice describing the non-performance to the Non-Federal

Sponsor. If, after 30 calendar days from receipt of notice, the Non-Federal Sponsor continues to fail to perform, then the Government shall have the right to enter, at reasonable times and in a reasonable manner, upon property that the Non-Federal Sponsor owns or controls for access to the Project for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Government shall operate to relieve the Non-Federal Sponsor of responsibility to meet the Non-Federal Sponsor's obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to ensure faithful performance pursuant to this Agreement.

ARTICLE IX - INDEMNIFICATION

The Non-Federal Sponsor shall hold and save the Government free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the Project and any Project-related betterments, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE X - MAINTENANCE OF RECORDS AND AUDIT

A. Not later than 60 calendar days after the effective date of this Agreement, the Government and the Non-Federal Sponsor shall develop procedures for keeping books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to this Agreement. These procedures shall incorporate, and apply as appropriate, the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 C.F.R. Section 33.20. The Government and the Non-Federal Sponsor shall maintain such books, records, documents, and other evidence in accordance with these procedures and for a minimum of three years after the period of construction and resolution of all relevant claims arising therefrom. To the extent permitted under applicable Federal laws and regulations, the Government and the Non-Federal Sponsor shall each allow the other to inspect such books, documents, records, and other evidence.

B. Pursuant to 32 C.F.R. Section 33.26, the Non-Federal Sponsor is responsible for complying with the Single Audit Act of 1984, 31 U.S.C. Sections 7501-7507, as implemented by Office of Management and Budget (OMB) Circular No. A-128 and Department of Defense Directive 7600.10. Upon request of the Non-Federal Sponsor and to the extent permitted under applicable Federal laws and regulations, the Government shall provide to the Non-Federal Sponsor and independent auditors any information necessary to enable an audit of the Non-Federal Sponsor's activities under this Agreement. The costs of any non-Federal audits performed in accordance with this paragraph shall be allocated in accordance with the provisions of OMB Circulars A-87

and A-128, and such costs as are allocated to the Project shall be included in total project costs and cost shared in accordance with the provisions of this Agreement.

C. In accordance with 31 U.S.C. Section 7503, the Government may conduct audits in addition to any audit that the Non-Federal Sponsor is required to conduct under the Single Audit Act. Any such Government audits shall be conducted in accordance with Government Auditing Standards and the cost principles in OMB Circular No. A-87 and other applicable cost principles and regulations. The costs of Government audits performed in accordance with this paragraph shall be included in total project costs and cost shared in accordance with the provisions of this Agreement.

ARTICLE XI - FEDERAL AND STATE LAWS

In the exercise of their respective rights and obligations under this Agreement, the Non-Federal Sponsor and the Government agree to comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulations 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army".

ARTICLE XII - RELATIONSHIP OF PARTIES

A. In the exercise of their respective rights and obligations under this Agreement, the Government and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other.

B. In the exercise of its rights and obligations under this Agreement, neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights such other party may have to seek relief or redress against such contractor either pursuant to any cause of action that such other party may have or for violation of any law.

ARTICLE XIII - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, nor any resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE XIV - TERMINATION OR SUSPENSION

A. If at any time the Non-Federal Sponsor fails to fulfill its obligations under Article II.B., II.D., II.E., VI, or XVIII.C. of this Agreement, the Assistant Secretary of the Army (Civil Works) shall terminate this Agreement or suspend future performance

under this Agreement unless he determines that continuation of work on the Project is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with the Project.

B. If the Government fails to receive annual appropriations in amounts sufficient to meet Project expenditures for the then-current or upcoming fiscal year, the Government shall so notify the Non-Federal Sponsor in writing, and 60 calendar days thereafter either party may elect without penalty to terminate this Agreement or to suspend future performance under this Agreement. In the event that either party elects to suspend future performance under this Agreement pursuant to this paragraph, such suspension shall remain in effect until such time as the Government receives sufficient appropriations or until either the Government or the Non-Federal Sponsor elects to terminate this Agreement.

C. In the event that either party elects to terminate this Agreement pursuant to this Article or Article XV of this Agreement, both parties shall conclude their activities relating to the Project and proceed to a final accounting in accordance with Article VI.D. of this Agreement.

D. Any termination of this Agreement or suspension of future performance under this Agreement in accordance with this Article or Article XV of this Agreement shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13-week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3-month period if the period of delinquency exceeds 3 months.

ARTICLE XV - HAZARDOUS SUBSTANCES

A. After execution of this Agreement and upon direction by the District Engineer, the Non-Federal Sponsor shall perform, or cause to be performed, any investigations for hazardous substances that the Government or the Non-Federal Sponsor determines to be necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (hereinafter "CERCLA"), 42 U.S.C. Sections 9601-9675, that may exist in, on, or under lands, easements, and rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for the construction, operation, and maintenance of the Project. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigations unless the District Engineer provides the Non-Federal Sponsor with prior specific written direction, in which case the Non-Federal Sponsor shall perform such investigations in accordance with such written direction. All actual costs incurred by the Non-Federal Sponsor for such investigations for hazardous substances shall be

included in total project costs and cost shared in accordance with the provisions of this Agreement, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs.

B. In the event it is discovered through any investigation for hazardous substances or other means that hazardous substances regulated under CERCLA exist in, on, or under any lands, easements, or rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for the construction, operation, and maintenance of the Project, the Non-Federal Sponsor and the Government shall provide prompt written notice to each other, and the Non-Federal Sponsor shall not proceed with the acquisition of the real property interests until both parties agree that the Non-Federal Sponsor should proceed.

C. The Government and the Non-Federal Sponsor shall determine whether to initiate construction of the Project, or, if already in construction, whether to continue with work on the Project, suspend future performance under this Agreement, or terminate this Agreement for the convenience of the Government, in any case where hazardous substances regulated under CERCLA are found to exist in, on, or under any lands, easements, or rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for the construction, operation, and maintenance of the Project. Should the Government and the Non-Federal Sponsor determine to initiate or continue with construction after considering any liability that may arise under CERCLA, the Non-Federal Sponsor shall be responsible, as between the Government and the Non-Federal Sponsor, for the costs of clean-up and response, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of total project costs. In the event the Non-Federal Sponsor fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge the Non-Federal Sponsor's responsibilities under this paragraph upon direction by the Government, the Government may, in its sole discretion, either terminate this Agreement for the convenience of the Government, suspend future performance under this Agreement, or continue work on the Project.

D. The Non-Federal Sponsor and the Government shall consult with each other in accordance with Article V of this Agreement in an effort to ensure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph C. of this Article shall not relieve any third party from any liability that may arise under CERCLA.

E. As between the Government and the Non-Federal Sponsor, the Non-Federal Sponsor shall be considered the operator of the Project for purposes of CERCLA liability. To the maximum extent practicable, the Non-Federal Sponsor shall operate, maintain, repair, replace, and rehabilitate the Project in a manner that will not cause liability to arise under CERCLA.

ARTICLE XVI - NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and either delivered personally or by telegram or mailed by first-class, registered, or certified mail, as follows:

If to the Non-Federal Sponsor:

The Reclamation Board
1416 Ninth Street, Room 1148
Sacramento, California 95814-5594

If to the Government:

US Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

C. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at the earlier of such time as it is actually received or seven calendar days after it is mailed.

ARTICLE XVII - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE XVIII - HISTORIC PRESERVATION

A. The costs of identification, survey and evaluation of historic properties shall be included in total project costs and cost shared in accordance with the provisions of this Agreement.

B. As specified in Section 7(a) of Public Law 93-291 (16 U.S.C. Section 469c(a)), the costs of mitigation and data recovery activities associated with historic preservation shall be borne entirely by the Government and shall not be included in total project costs, up to the statutory limit of one percent of the total amount authorized to be appropriated for the Project.

C. The Government shall not incur costs for mitigation and data recovery that exceed the statutory one percent limit specified in paragraph B. of this Article unless and until the Assistant Secretary of the Army (Civil Works) has waived that limit in accordance with Section 208(3) of Public Law 96-515 (16 U.S.C. Section 469c-2(3)). Any costs of mitigation and data recovery that exceed the one percent limit shall not be included in total project costs but shall be cost shared between the Non-Federal Sponsor and the Government consistent with the minimum non-Federal cost sharing requirements for the underlying flood control purpose, as follows: 25 percent borne by the Non-Federal Sponsor, and 75 percent borne by the Government.

ARTICLE XX - OBLIGATIONS OF FUTURE APPROPRIATIONS

Nothing herein shall constitute, nor be deemed to constitute, an obligation of future appropriations by the legislature of the State of California.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the Assistant Secretary of the Army (Civil Works).

THE DEPARTMENT OF THE ARMY

BY: _____
H. Martin Lancaster
Assistant Secretary of the Army
(Civil Works)

DATE: 12 SEP 1996

THE RECLAMATION BOARD OF THE STATE OF CALIFORNIA

BY: _____
Michael W. Stearns
President

DATE: SEP 12 1996

CERTIFICATE OF AUTHORITY

I, Ward Tabor, do hereby certify that I am the principal legal officer of The Reclamation Board of the State of California (The Reclamation Board), that The Reclamation Board is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and The Reclamation Board in connection with the Mid-Valley Area Levee Reconstruction project, and to pay damages in accordance with the terms of this Agreement, if necessary, in the event of the failure to perform, as required by Section 221 of Public Law 91-611 (42 U.S.C. Section 1962d-5b), and that the persons who have executed this Agreement on behalf of The Reclamation Board have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this 17 day of September 1996.

Ward Tabor, Counsel
The Reclamation Board

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Michael W. Stearns, President
The Reclamation Board of the State of California

DATE: SEP 1 2 1996

EXHIBIT I

RD 1500 Relief Well Baseline Test Results

CESPK-ED-GG **DATE: 27 June 2007**

SUBJECT: Estimated Aquifer Transmissivities, Recently Installed Relief Wells, PL 84-99, RD 1500, Marysville, CA.

On 26 June 2007, the pumping test data collected by Sierra Testing Laboratories for relief wells installed at RD 1500 were reviewed and values for aquifer transmissivity estimated. The estimates obtained from these pumping tests are qualified on the following points. First, these pumping tests were short term, only two hours, and therefore are only useful in roughly approximating the transmissivity values of the aquifers. Second, water levels were drawn down in the pumped well below the top of the screens. This results in significantly increased well and aquifer inefficiencies, creating an increased drawdown yielding incorrect transmissivity estimate.

Finally, the estimates provided by Sierra Testing Laboratories were based upon a conversion of well specific capacity into a transmissivity value. The estimate of transmissivity yielded by this method is imperfect, and presumed to be less realistic than the estimates that can be made from time/drawdown or distance/drawdown tests, if those data are available. This solution method includes several assumptions that should limit the confidence placed in its estimates:

a) The tested aquifer is confined, non-leaky, homogeneous and isotropic;
b) The storage coefficient of the aquifer is known;
c) The well loss is known;
d) The effective aquifer thickness is known.

Additionally, Sierra Testing used a coefficient for an unconfined aquifer for the transmissivity estimate. Coefficient of storage (storativity) estimations (see attached figures) from observation well data, have values that are less than 0.005 which should define the aquifer as semi confined to confined, and the appropriate conversions coefficient used.

In general, recovery data is preferred over data collected during pumping because of the influence of efficiency issues mentioned earlier. However, data from an observation well is more preferred because they are not impacted by well and aquifer efficiency issued related to the pumping well, thus measuring the response of the aquifer more accurately. Also depending upon their distance from the pumped well, they can provide a more general estimate of aquifer properties. Transmissivities estimated from data collected from the well acting as an observation well are consistent and should be considered the transmissivity for the aquifer.

For the Cooper-Jacob solution to be valid for use with observation well data, the value of u must be < 0.05. For all evaluated observation well data sets, the estimated u value met the criterion. This is annotated on the attached data calculation sheets.

Based upon the analysis of the pumping test data, transmissivities ranged from approximately 2,500 to 6,500 ft2/day at the two sites. These values are generally consistent with deposits encountered during the drilling of the relief well pilot holes. The exception is at RW-1N, which is much lower than the other estimated values. This is likely due to its location on the margin of an apparent buried stream channel resulting in much finer aquifer material and laterally restricted aquifer. The shallowness and thinness of the aquifer at RD1500 resulted in water being pulled into the screened section of the relief well. Under high water conditions, the artesian

nature of these wells should function as designed because the screened sections will remain fully submerged, reducing well efficiency factors caused by pumping.

The following table presents the estimated transmissivities for the aquifer based upon the pumping test data. Additional analysis was accomplished using Excel spreadsheets designed for the analysis of aquifer test data (USGS, 2002). Data sheets showing the analysis of the test results are attached.

Table 1 – Aquifer Parameters and Pumping Test Information, RD1500

Well Identification	Pumping Rate (GPM)*	Max Observed Drawdown (Ft)*	Specific Capacity (SC) (ft3/day)/ft*	Transmissivity Pumping (ft2/day) (pumped well)	Transmissivity Recovery (ft2/day) (pumped well)	Transmissivity Pumping (ft2/day) (observation well)	Transmissivity Recovery (ft2/day) (observation well)	Transmissivity from SC (ft2/day)
RW-1N	3.7 [a]	8.40	85 [d]	130	24	ND	ND	118 [d]
RW-2 [b]	11 [a]	10.40	204 [d]	360	620	6,471	ND	283 [d]
RW-3 [b]	33 [a]	7.60	838 [d]	1,200	2,900	5,546	3,000	1,161 [d]
RW5 [c]	30	10.80	534.8	1,300	820	3,429	2,600	743 [e]
RW-7 [c]	24 [a]	4.60	1,019 [d]	1,300	1,100	3,782	4,200	1,395 [d]

Notes:

* - Sierra Testing Data except where noted.

[a] – Field notes indicate pumping rate different from what was listed on Sierra Testing summary sheet.

ND – No data

[b] – Wells RW-2 and RW-3 were both monitored while one was being pumped and vice versa.

[c] – Wells RW-5 and RW-7 were both monitored while one was being pumped and vice versa.

[d] - Based upon pumping rate listed rather than on Sierra Testing summary sheet, see note a.

[e] – Estimate based upon corrected conversion coefficient for confined aquifers.

