



## TECHNICAL MEMORANDUM

March 26, 2020

**TO:** Prado Basin Habitat Sustainability Committee

**FROM:** Chino Basin Watermaster Engineer – Wildermuth Environmental Inc.

**RE:** Recommended Scope and Budget of the Prado Basin Habitat Sustainability Program for Fiscal Year 2020/21

### Background and Purpose

Pursuant to the Mitigation Measure 4.4-3 of the Peace II Subsequent Environmental Impact Report (SEIR), the Chino Basin Watermaster (Watermaster) and the Inland Empire Utility Agency (IEUA) implement an Adaptive Management Plan (AMP) as a contingency measure to ensure that the riparian habitat in the Prado Basin will not incur significant adverse impacts associated with implementation of the Peace II Agreement. The AMP is implemented under the guidance and supervision of the Prado Basin Habitat Sustainability Committee (PBHSC), which is composed of representatives from all interested Prado Basin stakeholders.

The AMP calls for the implementation of a monitoring and reporting program called the Prado Basin Habitat Sustainability Program (PBHSP). The PBHSP is an effort to monitor the extent and quality of the riparian habitat, and all of the factors that could affect the riparian habitat which include, but are not limited to: changes in groundwater levels, changes in surface-water discharge, weather events, climatic changes, pests, and wildfire. The most likely factor that may be associated with the implementation of the Peace II Agreement is the lowering of groundwater levels.

The AMP calls for annual data analysis and reporting. The annual report describes the results and interpretations of the monitoring data and makes recommendations for adjustments to the monitoring program for the following fiscal year (FY), if appropriate.

This memorandum describes the recommended activities for the PBHSP for FY 2020/21 in the form of a proposed scope-of-work and budget. Members of the PBHSC are being asked to:

1. Review this memorandum by March 10, 2020.
2. Attend a meeting of the PBHSC at 1:30 pm on March 10, 2020 at Watermaster to discuss the proposed scope-of-work and budget for FY 2020/21.
3. Submit comments and suggested revisions on the scope-of-work and budget for FY 2020/21 by March 25, 2020.



The final scope-of-work and budget recommended by the PBHSC will go through the IEUA and Watermaster budgeting processes for approval. The final scope-of-work, budget, and schedule for FY 2020/21 will be included in the *Annual Report for Prado Basin Habitat Sustainability Committee for Water Year 2018/19* that will be finalized in May 2020.

## Recommended Scope of Work and Budget – FY 2020/21

The proposed scope-of-work and budget is shown in Table 1 as a line-item cost estimate. The costs of the PBHSP are shared between the Watermaster and IEUA per a 2016 Agreement.<sup>1</sup> Watermaster is responsible for the costs associated with Tasks 1 through 3; IEUA and Watermaster split costs equally for Tasks 4 through 7. The Orange County Water District (OCWD) also is a cost-sharing partner for selected sub-tasks.

The proposed scope-of-work is described below by task:

### Task 1—Groundwater-Level Monitoring Program.

The monitoring of groundwater levels in the Prado Basin is a key component of the PBHSP because declining groundwater levels could be a factor related to Peace II implementation that adversely impacts riparian vegetation. Sixteen monitoring wells were installed specifically for the PBHSP in 2015. These wells, plus monitoring wells HCMP-5/1 and RP3-MW3, are monitored for groundwater levels. Figure 1 shows these 18 PBHSP monitoring wells located at nine sites in the Prado Basin along the fringes of the riparian habitat. The 18 monitoring wells are equipped with integrated pressure-transducers/data-loggers that measure and record water-level measurements every 15 minutes. This task includes quarterly field visits to all 18 PBHSP monitoring wells to download data. All data will be checked and uploaded to the PBHSP database. This task is consistent with the work performed during the previous FY.

### Task 2—Groundwater-Quality Monitoring Program.

Since the PBHSP monitoring wells were constructed in 2015, groundwater-quality monitoring has been tailored to discern the groundwater/surface-water interactions that are important to the sustainability of the riparian habitat in Prado Basin. From FY 2015/16 through 2017/18, quarterly groundwater samples were collected from the 18 PBHSP monitoring wells and analyzed at a minimum for general minerals. The general mineral chemistry data collected was analyzed along with groundwater-level data, model-generated groundwater-flow directions, and surface-water quality and flow data to help characterize groundwater/surface-water interactions in the Prado Basin and determine the source of the shallow groundwater that is available for consumptive use by the riparian vegetation.

