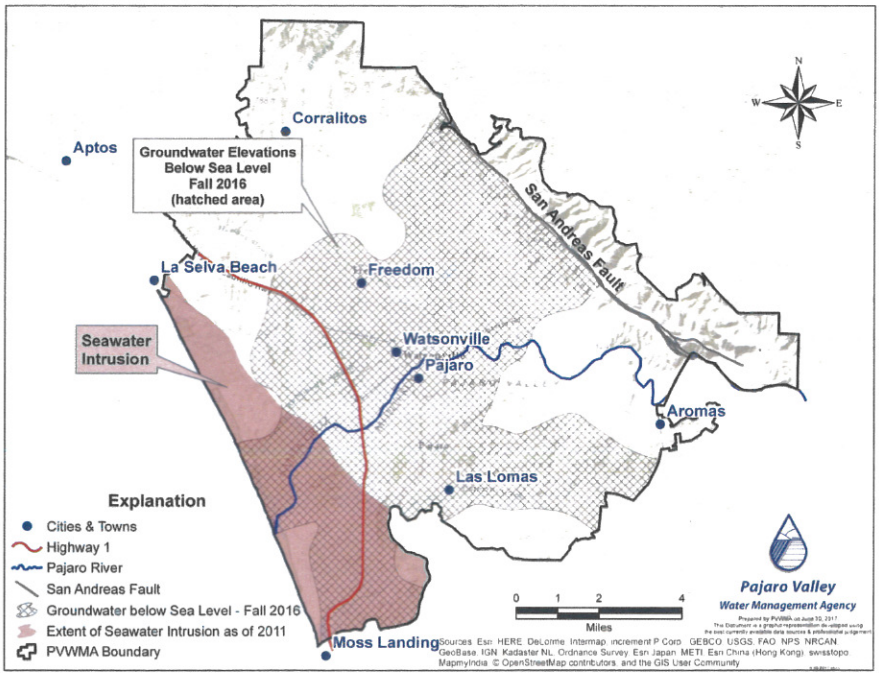
PV WATER BASIN MANAGEMENT PLAN

Since its formation in 1984, the Pajaro Valley Water Management Agency (PV Water) has been working to preserve and protect the Valley's water resources. One of the key elements of this effort has been the development and implementation of the Basin Management Plan (BMP).

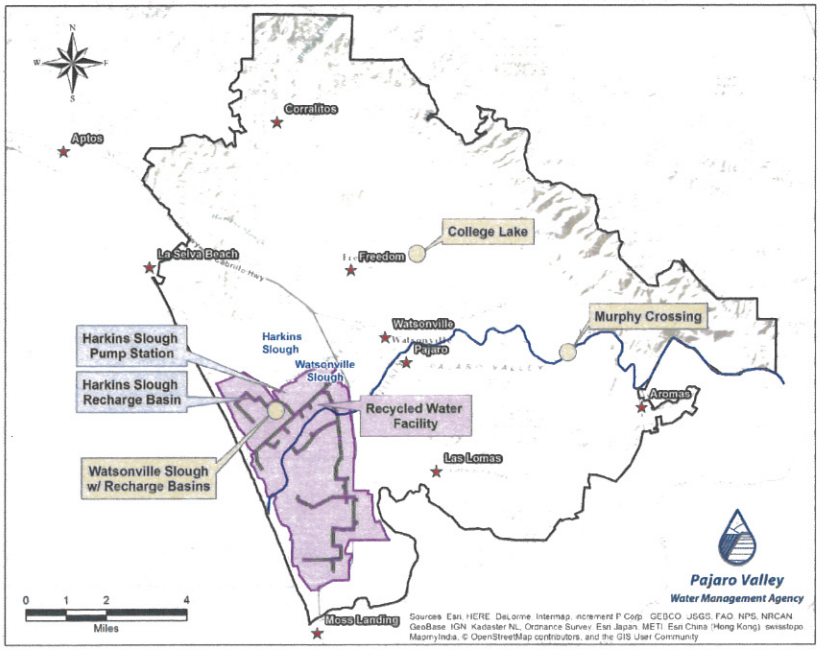
In 2010, the PV Water Board of Directors established an Ad Hoc Basin Management Planning Committee of three Board members and 18 stakeholders to provide input for updating the BMP. This community-based Committee was tasked with finding solutions to the serious groundwater overdraft and seawater intrusion problems, while ensuring sufficient water supplies for present and projected needs in the Pajaro Valley.



