Water Stabilization Project No. 2 Implementation Grant Proposal

Submitted by

Antelope Valley-East Kern Water Agency

January 7, 2011

WATER SUPPLY STABILIZATION PROJECT NO. 2 IMPLEMENTATION GRANT PROPOSAL

Submitted by the Antelope Valley-East Kern Water Agency

GRANT APPLICATION CHECKLIST

APPLICATION INFORMATION

Applicant Information

Organization Name	Antelope Valley-East Kern Water Agency (AVEK)
Taxpayer ID	95-2090223
Proposal Name	Water Supply Stabilization Project No. 2 (WSSP2)
Proposal Objective	The WSSP2 is a groundwater basin banking project that will increase the reliability of the Antelope Valley Region's water supplies through construction of the necessary infrastructure to store excess water available from the State Water Project (SWP) during wet periods and recover and serve it to customers during dry and high demand periods or during a disruption in deliveries from the SWP. By "banking" excess water for future use, the WSSP2 will significantly reduce the Region's dependence on constant water deliveries from the Delta. The WSSP2 will also increase the amount of groundwater in the basin through recharge and preserve agricultural land and open space.

Budget

Other Contributions	$0
Funding Match	$31,573,572
Federal Contribution	$0
In-kind Contribution	$0
Grant Funds Requested	$6,000,000
Total Proposal Cost	$37,573,572

Geographic Information

Latitude of Center of IRWM Region	34° 49' North
Longitude of Center of IRWM Region	118° 10' West
Location of Center of IRWM Region	Intersection Ave. "A" and State Highway 14
County	Los Angeles, Kern, and San Bernardino
Groundwater Basins	Antelope Valley
Hydrologic Basin	South Lahontan
Watershed	Antelope Valley

Legislative Information

State Assembly Districts	32, 34, 36, 37
State Senate Districts	17, 18
Congressional Districts	22, 25

APPLICANT INFORMATION AND QUESTIONS

Q1. Proposal Description

The WSSP2 is a single project which proposes to construct a groundwater recharge and recovery project on land already owned by AVEK. SWP water will be delivered to the recharge site through AVEK's existing West Feeder. The Project includes about 400 acres of recharge ponds, five recovery wells, pipelines, and a pump station to pump the recovered water into AVEK's South-North Intertie Pipeline (SNIP) from which the recovered water can be delivered to any of AVEK's customers.

Q2. Project Director

Dan Flory, General Manager
6500 West Avenue N
Palmdale, Ca. 93551
661.943.3201
dflory@avek.org

Q3. Project Manager

Tom Barnes, Resource Manager
6500 West Avenue N
Palmdale, Ca. 93551
661.943.3201
tbarnes@avek.org

Q4. Applicant information

Antelope Valley-East Kern Water Agency
6500 West Avenue N
Palmdale, Ca. 93551

Q5. Additional Information

Lahontan Funding Area (Antelope Valley)

Q6. Responsible RWQCB

Lahontan Regional Water Quality Control Board

Q7. Eligibility

The total Project cost is estimated to be $37,573,572. AVEK is requesting $6,000,000 from Proposition 84 funds. AVEK will fund the remainder or about 84%.

Q8. Eligibility

Lahontan Funding Area—Antelope Valley.

Q9. Eligibility

AVEK is a local agency as defined in Appendix B—Definitions--of the Proposition 84 grant guidelines.

Q10. Eligibility

AVEK is the sole sponsor of the proposal

Q11. Eligibility

AVEK has submitted the 2005 and 2008 Urban Water Management Plan to DWR. AVEK has not received any confirmation accepting the Plan as complete. AVEK is committed to comply with any additional requirements issued by DWR to deem the Plan as complete before the execution of the Grant Agreement. AVEK is also committed to submit an updated UWMP which is consistent with the 2010 UWMP Guidebook to be verified as complete by DWR before the execution of a grant agreement.

Q12. Eligibility

AVEK will submit self certifications for AB 1420 as part of this Grant Proposal

Q13. Eligibility

The project is eligible for proposition 84 funds as it is a groundwater recharge and recovery project. The project name is Water Supply Stabilization Project No. 2 and it will be implemented by the Antelope Valley-East Kern Water Agency.

Q14. Eligibility

The Antelope Valley IRWM Plan, as prepared and adopted by AVEK and the other members of the Antelope Valley Regional Water Management Group, meets all of the requirements of a Groundwater Management Plan in compliance with CWC § 10753.7. The following Assembly Bill (AB) 3030 elements are associated with groundwater supply management within the Antelope Valley Region. A discussion of how these elements are addressed in the Antelope Valley IRWM Plan is provided below.