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<sup>1</sup> Agreement Between Chino Basin Watermaster and Inland Empire Utilities Agency Regarding Reimbursement of the Peace II Subsequent Environmental Impact Report Mitigation Measure 4.4.5 (Prado Basin Habitat Sustainability Program). Signed September 2016.



During FY 2018/19, a pilot monitoring program was initiated at four monitoring wells at two locations along Chino Creek (PB-7 and PB-8). Probes were installed in the four monitoring wells to measure and record EC, temperature, and water levels at 15-minute intervals in coordination with similar high-frequency monitoring at two nearby surface water sites in Chino Creek (Tasks 3.3 and 3.4). Groundwater-quality samples were also collected quarterly at these wells and analyzed for EC, temperature, and general minerals to validate and support the high-frequency data. The purpose of the pilot monitoring program is to determine if the high-frequency data better reveals the groundwater/surface-water interactions and enhances the interpretation of the general mineral data derived from sampling. The data collected thus for this pilot monitoring program in FY 2018/19 and 2019/20 is limited, but shows promise, and will be charted and described in the annual report. In addition, there is not an extended period of the same data collected at the nearby surface water probes in Chino Creek because they were lost during large storm events in FY 2018/19 and were reinstalled during FY 2019/20. Tasks 2.1 and 2.2 are to continue the pilot monitoring program in FY 2020/21 to collect the high-frequency data in groundwater to help discern the groundwater/surface water interactions near PB-7 and PB-8. The monitoring wells will be visited quarterly to download the data from the probes and semi-annually<sup>2</sup> to collect samples for laboratory analyses of the general mineral analytes listed in Table 2. All data will be checked and uploaded to the PBHSP database.

### Task 3—Surface-Water Monitoring Program.

Surface-water discharge data from the Santa Ana River and the tributaries that cross Prado Basin are evaluated to characterize the influence of surface-water discharge on the riparian habitat. The surface-water monitoring program utilizes publicly-available data sets which include: the USGS daily discharge measurements at six sites along the Santa Ana River and its tributaries; daily discharge and water-quality data from Publicly-Owned Treatment Works (POTWs) that are tributary to Prado Basin; US Army Corps of Engineers (ACOE) daily measurements of reservoir elevation and releases from the reservoir at Prado Dam; and Watermaster's quarterly surface-water-quality monitoring at two sites along the Santa Ana River. The locations of these surface-water monitoring sites are shown on Figure 1.

Tasks 3.1 and 3.2 include the annual collection of the USGS, POTW, and ACOE data for water year 2020, and the processing, checking, and uploading of these data to the PBHSP database. These tasks do not include the processing, checking, and uploading of the Watermaster-collected Santa Ana River data, which is performed for another Watermaster task. The scope of these tasks is consistent with the work performed for the previous fiscal year.

Surface water-quality data are also collected and analyzed to help characterize groundwater/surface water interactions. During FY 2018/19, a pilot monitoring program was initiated at two locations along Chino Creek adjacent to wells PB-7 and PB-8. At these locations,

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<sup>2</sup> Sample collection is being reduced from quarterly to semi-annual in FY 2020/21. The data collected thus far demonstrates that semi-annual data will be sufficient to continue to validate and support the high-frequency data.



probes were installed in Chino Creek to measure and record EC, temperature, and stage at 15-minute intervals in coordination with the similar high-frequency monitoring at PB-7 and PB-8 (Task 2). Grab samples of surface water were also collected quarterly for EC, temperature, and general mineral analyses. As described above for *Task 2 – Groundwater-Quality Monitoring Program*, the purpose of the pilot monitoring program is to determine if the high-frequency data better reveals the groundwater/surface-water interactions and enhances the interpretation of the general mineral data derived from grab sampling. The data collected for this pilot monitoring program in 2018/19 is limited, but shows promise, and will be charted and described in the annual report. Tasks 3.3 and 3.4 are to continue the pilot monitoring program in FY 2020/21 to collect the high-frequency data in surface water to help discern the groundwater/surface water interactions near wells PB-7 and PB-8. The probes will be visited quarterly to download the data and surface water samples will be collected semi-annually<sup>3</sup> for laboratory analyses of the general mineral analytes listed in Table 2. All data will be checked and uploaded to the PBHSP database.