REFERENCE

USGS, 2002, Open File Report 02-197, Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data, Carson City, Nevada

WELL ID: RW-1N

Local ID: RD1500
Date: 2/14/2007
Time: 10:00

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	13 Feet
Depths to:	
water level (DTW)	8.75 Feet
Top of Aquifer	15 Feet
Base of Aquifer	28 Feet
Annular Fill:	
across screen -- Fine Sand	
above screen -- Cement	
Aquifer Material -- Fine Sand	
FLOW RATE	3.7 GPM

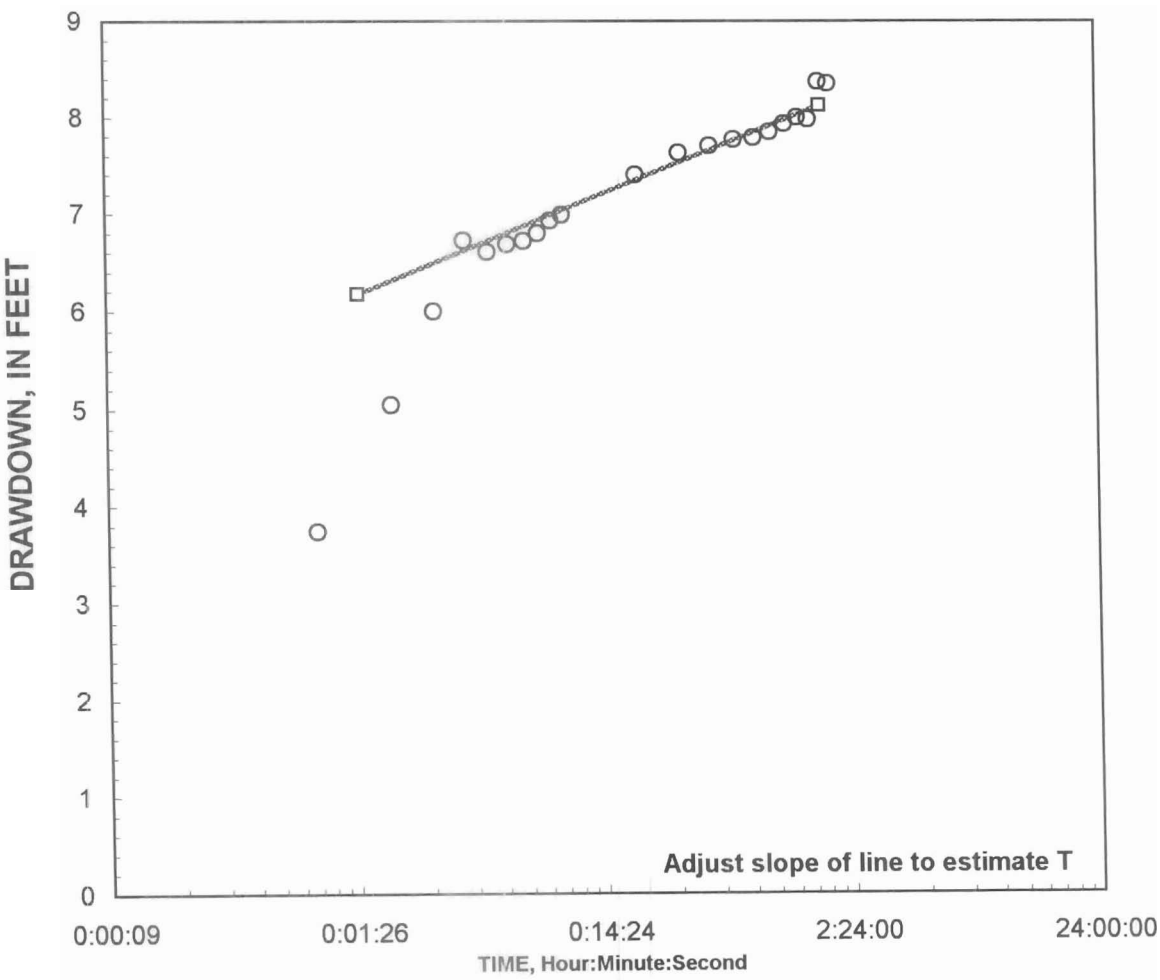
COMPUTED

Aquifer thickness = **13 Feet**

Slope = 1.035219 Feet/log10

Input is consistent.

K =	9.7 Feet/Day
T =	130 Feet2/Day



REMARKS:

Cooper-Jacob analysis of single-well aquifer test

RD15003 Relief Well

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	4/19/00 10:00:00	8.75
2	4/19/00 10:01:00	12.50
3	4/19/00 10:02:00	13.80
4	4/19/00 10:03:00	14.75
5	4/19/00 10:04:00	15.48
6	4/19/00 10:05:00	15.36
7	4/19/00 10:06:00	15.44
8	4/19/00 10:07:00	15.47
9	4/19/00 10:08:00	15.55
10	4/19/00 10:09:00	15.68
11	4/19/00 10:10:00	15.74
12	4/19/00 10:20:00	16.15
13	4/19/00 10:30:00	16.38
14	4/19/00 10:40:00	16.45
15	4/19/00 10:50:00	16.52
16	4/19/00 11:00:00	16.54
17	4/19/00 11:10:00	16.60
18	4/19/00 11:20:00	16.68
19	4/19/00 11:30:00	16.75
20	4/19/00 11:40:00	16.73
21	4/19/00 11:50:00	17.12
22	4/19/00 12:00:00	17.10

WELL ID: RW-1N

Local ID: RD 1500
Date: 2/14/2007
Time: 10:00

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	5 Feet
Depths to:	
water level (DTW)	8.55 Feet
Top of Aquifer	15 Feet
Base of Aquifer	28 Feet
Annular Fill:	
across screen --	Medium Sand
above screen --	Cement
Aquifer Material --	Surficial Aquifer, centra
FLOW RATE	3.6 GPM

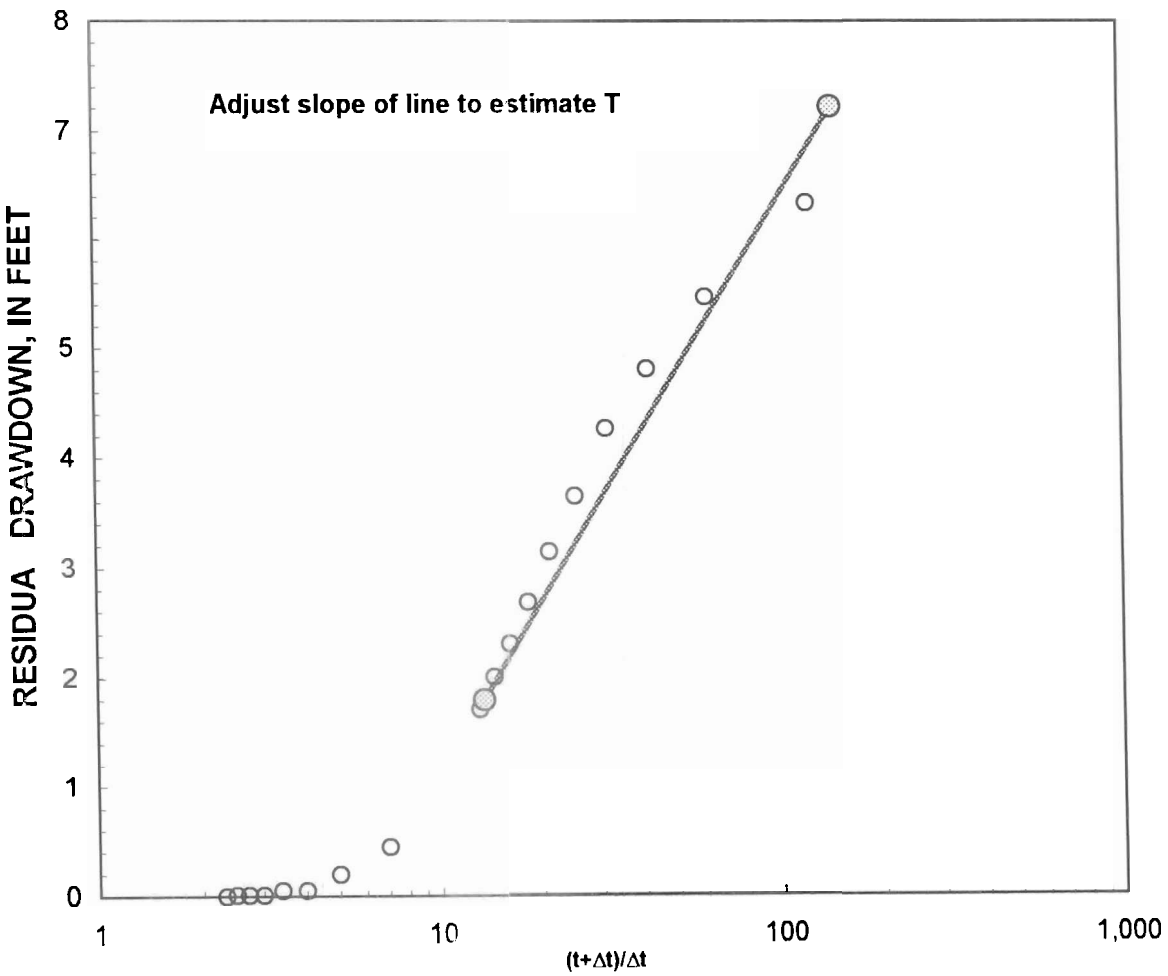
COMPUTED

Aquifer thickness = 13 Feet

Slope = 5.26213592 Feet/log10

Input is consistent.

K =	1.9 Feet/Day
T =	24 Feet2/Day



REMARKS:

RD1500 Relief well

Cooper-Jacob recovery analysis of single-well aquifer test

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	1/0/00 10:00:00	8.75
2	1/0/00 12:00:00	17.10
3	1/0/00 12:01:00	15.09
4	1/0/00 12:02:00	14.22
5	1/0/00 12:03:00	13.56
6	1/0/00 12:04:00	13.02
7	1/0/00 12:05:00	12.40
8	1/0/00 12:06:00	11.90
9	1/0/00 12:07:00	11.44
10	1/0/00 12:08:00	11.06
11	1/0/00 12:09:00	10.76
12	1/0/00 12:10:00	10.46
13	1/0/00 12:20:00	9.20
14	1/0/00 12:30:00	8.95
15	1/0/00 12:40:00	8.80
16	1/0/00 12:50:00	8.80
17	1/0/00 13:00:00	8.76
18	1/0/00 13:10:00	8.76
19	1/0/00 13:20:00	8.76
20	1/0/00 13:30:00	8.75

WELL ID: RW-2

Local ID: RD1500
Date: 2/13/2007
Time: 8:10

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	5 Feet
Depths to:	
water level (DTW)	8.55 Feet
Top of Aquifer	17 Feet
Base of Aquifer	22 Feet
Annular Fill:	
across screen -- Fine Sand	
above screen -- Cement	
Aquifer Material -- Coarse Sand	
FLOW RATE	11 GPM

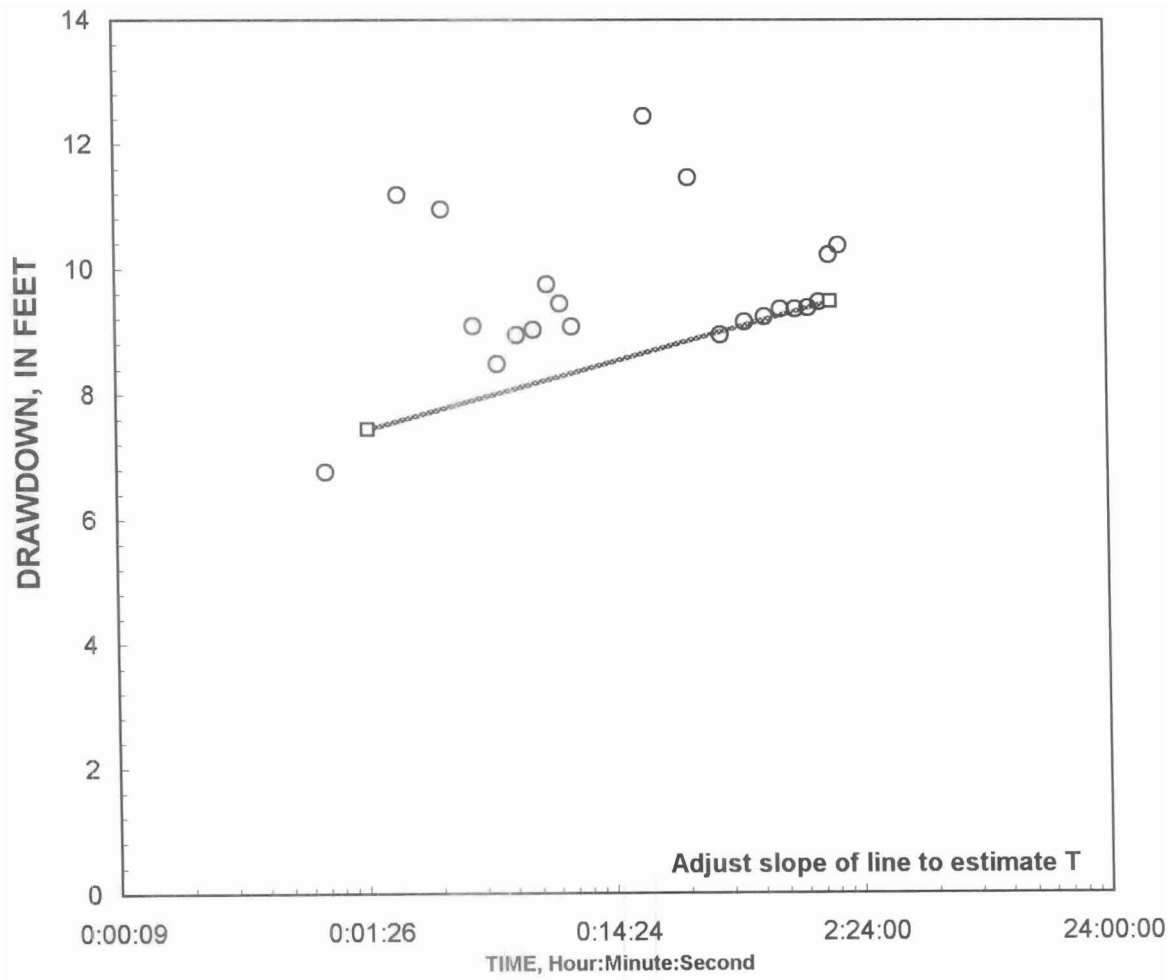
COMPUTED

Aquifer thickness = **5 Feet**

Slope = 1.083244 Feet/log10

Input is consistent.