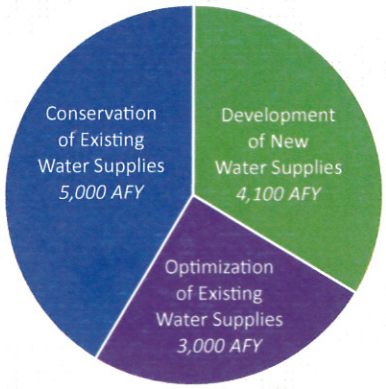
Over two years, the Committee provided input that guided the development of the BMP Update, the projects and programs described within it, and conducted a project screening analysis. Forty-four potential projects were identified. Fourteen projects passed the initial screening process and were used by the Committee to (1) develop a program that together could achieve the dual goals of balancing the basin and halting seawater intrusion, and (2) recommend which of the projects to include in the first phase of implementation between 2015 and 2025.

Now, PV Water is preparing to implement the first three priority projects outlined by stakeholders in the BMP Update – the first of several to be implemented over a 20-year period. The goal is to achieve a sustainable groundwater basin using only local water resources, in combination with an efficient conservation program, while preserving the Valley's robust economy. Postponing implementation of the BMP would result in the further depletion of groundwater supply and degradation of groundwater quality including through seawater intrusion, putting the Valley at greater risk of State intervention. The Sustainable Groundwater Management Act requires that critically overdrafted groundwater basins, like the Pajaro Valley, become sustainable by 2040.

PROPOSED BMP PROJECTS



Basin Management Plan Update Project Locations



The BMP goal is for 12,100 acre-feet per year offset in groundwater pumping.

The Committee's priorities for identifying individual BMP projects were:

- Water use efficiency and water demand reduction alternatives that have the potential to reduce basin demands.
- Improvements to existing infrastructure to maximize supply.
- New supply projects to balance the groundwater basin and prevent long-term overdraft.

Proposed Harkins Slough Recharge Facilities Upgrades Project

A network of sloughs, or channels, drains the northwestern region of the PV Water service area. The Watsonville Slough system includes Harkins, Hansens, West Branch, Galligans, Struve, and Watsonville Sloughs. Harkins Slough has the largest drainage area and the largest annual average flux of 3,000 acre-feet. The BMP identified priority projects in both the Harkins and Watsonville slough systems.

The BMP recommendedthat facility improvements are needed for Harkins Slough to accomplish three goals:

1. Maximize diversions from the slough
2. Maximize infiltration of diverted water
3. Maximize water extracted from the recovery wells

The proposed Harkins Slough Recharge Facilities Upgrades are designed to accomplish these goals through the construction of new infrastructure and upgrades to existing infrastructure. This would include installing new recovery wells at the recharge basin, upgrading the pump station and filters at the slough diversion to improve system operation and recharge percolation rates, and constructing a new recharge basin.

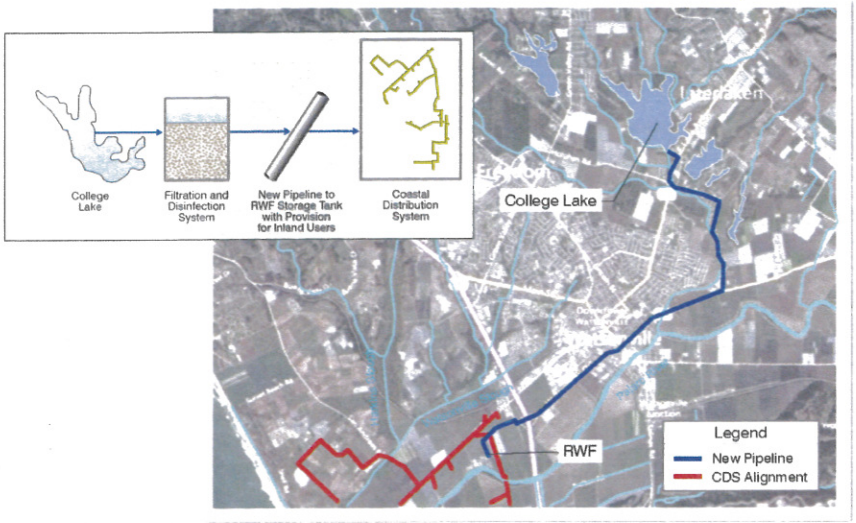
Harkins Slough is one of the Basin Management Plan Update's first three priority projects.

Proposed Watsonville Slough Diversion with Recharge Basins Project

The Watsonville Slough system, of which Struve Slough is a component, is a network of approximately 800 acres of coastal salt marsh, seasonal wetlands, brackish and freshwater emergent marsh, and riparian communities. It receives runoff from a 13,000-acre watershed area. The proposed project is to utilize some of the available freshwater supply that would otherwise drain to Monterey Bay.