Mitigation of Conditions of Overdraft. Although the groundwater basin is not currently adjudicated, an adjudication process has begun. Although there are no existing restrictions on pumping, water rights may be assigned as part of the adjudication process. The groundwater adjudication process is a management action discussed in the Antelope Valley IRWM Plan.

Replenishment of Groundwater Extracted by Water Producers. Several groundwater recharge and banking projects are being considered and evaluated as part of the IRWM Plan. Additionally, Edwards AFB has been actively involved in projects aimed at refilling the depleted aquifers. The goals of these projects are to recharge/bank sufficient groundwater supply in wet years for use during dry years, thereby minimizing long-term impacts to groundwater levels.

Monitoring of Groundwater Levels and Storage. Groundwater level and storage monitoring is a direct indicator of the groundwater supply. The Water Supply Management Strategy (WSMS) (provided in Section 5 of the IRWM Plan) includes management and compilation of groundwater levels and water quality data.

Facilitating Conjunctive Use Operations. Conjunctive use operations relate to the combined use of surface water and groundwater to optimize resources and minimize adverse effects of using a single source. Conjunctive use will be facilitated as part of the IRWM Plan through many of the water supply management projects in the WSMS described in more detail in Section 5 of the IRWM Plan. Conjunctive use opportunities with native water is limited, however, due to the relatively small amount of native surface and groundwater available. Thus, the success of conjunctive use operations will depend heavily on the ability to import water from outside of the Antelope Valley Region.

Q15. Eligibility State Water Project Contractors that supply water to the Antelope Valley IRWM Region have a combined Table A Allocation of 165,000 acre-feet per year of water supplied from the Sacramento-San Joaquin Delta.

Q16. Eligibility The portfolio of projects and programs that make up the AVIRWM Plan help reduce dependence on the Sacramento-San Joaquin Delta for water supply. Attachment 15 has been completed to demonstrate the reduction of delta water dependence.

Q17. Eligibility The Antelope Valley IRWM Group was recently awarded Proposition 84 Planning grant funding to update the IRWM Plan. The IRWM Plan updates, along with this proposed WSSP2 Project, will continue to include projects and programs that reduce dependence on the Sacramento-San Joaquin Delta for water supply. Attachment 15 has been completed for further explanation.

PROJECT INFORMATION

Project Benefits Information

Project Name Water Supply Stabilization Project No. 2 (WSSP2)

Benefit Type Water Storage – Groundwater Supply Enhancement

Benefit level Primary

Description AVEK will recharge unused water from their State Water Project contracted supplies during low demand periods expected to be November through February.

Measurement 23,000 Ac Ft per year

Benefit Type Water Storage – Groundwater Recharge Areas Developed

Benefit level Primary

Description AVEK will construct a total of 400 gross acres of recharge basins which are expected to percolate at a rate of a half of foot a day. Recharge will take place during low demand months which are expected to be November Through February.

Measurement 23,000 Ac Ft per year

Benefit Type Water Storage – Surface Water Quality Improvement

Benefit level Primary

Description AVEK expects to treat the surface water from the California Aqueduct as it is passes through the various soil layers during the recharge process. When the recharged water is recovered AVEK will simply chlorinate the water to meet current potable water standards at the proposed Recovered Water Pump Station site.

Measurement 191 Ac Ft per day

Benefit Type Other – Improve Water Supply Facilities

Benefit level Primary

Description AVEK will recharge up to 23,000 Ac Ft of water per year during wet years and will recover up to 90% of the recharged water during dry years when supplies from the State Water Project are low.

Measurement 20 MGD

Benefit Type Groundwater Management – Groundwater Quality Samples Taken

Benefit level Secondary

Description As part of the Performance Monitoring and Assessment Plan for the Project AVEK will collect samples from about 8 monitoring wells on or near the recharge basin site which will determine the water quality of the groundwater basin.

Measurement NA

Benefit Type Groundwater Management – Water Level Measurements Taken

Benefit level Secondary

Description As part of the Performance Monitoring and Assessment Plan for the Project AVEK will monitor the groundwater levels through 8 monitoring wells on or near the recharge basin.