K =	72 Feet/Day
T =	360 Feet2/Day



REMARKS:

Cooper-Jacob analysis of single-well aquifer test

RD1500 Relief Well

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	4/19/00 8:10:00	8.55
2	4/19/00 8:11:00	15.32
3	4/19/00 8:12:00	19.74
4	4/19/00 8:13:00	19.50
5	4/19/00 8:14:00	17.64
6	4/19/00 8:15:00	17.04
7	4/19/00 8:16:00	17.50
8	4/19/00 8:17:00	17.58
9	4/19/00 8:18:00	18.30
10	4/19/00 8:19:00	18.00
11	4/19/00 8:20:00	17.63
12	4/19/00 8:30:00	21.00
13	4/19/00 8:40:00	20.01
14	4/19/00 8:50:00	17.50
15	4/19/00 9:00:00	17.70
16	4/19/00 9:10:00	17.78
17	4/19/00 9:20:00	17.90
18	4/19/00 9:30:00	17.90
19	4/19/00 9:40:00	17.92
20	4/19/00 9:50:00	18.02
21	4/19/00 10:00:00	18.77
22	4/19/00 10:10:00	18.92

WELL ID: RW-2

Local ID: RD1500
Date: 2/13/2007
Time: 8:10

INPUT

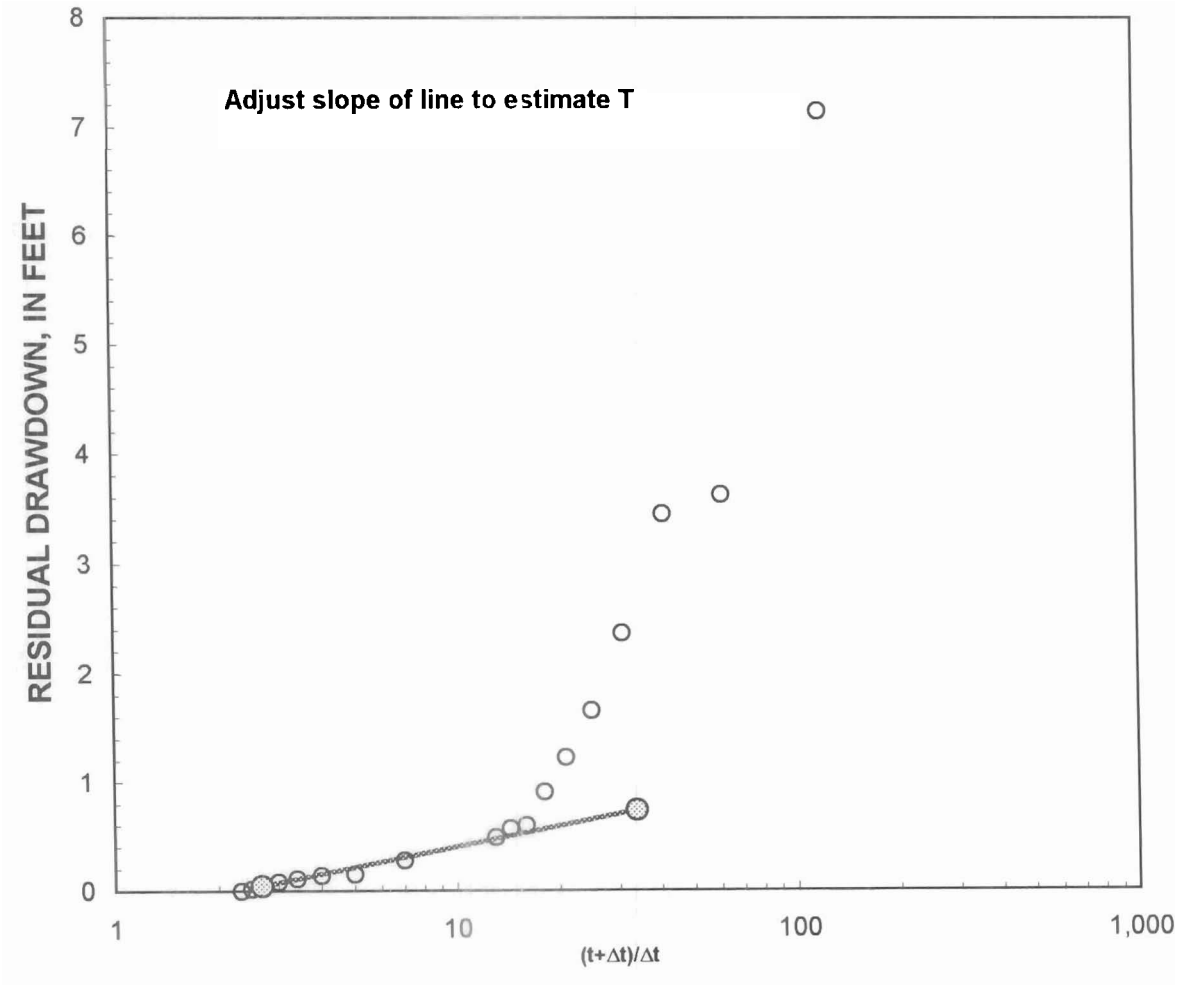
Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	5 Feet
Depths to:	
water level (DTW)	8.55 Feet
Top of Aquifer	17 Feet
Base of Aquifer	22 Feet
Annular Fill:	
across screen -- Medium Sand	
above screen -- Cement	
Aquifer Material -- Coarse Sand	
FLOW RATE	11 GPM

COMPUTED

Aquifer thickness =	5 Feet
Slope =	0.63 Feet/log10

Input is consistent.

K =	120 Feet/Day
T =	620 Feet2/Day



REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

RD1500 Relief well
RW-5 was the pumped well

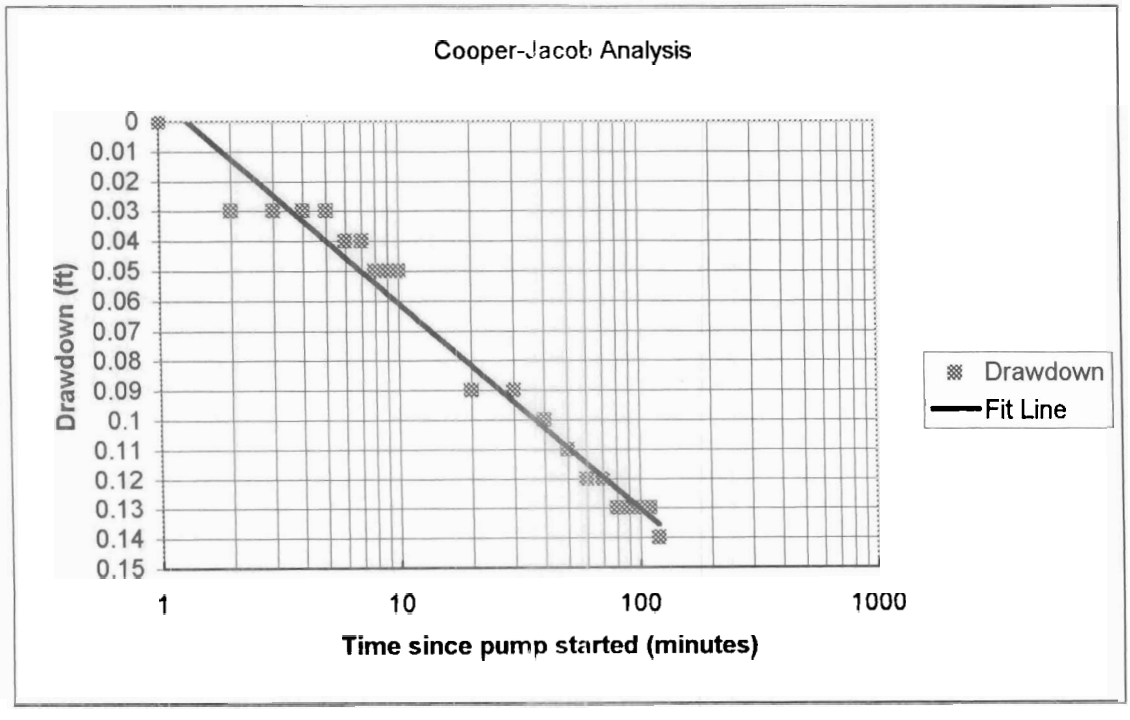
Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	1/0/00 8:10:00	8.55
2	1/0/00 10:10:00	18.92
3	1/0/00 10:11:00	15.70
4	1/0/00 10:12:00	12.18
5	1/0/00 10:13:00	12.00
6	1/0/00 10:14:00	10.92
7	1/0/00 10:15:00	10.21
8	1/0/00 10:16:00	9.78
9	1/0/00 10:17:00	9.46
10	1/0/00 10:18:00	9.15
11	1/0/00 10:19:00	9.12
12	1/0/00 10:20:00	9.04
13	1/0/00 10:30:00	8.83
14	1/0/00 10:40:00	8.70
15	1/0/00 10:50:00	8.69
16	1/0/00 11:00:00	8.66
17	1/0/00 11:10:00	8.63
18	1/0/00 11:20:00	8.59
19	1/0/00 11:30:00	8.57
20	1/0/00 11:40:00	8.55

Observation Well RW 3
Pumped well = RW-2
Test Date 2/13/2007
Distance from pumped well (FEET) 49.33
Q (gpm) 11
Aquifer Thickness (ft) 10

del S =	0.07
T (gpd/ft) =	41486
T (Ft2/day)=	**5546**
K (ft/day)	555
S =	0.005327536
u	0.0070125 Valid u YES
to	0.001041667

Time (min) since pump on	DTW	Drawdown (FT)
0	8.45	
1	8.45	0
2	8.48	0.03
3	8.48	0.03
4	8.48	0.03
5	8.48	0.03
6	8.49	0.04
7	8.49	0.04
8	8.5	0.05
9	8.5	0.05
10	8.5	0.05
20	8.54	0.09
30	8.54	0.09
40	8.55	0.1
50	8.56	0.11
60	8.57	0.12
70	8.57	0.12
80	8.58	0.13
90	8.58	0.13
100	8.58	0.13
110	8.58	0.13
120	8.59	0.14



WELL ID: RW-3

Local ID: RD1500
Date: 2/12/2007
Time: 11:00

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	10 Feet
Depths to:	
water level (DTW)	8.55 Feet
Top of Aquifer	15 Feet
Base of Aquifer	25 Feet
Annular Fill:	
across screen -- Fine Sand	
above screen -- Cement	
Aquifer Material -- Coarse Sand	
FLOW RATE	33 GPM

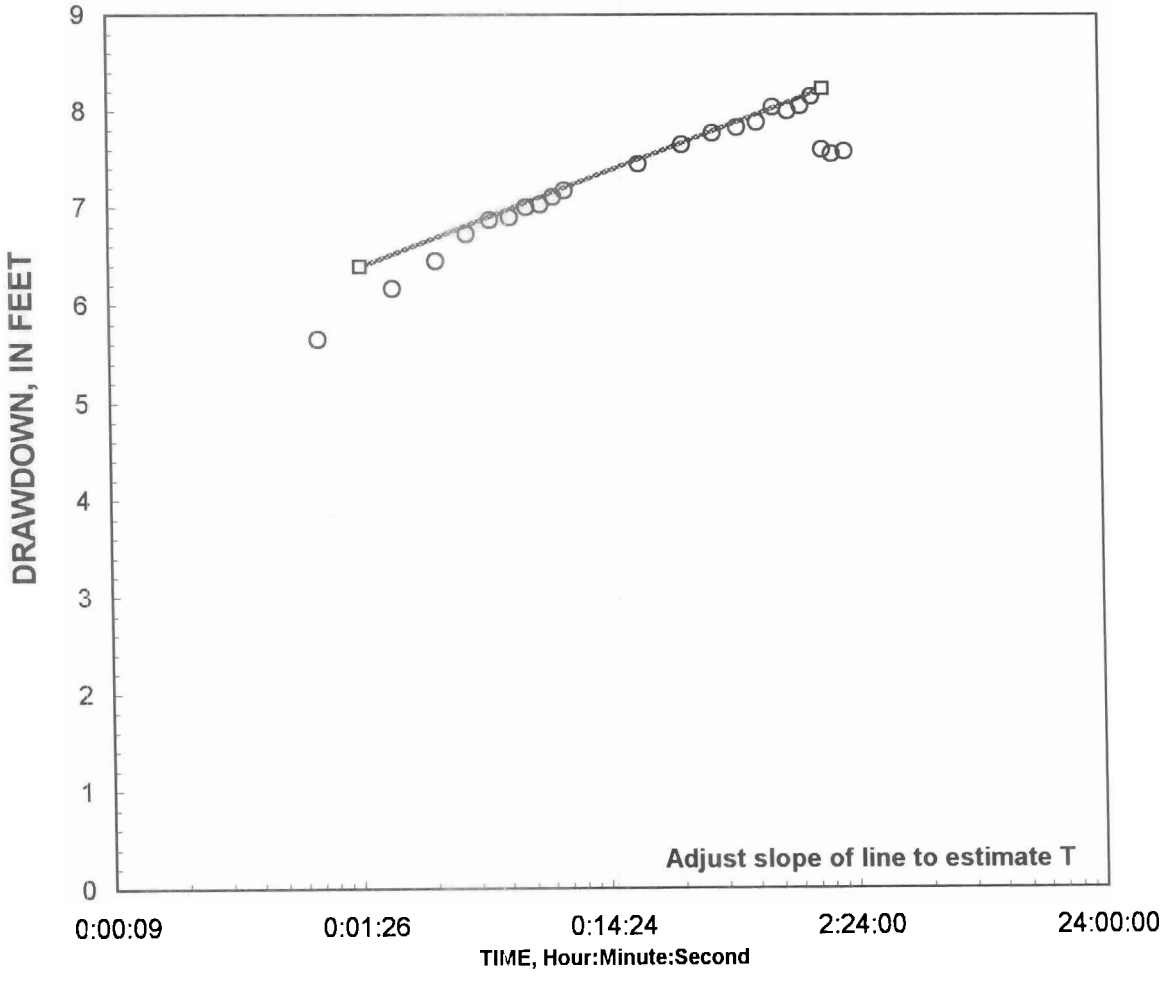
COMPUTED

Aquifer thickness = 10 Feet

Slope = 0.981857 Feet/log10

Input is consistent.