#### Task 4 – Climate Monitoring Program.

Climatic data are evaluated in the vicinity of the Prado Basin to characterize trends, and to determine if these trends contribute to impacts on the riparian habitat. The climate monitoring program utilizes publicly-available datasets. Two types of datasets are compiled: time-series data measured at weather stations and spatially-gridded datasets. Task 4 includes the annual collection of the time-series data and spatially-gridded datasets for water year 2020 (October 2019 – September 2020), and the checking and uploading of the data to the PBHSP database. The scope of this task is consistent with the work performed for the previous fiscal year.

#### Task 5—Riparian Habitat Monitoring Program.

Monitoring the extent and quality of the riparian habitat in the Prado Basin is a fundamental component of the PBHSP to characterize how the riparian habitat changes over time. To characterize the impacts of Peace II implementation on the riparian habitat (if any) it is necessary to understand the long-term historical trends of its extent and quality and the factors that have affected it. The current riparian habitat monitoring program consists of both regional and site-specific components. The proposed riparian habitat monitoring program for FY 2020/21 is described in the subsections below.

##### Regional Monitoring

The regional monitoring of riparian habitat is performed via two independent methods that complement each other: mapping and analysis of the riparian habitat using (i) air photos and (ii) the normalized distribution vegetation index (NDVI) derived from the Landsat remote-sensing program. Tasks 5.1, 5.2, and 5.3 are for the collection and compilation of the regional monitoring data, including:

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<sup>3</sup> Sample collection is being reduced from quarterly to semi-annual in FY 2020/21. The data collected thus far demonstrates that semi-annual data will be sufficient to continue to validate and support the high-frequency data.



- Perform a custom flight (via outside professional services) to acquire a high-resolution air photo (three-inch pixel) of the Prado Basin during summer 2020. The cost for the air photo is shared with OCWD.
- Catalog and review the 2020 high-resolution air photo in ArcGIS and digitize the extent of the riparian habitat.
- Collect, review, and upload the Landsat NDVI data for water year 2020.

#### Site-Specific Monitoring

The site-specific monitoring of the riparian habitat consists of periodic field surveys of the riparian vegetation at selected locations. These surveys provide an independent measurement of vegetation quality that can be used to “ground truth” the regional monitoring of the riparian habitat. To date, the United States Bureau of Reclamation (USBR) along with the OCWD<sup>4</sup> has conducted field surveys once every three years. The most recent triennial field survey was conducted in the summer of 2019. The next field survey is scheduled for the summer of 2022. There is no scope or budget proposed for site-specific monitoring for FY 2020/21.

#### Task 6—Prepare Annual Report of the PBHSC

This task involves the analysis of the data sets generated by the PBHSP through water year 2020. The results and interpretations generated from the data analysis will be documented in the *Annual Report for Prado Basin Habitat Sustainability Committee for Water Year 2019/20*. This task includes the effort to prepare an administrative draft report for Watermaster and IEUA staff review, a draft report for the review by the PBHSC, and a final report including comments and responses. A PBHSC meeting will be conducted in May 2021 to review the draft report and facilitate comments on the report. The scope of this task is consistent with the work performed for the previous fiscal year.

#### Task 7—Project Management and Administration

This task includes the effort to prepare the PBHSP scope, schedule, and budget for the subsequent fiscal year. A draft *Technical Memorandum Recommended Scope and Budget of the Prado Basin Habitat Sustainability Program for FY 2021/22* will be submitted to the PBHSC in February 2021. A PBHSC meeting will be conducted in March 2021 to review the draft recommended scope and budget and facilitate comments. Also included in this task is project administration, including management of staffing and monthly financial reporting. The scope of this task is consistent with the work performed for the previous fiscal year.

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<sup>4</sup> OCWD staff provides assistance to the USBR in the field as in-kind services.