Measurement NA

Budget

Other Contributions	$0
Funding Match	$31,573,572
Federal Contribution	$0
In-kind Contribution	$0
Grant Funds Requested	$6,000,000

Total Proposal Cost	$37,573,572

Geographic Information

Latitude of Center of Project	34^{o} 49' North
Longitude of Center of Project	118^{o} 19' West
Location of Center of Project	Intersection Ave. "A-8" and 110^{th} Street West
County	Los Angeles, and Kern
Groundwater Basins	Antelope Valley
Hydrologic Basin	South Lahontan
Watershed	Antelope Valley

Legislative Information

State Assembly Districts	32, 34, 36, 37
State Senate Districts	17, 18
Congressional Districts	22, 25

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ATTACHMENT 1. AUTHORIZATION AND ELIGIBILITY REQUIREMENTS

AUTHORIZING DOCUMENTATION

The attached resolution authorizes the Antelope Valley-East Kern Water Agency to submit this Implementation Grant Proposal and execute an agreement with the State of California.

ELIGIBLE APPLICANT DOCUMENTATION

The applicant (Antelope-Valley-East Kern Water Agency [AVEK]) is a local organization and was created on September 9, 1959, by an act of the California Legislature. The primary purpose for the formation of the Agency was to obtain imported water from the State Water Project to supplement over-drafted groundwater resources.

In January 1962, the State Department of Water Resources issued a report entitled *Report on Feasibility of Serving the Antelope Valley-East Kern Water Agency from State Water Facilities*. The principal conclusion of the report was, "The Antelope Valley-East Kern Water Agency and the area it encompasses has the ability, the necessity, the economic justification, and the financial capability required to enter into a contract with the State of California for the service of water from State Water Facilities."

In September 1962, AVEK executed a contract with the State Department of Water Resources for delivery of a maximum entitlement of 120,000 AFY of water. Subsequent amendments to the contract increased AVEK's entitlement to 141,400 AFY.

File 2 of Attachment 2 of this application includes the Integrated Regional Water Management Plan Implementation Agreement among the Regional Water Management Group (RWMG) participants. AVEK is the only sponsor for the project with many of the RWMG participants supporting the proposal.

GROUND WATER MANAGEMENT PLAN COMPLIANCE

One of the more prevalent concerns in the Antelope Valley Region relates to management of the Antelope Valley Groundwater Basin. Groundwater has and continues to be an important resource within the Antelope Valley Region. Projected urban growth, coupled with limits on the available local and imported water supply, are likely to continue to increase the reliance on groundwater.

The Antelope Valley IRWM Plan (previously submitted to DWR), as prepared and adopted by AVEK and the other members of the Antelope Valley Regional Water Management Group, meets all of the requirements of a Groundwater Management Plan in compliance with CWC § 10753.7. The following Assembly Bill (AB) 3030 elements are also associated with groundwater supply management within the Antelope Valley Region. A discussion of how these elements are addressed in IRWM Plan is provided below.

Mitigation of Conditions of Overdraft

The Antelope Valley groundwater basin is not currently adjudicated, but an adjudication process is currently in litigation. Although there are no existing restrictions on pumping, water rights may be assigned as part of the adjudication process. The groundwater adjudication process is a management action discussed in the Antelope Valley IRWM Plan.

Replenishment of Groundwater Extracted by Water Producers

Several groundwater recharge and banking projects were evaluated as part of the IRWM Plan including the proposed Water Supply Stabilization Project No. 2. Additionally, Edwards Air Force Base has been actively involved in projects aimed at recharging the depleted aquifers. The goals of these projects are to recharge/bank sufficient groundwater supply in wet years for use during dry years, thereby minimizing long-term impacts to groundwater levels.

Monitoring of Groundwater Levels and Storage

Groundwater level and storage monitoring is a direct indicator of the groundwater supply. The Water Supply Management Strategy (WSMS) (provided in Section 5 of the IRWM Plan) includes management and compilation of groundwater water levels and water quality. A significant portion of the WSMS is implemented through a contract between AVEK and the USGS to annually monitor groundwater levels in a network of existing wells.

Facilitating Conjunctive Use Operations

Conjunctive use operations relate to the combined use of surface water and groundwater to optimize resources and minimize adverse effects of using a single source. Conjunctive use will be facilitated as part of the Antelope Valley IRWM Plan through many of the water supply management projects in the WSMS described in more detail in Section 5 of the Antelope Valley IRWM Plan. Conjunctive use opportunities with locally available water are limited, due to the relatively small amount of native surface and groundwater available. Thus, the success of conjunctive use operations will depend on the ability to import water from outside of Antelope Valley.

Compliance with CWC 83002.(b)(3)(B)

The Antelope Valley IRWM Plan was adopted prior to September 30, 2008. The Regional Water Management Group will enter into an agreement with the State to receive funds under the proposal for a Planning Grant, Round 1 as submitted by the Antelope Valley State Water Contractors Association to update the adopted IRWM Plan. The updated plan will conform to the new guidelines and standards for preparation and implementation and will undertake reasonable effort to take into account water-related needs of disadvantaged communities as described in the Region’s Planning Grant Application.