K =	120 Feet/Day
T =	1,200 Feet2/Day



REMARKS:

Cooper-Jacob analysis of single-well aquifer test

RD1500 Relief Well

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	4/19/00 11:00:00	8.55
2	4/19/00 11:01:00	14.20
3	4/19/00 11:02:00	14.72
4	4/19/00 11:03:00	15.00
5	4/19/00 11:04:00	15.28
6	4/19/00 11:05:00	15.42
7	4/19/00 11:06:00	15.45
8	4/19/00 11:07:00	15.55
9	4/19/00 11:08:00	15.58
10	4/19/00 11:09:00	15.66
11	4/19/00 11:10:00	15.72
12	4/19/00 11:20:00	16.00
13	4/19/00 11:30:00	16.20
14	4/19/00 11:40:00	16.32
15	4/19/00 11:50:00	16.38
16	4/19/00 12:00:00	16.43
17	4/19/00 12:10:00	16.59
18	4/19/00 12:20:00	16.55
19	4/19/00 12:30:00	16.60
20	4/19/00 12:40:00	16.70
21	4/19/00 12:50:00	16.15
22	4/19/00 13:00:00	16.10
23	4/19/00 13:15:00	16.13

WELL ID: RW-3

Local ID: RD 1500
Date: 2/12/2007
Time: 11:00

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	10 Feet
Depths to:	
water level (DTW)	8.55 Feet
Top of Aquifer	15 Feet
Base of Aquifer	25 Feet
Annular Fill:	
across screen --	Medium Sand
above screen --	Cement
Aquifer Material --	Sand and Gravel Mixes
FLOW RATE	33 GPM

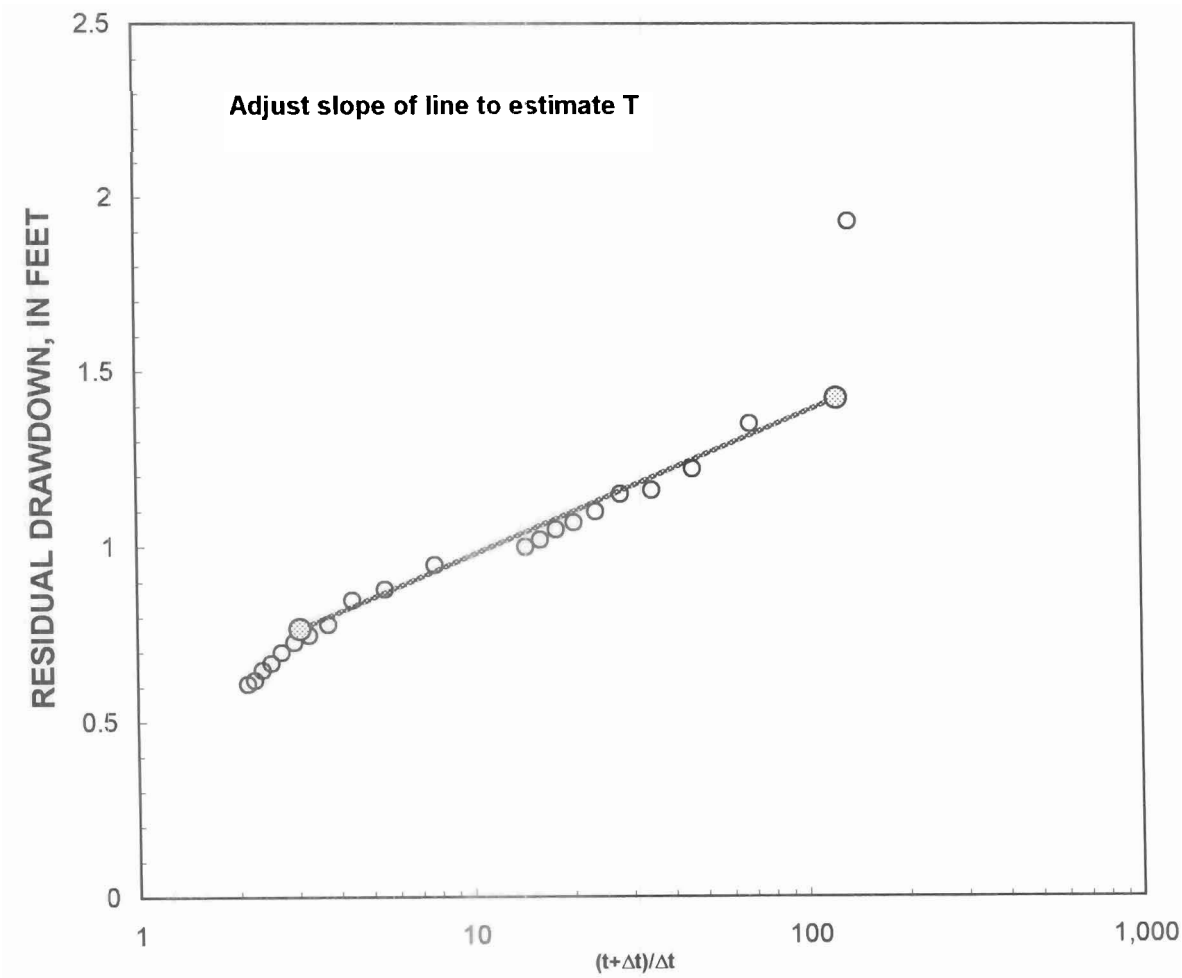
COMPUTED

Aquifer thickness = 10 Feet

Slope = 0.40708515 Feet/log10

Input is consistent.

K =	290 Feet/Day
T =	2,900 Feet2/Day



REMARKS:

Cooper-Jacob recovery analysis of single-well aquifer test

RD1500 Relief well

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	1/0/00 11:00:00	8.55
2	1/0/00 13:15:00	16.13
3	1/0/00 13:16:00	10.48
4	1/0/00 13:17:00	9.90
5	1/0/00 13:18:00	9.77
6	1/0/00 13:19:00	9.71
7	1/0/00 13:20:00	9.70
8	1/0/00 13:21:00	9.65
9	1/0/00 13:22:00	9.62
10	1/0/00 13:23:00	9.60
11	1/0/00 13:24:00	9.57
12	1/0/00 13:25:00	9.55
13	1/0/00 13:35:00	9.50
14	1/0/00 13:45:00	9.43
15	1/0/00 13:55:00	9.40
16	1/0/00 14:05:00	9.33
17	1/0/00 14:15:00	9.30
18	1/0/00 14:25:00	9.28
19	1/0/00 14:35:00	9.25
20	1/0/00 14:45:00	9.22
21	1/0/00 14:55:00	9.20
22	1/0/00 15:05:00	9.17
23	1/0/00 15:15:00	9.16

WELL ID: RW-3

Local ID: RD1500
Date: 2/13/2007
Time: 8:10

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	10 Feet
Depths to:	
water level (DTW)	8.45 Feet
Top of Aquifer	15 Feet
Base of Aquifer	25 Feet
Annular Fill:	
across screen -- Medium Sand	
above screen -- Cement	
Aquifer Material -- Gravel	
FLOW RATE	11 GPM

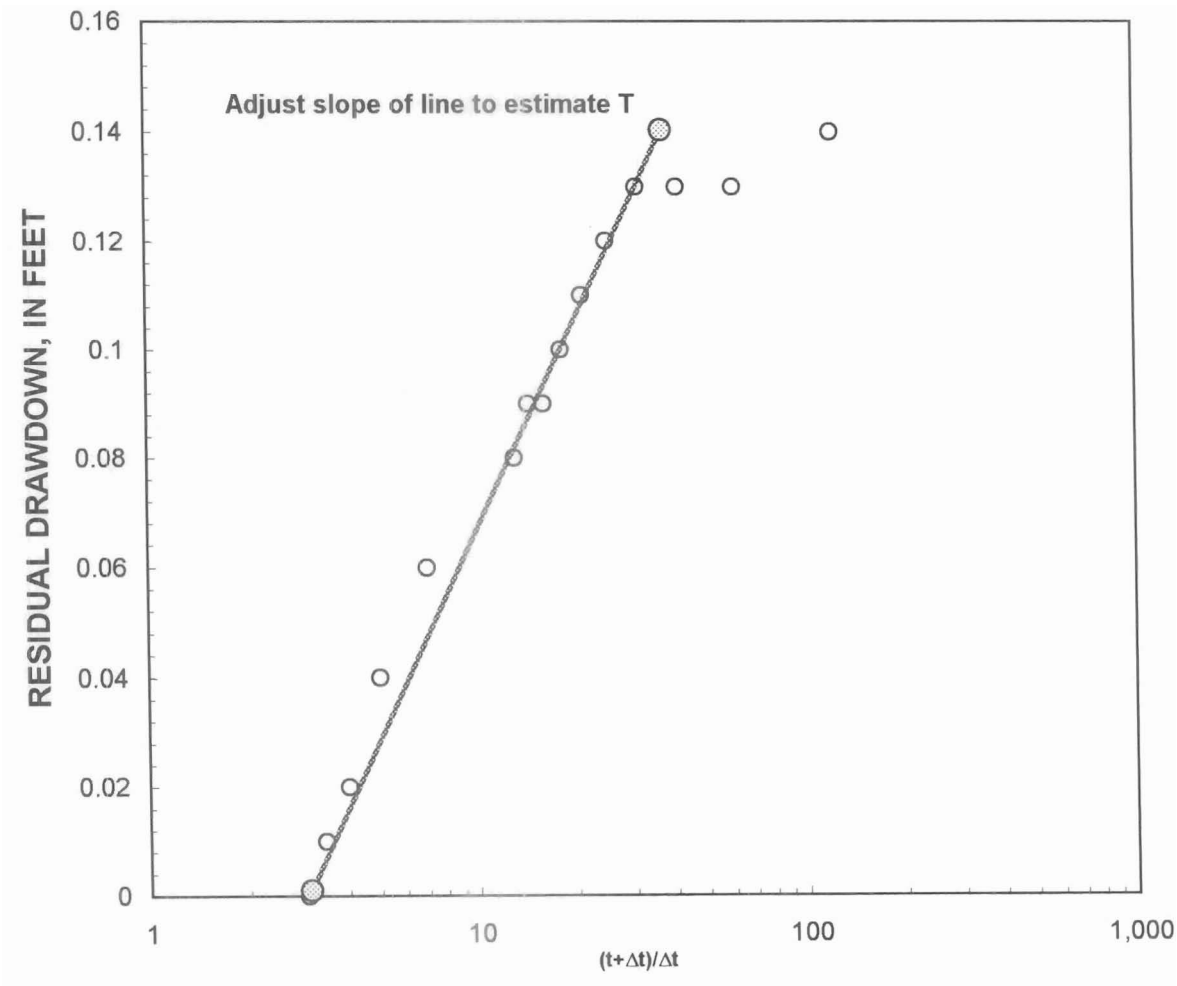
COMPUTED

Aquifer thickness = 10 Feet

Slope = 0.12850554 Feet/log10

Input is consistent.

K =	300 Feet/Day
T =	3,000 Feet2/Day



REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

RD1500 Relief well
Recovery from pumping of RW-2

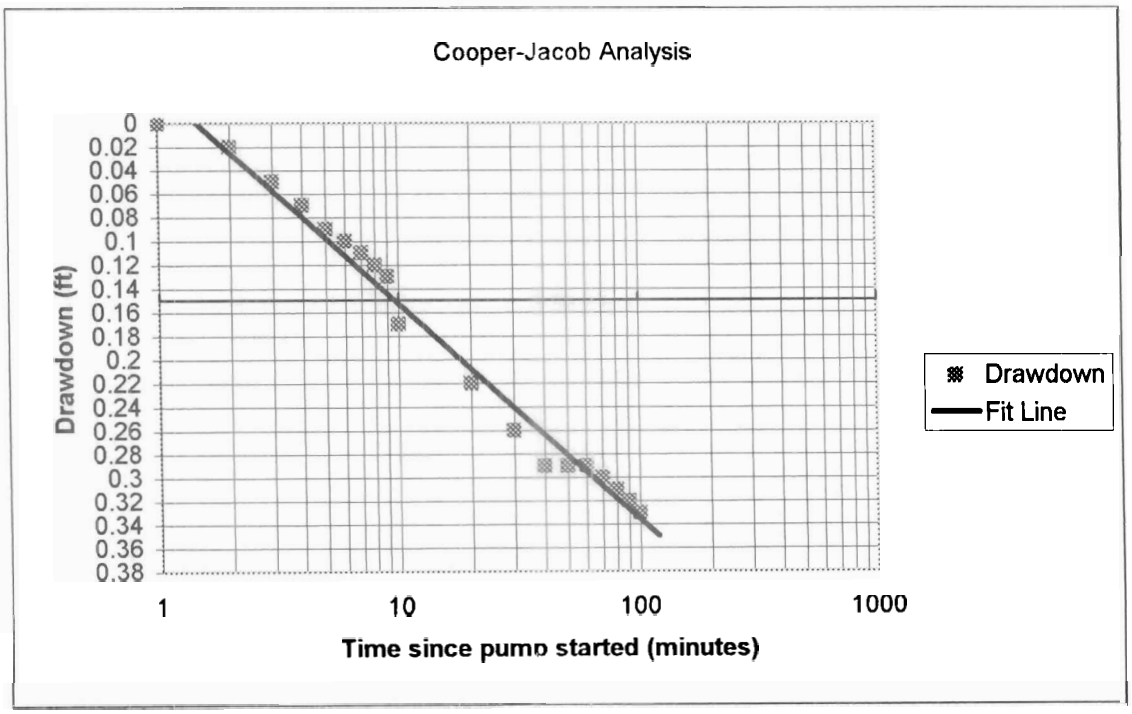
Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	1/0/00 8:10:00	8.45
2	1/0/00 10:10:00	8.59
3	1/0/00 10:11:00	8.59
4	1/0/00 10:12:00	8.58
5	1/0/00 10:13:00	8.58
6	1/0/00 10:14:00	8.58
7	1/0/00 10:15:00	8.57
8	1/0/00 10:16:00	8.56
9	1/0/00 10:17:00	8.55
10	1/0/00 10:18:00	8.54
11	1/0/00 10:19:00	8.54
12	1/0/00 10:20:00	8.53
13	1/0/00 10:30:00	8.51
14	1/0/00 10:40:00	8.49
15	1/0/00 10:50:00	8.47
16	1/0/00 11:00:00	8.46
17	1/0/00 11:10:00	8.45

Observation Well RW 2
Pumped well = RW-3
Test Date 2/12/2007
Distance from pumped well (FEET) 49.33
Q (gpm) 33
Aquifer Thickness (ft) 5

del S =	0.18
T (gpd/ft) =	48400
T (Ft2/day)=	**6471**
K (ft/day)	1294
S =	0.006215458
u	0.0070125 Valid u YES
to	0.001041667

Time (min) since pump on	DTW	Drawdown (FT)
0	8.9	
1	8.9	0
2	8.92	0.02
3	8.95	0.05
4	8.97	0.07
5	8.99	0.09
6	9	0.1
7	9.01	0.11
8	9.02	0.12
9	9.03	0.13
10	9.07	0.17
20	9.12	0.22
30	9.16	0.26
40	9.19	0.29
50	9.19	0.29
60	9.19	0.29
70	9.2	0.3
80	9.21	0.31
90	9.22	0.32
100	9.23	0.33
110		
120		