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Table 1. Work Breakdown Structure and Cost Estimate – Prado Basin Habitat Sustainability Program – FY 2020/21

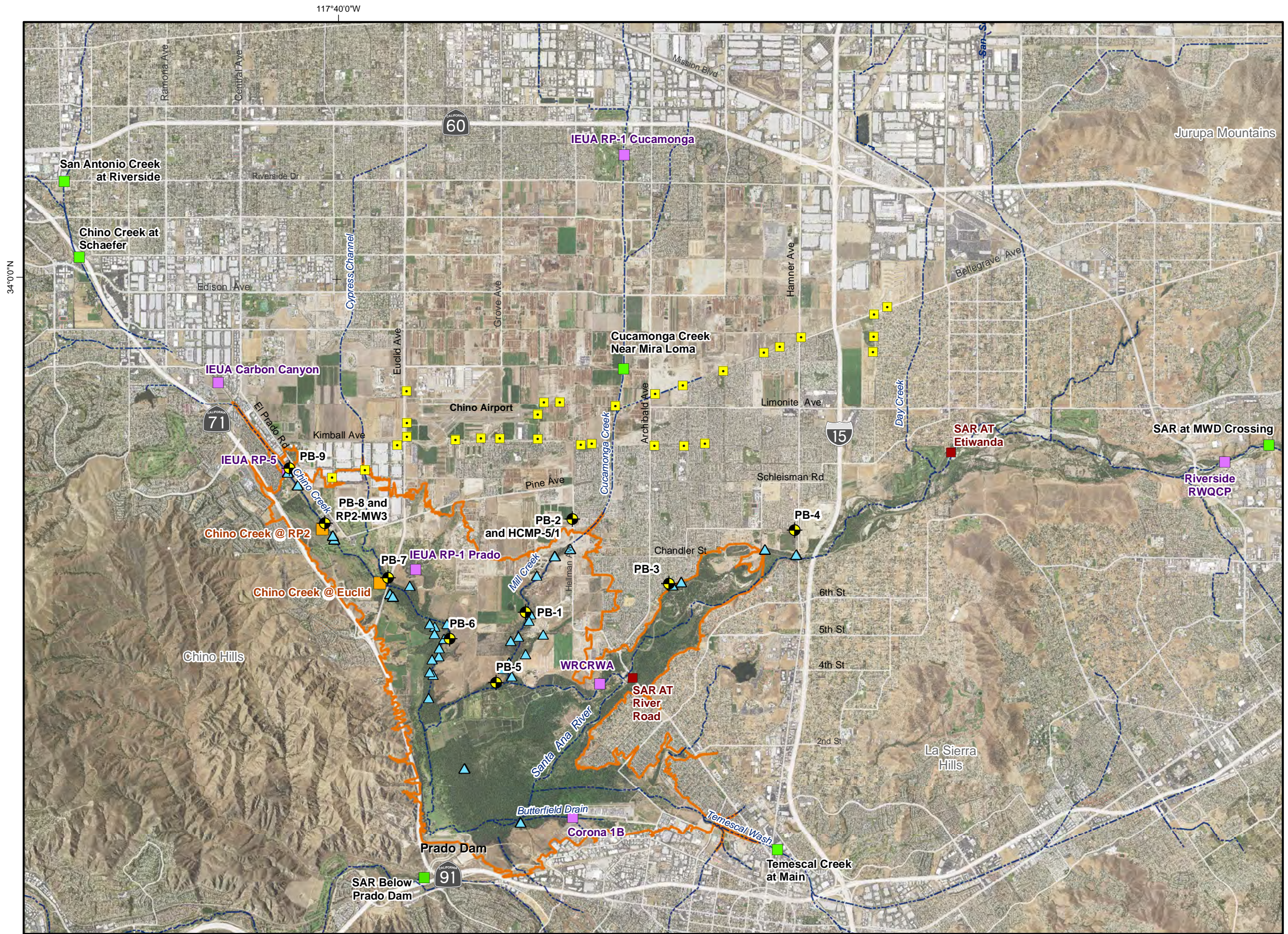
Figure 1. Prado Basin Habitat Sustainability Program Monitoring Sites – Fiscal Year 2020/21