Consistency with an Adopted IRWM Plan

Appendix E of Volume 2 of the IRWM Plan shows the proposed project (Water Supply Stabilization Project – Westside) as one of the high priority implementation projects of the IRWM Plan to be implemented by the applicant. The RWMG and stakeholders agreed that the proposed project would be the only project submitted in the application for an implementation grant considering the limited funds available to the Region in Round 1.

Attachment Exhibits

File 2 of 4 – Resolution Approving Implementation Grant Application

File 3 of 4 – Project Letters of Support

File 4 of 4 – IRWM Plan Prioritized Project List

Attachment 1 Exhibit
Resolution Approving Implementation Grant Application

RESOLUTION NO. R-10-19

ANTELOPE VALLEY-EAST KERN WATER AGENCY
RESOLUTION APPROVING APPLICATION FOR IMPLEMENTATION GRANT – PROPOSITION 84 GRANT FUNDS INTEGRATED REGIONAL WATER MANAGEMENT PLAN (IRWMP-ROUND 1), AVEK WATER SUPPLY STABILIZATION PROJECT-2 (WSSP2) GROUNDWATER RECHARGE PROJECT

WHEREAS, the California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the legislature and Governor of the State of California have provided Proposition 84, Round 1, funds through the IRWMP Grant Program for the implementation of projects that support better integrated water management.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors acting as the governing body of the Antelope Valley-East Kern Water Agency, that application be made to the California Department of Water Resources to obtain an Integrated Regional Water Management Implementation Grant pursuant to the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Public Resource Code Section 75001 et seq.), and to enter into an agreement to receive a grant for the AVEK WSSP-2 Ground Water Recharge Project.

The staff of the Antelope Valley-East Kern Water Agency is hereby authorized and directed to prepare the necessary data, conduct investigations, file such application, and execute a grant agreement with the California Department of Water Resources.

The foregoing Resolution was adopted on the 23RD day of NOV., 2010, by the **BOARD OF DIRECTORS, as the governing body of the** ANTELOPE VALLEY-EAST KERN WATER AGENCY:

By ______________________________
BOARD PRESIDENT

APPROVED AS TO FORM:

By ______________________________
Legal Counsel

RECOMMENDED BOARD ORDER 5 (a-7)

To the Board of Directors FOR BOARD ACTION

ADOPT RESOLUTION NO. R-10-19,
APPROVING APPLICATION FOR IMPLEMENTATION GRANT –
PROPOSITION 84 GRANT FUNDS – IRWMP – ROUND 1

The Board of Directors adopted the following board order on November 23, 2010:

To adopt Resolution No. R-10-19, approving the Application for Implementation Grant – Proposition 84 Grant Funds for Integrated Regional Water Management Plan (IRWMP-Round 1) for the AVEK Water Supply Stabilization Project (WSSP-2) Groundwater Recharge Project.

Motion by Rizzo

Second by Donato

Carried Ayes

Attachment 1 Exhibit
Project Letters of Support

PALMDALE
a place to call home

December 23, 2010

James C. Ledford, Jr.
Mayor

Tom Lackey
Mayor Pro Tem

Laura Bettencourt
Councilmember

Mike Dispenza
Councilmember

Steven D. Hofbauer
Councilmember

38300 Sierra Highway

Palmdale, CA 93550-4798

Tel: 661/267-5100

Fax: 661/267-5122

TDD: 661/267-5167

California Department of Water Resources
Division of Integrated Regional Water Management
Financial Assistance Branch
Post Office Box 942836
Sacramento, CA 94236-0001
Attn: Mr. Trevor Joseph

Subject: **Support For Grant Funding Of The Antelope Valley Integrated Regional Water Management Program Proposition 84 Implementation Grant, Round 1, Application -AVEK (Project Proponent) Water Supply Stabilization Project (WSSP- 2)**

Dear Mr. Joseph:

The City of Palmdale appreciates the opportunity to express our support of the Antelope Valley East-Kern Water Agency's (AVEK's) application for funding for development of the Water Supply Stabilization Project (WSSP-2, Project) aimed at improving recharge and recovery operations within the Antelope Valley Region. Several years ago, leaders and agencies in the Antelope Valley Region recognized the need for regional cooperation and planning with respect to preserving the future of water resources. Water resource needs within the Antelope Valley Region are highly interconnected and require a broad and integrated approach in order to meet future needs of the Region and ultimately the broader interests of Southern California.

