

# BORBA FARMS

## Water Banking Facility Report

Prepared For:  
Porterville Irrigation District



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Prepared By:



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## Introduction

Borba Farms is a landowner in Porterville Irrigation District (PID) which has developed and operates a permanent recharge basin facility in PID. The recharge basin facility, referred to subsequently as the Project, will be operated and maintained in compliance with the PID *“Policy Principles for Porterville Irrigation District Groundwater Banking Program”* (adopted on December 12, 2017). In addition, the Project would be operated in compliance with the Eastern Tule Groundwater Sustainability Agency (Eastern Tule GSA) Groundwater Sustainability Plan (GSP) that will be completed before January of 2020.

The Project is comprised of approximately 12 acres of recharge basin on the Borba Farms property. The purpose of this report is to provide PID with information about the recharge Project in accordance with requirements listed under the Policy Principles for Porterville Irrigation District Groundwater Banking Program.

## Project Purpose

The Project would primarily bank water that is periodically available above current needs from the Tule River #2 Canal or Tipton Ditch, which receives its water from both the Friant-Kern Canal and the Tule River. Recovered water would be delivered to lawful recipients within the allowed Places of Use of the banked water. Project objectives would be as follows:

1. To increase water supply available within the District
2. Improve groundwater conditions within the District and the Tule Subbasin
3. Contribute to the reduction of costs to produce groundwater for the District and landowners
4. Increase diversification and availability of water supplies to the District, landowners and other participants
5. Facilitate the District's compliance with the Sustainable Groundwater Management Act (SGMA)
6. Reduce ground subsidence by accruing more water to the local aquifer system and by reducing groundwater pumping in the places of use.

### A. Banking Site Location

The recharge basin is located within Borba Farms, located at 14856 Road 200 in Porterville, Tulare County, California as depicted in **Attachment A**. The Tulare County Assessor's Parcel Map Number (APN) for the Site is 236-150-001. The site is situated in the northwest corner of Section 36, Township 21 South, Range 26 East, Mount Diablo Base Meridian. Borba Farms is comprised of an existing dairy facility, field crops and a recharge basin which accounts for approximately 12 acres of the 154-acre total. Based on existing reports for this site, the soil in the area is categorized as Nord fine sandy loam, which is considered rapidly to moderately permeable.

### B. Project Conveyance and Distribution Facilities

The Project consists of two (2) existing turnout structures from the Tule River Intertie and Tipton Ditch. Additionally, three (3) existing wells adjacent to the Tule River Intertie could be used as a future option to pump water back into the water system. **Attachment B** presents the existing Project Facility Map.



### **C. Recharge Facility Operations Manner and Methods**

The Project would primarily bank water from the Tule River Intertie and Tipton Ditch through existing turnout structures. It is possible that the Project might bank water from other systems, but separate approvals would be required and explored prior to utilization. As required by the Banking Policy, 10% to 30% of the total recharged water reported annually would be allocated to PID's storage master account.

Recharge operations would be required to comply with district rules, regulations and policies. The ability for Borba Farms to divert and convey water would be dependent on approval from the water entities, ensuring the operations of Borba Farms do not interfere with those of the district.

### **D. Recovery Facilities and Operations**

The Project has the option to recover banked water, through project wells, into the Tule River Intertie for physical delivery within PID if operated within the districts' rules, regulations and policies.

The Project also has the potential to accrue groundwater credits to be established by the Eastern Tule GSA GSP. The GSP, set to be finalized by January 2020, may include procedures in which recharged water can be transferred between the Eastern Tule GSA, LTRID GSA and Pixley ID GSA.

Intended forms of recovery include:

1. Direct usage from facility wells or other PID wells
2. Pump back from Project wells into Tule River Intertie and Tipton Ditch
3. Transfer of surface water to downstream PID users
4. Transfer of groundwater credits as established under SGMA by Eastern Tule GSA or other neighboring GSA's.