The project approach and design are similar to the Harkins Slough Recharge Facilities, including diversion, treatment, and recharge facilities. This proposed project would divert water during winter high flows from approximately November through May. The water would be stored in the shallow aquifer at the proposed North Dunes Recharge Basin or at alternative locations near the existing Harkins Slough Recharge Basin.

Proposed College Lake Project: Potential for greatest amount of new water supply



College Lake Project Map

College Lake is a naturally occurring seasonal lake located approximately 1 mile northeast of Watsonville City limits. To accommodate farming, the College Lake Reclamation District drains the lake each spring by pumping the water downstream into Salsipuedes Creek and it ultimately flows into Monterey Bay.

The proposed College Lake Project would increase the storage capacity of the lake, allowing water to be captured, stored, treated, and delivered for agricultural irrigation. For the proposed project to be successful, water must be retained in College Lake for longer periods than currently occurs.

The proposed project includes construction of a new adjustable weir downstream of the existing fixed weir. The new outlet weir would raise the College Lake outlet elevation by 2.4 feet, increasing the total storage capacity of the lake from approximately 1,000 acre-feet to approximately 1,700 acre-feet. The estimated yield of the proposed project, given the increased storage capacity and projected inflows, is 2,400 acre-feet per year, assuming water may be stored in the lake through September of each year. It also would increase the total inundated area from approximately 234 acres to 285 acres.

Proposed College Lake Project Status Update

- Initial development of a water rights application is underway; filing the application with the State is planned to occur in Fall 2017.
- Conceptual design is underway.
- Mapping, flow modeling, site research and initial environmental permitting is underway.
- The Notice of Preparation for the Draft Environmental Impact Report will be published in Fall 2017.

College Lake Anticipated Water Supply

Date Lake Drained By	Estimated yield if lake must be drained by date (afy)	Estimated yield if lake must be drained by date (%)	Available Planting Season
30-Apr	260	11%	4 months
31-May	610	25%	3 months
30-Jun	1150	48%	2 months
31-Jul	1700	71%	1 month
31-Aug	2150	90%	0 months
30-Sep	2400	100%	0 months

PV Water submitted a water rights application to the State Water Resources Control Board in 1995 for diversion and storage at College Lake. The water rights application is being re-initiated with updated project components.

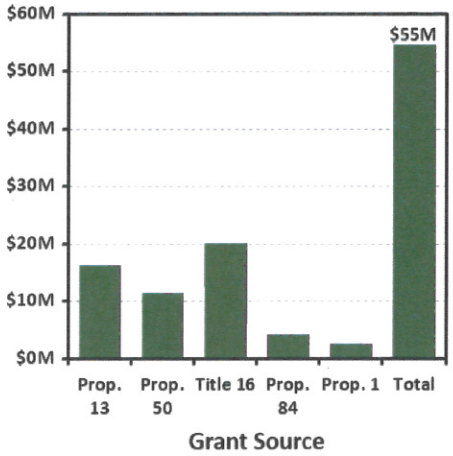
The Sustainable Groundwater Management Act

In 2014, the State of California enacted the Sustainable Groundwater Management Act (SGMA) – legislation aimed at stopping overuse of groundwater supplies and achieving unprecedented sustainable groundwater management. PV Water is taking the lead in regional efforts to comply with SGMA through implementation of the BMP projects to halt groundwater overdraft and seawater intrusion. PV Water proposes to preserve and protect the Pajaro Valley's groundwater basin through local projects and programs.

The California Department of Water Resources has identified the Pajaro Valley as a high priority, critically overdrafted basin. *"A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."*

Competitively Securing Grant Funding

PV Water will take many steps to secure funding and minimize project costs for ratepayers, while ensuring essential projects and facilities are in place. The projects in the BMP—water conservation, optimizing the use of local water resources, and developing local water supplies—are competitive for state and federal funding. Grant revenue provided approximately half of the existing infrastructure costs, and staff will continue to aggressively pursue grant funding for the proposed BMP projects.



PV Water has obtained $55 million in grants for previous projects. The current PV Water facility improvements have already garnered nearly $8 million in direct grant support.