The Proposed WSSP-2 Project enhances water supply reliability and flexibility through a water bank/water market that can help reduce the rate of aquifer overdraft and encourage conjunctive locally and inter-regionally. The Project will implement a water bank as a mechanism to make water available to meet the existing water supply and ensure the reliability of future demands. This WSSP-2 Project will also help to provide the operational flexibility that many agencies need in order to provide a constant and reliable level of service to their customers.

Auxiliary aids provided for communication accessibility upon 72 hours' notice and request.

As such, we strongly encourage you to give your fullest consideration to the AVEK's Water Supply Stabilization Project. For information regarding our support, the Department of Public Works may be contacted at 661-267-5300.

Sincerely,

Stephen H. Williams
City Manager

cc: Mayor and City Council
Laurie Lile, Assistant City Manager
Michael J. Mischel, Director of Public Works

FOUNDED 1892

LITTLEROCK CREEK IRRIGATION DISTRICT

December 22, 2010

California Department of Water Resources
Division of Integrated Regional Water Management
Financial Assistance Branch
Post Office Box 942836
Sacramento, CA 94236-0001

Attn: Mr. Trevor Joseph

Subject: SUPPORT FOR GRANT FUNDING OF THE ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PROGRAM

PROPOSITION 84 IMPLEMENTATION GRANT, ROUND 1, APPLICATION - Antelope Valley - East Kern Water Agency (Project Proponent) Water Supply Stabilization Project (WSSP- 2)

Dear Mr. Joseph:

The Littlerock Creek Irrigation District appreciates the opportunity to express our support of the Antelope Valley East-Kern Water Agency's (AVEK's) application for funding for development of the Water Supply Stabilization Project (WSSP- 2 Project) aimed at improving recharge and recovery operations within the Antelope Valley Region. Several years ago, leaders and agencies in the Antelope Valley Region recognized the need for regional cooperation and planning with respect to preserving the future of water resources. Water resource needs within the Antelope Valley Region are highly interconnected and require a broad and integrated approach in order to meet future needs of the Region and ultimately the broader interests of Southern California.

The Proposed WSSP-2 Project enhances water supply reliability and flexibility through a water bank/water market that can help reduce the rate of aquifer overdraft and encourage conjunctive locally and inter-regionally. The Project will implement a water bank as a mechanism to make water available to meet the existing water supply and ensure the reliability of future demands. This WSSP-2 Project will also help to provide the operational flexibility that many agencies need in order to provide a constant and reliable level of service to their customers.

35141 87TH STREET EAST LITTLEROCK, CALIFORNIA 93543
(661) 944-2015 • FAX (661) 944-3668

The development of the WSSP-2 Project including recharge, recovery, and recovery pipeline facilities, is an imported water stabilization program that utilizes State Water Project water delivered to the Antelope Valley for groundwater recharge and provides a supplemental supply required for the region during summer peaking demand and anticipated dry years. The Proposed Project includes additional facilities necessary for the delivery of untreated water for direct recharge (via recharge basins) and for wells and pipeline for treated water conveyance.

A total of 20 percent of the Antelope Valley Region, which is serviced by AVEK, is comprised of Disadvantaged Community (DACs). The Proposed Project provides a direct benefit to several of the communities who rely on the Region's common water resources. Therefore, Littlerock Creek Irrigation District is clearly interested in and supportive of this Project which will improve water management and efficiency in the area. We understand and believe that implementation of the Water Supply Stabilization Project (WSSP-2) will provide the regional and local water improvements that merit our support.

Finally, we hope that our expression of support is helpful in your efforts to secure grant funding assistance to implement these types of critical projects. If the funding agency would like to discuss our interest and support for this Project, we would be happy to do so.

Sincerely,

B J Bones

Brad Bones
General Manager
Littlerock Creek Irrigation District

TEJON RANCH COMPANY

December 22, 2010

California Department of Water Resources
Division of Integrated Regional Water Management,
Financial Assistance Branch
Post Office Box 942836
Sacramento, CA 94236-0001

Attn: Mr. Trevor Joseph

Subject: SUPPORT FOR GRANT FUNDING OF THE ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PROGRAM

PROPOSITION 84 IMPLEMENTATION GRANT, ROUND 1, APPLICATION - Antelope Valley - East Kern Water Agency (Project Proponent) Water Supply Stabilization Project (WSSP- 2)

Dear Mr. Joseph:

The Tejon Ranch Company appreciates the opportunity to express our support of the Antelope Valley East-Kern Water Agency's (AVEK's) application for funding for development of the Water Supply Stabilization Project (WSSP- 2 Project) aimed at improving recharge and recovery operations within the Antelope Valley Region. Several years ago, leaders and agencies in the Antelope Valley Region recognized the need for regional cooperation and planning with respect to preserving the future of water resources. Water resource needs within the Antelope Valley Region are highly interconnected and require a broad and integrated approach in order to meet future needs of the Region and ultimately the broader interests of Southern California.