WELL ID: RW-5

Local ID: RD1500
Date: 2/14/2007
Time: 8:10

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	4 Feet
Depths to:	
water level (DTW)	5.63 Feet
Top of Aquifer	16 Feet
Base of Aquifer	24 Feet
Annular Fill:	
across screen -- Medium Sand	
above screen -- Cement	
Aquifer Material -- Gravel	
FLOW RATE	24 GPM

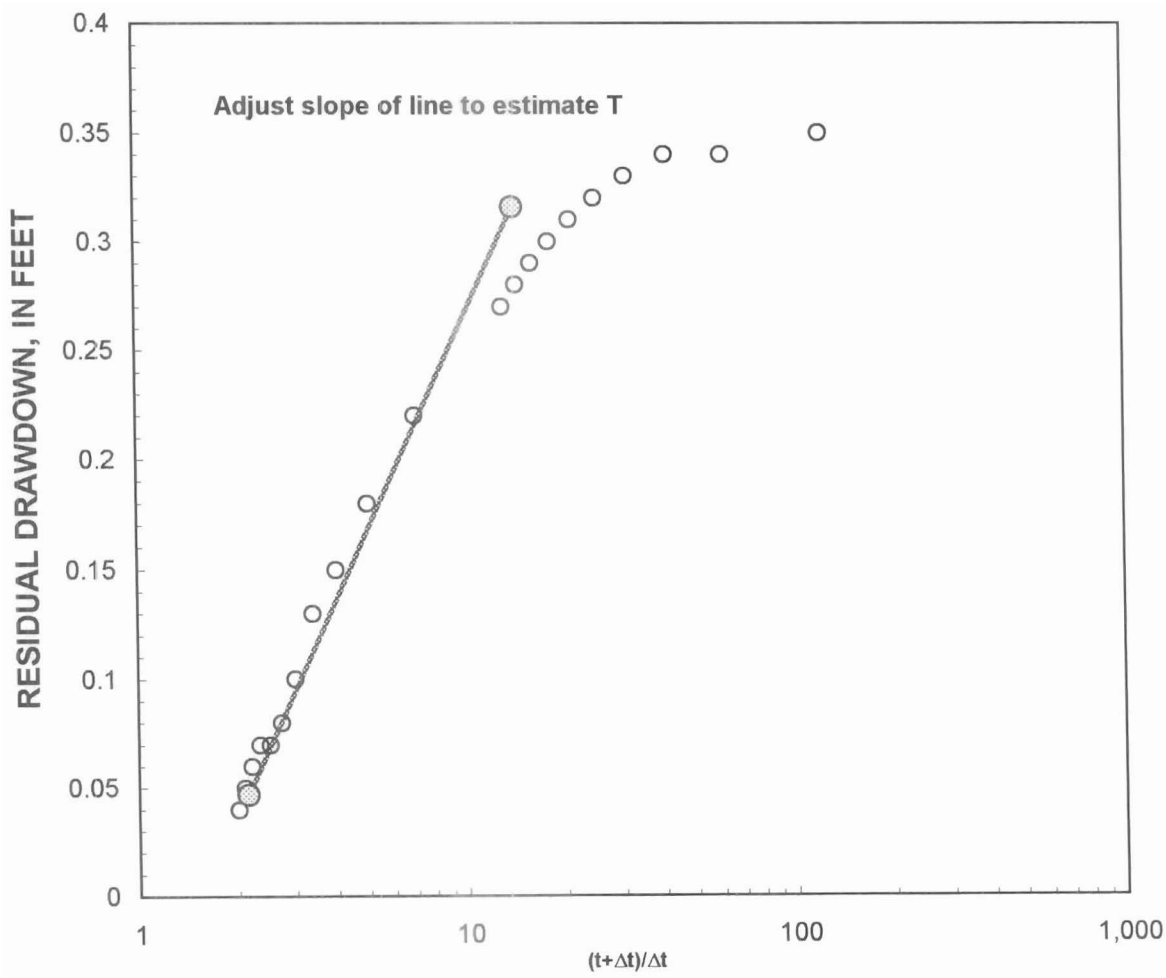
COMPUTED

Aquifer thickness = 8 Feet

Slope = 0.32844933 Feet/log10

Input is consistent.

K =	320 Feet/Day
T =	2,600 Feet2/Day



REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

RD1500 Relief well
RW-7 was the pumped well

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	1/0/00 8:10:00	5.63
2	1/0/00 10:10:00	5.98
3	1/0/00 10:11:00	5.98
4	1/0/00 10:12:00	5.97
5	1/0/00 10:13:00	5.97
6	1/0/00 10:14:00	5.96
7	1/0/00 10:15:00	5.95
8	1/0/00 10:16:00	5.94
9	1/0/00 10:17:00	5.93
10	1/0/00 10:18:00	5.92
11	1/0/00 10:19:00	5.91
12	1/0/00 10:20:00	5.90
13	1/0/00 10:30:00	5.85
14	1/0/00 10:40:00	5.81
15	1/0/00 10:50:00	5.78
16	1/0/00 11:00:00	5.76
17	1/0/00 11:10:00	5.73
18	1/0/00 11:20:00	5.71
19	1/0/00 11:30:00	5.70
20	1/0/00 11:40:00	5.70
21	1/0/00 11:50:00	5.69
22	1/0/00 12:00:00	5.68
23	1/0/00 12:10:00	5.67

WELL ID: RW-5

Local ID: RD1500
Date: 2/17/2007
Time: 12:30

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	6 Feet
Depths to:	
water level (DTW)	6 Feet
Top of Aquifer	16 Feet
Base of Aquifer	24 Feet
Annular Fill:	
across screen -- Fine Sand	
above screen -- Cement	
Aquifer Material -- Coarse Sand	
FLOW RATE	30 GPM

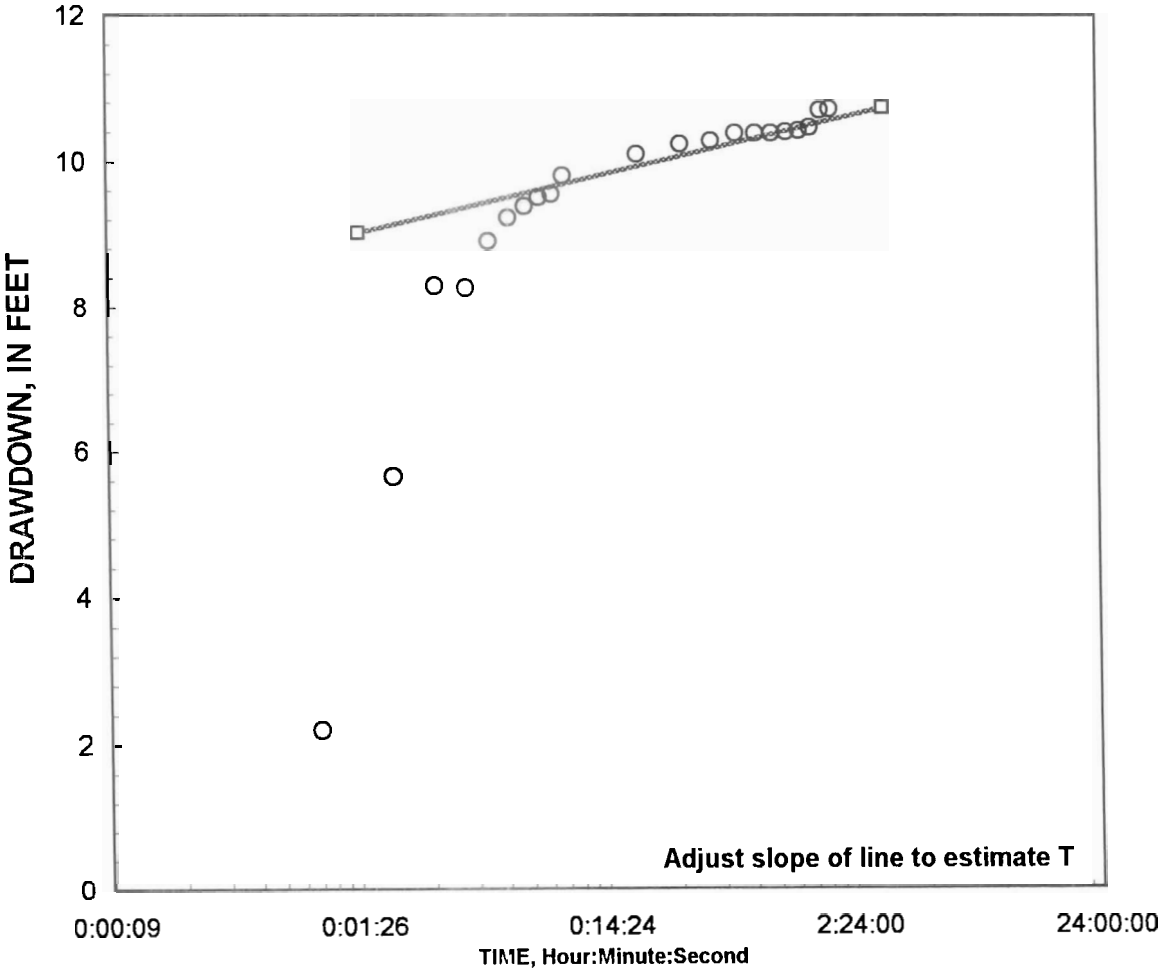
COMPUTED

Aquifer thickness = 8 Feet

Slope = 0.810556 Feet/log10

Input is consistent.

K = 160 Feet/Day
T = 1,300 Feet2/Day



Cooper-Jacob analysis of single-well aquifer test

RD1500 Relief Well

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	4/19/00 12:30:00	6.00
2	4/19/00 12:31:00	8.20
3	4/19/00 12:32:00	11.65
4	4/19/00 12:33:00	14.30
5	4/19/00 12:34:00	14.27
6	4/19/00 12:35:00	14.90
7	4/19/00 12:36:00	15.22
8	4/19/00 12:37:00	15.38
9	4/19/00 12:38:00	15.50
10	4/19/00 12:39:00	15.55
11	4/19/00 12:40:00	15.80
12	4/19/00 12:50:00	16.10
13	4/19/00 13:00:00	16.24
14	4/19/00 13:10:00	16.28
15	4/19/00 13:20:00	16.38
16	4/19/00 13:30:00	16.38
17	4/19/00 13:40:00	16.38
18	4/19/00 13:50:00	16.40
19	4/19/00 14:00:00	16.42
20	4/19/00 14:10:00	16.46
21	4/19/00 14:20:00	16.70
22	4/19/00 14:30:00	16.72

WELL ID: RW-5

Local ID: RD1500
Date: 2/17/2007
Time: 12:30

INPUT

Construction:		
Casing dia. (d_c)	8	Inch
Annulus dia. (d_w)	16	Inch
Screen Length (L)	6	Feet
Depths to:		
water level (DTW)	6	Feet
Top of Aquifer	16	Feet
Base of Aquifer	24	Feet
Annular Fill:		
across screen -- Medium Sand		
above screen -- Cement		
Aquifer Material -- Coarse Sand		
FLOW RATE	30	GPM

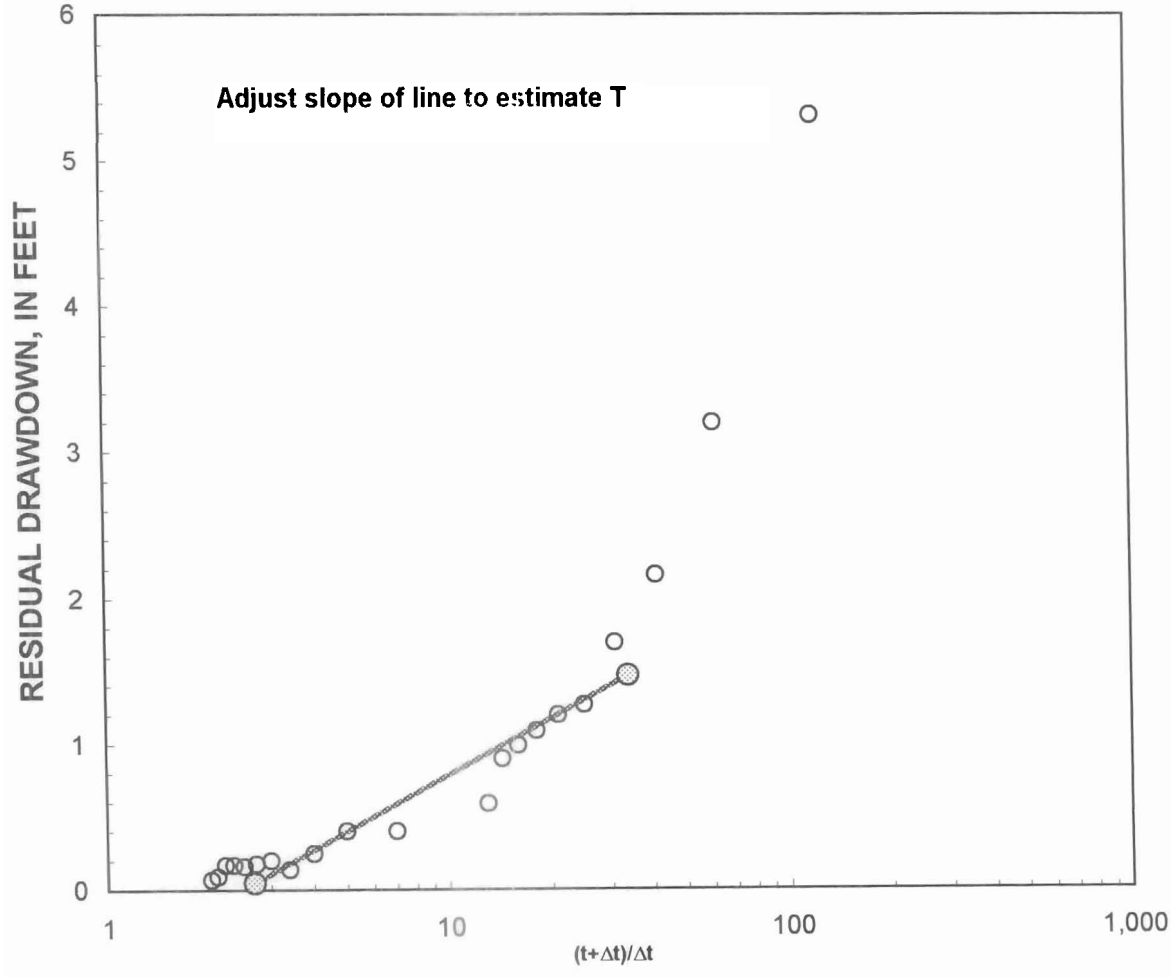
COMPUTED

Aquifer thickness = 8 Feet

Slope = 1.29363636 Feet/log10

Input is consistent.