Stay Involved

- **Summer 2017:** Community and Board Meetings
- **October 2017:** Environmental Review for Proposed College Lake Project and State Water Rights Application
- **Fall 2017 to 2018:** Individual Discussions with Property Owners

PV Water: Who We Are

Formed by the California State Legislature in 1984 under the "Agency Act," PV Water's mission is to efficiently manage existing and supplemental water supplies in order to prevent further increase in, and to accomplish continuing reduction of, long-term overdraft. PV Water is multi-jurisdictional and includes the City of Watsonville, parts of Santa Cruz, Monterey and San Benito Counties, and conducts basin management planning, well metering, hydrologic modeling, and supplemental water supply and conservation programs.

PV Water

PV Water Board of Directors

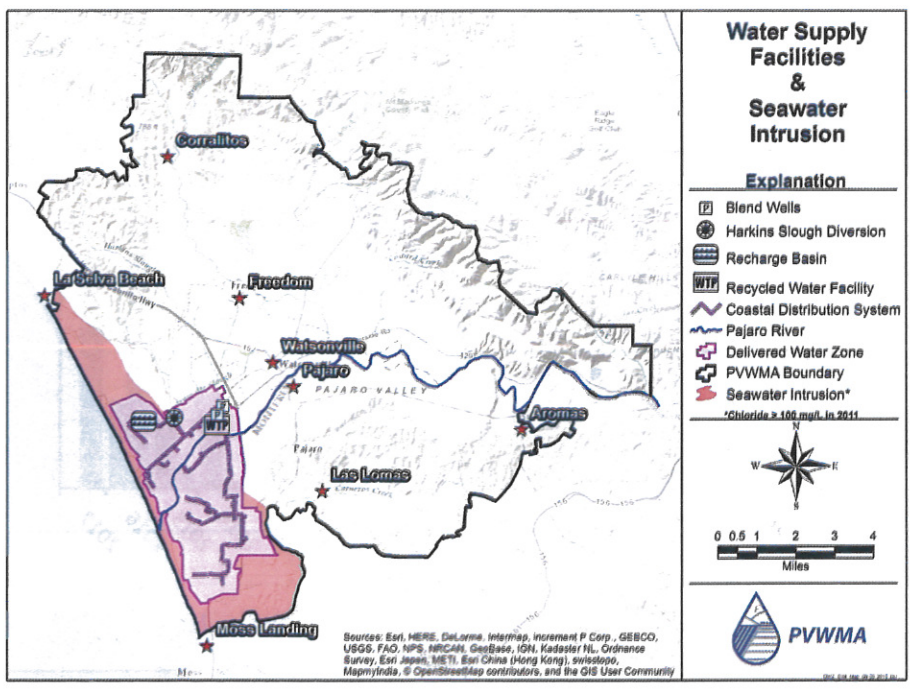
These board representatives are voters of and residents within the area served by PV Water. Elected directors serve up to four years per term.

- **Rosemarie Imazio**, Chair, Appointee, City of Watsonville
- **Amy Newell**, Vice Chair, Division "C," Santa Cruz County
- **Dwight Lynn**, Treasurer, Division "A," Santa Cruz County
- **Don Bussey**, Division "B," Santa Cruz County
- **Bob Culbertson**, Division "D," Santa Cruz, Monterey and San Benito Counties
- **David Cavanaugh**, Appointee, Santa Cruz County
- **Javier Zamora**, Appointee, Monterey County

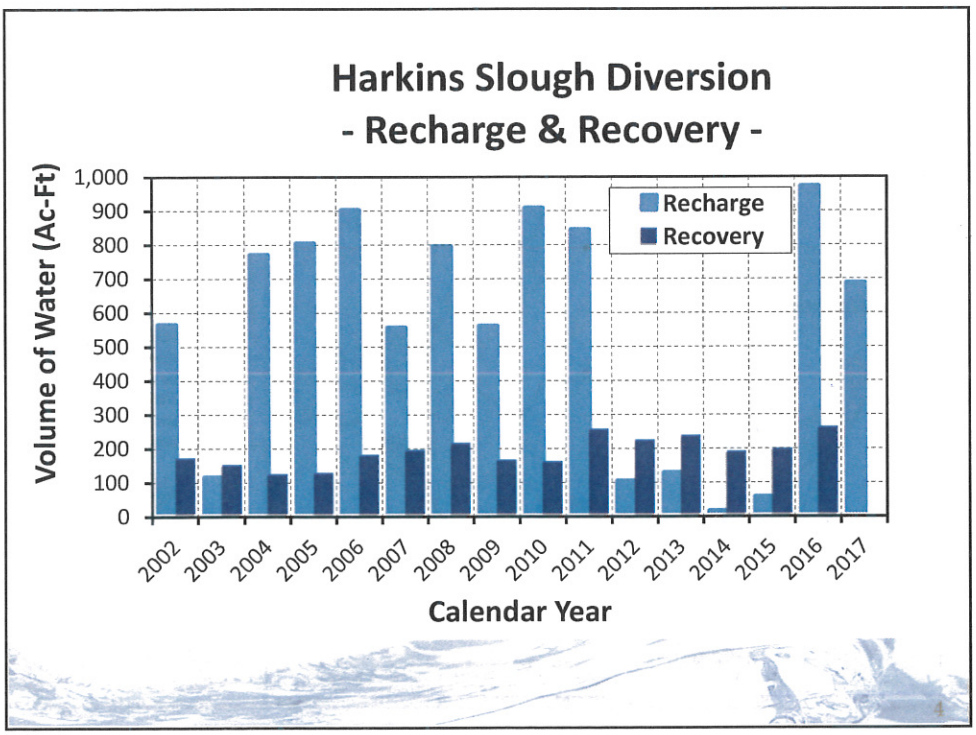
If your group would like a presentation on the BMP or specific projects, please contact **Marcus Mendiola** *at* ***831-722-9292 x33*** *or* ***mendiola@pvwater.org***.