The Proposed WSSP-2 Project enhances water supply reliability and flexibility through a water bank/water market that can help reduce the rate of aquifer overdraft and encourage conjunctive use locally and inter-regionally. The Project will implement a water bank as a mechanism to make water available to meet the existing water supply and ensure the reliability of future demands. This WSSP-2 Project will also help to provide the operational flexibility that many agencies need in order to provide a constant and reliable level of service to their customers.

The development of the WSSP-2 Project including recharge, recovery, and recovery pipeline facilities, is an imported water stabilization program that utilizes State Water Project water delivered to the Antelope Valley for groundwater recharge and provides a supplemental supply required for the region during summer peaking demand and anticipated dry years. The Proposed Project includes additional facilities necessary for the delivery of untreated water for direct recharge (via recharge basins) and for wells and pipeline for treated water conveyance.

A total of 20 percent of the Antelope Valley Region, which is serviced by AVEK, is comprised of Disadvantaged Community (DACs). The Proposed Project provides a direct benefit to several of the communities who rely on the Region's common water resources. Therefore, the Tejon Ranch Company is clearly interested in and supportive of this Project which will improve water management and efficiency in the area. We understand and believe that implementation of the Water Supply Stabilization Project (WSSP-2) will provide the regional and local water improvements that merit our support.

Finally, we hope that our expression of support is helpful in your efforts to secure grant funding assistance to implement these types of critical projects. If the funding agency would like to discuss our interest and support for this Project, we would be happy to do so.

Sincerely,

Dennis Atkinson

Dennis Atkinson
Senior Vice President, Agriculture

lancaster ca
it's positively clear

R. Rex Parris Mayor
Ronald D. Smith Vice Mayor
Sherry Marquez Council Member
Ken Mann Council Member
Marvin E. Crist Council Member
Mark V. Bozigian City Manager

December 29, 2010

California Department of Water Resources
Division of Integrated Regional Water Management
Financial Assistance Branch
Post Office Box 942836
Sacramento, California 94236-0001

Attn: Mr. Trevor Joseph

REF: SUPPORT FOR GRANT FUNDING OF THE ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PROGRAM

PROPOSITION 84 IMPLEMENTATION GRANT, ROUND I, APPLICATION - Antelope Valley - East Kern Water Agency (Project Proponent) Water Supply Stabilization Project (WSSP-2)

Dear Mr. Joseph:

The City of Lancaster (City) appreciates the opportunity to express our support of the Antelope Valley East-Kern Water Agency's (AVEK's) application for funding for development of the Water Supply Stabilization Project (WSSP-2 Project) aimed at improving recharge and recovery operations within the Antelope Valley Region. Several years ago, leaders and agencies in the Antelope Valley Region recognized the need for regional cooperation and planning with respect to preserving the future of water resources. Water resource needs within the Antelope Valley Region are highly interconnected and require a broad and integrated approach to meet future needs of the Region and ultimately the broader interests of Southern California.

The proposed WSSP-2 Project enhances water supply reliability and flexibility through a water bank/water market that can help reduce the rate of aquifer overdraft and encourage conjunctive use locally and inter-regionally. The project will implement a water bank as a mechanism to make water available to meet the existing water supply and ensure the reliability of future demands. This WSSP-2 Project will also help to provide the operational flexibility that many agencies need in order to provide a constant and reliable level of service to their customers.

The development of the WSSP-2 Project including recharge, recovery, and recovery pipeline facilities is an imported water stabilization program that utilizes State Water Project water delivered to the Antelope Valley for groundwater recharge and provides a supplemental supply required for the region during summer peaking demand and anticipated dry years. The proposed project includes additional facilities necessary for the delivery of untreated water for direct recharge (via recharge basins) and for wells and pipeline for treated water conveyance.

44933 Fern Avenue • Lancaster, CA 93534 • 661.723.6000
www.cityoflancasterca.org

A total of 20 percent of the Antelope Valley Region, which is serviced by AVEK, is comprised of Disadvantaged Community (DACs). The proposed project provides a direct benefit to several of the communities who rely on the Region's common water resources. Therefore, the City is clearly interested in and supportive of this project which will improve water management and efficiency in the area. We understand and believe that implementation of the Water Supply Stabilization Project (WSSP-2) will provide the regional and local water improvements that merit our support.