Recovered water used for pump back into district facilities will need to meet the following requirements:

1. Flow meter to determine volume of flow into surface water system (see **Water Accounting and Monitoring**; Data Collection)
2. Water Quality Testing prior to pump back to ensure water quality meets Basin Plan water quality standards (see **Water Accounting and Monitoring**; Water Quality Monitoring)
3. Pump back location and methodologies approval from PID

### **E. Energy Facilities**

The facility currently operates on a combination of electric and diesel-powered wells. Once project wells are identified for banking/recovery activities, each will be documented, including source of power.

Current flow into the banking system occurs via gravity turnout and pipeline, thus requiring no energy to reach the recharge basin.

### **F. Schedule**

The Project currently operates as a recharge basin, therefore nearly all required permitting and construction associated with the project is completed.

#### Permitting

If operations do require CEQA, the current permitting requirements would need to be evaluated.

### Construction

Additional construction is limited to the modification of existing wells to be capable of pumping back into PID canals and improvements to PID canals inlet structures to prevent damage from the Projects pump back operations.

### Operational Commencement

Upon approval by the PID Board appointed manager, the operator would seek to receive credit for banked water immediately allowing for direct usage of banked water through Project and PID wells. After further investigation into the quality of water being produced by Project wells utilized for pump back, the operator will seek approval of this portion of the banking project at a later date.

## **G. Banking Facility Operation and Maintenance**

Borba Farms is responsible for managing, operating and maintaining the banking facility. PID and LTRID will assist in managing the operation of district facilities. Borba Farms would enter into agreements with the districts which detail the conditions under which district facilities might be used and how the districts would be reimbursed for the costs they incur in supporting the Project.

The Project would be maintained using normal farming and irrigation district practices to prevent invasive plants from migrating onto adjacent farms and to prevent/repair berm erosion and rodent burrows. During operation, water levels in recharge basins would generally be maintained less than 2 feet above surrounding ground levels and an operator would be on-call to inspect and quickly respond if the basin begins overfilling or encounters berm failure. Existing wells would be maintained and operated using normal farming and irrigation district practices.

## **H. Banking Water Supply Source**

The Project would primarily bank water that is periodically available above current needs from the Tule River Intertie or Tipton Ditch, both conveyance facilities receive water from the Friant-Kern Canal and Tule River. The existing recharge basin facility is able to receive water supply from both conveyance facilities and would manage supply to the recharge basin based on available water supply in either conveyance facility.

## **I. Water Accounting and Monitoring**

Data Collection: In accordance with the practice already in use by Borba Farms on the existing recharge basin within PID, the basin would include the following data collection to ensure accurate measurement of recharged, evaporated, banked and recovered water:

- Instantaneous and totalizing flow meters on each conveyance delivering water into recharge basins (make/type of meter subject to approval from PID)
- Instantaneous and totalizing flow meters on each recovery well
- Uses of data from California Irrigation Managements Information System (CIMIS) meteorological Station 169 (Porterville) to estimate evaporative loss of applied water before it percolates into the ground.

Each flow meter is to be equipped with data logger to ensure a continuous record of operations. Readings would be manually recorded daily during operating periods. Each meter would be calibrated annually or as requested by PID. To the degree there is a discrepancy between landowner data and district records that cannot be reconciled; the record would be modified to reflect whichever records the parties deem most reliable.

**Banked Water Accounting:** In accordance with practices already in use by Borba Farms on the recharge basin, the amount of water recharged would be computed in daily increments. The volume of applied water lost to evaporation prior recharge would be estimated using data from CIMIS Station 169. The remaining volume after subtraction of evaporative losses would be reported to PID as the recharged volume.

**Surface Water Level Monitoring:** Water level monitoring is managed by Borba Farms which has staff working at all hours of the day, 365 days a year. During recharge events staff will monitor the basin and if the water level rises within 1 foot of the basin berm crest, the operator will be notified. Borba Farms will establish procedures to ensure that the operator adjusts or shuts off recharge operations to prevent overfilling.