Existing Water Supply Facilities to Stop Overdraft & Seawater Intrusion

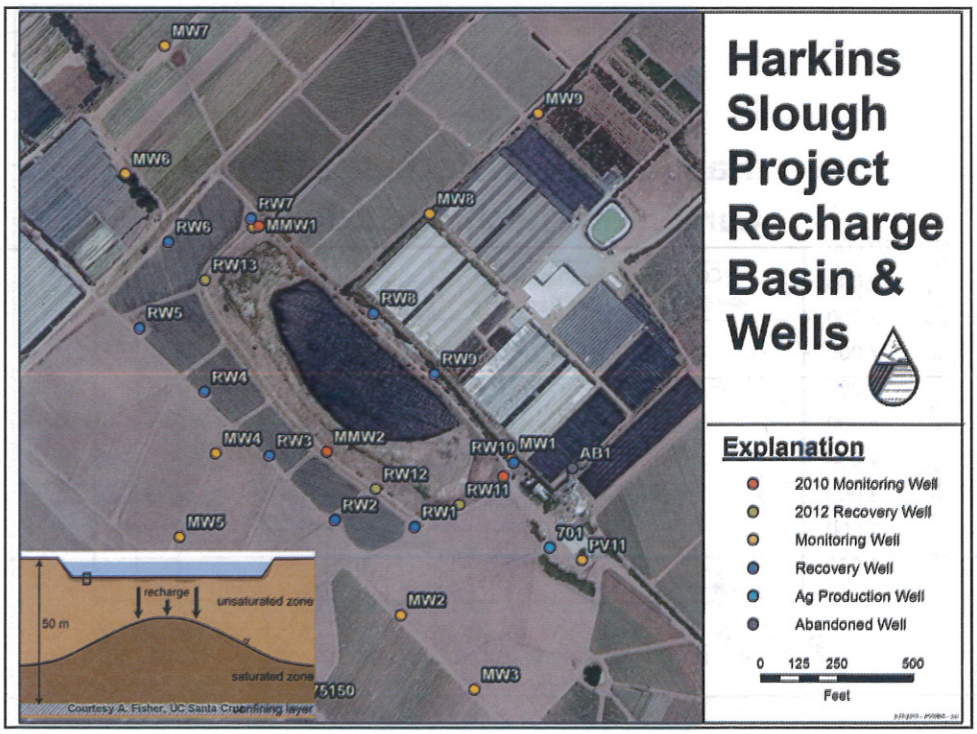
- **Harkins Slough Facility**
  - Managed Aquifer Recharge & Recovery
  - Stream flow diversion
  - 8,700 AF recharged since 2002
- **Recycled Water Facility**
  - 4,000 AFY irrigation season capacity
  - Drought tolerant supply
  - Reduces discharge of secondary effluent to marine sanctuary
- **Coastal Distribution System**
  - Over 21 miles of water conveyance pipeline
- **Blend Supplies**