K =	100	Feet/Day
T =	820	Feet2/Day



REMARKS:

Cooper-Jacob recovery analysis of single-well aquifer test

RD1500 Relief well
RW-5 was the pumped well

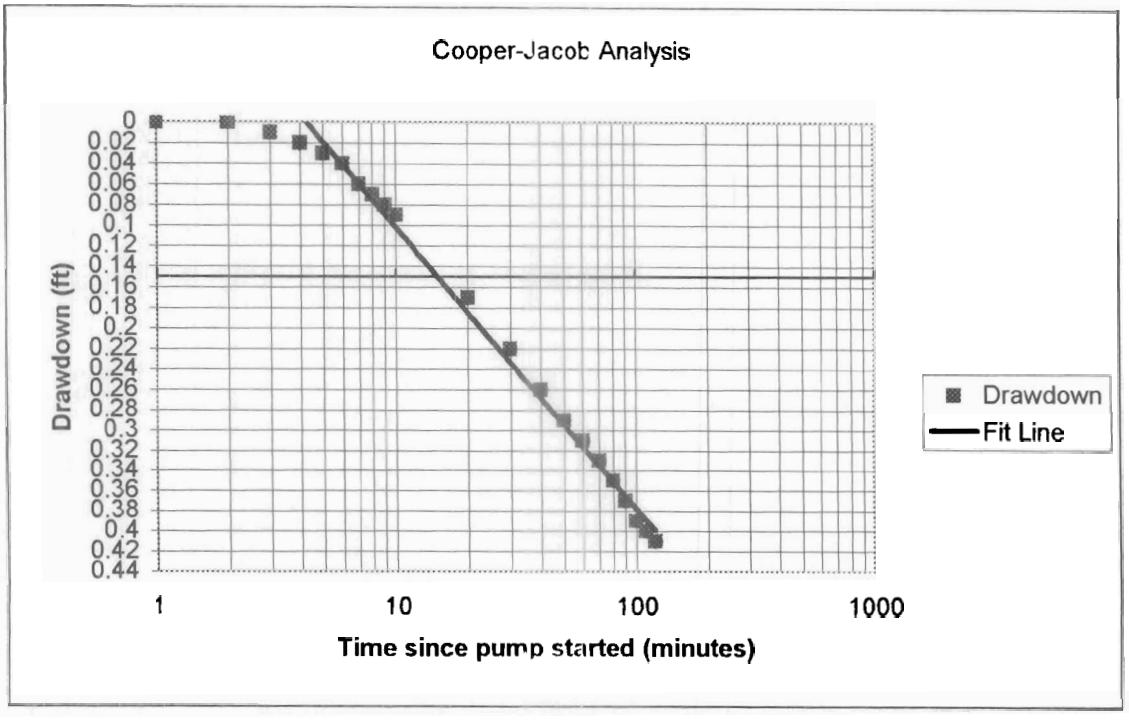
Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	1/0/00 12:30:00	6.00
2	1/0/00 14:30:00	16.72
3	1/0/00 14:31:00	11.32
4	1/0/00 14:32:00	9.20
5	1/0/00 14:33:00	8.16
6	1/0/00 14:34:00	7.70
7	1/0/00 14:35:00	7.27
8	1/0/00 14:36:00	7.20
9	1/0/00 14:37:00	7.09
10	1/0/00 14:38:00	6.99
11	1/0/00 14:39:00	6.90
12	1/0/00 14:40:00	6.59
13	1/0/00 14:50:00	6.40
14	1/0/00 15:00:00	6.40
15	1/0/00 15:10:00	6.25
16	1/0/00 15:20:00	6.14
17	1/0/00 15:30:00	6.20
18	1/0/00 15:40:00	6.18
19	1/0/00 15:50:00	6.16
20	1/0/00 16:00:00	6.17
21	1/0/00 16:10:00	6.17
22	1/0/00 16:20:00	6.09
23	1/0/00 16:30:00	6.07

Observation Well RW 7
Pumped well = RW-5
Test Date 2/12/2007
Distance from pumped well (FEET) 103.5
Q (gpm) 30
Aquifer Thickness (ft) 4

del S =	0.28
T (gpd/ft) =	28286
T (Ft2/day)=	**3782**
K (ft/day)	945
S =	0.002365449
u	0.0201025 Valid u YES
to (days)	0.002986111

Time (min) since pump on	DTW	Drawdown (FT)
0	5.23	
1	5.23	0
2	5.23	0
3	5.24	0.01
4	5.25	0.02
5	5.26	0.03
6	5.27	0.04
7	5.29	0.06
8	5.3	0.07
9	5.31	0.08
10	5.32	0.09
20	5.4	0.17
30	5.45	0.22
40	5.49	0.26
50	5.52	0.29
60	5.54	0.31
70	5.56	0.33
80	5.58	0.35
90	5.6	0.37
100	5.62	0.39
110	5.63	0.4
120	5.64	0.41



WELL ID: RW-7

Local ID: RD1500
Date: 2/14/2007
Time: 8:10

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	4 Feet
Depths to:	
water level (DTW)	6 Feet
Top of Aquifer	12 Feet
Base of Aquifer	16 Feet
Annular Fill:	
across screen -- Fine Sand	
above screen -- Cement	
Aquifer Material -- Gravel	
FLOW RATE	24 GPM

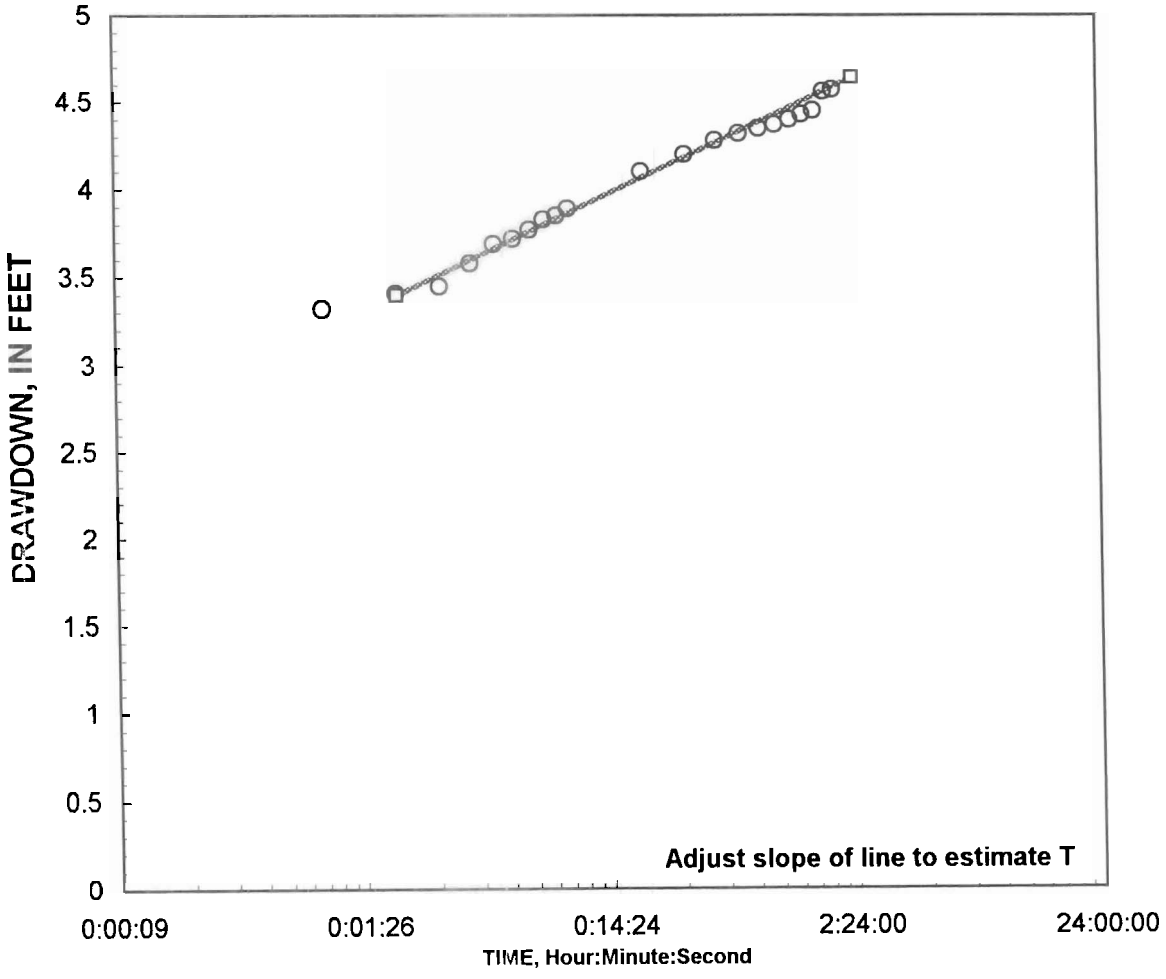
COMPUTED

Aquifer thickness = 4 Feet

Slope = 0.668824 Feet/log10

Input is consistent.

K =	320 Feet/Day
T =	1,300 Feet2/Day



REMARKS:

Cooper-Jacob analysis of single-well aquifer test

RD1500 Relief Well

Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	4/19/00 8:10:00	6.00
2	4/19/00 8:11:00	9.32
3	4/19/00 8:12:00	9.41
4	4/19/00 8:13:00	9.45
5	4/19/00 8:14:00	9.58
6	4/19/00 8:15:00	9.69
7	4/19/00 8:16:00	9.72
8	4/19/00 8:17:00	9.77
9	4/19/00 8:18:00	9.83
10	4/19/00 8:19:00	9.85
11	4/19/00 8:20:00	9.89
12	4/19/00 8:30:00	10.10
13	4/19/00 8:40:00	10.20
14	4/19/00 8:50:00	10.28
15	4/19/00 9:00:00	10.32
16	4/19/00 9:10:00	10.35
17	4/19/00 9:20:00	10.37
18	4/19/00 9:30:00	10.40
19	4/19/00 9:40:00	10.43
20	4/19/00 9:50:00	10.45
21	4/19/00 10:00:00	10.56
22	4/19/00 10:10:00	10.57

WELL ID: RW-7

Local ID: RD1500
Date: 2/14/2007
Time: 8:10

INPUT

Construction:	
Casing dia. (d_c)	8 Inch
Annulus dia. (d_w)	16 Inch
Screen Length (L)	4 Feet
Depths to:	
water level (DTW)	5.23 Feet
Top of Aquifer	12 Feet
Base of Aquifer	16 Feet
Annular Fill:	
across screen --	Medium Sand
above screen --	Cement
Aquifer Material --	Sand and Gravel Mixes
FLOW RATE	24 GPM

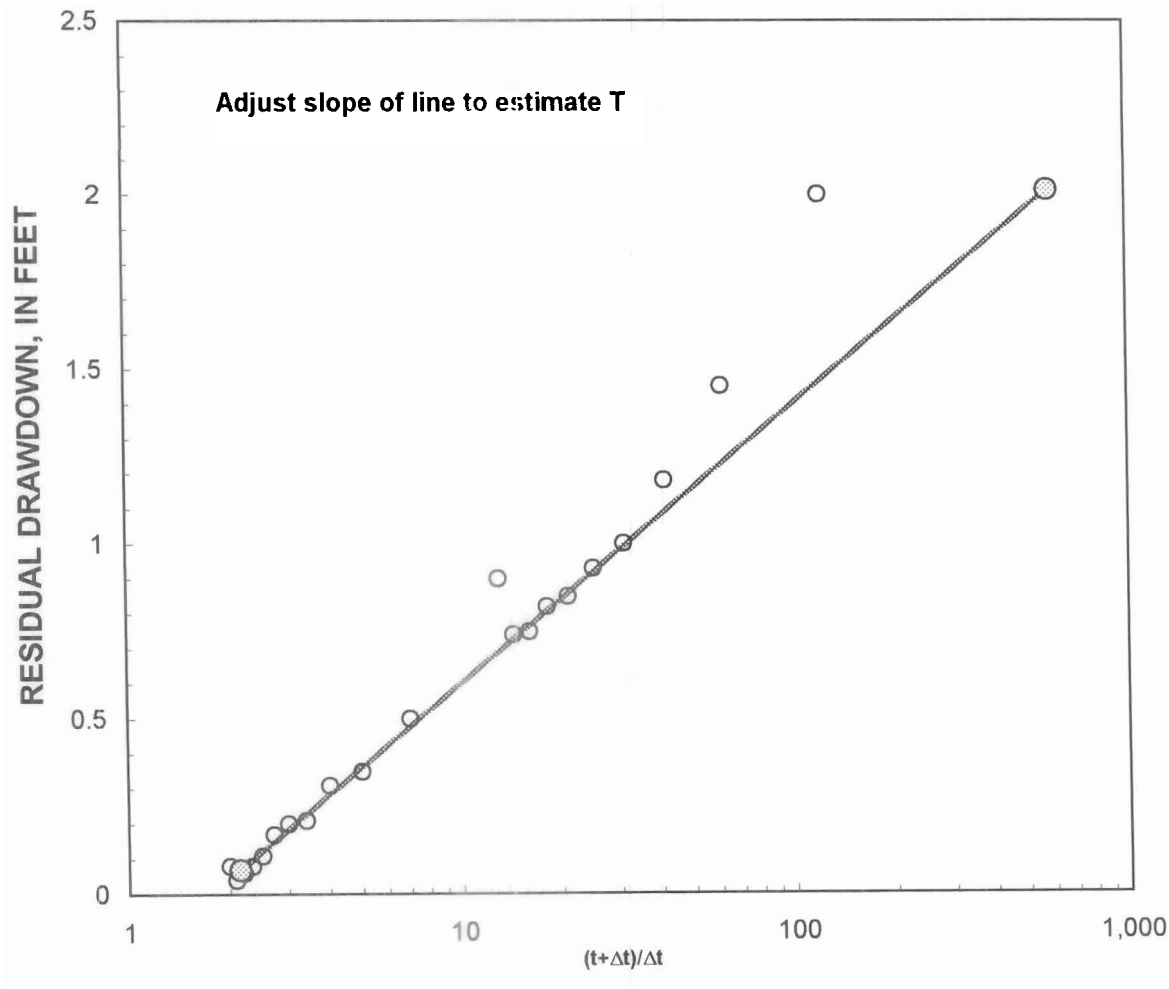
COMPUTED

Aquifer thickness = 4 Feet

Slope = 0.79794661 Feet/log10

Input is consistent.