**Groundwater Level Monitoring:** Groundwater levels would be measured in the nearest adjacent land owner controlled wells (both irrigation and domestic, contingent on well owner approval) on a monthly basis during periods of recharge and recovery and twice a year (spring, fall) during non-banking activities. During recharge, operations would be constrained or shut down in the event that offsite water levels rise within 25 feet of the ground surface. This is done to maintain a 5 foot difference between the lowest dairy pond depth of 20 feet at the dairy facility. During recovery, if operations cause unacceptable drops in adjacent land owner well water levels, operations would be adjusted in accordance with the procedures summarized above.

**Water Quality Monitoring:** Recharged water, groundwater and recovered water quality would be monitored to ensure that water quality remains appropriate for designated beneficial uses as follows:

**Initial Sampling**

- *Baseline sampling:* all operable wells (irrigation and domestic) within a ¼ mile radius of Project at the facility would be initially sampled for Table 1: Monitoring Constituents.
- *Recovered water sampling:* 45 days prior to the operator recovering banked water to be used for pump back into district facilities, water quality samples will be obtained from proposed recovery wells to ensure the recovered water does not degrade surface water quality.
- *On-going sampling:* all Project wells and the nearest operable wells (irrigation and domestic) on the facility immediately adjacent to Project recharge facilities would be sampled once a month for Table 1: Monitoring Constituents 1

**Table 1: Monitoring Constituents 1**

Constituents	Units
Boron	EPA 200.7
Calcium	EPA 200.7
Carbonates + Bicarbonates	EPA 310.1
Chloride	SM 4500
Magnesium	EPA 200.7
Nitrate as N	EPA 300.0
Potassium	EPA 200.7
pH (Field)	EPA 150.1
Sodium	EPA 200.7
Specific conductance (Field)	EPA 120.1
Sulfate	EPA 375.4
Temperature (Field)	EPA 170.1
Total dissolved solids (TDS)	EPA 160.3

## **J. Monitoring and Operational Constraint Plan (MOCP)**

The banking facility would be operated and monitored in a manner to ensure that the beneficial effects are maximized while preventing significant unacceptable impacts to the aquifer, groundwater levels, groundwater quality, water quality in the Tule River Intertie and the Tipton Ditch. See **Appendix A** for daily, monthly and annual monitoring and operation reporting logs.

Reporting: Before commencement of the operation, the operator will provide water quality data relating to Project wells to be utilized for pump back into district facilities. The results from the quality testing will be provided to the Board appointed manager for approval.