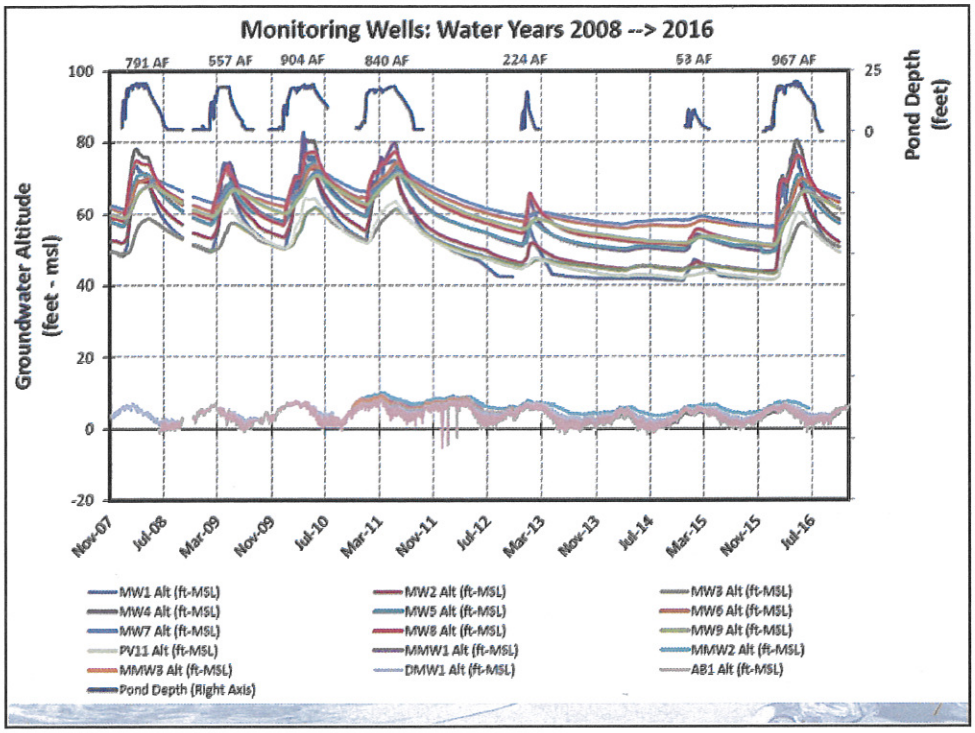


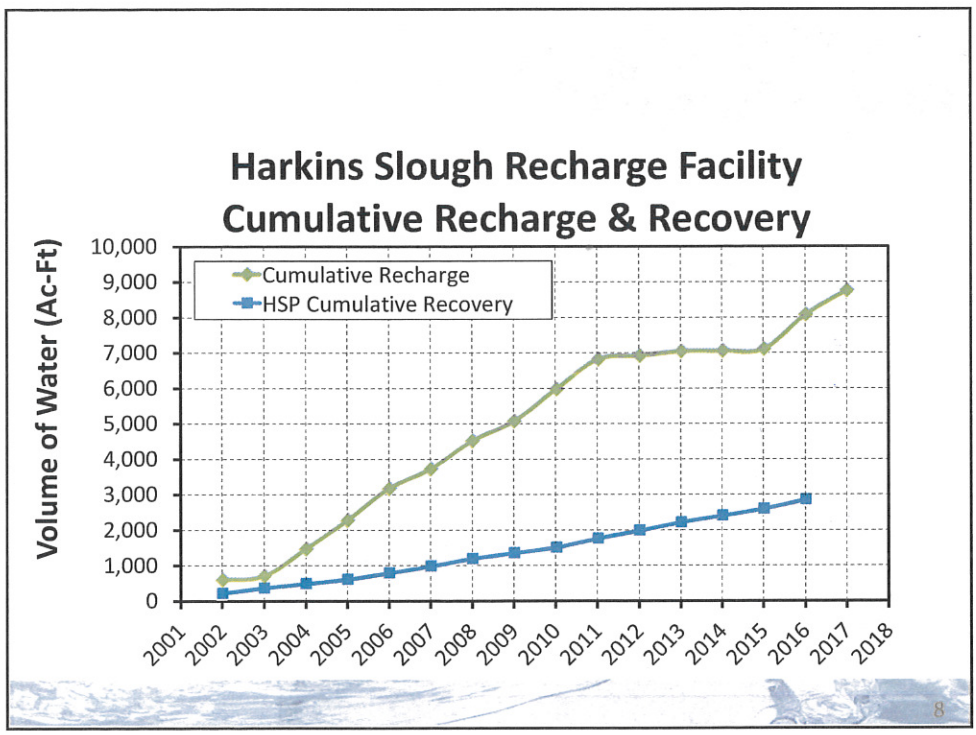
Harkins Slough Pump Station

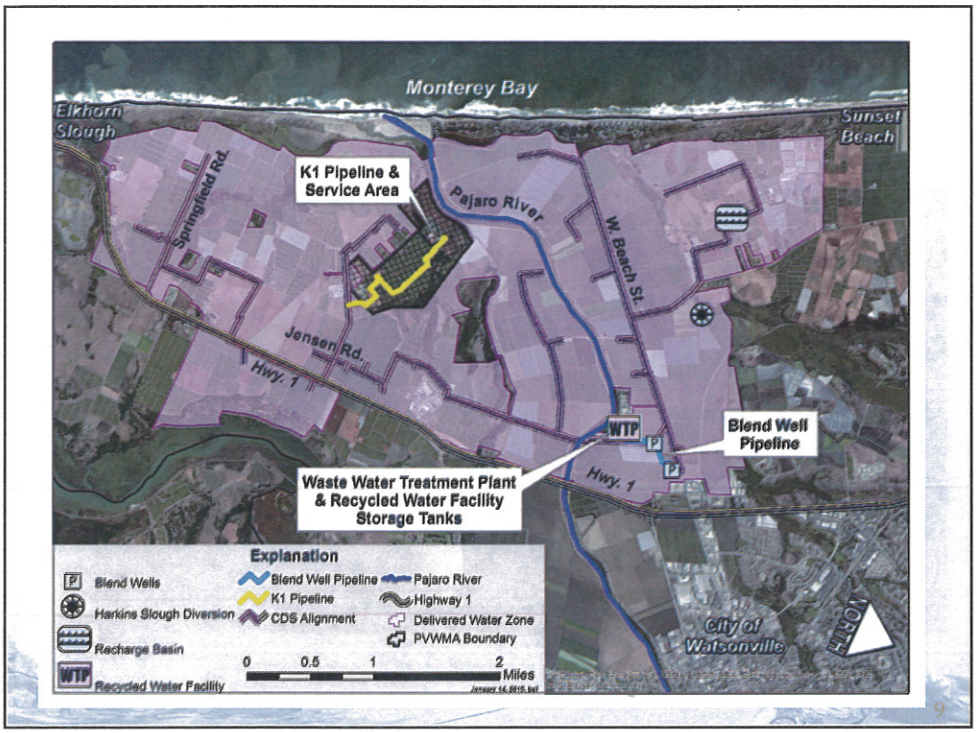


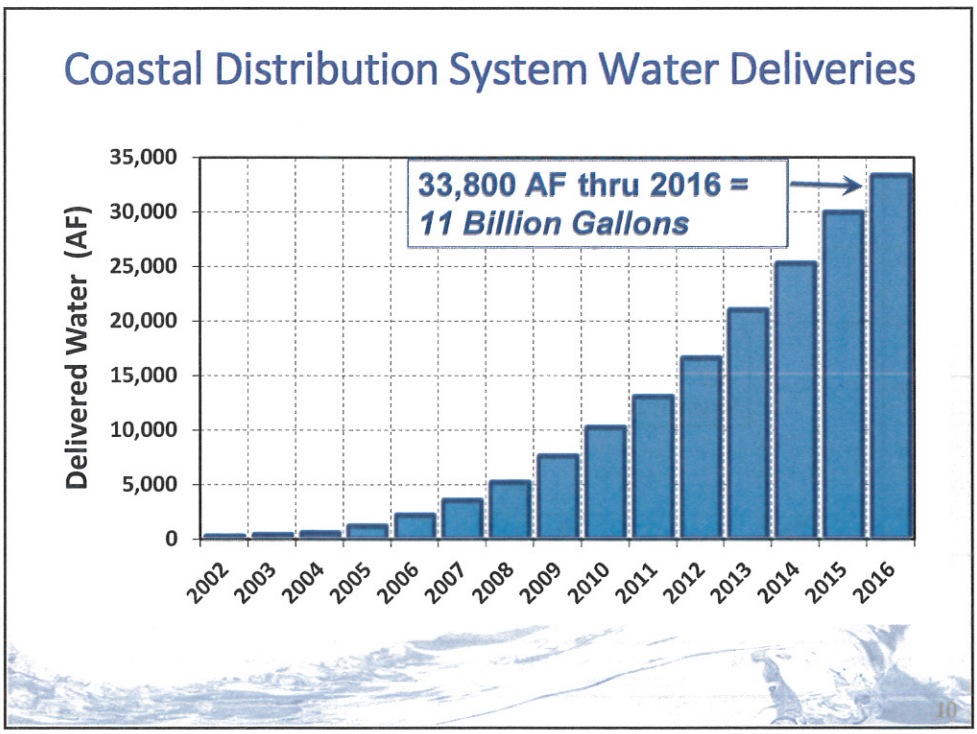

Harkins Slough Managed Aquifer Recharge & Recovery


MW7
MW9
MW6
RW7
MW8
RW6
MMW1
RW13
RW8
RW5
RW9
RW4
MW4
RW3
MMW2
RW10
MW1
AB1
RW12
RW11
RW2
RW1
MW5
701
PV11
MW2
MW3
recharge
unsaturated zone
50 m
saturated zone
confining layer
75150
Courtesy A. Fisher, UC Santa Cruz
Harkins Slough Project Recharge Basin & Wells
Explanation
2010 Monitoring Well
2012 Recovery Well
Monitoring Well
Recovery Well
Ag Production Well
Abandoned Well
0 125 250 500
Feet


Monitoring Wells: Water Years 2008 --> 2016
791 AF
557 AF
904 AF
840 AF
224 AF
53 AF
967 AF
Groundwater Altitude (feet - msl)