**Table 1**  
**Work Breakdown Structure and Cost Estimate**  
*Prado Basin Habitat Sustainability Program: FY 2020/21*

Task Description	No. of sites	Labor Total		Other Costs						Notes	Totals					
		Person Days	Total	Travel	Equip. Rental	Lab	Outside Pro	Equip	Total		Recommended Budget 2020/21	Budget 2019/20	Difference 2019/20 to 2020/21	IEUA Share 2019/20	CBWM Share 2020/21	
<b>Task 1: Groundwater Level Monitoring Program</b>		<b>11.4</b>	<b>\$13,896</b>							<b>\$782</b>		<b>\$14,678</b>	<b>\$14,220</b>	<b>\$458</b>	-	<b>\$14,678</b>
1.1 Collect Transducer Data from PBHSP Wells (Quarterly)	18	5.0	\$5,128	\$590	\$192					\$782		\$5,910				
1.2 Collect, Check, and Upload Transducer Data from PBHSP Wells (Quarterly)	18	6.4	\$8,768							\$0		\$8,768				
<b>Task 2: Groundwater Quality Monitoring Program</b>		<b>3.3</b>	<b>\$7,778</b>							<b>\$2,362</b>		<b>\$10,140</b>	<b>\$15,514</b>	<b>-\$5,374</b>	-	<b>\$10,140</b>
2.1 Collect, Check, and Upload High-Frequency Probe Data from Pilot Monitoring Program (Quarterly)	4	3.4	\$4,235	\$240						\$240		\$4,475				
2.2 Collect, Check, and Upload Grab Sample General Mineral Chemistry Data (Semi-annually)	4	3.3	\$3,543	\$472	\$250	\$1,400				\$2,122		\$5,665				
<b>Task 3: Surface Water Monitoring Program</b>		<b>2.7</b>	<b>\$13,062</b>							<b>\$1,190</b>		<b>\$14,252</b>	<b>\$33,558</b>	<b>-\$19,306</b>	-	<b>\$14,252</b>
3.1 Collect, Check, and Upload Surface Water Discharge and Quality Data from POTWs, and Dam Level data from the ACOE (Annual)		1.9	\$2,559							\$0		\$2,559				
3.2 Collect, Check, and Upload Surface Water Discharge and Quality Data from USGS gaging stations (Annual)		0.8	\$1,096							\$0		\$1,096				
3.3 Collect, Check, and Upload High-Frequency Probe Data for Chino Creek from Pilot Monitoring Program (Quarterly)	2	4.8	\$5,554	\$240						\$240		\$5,794				
3.4 Collect, Check, and Upload Grab Surface Water Quality Field and Lab Data for Chino Creek from Pilot Monitoring Program (Semi-annually)	2	3.6	\$3,852		\$250	\$700				\$950		\$4,802				
<b>Task 4: Climate Monitoring Program</b>		<b>1.3</b>	<b>\$1,764</b>							<b>\$275</b>		<b>\$2,039</b>	<b>\$1,980</b>	<b>\$59</b>	<b>\$1,019.50</b>	<b>\$1,019.50</b>
4.1 Collect, Check, and Upload Climatic Data (Annual)		1.3	\$1,764					\$275		\$275		\$2,039				
<b>Task 5: Riparian Habitat Monitoring Program</b>		<b>22.3</b>	<b>\$24,738</b>							<b>\$10,000</b>		<b>\$34,738</b>	<b>\$80,044</b>	<b>-\$45,306</b>	<b>\$17,369.00</b>	<b>\$17,369.00</b>
5.1 Perform a Custom Flight to Acquire a High-Resolution 2019 Air Photo of the Prado Basin		1.5	\$2,860					\$10,000		\$10,000	1	12,860				
5.2 Catalog, Check, and Review the Extent of the Riparian Vegetation in the 2020 Air Photo of the Prado Basin		4.8	\$7,642							\$0		7,642				
5.3 Collect, Check, and Upload 2019 Landsat NDVI Data to the PBHSP Database		9.0	\$14,236							\$0		\$14,236				
<b>Task 6: Prepare Annual Report of the PBHSC</b>		<b>57.3</b>	<b>\$91,044</b>							<b>\$180</b>		<b>\$91,224</b>	<b>\$100,434</b>	<b>-\$9,210</b>	<b>\$45,612.00</b>	<b>\$45,612.00</b>
6.1 Analyze Data and Prepare Admin Draft Report for CBWM/IEUA		42.8	\$66,268							\$0		\$66,268				
6.2 Meet with CBWM/IEUA to Review Admin Draft Report		2.0	\$3,912	\$90						\$90		\$4,002				
6.3 Incorporate CBWM/IEUA Comments and Prepare Draft Report: Submit Draft Report to PBHSC		5.0	\$7,680							\$0		\$7,680				
6.4 Meet with PBHSC to Review Draft Report		3.0	\$5,720	\$90						\$90		\$5,810				
6.5 Incorporate PBHSC Comments and Finalize Report		4.5	\$7,464							\$0		\$7,464				
<b>Task 7: Project Management and Administration</b>		<b>11.1</b>	<b>\$20,661</b>							<b>\$90</b>		<b>\$20,751</b>	<b>\$21,675</b>	<b>-\$924</b>	<b>\$10,375.40</b>	<b>\$10,375.40</b>
7.1 Prepare Scope and Budget for FY 2021/22		4.0	\$7,528							\$0		\$7,528				
7.2 Meet with PBHSC to Review Scope and Budget for FY 2021/22		3.5	\$6,624	\$90						\$90		\$6,714				
7.3 Project Administration and Financial Reporting		3.6	\$6,509							\$0		\$6,509				
<b>Totals</b>		<b>228</b>	<b>\$172,942</b>	<b>\$1,492</b>	<b>\$500</b>	<b>\$2,100</b>	<b>\$10,275</b>	<b>\$0</b>	<b>\$14,879</b>			<b>\$187,821</b>	<b>\$267,425</b>	<b>-\$79,604</b>	<b>\$74,376</b>	<b>\$113,446</b>