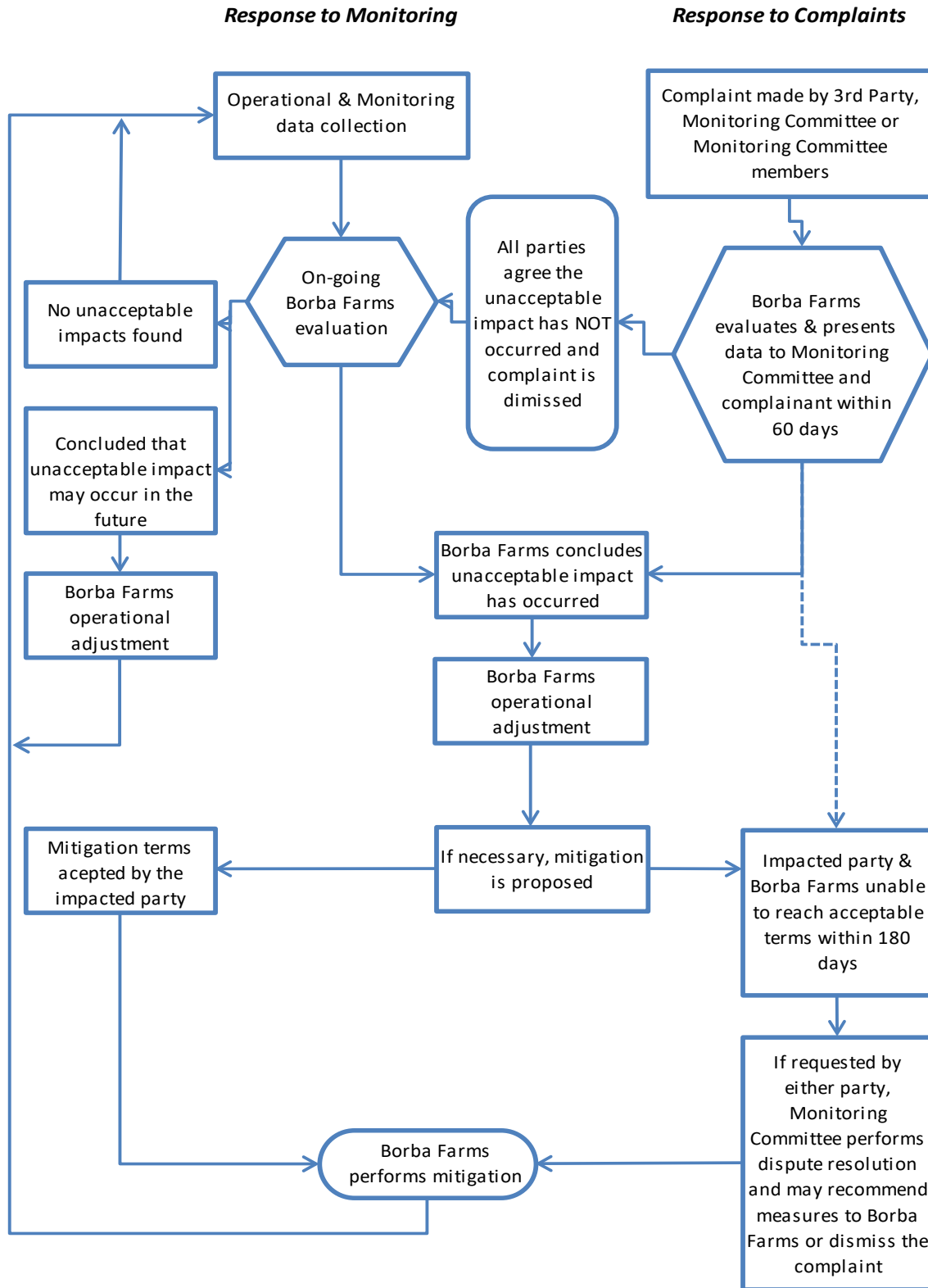
During operation periods Borba Farms will submit monthly reports to PID which will include the following:

- The initial volumes in the banked water accounts
- The sources of water sent to the recharge basin turnouts
- Volumes of water discharged to the recharge basin
- Percolation rates
- Losses to evaporation
- Net volumes of recharged water
- The volumes of recharged water allocated to Borba Farms and PID accounts in accordance with the Banking Policy
- The volumes of the banked water extracted or transferred to others, the places of use
- The ending volumes of water in the PID and Borba Farms banked water accounts
- Depth to groundwater for key wells identified by the District

On January 15 of each year, regardless if there were any Project operations occurring, Borba Farms will submit an annual report for the prior year. The year runs from October 1 through September 30. The report submitted to PID will include the annual totals for the information listed above and will additionally include the following information:

- A summary of operations and response to issues, if presented
- Tabulations of water levels, water quality, water volumes monitoring data
- A map presenting the distribution of total dissolved solids in monitored wells
- A map of the Spring and Fall groundwater elevations, including directions of groundwater flow
- Maps presenting the Spring and Fall depth to groundwater in wells

In order to address third party complaints and to protect the interest of all parties involved, a Monitoring Committee shall be created to ensure that an agreement is reached between Borba Farms and the third party. **Figure 1** depicts the steps taken to evaluate for potential impacts, response to complaints and mitigation, if needed. The Monitoring Committee shall be made up of representatives from Borba Farms, PID directors, and other members as PID Directors deems appropriate.