Finally, we hope that our expression of support is helpful in your efforts to secure grant funding assistance to implement these types of critical projects. If the funding agency would like to discuss our interest and support for this project or if you have any questions, please contact Steve Dassler, Utilities Services Manager, at (661) 945-6863.

Sincerely,

FOR Robert C. Neal, P.E.
Director of Public Works

RCN:PZ:vp

cc: Mark Bozigian, City Manager, City of Lancaster
Jason Caudle, Deputy City Manager, City of Lancaster
Tom Barnes, Resource Manager, Antelope Valley East Kern Water Agency

WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

STEPHEN R. MAGUIN
Chief Engineer and General Manager

December 27, 2010

Trevor Joseph
California Department of Water Resources
Division of Integrated Regional Water Management
Financial Assistance Branch
Post Office Box 942836
Sacramento, CA 94236-0001

Dear Mr. Joseph:

Support for Grant Funding of the Antelope Valley Integrated Regional Water Management Program Proposition 84 Implementation Grant, Round 1, Application - Antelope Valley – East Kern Water Agency Water Supply Stabilization Project (WSSP-2)

County Sanitation District No. 14 of Los Angeles County (District) appreciates the opportunity to express our support of the Antelope Valley East-Kern Water Agency's (AVEK's) application for funding development of the Water Supply Stabilization Project (Proposed Project), which would improve recharge and recovery operations within the Antelope Valley Region. The District is a member of the County Sanitation Districts of Los Angeles County which are a confederation of 23 special districts that operate and maintain regional wastewater and solid waste management systems for over 5 million people residing in 78 cities and unincorporated areas in Los Angeles County. The District owns and operates the Lancaster Water Reclamation Plant, which produces a significant portion of the Antelope Valley's recycled water and is currently under construction to increase capacity and provide tertiary treated recycled water.

Several years ago, stakeholders within the Antelope Valley Region recognized the need for regional cooperation and planning to preserve the region's water resources, which are highly interconnected. These resources require a broad and integrated approach to meet the region's needs and, ultimately, the broader interests of Southern California.

The Proposed Project includes facilities for direct recharge of untreated State Water Project water (via recharge basins) and wells and pipelines to convey extracted water. The Proposed Project would create a water bank that would improve the quantity and reliability of the region's water supply as well as reduce aquifer overdraft and encourage conjunctive water use. The Proposed Project would also help to provide the operational flexibility that many agencies need to provide consistent and reliable service to their customers.

In summary, the District believes this project would yield significant and broad water resource benefits and, as such, should be strongly considered for grant funding under Proposition 84. If you would like to discuss our interest and support for the Proposed Project, please contact Lysa Gaboudian at (562) 908-4288, extension 2707 or Lgaboudian@lacd.org.

Very truly yours,

Thomas J. LeBrun
Department Head
Facilities Planning Department

BL:LG:eg

DOC #1773079

Recycled Paper

WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

STEPHEN R. MAGUIN
Chief Engineer and General Manager

December 27, 2010

Trevor Joseph
California Department of Water Resources
Division of Integrated Regional Water Management
Financial Assistance Branch
Post Office Box 942836
Sacramento, CA 94236-0001

Dear Mr. Joseph:

Support for Grant Funding of the Antelope Valley Integrated Regional Water Management Program Proposition 84 Implementation Grant, Round 1, Application - Antelope Valley – East Kern Water Agency Water Supply Stabilization Project (WSSP- 2)

County Sanitation District No. 20 of Los Angeles County (District) appreciates the opportunity to express our support of the Antelope Valley East-Kern Water Agency's (AVEK's) application for funding development of the Water Supply Stabilization Project (Proposed Project), which would improve recharge and recovery operations within the Antelope Valley Region. The District is a member of the County Sanitation Districts of Los Angeles County which are a confederation of 23 special districts that operate and maintain regional wastewater and solid waste management systems for over 5 million people residing in 78 cities and unincorporated areas in Los Angeles County. The District owns and operates the Palmdale Water Reclamation Plant, which produces a significant portion of the Antelope Valley's recycled water and is currently under construction to increase capacity and provide tertiary treated recycled water.

Several years ago, stakeholders within the Antelope Valley Region recognized the need for regional cooperation and planning to preserve the region's water resources, which are highly interconnected. These resources require a broad and integrated approach to meet the region's needs and, ultimately, the broader interests of Southern California.

The Proposed Project includes facilities for direct recharge of untreated State Water Project water (via recharge basins) and wells and pipelines to convey extracted water. The Proposed Project would create a water bank that would improve the quantity and reliability of the region's water supply as well as reduce aquifer overdraft and encourage conjunctive water use. The Proposed Project would also help to provide the operational flexibility that many agencies need to provide consistent and reliable service to their customers.