K =	260 Feet/Day
T =	1,100 Feet2/Day



REMARKS:

Cooper-Jacob recovery analysis of single-well aquifer test

RD1500 Relief well
RW-7 was the pumped well

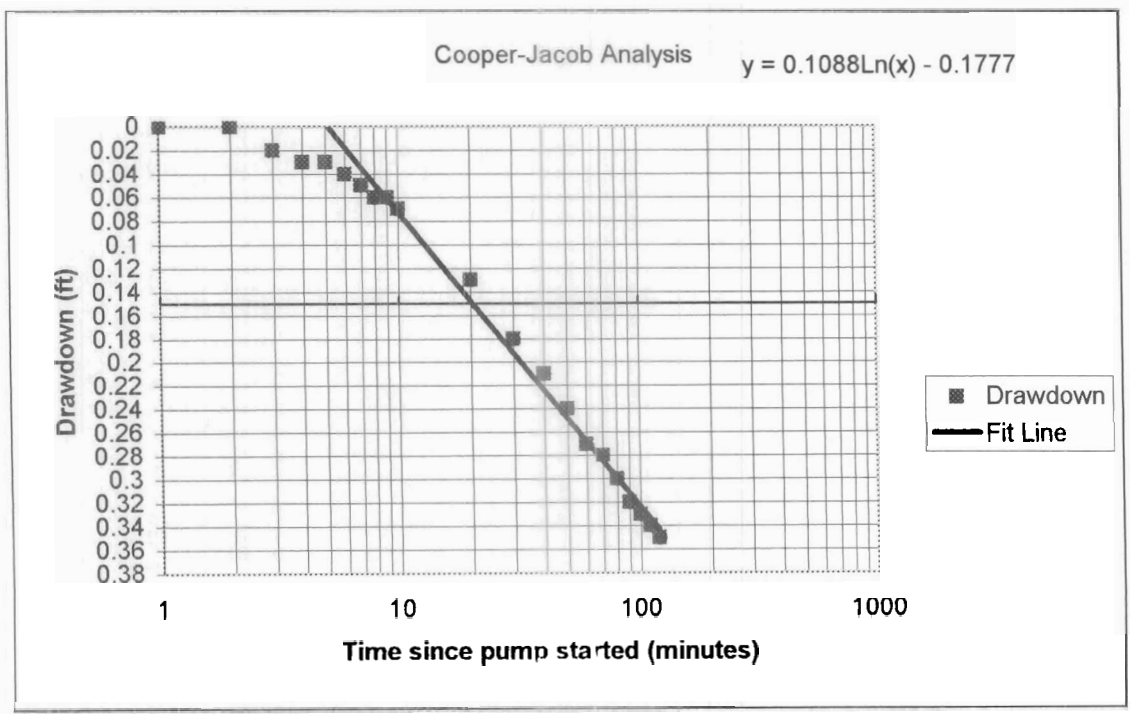
Reduced Data

Entry	Time, Date Hr:Min:Sec	Water Level Feet
1	1/0/00 8:10:00	6.00
2	1/0/00 10:10:00	10.57
3	1/0/00 10:11:00	8.00
4	1/0/00 10:12:00	7.45
5	1/0/00 10:13:00	7.18
6	1/0/00 10:14:00	7.00
7	1/0/00 10:15:00	6.93
8	1/0/00 10:16:00	6.85
9	1/0/00 10:17:00	6.82
10	1/0/00 10:18:00	6.75
11	1/0/00 10:19:00	6.74
12	1/0/00 10:20:00	6.90
13	1/0/00 10:30:00	6.50
14	1/0/00 10:40:00	6.35
15	1/0/00 10:50:00	6.31
16	1/0/00 11:00:00	6.21
17	1/0/00 11:10:00	6.20
18	1/0/00 11:20:00	6.17
19	1/0/00 11:30:00	6.11
20	1/0/00 11:40:00	6.08
21	1/0/00 11:50:00	6.06
22	1/0/00 12:00:00	6.04
23	1/0/00 12:10:00	6.08

Observation Well RW 5
Pumped well = RW-7
Test Date 2/14/2007
Distance from pumped well (FEET) 103.5
Q (gpm) 24
Aquifer Thickness (ft) 4

del S =	0.247
T (gpd/ft) =	25652
T (Ft2/day)=	**3429**
K (ft/day)	857
S =	0.002494401
u	0.023375 Valid u YES
to (days)	0.003472222

Time (min) since pump on	DTW	Drawdown (FT)
0	5.63	
1	5.63	0
2	5.63	0
3	5.65	0.02
4	5.66	0.03
5	5.66	0.03
6	5.67	0.04
7	5.68	0.05
8	5.69	0.06
9	5.69	0.06
10	5.7	0.07
20	5.76	0.13
30	5.81	0.18
40	5.84	0.21
50	5.87	0.24
60	5.9	0.27
70	5.91	0.28
80	5.93	0.3
90	5.95	0.32
100	5.96	0.33
110	5.97	0.34
120	5.98	0.35



NORDIC
INDUSTRIES, INC.

May 23, 2007

U S Army Engineer District, Sacramento
Sacramento Resident Office
Attn: Larry Smith, Resident Engineer
2194 Ascot Avenue, Bldg 1055
Rio Linda, CA 95673-9988

H-0043

Re: W91238-04-D-0002
Indefinite Delivery, Requirements Contract
Emergency Levee Repair, North of I-80
Sacramento River Basin, California

Subject: RD 784; TO 0004
RD 1500; TO 0007
Well Pump Testing (02525a)

Gentlemen:

Enclosed is the "Relief Well Pumping Test Report" for TO 0004 and TO 0007 as specified in Spec Section 02525a, paragraph 3.6.

Sincerely,
Nordic Industries, Inc.

John K. Egbert, P.E.

1437 Furneaux Road • Marysville, California 95901
(530) 742-7124 • Fax (530) 742-3707 • Estimating Fax (530) 742-5545
PUC T 107.529 CONTRACTORS LICENSE # 592271

RD1500

SIERRA TESTING LABORATORIES, INC.
GEOTECHNICAL AND MATERIALS TESTING SERVICES

PROJECT:	PL 84-99 TASK ORDER 0007	LEVEE DISTRICT:	RD 1500 RELIEF WELLS
LOCATION:	MARYSVILLE, CA		
JOB NO.	06-370	DATE:	2/12/07 TO 2/17/07

ASTM D 5472 - 93 (Reaproved 2005)
Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well

Specific Capacity and Transmissivity at the Control Well

Well #	Q (GPM)	Drawdown, s (FT)	SPECIFIC CAPACITY (ft^3/day)/ft	TRANSMISSIVITY (ft^2/day)
1 N	75	8.40	1,718.9	1,375.1
2	30	10.40	555.3	444.3
3	30	7.60	759.9	607.9
5	30	10.80	534.8	427.8
7	30	4.60	1,255.5	1,004.4

REMARKS: Specs require flow rate of at least 50 gpm, but test flow rate (Q) was only 30 gpm in W2, W3, W5 and W7.

Drawdown = Water level at beginning of test - Water level at end of test

Specific Capacity = Q/s[(L^3*T^-1)L^-1]

Transmisivity = C1*Q/s

C1 = 0.8 for Unconfined Aquifers per ASTM 5472-93
Value modified from Harlan, Kolm, and Gutemberg for areas where aquifer properties are not known and drillers log data are lacking.

5040 Robert J. Mathews Parkway
El Dorado Hills, CA 95762
(916) 939-3460 (916) 939-3507
http://www.sierratestinglaboratories.com

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007

LEVEE DISTRICT: RD 1500 RELIEF WELLS

LOCATION (STA): MARYSVILLE, CA

ELE / TOF OF RISER: 8.75

WELL NO: 1 N

DATE: 2/14/2006

TIME TEST STARTED: 10:00 AM

TIME TEST COMPLETED: 12:00 PM

TIME	ELAPSED TIME HR/MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM		RECOVERY TIME	ELAPSED TIME MINUTES	DEPTH TO WATER AT RECOVERY	
10:01	0:01	12.5	3.75	75		12:01	1	15.09	
10:02	0:02	13.8	5.05	75		12:02	2	14.22	
10:03	0:03	14.75	6	75		12:03	3	13.56	
10:04	0:04	15.48	6.73	75		12:04	4	13.02	
10:05	0:05	15.36	6.61	75		12:05	5	12.4	
10:06	0:06	15.44	6.69	75		12:06	6	11.9	
10:07	0:07	15.47	6.72	75		12:07	7	11.44	
10:08	0:08	15.55	6.8	75		12:08	8	11.06	
10:09	0:09	15.68	6.93	75		12:09	9	10.76	
10:10	0:10	15.74	6.99	75		12:10	10	10.46	
10:20	0:20	16.15	7.4	75		12:20	20	9.2	
10:30	0:30	16.38	7.63	75		12:30	30	8.95	
10:40	0:40	16.45	7.7	75		12:40	40	8.8	
10:50	0:50	16.52	7.77	75		12:50	50	8.8	
11:00	1:00	16.54	7.79	75		1:00	60	8.76	

SAND INFILTRATION TEST

DEPTH OF WELL:

DEPTH TO SAND IN WELL BEFORE TEST:

SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTR ATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:

SAND IN WELL AFTER TEST:

SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007

LEVEE DISTRICT: RD 1500 RELIEF WELLS

LOCATION (STA): MARYSVILLE, CA

ELEV TOP OF RISER: 8.75

WELL NO: 1 N

DATE: 2/14/2006

TIME TEST STARTED: 10:00 AM

TIME TEST COMPLETED: 12:00 PM

TIME	ELAPSED TIME HR/MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM		RECOVERY TIME	ELAPSED TIME MINUTES	DEPTH TO WATER AT RECOVERY	
11:10	1:10	16.6	7.85			1:10	70	8.76	
11:20	1:20	16.68	7.93			1:20	80	8.76	
11:30	1:30	16.75	8			1:30	90	8.75	
11:40	1:40	16.73	7.98			1:40	100		
11:50	1:50	17.12	8.37			1:50	110		
12:00	2:00	17.1	8.35			2:00	120		

SAND INFILTRATION TEST

DEPTH OF WELL:

DEPTH TO SAND IN WELL BEFORE TEST:

SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:

SAND IN WELL AFTER TEST:

SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007		LEVEE DISTRICT: RD 1500 RELIEF WELLS	
LOCATION (STA): MARYSVILLE, CA	ELE / TOP OF RISER: 8.55		WELL NO: 2/3*
DATE: 2/13/2007	TIME TEST STARTED: 8:10 AM	TIME TEST COMPLETED: 10:10 AM	

RW 2 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 3 TIME	ELAPSED TIME MINUTES	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
8:11	0:01	15.32	6.77	30	8:11	0:01	8.45	-0.1	
8:12	0:02	19.74	11.19	30	8:12	0:02	8.48	-0.07	
8:13	0:03	19.5	10.95	30	8:13	0:03	8.48	-0.07	
8:14	0:04	17.64	9.09	30	8:14	0:04	8.48	-0.07	
8:15	0:05	17.04	8.49	30	8:15	0:05	8.48	-0.07	
8:16	0:06	17.5	8.95	30	8:16	0:06	8.49	-0.06	
8:17	0:07	17.58	9.03	30	8:17	0:07	8.49	-0.06	
8:18	0:08	18.3	9.75	30	8:18	0:08	8.5	-0.05	
8:19	0:09	18	9.45	30	8:19	0:09	8.5	-0.05	
8:20	0:10	17.63	9.08	30	8:20	0:10	8.5	-0.05	
8:30	0:20	21	12.45	30	8:30	0:20	8.54	-0.01	
8:40	0:30	20.01	11.46	30	8:40	0:30	8.54	-0.01	
8:50	0:40	17.5	8.95	30	8:50	0:40	8.55	0	
9:00	0:50	17.7	9.15	30	9:00	0:50	8.56	0.01	
9:10	1:00	17.78	9.23	30	9:10	1:00	8.57	0.02	

SAND INFILTRATION TEST

DEPTH OF WELL:	DEPTH TO SAND IN WELL BEFORE TEST:	SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS: * - 2/3 indicates wells 2 and 3 were monitored simultaneously

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007

LEVEE DISTRICT: RD 1500 RELIEF WELLS

LOCATION (STA): MARYSVILLE, CA

ELEV TOP OF RISER: 8.55

WELL NO: 2/3

DATE: 2/13/2007

TIME TEST STARTED: 8:10 AM

TIME TEST COMPLETED: 10:10 AM

RW 2 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 3 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
9:20	1:10	17.9	9.35	30	9:20	1:10	8.57	0.02	
9:30	1:20	17.9	9.35	30	9:30	1:20	8.58	0.03	
9:40	1:30	17.92	9.37	30	9:40	1:30	8.58	0.03	
9:50	1:40	18.02	9.47	30	9:50	1:40	8.58	0.03	
10:00	1:50	18.77	10.22	30	10:00	1:50	8.58	0.03	
10:10	2:00	18.92	10.37	30	10:10	2:00	8.59	0.04	

SAND INFILTRATION TEST

DEPTH OF WELL:

DEPTH TO SAND IN WELL BEFORE TEST:

SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN THE WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:

SAND IN WELL AFTER TEST:

SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007	LEVEE DISTRICT: RD 1500 RELIEF WELLS
LOCATION (STA): MARYSVILLE, CA	ELEV TOP OF RISER: 8.55
WELL NO 2/3	
DATE: 2/13/2007	TIME TEST STARTED: 8:10 AM
TIME TEST COMPLETED: 10:10 AM	

RW 2 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY			RW 3 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY		
10:11	1	15.7			10:11	1	8.59		
10:12	2	12.18			10:12	2	8.58		
10:13	3	12			10:13	3	8.58		
10:14	4	10.92			10:14	4	8.58		
10:15	5	10.21			10:15	5	8.57		
10:16	6	9.78			10:16	6	8.56		
10:17	7	9.46			10:17	7	8.55		
10:18	8	9.15			10:18	8	8.54		
10:19	9	9.12			10:19	9	8.54		
10:20	10	9.04			10:20	10	8.53		
10:30	20	8.83			10:30	20	8.51		
10:40	30	8.7			10:40	30	8.49		
10:50	40	8.69			10:50	40	8.47		
11:00	50	8.66			11:00	50	8.46		
11:10	60	8.63			11:10	60	8.45		
11:20	70	8.59			11:20	70			
11:30	80	8.57			11:30	80			
11:40	90	8.55			11:40	90			
11:50	100				11:50	100			
12:00	110				12:00	110			