Pond Depth (feet)
100
80
60
40
20
0
-20
25
0
Nov-07
Jul-08
Mar-09
Nov-09
Jul-10
Mar-11
Nov-11
Jul-12
Mar-13
Nov-13
Jul-14
Mar-15
Nov-15
Jul-16
MW1 Alt (ft-MSL)
MW2 Alt (ft-MSL)
MW3 Alt (ft-MSL)
MW4 Alt (ft-MSL)
MW5 Alt (ft-MSL)
MW6 Alt (ft-MSL)
MW7 Alt (ft-MSL)
MW8 Alt (ft-MSL)
MW9 Alt (ft-MSL)
PV11 Alt (ft-MSL)
MMW1 Alt (ft-MSL)
MMW2 Alt (ft-MSL)
MMW3 Alt (ft-MSL)
DMW1 Alt (ft-MSL)
AB1 Alt (ft-MSL)
Pond Depth (Right Axis)


Harkins Slough Recharge Facility
Cumulative Recharge & Recovery
Volume of Water (Ac-Ft)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Cumulative Recharge
HSP Cumulative Recovery
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

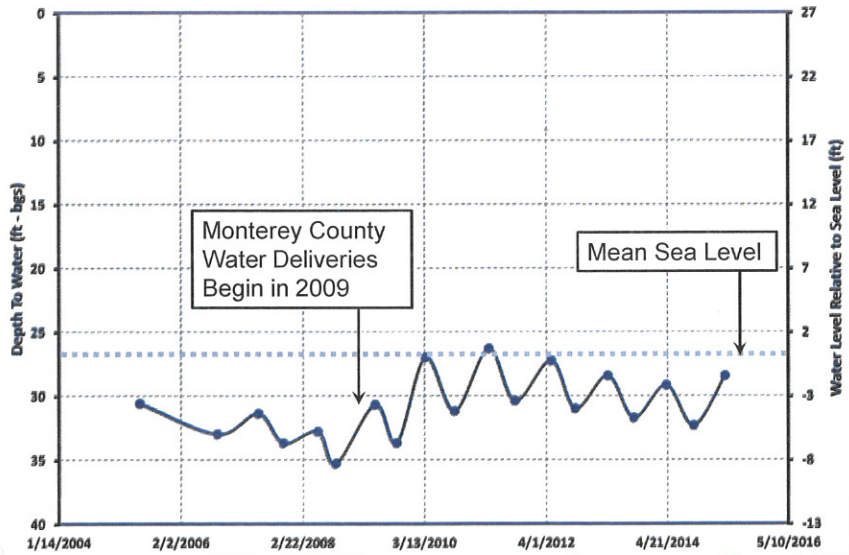

Monterey Bay
Elkhorn Slough
Sunset Beach
K1 Pipeline & Service Area
Springfield Rd.
Pajaro River
W. Beach St.
Jensen Rd.
Hwy. 1
WTP
Blend Well Pipeline
Waste Water Treatment Plant & Recycled Water Facility Storage Tanks
Hwy. 1
City of Watsonville
NORTH
Explanation
Blend Wells
Harkins Slough Diversion
Recharge Basin
Recycled Water Facility
Blend Well Pipeline
K1 Pipeline
CDS Alignment
Pajaro River
Highway 1
Delivered Water Zone
PVWMA Boundary
0 0.5 1 2 Miles


Coastal Distribution System Water Deliveries
Delivered Water (AF)
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
33,800 AF thru 2016 =
11 Billion Gallons
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

Coastal Distribution System (CDS)

11

Hydrograph of a Well on Springfield Terrace



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