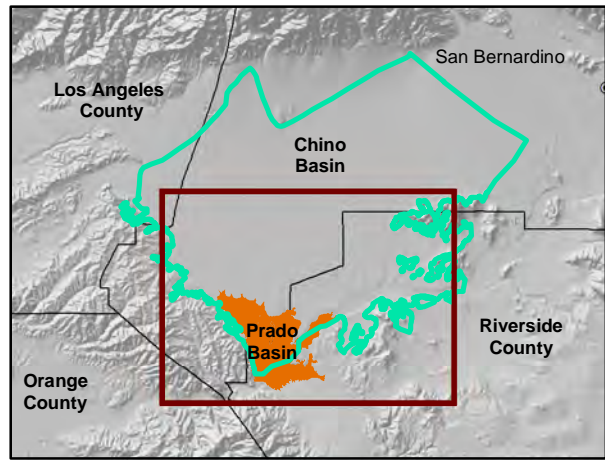
1 - This is half of the cost for the outside professional. OCWD will pay the other half.



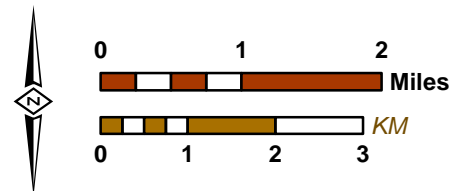


- Groundwater and Surface Water Monitoring Sites**
- PBHSP Well Site (Groundwater Levels and Quality)
  - POTW Discharge Outfall (Discharge and Surface Water Quality)
  - USGS Stream Gage Station (Discharge)
  - Watermaster Santa Ana River Sites - Maximum Benefit Monitoring (Surface Water Quality)
  - PBHSP Surface Water Site on Chino Creek (High-Frequency Temperature, EC, and Level and Surface Water Quality)
- Vegetation Field Survey Sites**
- Active Survey Locations
- Other Features**
- Prado Basin Management Zone (Prado Basin)
  - Chino Basin Desalter Authority Well
  - Concrete-Lined Channels
  - Unlined Rivers and Streams

Aerial Photo: USDA, 2014. Mosaic of photos from May 13, 2014 to June 3, 2014



Prepared by:  
 Author: VMW  
 Date: 2/24/2020  
 File: Figure 1 FY 2020-21 Scope



**Prado Basin Habitat Sustainability Program**  
 Fiscal Year 2020/21 Scope and Budget

**Prado Basin Habitat Sustainability Program  
 Monitoring Sites - Fiscal Year 2020/21**

**Figure 1**