SAND INFILTRATION TEST

DEPTH OF WELL:				DEPTH TO SAND IN WELL BEFORE TEST:				SAND IN WELL BEFORE TEST:
TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN THE WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT PL 84-99 TASK ORDER 0007

LEVEE DISTRICT: RD 1500 RELIEF WELLS

LOCATION (STA): MARYSVILLE, CA

ELEV TOP OF RISER: 8.55

WELL NO: 3/2*

DATE: 2/12/2007

TIME TEST STARTED: 11:00 AM

TIME TEST COMPLETED: 1:15 PM

RW 3 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 2 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
11:01	0:01	14.2	5.65	30	11:01	0:01	8.9	0.35	
11:02	0:02	14.72	6.17	30	11:02	0:02	8.9	0.35	
11:03	0:03	15	6.45	30	11:03	0:03	8.92	0.37	
11:04	0:04	15.28	6.73	30	11:04	0:04	8.95	0.4	
11:05	0:05	15.42	6.87	30	11:05	0:05	8.97	0.42	
11:06	0:06	15.45	6.9	30	11:06	0:06	8.99	0.44	
11:07	0:07	15.55	7	30	11:07	0:07	9	0.45	
11:08	0:08	15.58	7.03	30	11:08	0:08	9.01	0.46	
11:09	0:09	15.66	7.11	30	11:09	0:09	9.02	0.47	
11:10	0:10	15.72	7.17	30	11:10	0:10	9.03	0.48	
11:20	0:20	16	7.45	30	11:20	0:20	9.07	0.52	
11:30	0:30	16.2	7.65	30	11:30	0:30	9.12	0.57	
11:40	0:40	16.32	7.77	30	11:40	0:40	9.16	0.61	
11:50	0:50	16.38	7.83	30	11:50	0:50	9.19	0.64	
12:00	1:00	16.43	7.88	30	12:00	1:00	9.19	0.64	

SAND INFILTRATION TEST

DEPTH OF WELL:

DEPTH TO SAND IN WELL BEFORE TEST:

SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:

SAND IN WELL AFTER TEST:

SAND IN WELL AFTER CLEANING:

REMARKS: * - 3/2 indicates wells 3 and 2 were monitored simultaneously

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007	LEVEE DISTRICT: RD 1500 RELIEF WELLS	
LOCATION (STA): MARYSVILLE, CA	ELEV TOP OF RISER: 8.55	WELL NO: 3/2
DATE: 2/12/2007	TIME TEST STARTED: 11:00 PM	TIME TEST COMPLETED: 1:00 PM

RW 3 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 2 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
12:10	1:10	16.59	8.04	30	12:10	1:10	9.19	0.64	
12:20	1:20	16.55	8	30	12:20	1:20	9.2	0.65	
12:30	1:30	16.6	8.05	30	12:30	1:30	9.21	0.66	
12:40	1:40	16.7	8.15	30	12:40	1:40	9.22	0.67	
12:50	1:50	16.15	7.6	30	12:50	1:50	9.23	0.68	
13:00	2:00	16.1	7.55	30					
13:15	2:15	16.13	7.58	30					

SAND INFILTRATION TEST

DEPTH OF WELL:	DEPTH TO SAND IN WELL BEFORE TEST:	SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT:	PL 84-99 TASK ORDER 0007	LEVEE DISTRICT:	RD 1500 RELIEF WELLS
LOCATION (STA):	MARYSVILLE, CA	ELEV TOP OF RISER:	8.55
WELL NO	3/2		
DATE:	2/13/2007	TIME TEST STARTED:	8:10 AM
TIME TEST COMPLETED:	10:10 AM		

RW 3 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY			RW 2 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY		
1:16	1	10.48							
1:17	2	9.9							
1:18	3	9.77							
1:19	4	9.71							
1:20	5	9.7							
1:21	6	9.65							
1:22	7	9.62							
1:23	8	9.6							
1:24	9	9.57							
1:25	10	9.55							
1:35	20	9.5							
1:45	30	9.43							
1:55	40	9.4							
2:05	50	9.33							
2:15	60	9.3							
2:25	70	9.28							
2:35	80	9.25							
2:45	90	9.22							
2:55	100	9.2							
3:05	110	9.17							
3:15	120	9.16							

SAND INFILTRATION TEST

DEPTH OF WELL:	DEPTH TO SAND IN WELL BEFORE TEST:	SAND IN WELL BEFORE TEST:	

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN THE WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT PL 84-99 TASK ORDER 0007

LEVEE DISTRICT: RD 1500 RELIEF WELLS

LOCATION (STA): MARYSVILLE, CA

ELEV TOP OF RISER: 6.0

WELL NO: 5/7

DATE: 2/17/2007

TIME TEST STARTED: 12:30 PM

TIME TEST COMPLETED: 2:30 PM

RW 5 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 7 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
12:31	0:01	8.2	2.2	30	12:31	0:01	5.23	-0.77	
12:32	0:02	11.65	5.65	30	12:32	0:02	5.23	-0.77	
12:33	0:03	14.3	8.3	30	12:33	0:03	5.24	-0.76	
12:34	0:04	14.27	8.27	30	12:34	0:04	5.25	-0.75	
12:35	0:05	14.9	8.9	30	12:35	0:05	5.26	-0.74	
12:36	0:06	15.22	9.22	30	12:36	0:06	5.27	-0.73	
12:37	0:07	15.38	9.38	30	12:37	0:07	5.29	-0.71	
12:38	0:08	15.5	9.5	30	12:38	0:08	5.3	-0.7	
12:39	0:09	15.55	9.55	30	12:39	0:09	5.31	-0.69	
12:40	0:10	15.8	9.8	30	12:40	0:10	5.32	-0.68	
12:50	0:20	16.1	10.1	30	12:50	0:20	5.4	-0.6	
13:00	0:30	16.24	10.24	30	13:00	0:30	5.45	-0.55	
13:10	0:40	16.28	10.28	30	13:10	0:40	5.49	-0.51	
13:20	0:50	16.38	10.38	30	13:20	0:50	5.52	-0.48	
13:30	1:00	16.38	10.38	30	13:30	1:00	5.54	-0.46	

SAND INFILTRATION TEST

DEPTH OF WELL:

DEPTH TO SAND IN WELL BEFORE TEST:

SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTR ATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:

SAND IN WELL AFTER TEST:

SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007		LEVEE DISTRICT: RD 1500 RELIEF WELLS	
LOCATION (STA): MARYSVILLE, CA	ELEV TOP OF RISER: 6.0		WELL NO: 5/7
DATE: 2/17/2007	TIME TEST STARTED: 12:30 PM		TIME TEST COMPLETED: 2:30 PM

RW 5 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 7 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
13:40	1:10	16.38	10.38	30	13:40	1:10	5.56	-0.44	
13:50	1:20	16.4	10.4	30	13:50	1:20	5.58	-0.42	
14:00	1:30	16.42	10.42	30	14:00	1:30	5.6	-0.4	
14:10	1:40	16.46	10.46	30	14:10	1:40	5.62	-0.38	
14:20	1:50	16.7	10.7	30	14:20	1:50	5.63	-0.37	
14:30	2:00	16.72	10.72	30	14:30	2:00	5.64	-0.36	

SAND INFILTRATION TEST

DEPTH OF WELL:				DEPTH TO SAND IN WELL BEFORE TEST:				SAND IN WELL BEFORE TEST:
TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007		LEVEE DISTRICT: RD 1500 RELIEF WELLS	
LOCATION (STA): MARYSVILLE, CA	ELEV TOP OF RISER: 6.0		WELL NO 5/7*
DATE: 2/17/2007	TIME TEST STARTED: 8:10 AM	TIME TEST COMPLETED: 10:10 AM	

RW 5 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY			RW 7 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY		
2:31	1	11.32			2:31	1	5.64		
2:32	2	9.2			2:32	2	5.63		
2:33	3	8.16			2:33	3	5.62		
2:34	4	7.7			2:34	4	5.61		
2:35	5	7.27			2:35	5	5.6		
2:36	6	7.2			2:36	6	5.58		
2:37	7	7.09			2:37	7	5.58		
2:38	8	6.99			2:38	8	5.57		
2:39	9	6.9			2:39	9	5.56		
2:40	10	6.59			2:40	10	5.5		
2:50	20	6.4			2:50	20	5.45		
3:00	30	6.4			3:00	30	5.43		
3:10	40	6.25			3:10	40	5.4		
3:20	50	6.14			3:20	50	5.38		
3:30	60	6.2			3:30	60	5.37		
3:40	70	6.18			3:40	70	5.36		
3:50	80	6.16			3:50	80	5.35		
4:00	90	6.17			4:00	90	5.34		
4:10	100	6.17			4:10	100	5.34		
4:20	110	6.09			4:20	110	5.34		
4:30	120	6.07			4:30	120	5.34		

SAND INFILTRATION TEST

DEPTH OF WELL:	DEPTH TO SAND IN WELL BEFORE TEST:	SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN THE WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS: * - 5/7 indicates wells 5 and 7 were monitored simultaneously

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007		LEVEE DISTRICT: RD 1500 RELIEF WELLS	
LOCATION (STA): MARYSVILLE, CA	ELEV TOP OF RISER: 6.0		WELL NO: 7/5*
DATE: 2/14/2007	TIME TEST STARTED: 8:10 AM		TIME TEST COMPLETED: 10:10 AM

RW 7 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 5 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
8:11	0:01	9.32	3.32	30	8:11	0:01	5.63	-0.37	
8:12	0:02	9.41	3.41	30	8:12	0:02	5.63	-0.37	
8:13	0:03	9.45	3.45	30	8:13	0:03	5.65	-0.35	
8:14	0:04	9.58	3.58	30	8:14	0:04	5.66	-0.34	
8:15	0:05	9.69	3.69	30	8:15	0:05	5.66	-0.34	
8:16	0:06	9.72	3.72	30	8:16	0:06	5.67	-0.33	
8:17	0:07	9.77	3.77	30	8:17	0:07	5.68	-0.32	
8:18	0:08	9.83	3.83	30	8:18	0:08	5.69	-0.31	
8:19	0:09	9.85	3.85	30	8:19	0:09	5.69	-0.31	
8:20	0:10	9.89	3.89	30	8:20	0:10	5.7	-0.3	
8:30	0:20	10.1	4.1	30	8:30	0:20	5.76	-0.24	
8:40	0:30	10.2	4.2	30	8:40	0:30	5.81	-0.19	
8:50	0:40	10.28	4.28	30	8:50	0:40	5.84	-0.16	
9:00	0:50	10.32	4.32	30	9:00	0:50	5.87	-0.13	
9:10	1:00	10.35	4.35	30	9:10	1:00	5.9	-0.1	

SAND INFILTRATION TEST

DEPTH OF WELL:	DEPTH TO SAND IN WELL BEFORE TEST:	SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS: * - 7/5 indicates wells 7 and 5 were monitored simultaneously

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007

LEVEE DISTRICT: RD 1500 RELIEF WELLS

LOCATION (STA). MARYSVILLE, CA

ELEV TOP OF RISER: 6.0

WELL NO: 7/5

DATE: 2/14/2007

TIME TEST STARTED: 8:10 PM

TIME TEST COMPLETED: 10:10 AM

RW 7 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER (FT)	DRAWDOWN IN FEET	FLOW IN GPM	RW 5 TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER	DRAWDOWN IN FEET	FLOW IN GPM
9:20	1:10	10.37	4.37	30	9:20	1:10	5.91	-0.09	
9:30	1:20	10.4	4.4	30	9:30	1:20	5.93	-0.07	
9:40	1:30	10.43	4.43	30	9:40	1:30	5.95	-0.05	
9:50	1:40	10.45	4.45	30	9:50	1:40	5.96	-0.04	
10:00	1:50	10.56	4.56	30	10:00	1:50	5.97	-0.03	
10:10	2:00	10.57	4.57	30	10:10	2:00	5.98	-0.02	

SAND INFILTRATION TEST

DEPTH OF WELL:

DEPTH TO SAND IN WELL BEFORE TEST:

SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	TOTAL INFLOW OF SAND IN TO WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTRATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:

SAND IN WELL AFTER TEST:

SAND IN WELL AFTER CLEANING:

REMARKS:

WES FORM 796
MAR '53
REVISED OCT '53

Richard Church
INSPECTOR

RELIEF WELL PUMPING TEST REPORT

PROJECT: PL 84-99 TASK ORDER 0007		LEVEE DISTRICT: RD 1500 RELIEF WELLS	
LOCATION (STA): MARYSVILLE, CA	ELEV TOP OF RISER: 6.0		WELL NO 7/5
DATE: 2/14/2007	TIME TEST STARTED: 8:10 AM	TIME TEST COMPLETED: 10:10 AM	

RW 7 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY			RW 5 RECOVERY TIME	ELAPSED TIME HR:MIN	DEPTH TO WATER AT RECOVERY		
10:11	1	8			10:11	5.98			
10:12	2	7.45			10:12	5.97			
10:13	3	7.18			10:13	5.97			
10:14	4	7			10:14	5.96			
10:15	5	6.93			10:15	5.95			
10:16	6	6.85			10:16	5.94			
10:17	7	6.82			10:17	5.93			
10:18	8	6.75			10:18	5.92			
10:19	9	6.74			10:19	5.91			
10:20	10	6.9			10:20	5.9			
10:30	20	6.5			10:30	5.85			
10:40	30	6.35			10:40	5.81			
10:50	40	6.31			10:50	5.78			
11:00	50	6.21			11:00	5.76			
11:10	60	6.2			11:10	5.73			
11:20	70	6.17			11:20	5.71			
11:30	80	6.11			11:30	5.7			
11:40	90	6.08			11:40	5.7			
11:50	100	6.06			11:50	5.69			
12:00	110	6.04			12:00	5.68			
12:10	120	6.08			12:10	5.67			

SAND INFILTRATION TEST

DEPTH OF WELL:	DEPTH TO SAND IN WELL BEFORE TEST:	SAND IN WELL BEFORE TEST:

TEST NO.	TIME	DEPTH TO SAND (FT)	SAND IN WELL (PTS)	GAIN OR LOST OF SAND IN WELL (PTS)	SAND PUMPED OUT OF WELL (PTS)	OTAL INFLO F SAND IN T WELL (PTS)	LENGTH OF TEST (MIN)	RATE OF SAND INFILTR ATION (PTS. HR)

DEPTH TO SAND IN WELL AFTER TEST:	SAND IN WELL AFTER TEST:	SAND IN WELL AFTER CLEANING:

REMARKS:

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