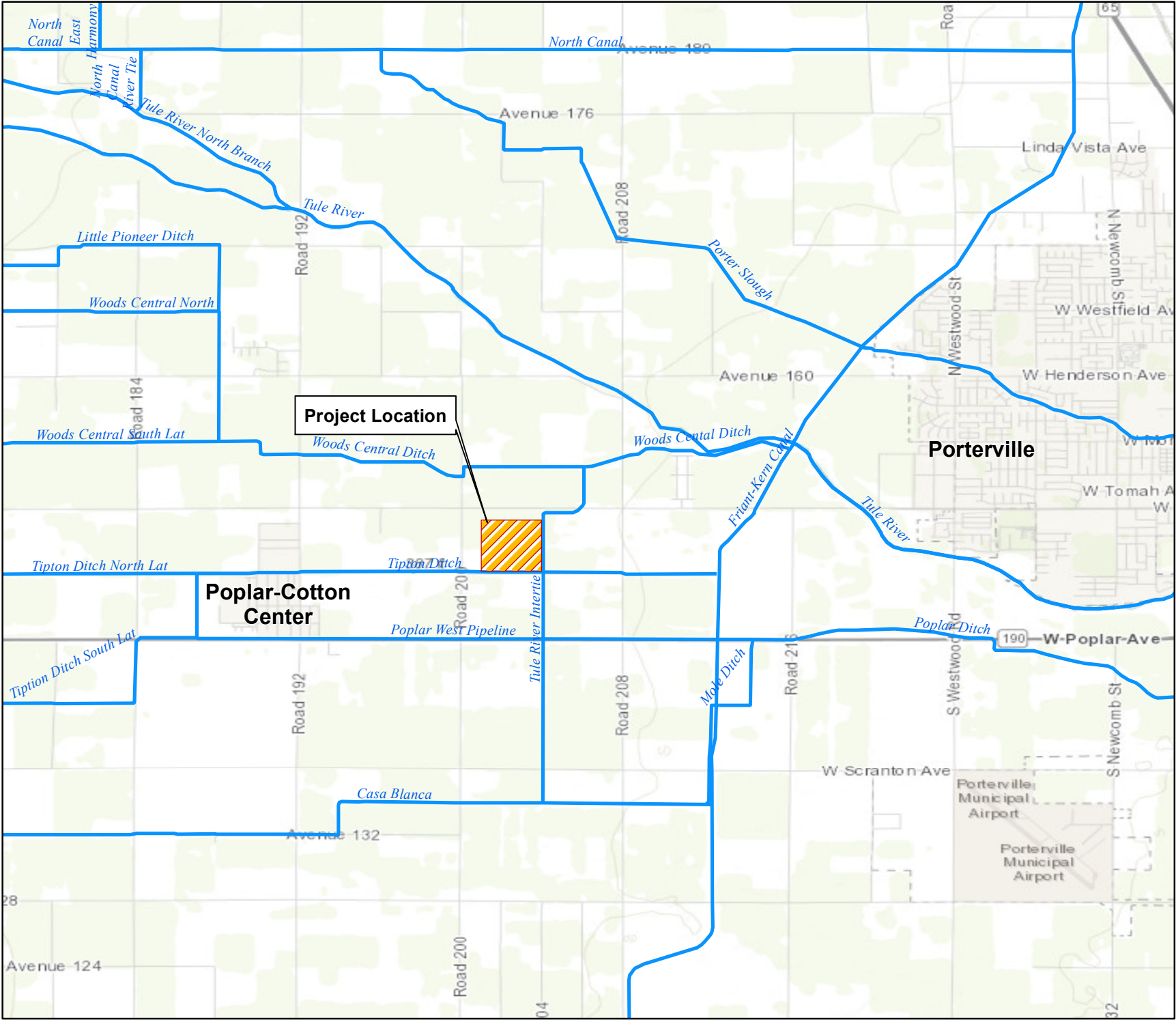


**Figure 1: Impact Evaluation Flow Chart**





# **ATTACHMENT 1**

## Overview Map



Overview Map

Legend

-  Waterways
-  Borba Farms

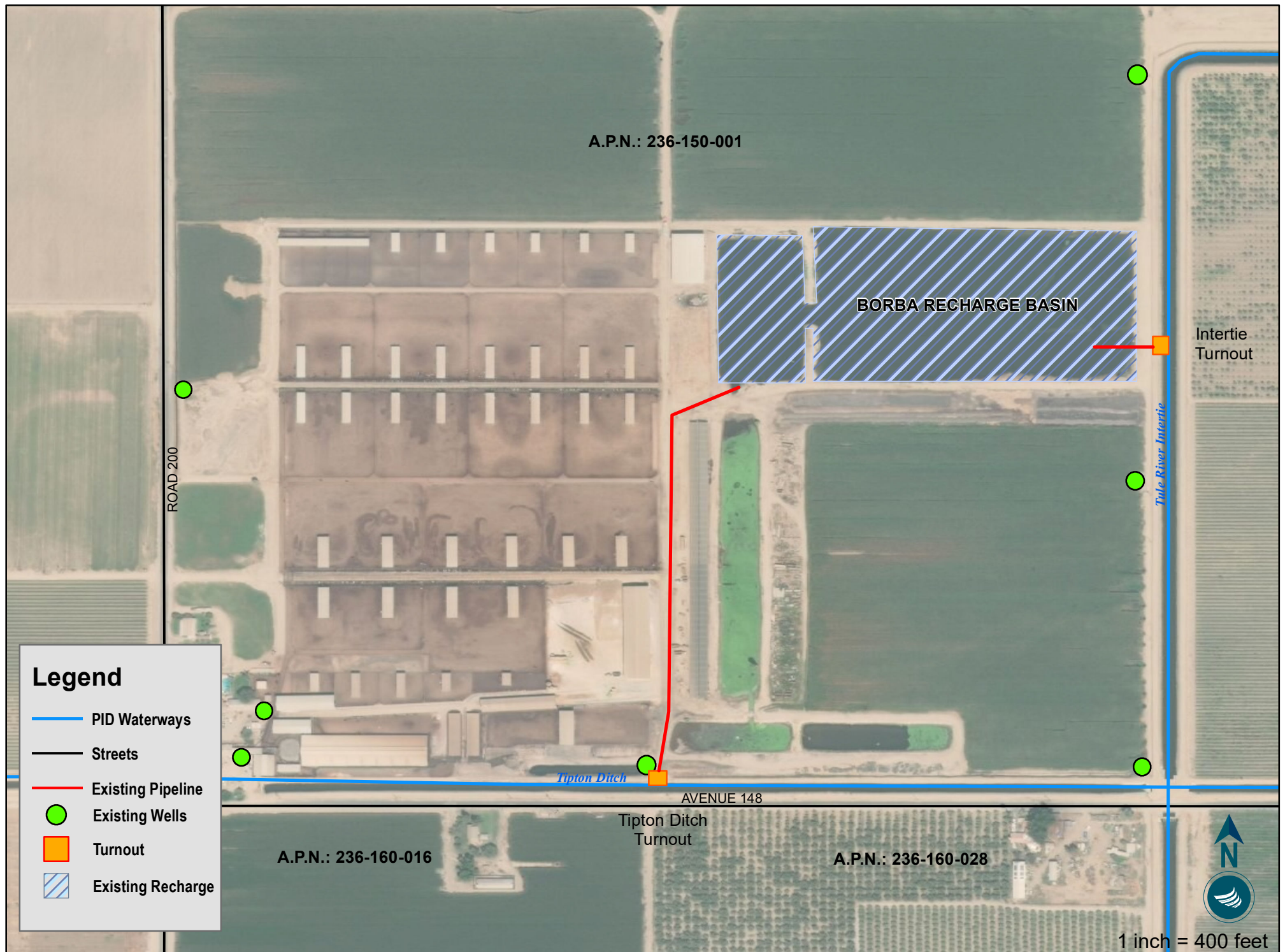


1 Inch = 1 Mile

Attachment 1: Overview Map

## **ATTACHMENT 2**

### **Borba Farms Facility Map**



Attachment 2: Borba Farms Facility Map

## **Appendix A**

### **Monitoring and Operations Reporting Logs**



## Daily Water Accounting Log

<b>Column A:</b> Event date
<b>Column B:</b> Source of water sent to recharge facility [ <i>Tule River Intertie or Tipton Ditch</i> ]
<b>Column C:</b> Volume of water sent to recharge facility (acre-ft) [ <i>Daily meter readings</i> ]
<b>Column D:</b> Recovered water place of use [ <i>facility wells, pump back, swr transfer, gw transfer</i> ]
<b>Column E:</b> Volume of recovered water (acre-ft) [ <i>Metered or transferred volume</i> ]

[illegible]

<p align="center"><b>Borba Farms Banking Facility</b></p> <p align="center"><b>Monthly Monitoring and Operation Constriant Plan (MOCP) Reporting Log</b></p>	
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Instructions: The Monthly MOCP Reporting Log is used to document the following events:	Calculation
<b>Column A:</b> Event date	
<b>Column B:</b> Initial volume in banked water accounts at start of the month (acre-ft)	Based on previous months ending volume
<b>Column C:</b> Source of water sent to recharge facility	Tule River Intertie or Tipton Ditch
<b>Column D:</b> Volume of water sent to recharge facility (acre-ft)	Based on Daily Water Accounting Record
<b>Column E:</b> Losses to evaporation (acre-ft)	Based on average daily CIMIS meteorological Station 169 data for period of operation
<b>Column F:</b> Net volume of recharged water (acre-ft)	D - E
<b>Column G:</b> Percolation rate of recharge facility (acre-feet/day)	F ÷ days of operation
<b>Column H:</b> Volume of recharged water allocated to districts account (acre-ft)	10% to 30% of F (based on PID Banking Policy)
<b>Column I:</b> Volume of recharged water allocated to bankers account(acre-ft)	F - H
<b>Column J:</b> Recovered water place of use	Facility wells, pump back, surface water transfer, or groundwater transfer
<b>Column K:</b> Volume of recovered water (acre-ft)	Based on Daily Water Accounting Record
<b>Column L:</b> Ending volume in banked water accounts at end of month (acre-ft)	B - (I + K)
<b>Page 2:</b> Depth to groundwater for key wells identified by the district (ft)	Measured values

Monthly MOCP Reporting Log

[illegible]

Depth of Groundwater Measurements

Well Name	Well Type	Completed Depth	Latitude	Longitude	Date Measured	Measured Depth

<div style="text-align: center;"> <b>Borba Farms Banking Facility</b>  <b>Annual Monitoring and Operation Reporting Log</b> </div>									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

**Instructions:** The Annual Monitoring and Operation Reporting Log to is used to summarize the facility monitoring for the prior year, starting on October 1 through September 30:

**Column A:** Year

**Column B:** Initial volume in banked water accounts on October 1 (acre-ft)

**Column C:** Source of water sent to recharge facility

**Column D:** Volume of water sent to recharge facility (acre-ft)

**Column E:** Losses to evaporation (acre-ft)

**Column F:** Net volume of recharged water (acre-ft)

**Column G:** Percolation rate of recharge facility (acre-feet/day)

**Column H:** Volume of recharged water allocated to districts account (acre-ft)

**Column I:** Volume of recharged water allocated to bankers account(acre-ft)

**Column J: Recovered water place of use**

**Column K:** Volume of recovered water (acre-ft)

**Column L:** Ending volume in banked water accounts on September 30 (acre-ft)

**Page 2:** Depth to groundwater for key wells identified by the district (ft)

Monthly MOCP Reporting Log

[illegible]

Depth of Groundwater Measurements

Well Name	Well Type	Completed Depth	Latitude	Longitude	Date Measured	Measured Depth