In summary, the District believes this project would yield significant and broad water resource benefits and, as such, should be strongly considered for grant funding under Proposition 84. If you would like to discuss our interest and support for the Proposed Project, please contact Lysa Gaboudian at (562) 908-4288, extension 2707 or Lgaboudian@lacd.org.

Very truly yours,

Thomas J. LeBrun

Thomas J. LeBrun
Department Head
Facilities Planning Department

BL:LG:eg

DOC #1774778

Recycled Paper

RESOURCE
CONSERVATION

Antelope Valley Resource
Conservation District

Kathleen Burr, President
Richard L. Campbell, Vice President
Keith Deagon, Director
Ruth Michael, Director
Vickie Nelson, Director
Tom Florence, Nursery
Danette Gordon, Business Manager

January 5, 2011

California Department of Water Resources
Division of Integrated Regional Water
Management Financial Assistance Branch
Post Office Box 942836
Sacramento, CA 94236-0001

Attn: Mr. Trevor Joseph

Subject: SUPPORT FOR GRANT FUNDING OF THE ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PROGRAM

PROPOSITION 84 IMPLEMENTATION GRANT, ROUND 1, APPLICATION - Antelope Valley - East Kern Water Agency (Project Proponent) Water Supply Stabilization Project (WSSP- 2)

Dear Mr. Joseph:

The Antelope Valley Resource Conservation District appreciates the opportunity to express our support of the Antelope Valley East-Kern Water Agency's (AVEK's) application for funding for development of the Water Supply Stabilization Project (WSSP- 2 Project) aimed at improving recharge and recovery operations within the Antelope Valley Region. Several years ago, leaders and agencies in the Antelope Valley Region recognized the need for regional cooperation and planning with respect to preserving the future of water resources. Water resource needs within the Antelope Valley Region are highly interconnected and require a broad and integrated approach in order to meet future needs of the Region and ultimately the broader interests of Southern California.

The Proposed WSSP-2 Project enhances water supply reliability and flexibility through a water bank/water market that can help reduce the rate of aquifer overdraft and encourage conjunctive locally and inter-regionally. The Project will implement a water bank as a mechanism to make water available to meet the existing water supply and ensure the reliability of future demands. This WSSP-2 Project will also help to provide the operational flexibility that many agencies need in order to provide a constant and reliable level of service to their customers.

The development of the WSSP-2 Project including recharge, recovery, and recovery pipeline facilities, is an imported water stabilization program that utilizes State Water Project water delivered to the Antelope Valley for groundwater recharge and provides a supplemental supply required for the region during summer peaking demand and anticipated dry years. The Proposed Project includes additional facilities necessary for the delivery of untreated water for direct recharge (via recharge basins) and for wells and pipeline for treated water conveyance.

A total of 20 percent of the Antelope Valley Region, which is serviced by AVEK, is comprised of Disadvantaged Community (DACs). The Proposed Project provides a direct benefit to several of the communities who rely on the Region's common water resources. Therefore, Antelope Valley Resource Conservation District is clearly interested in and supportive of this Project which will improve water management and efficiency in the area. We understand and believe that implementation of the Water Supply Stabilization Project (WSSP-2) will provide the regional and local water improvements that merit our support.

Finally, we hope that our expression of support is helpful in your efforts to secure grant funding assistance to implement these types of critical projects. If the funding agency would like to discuss our interest and support for this Project, we would be happy to do so.

Sincerely,

Danette Gordon

Danette Gordon
Business Manager

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

GAIL FARBER, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

January 5, 2011

IN REPLY PLEASE
REFER TO FILE: WW-1

Mr. Trevor Joseph
California Department of Water Resources
Division of Integrated Regional Water Management
Financial Assistance Branch
P.O. Box 942836
Sacramento, CA 94236-0001

Dear Mr. Joseph:

SUPPORT FOR THE PROPOSITION 84 IMPLEMENTATION GRANT FUNDING FOR THE ANTELOPE VALLEY-EAST KERN WATER AGENCY WATER SUPPLY STABILIZATION PROJECT

As a member of the Regional Water Management Group for the Antelope Valley Integrated Regional Water Management (IRWM) Plan and as a stakeholder and water supplier in the region, the Los Angeles County Waterworks District No. 40, Antelope Valley (District), has great interest in assisting with the implementation of the high-priority projects identified in the IRWM Plan for the Antelope Valley region.

The District extends its full support for the development of the Water Supply Stabilization Project (WSSP-2 Project) being submitted by the Antelope Valley-East Kern Water Agency as part of Proposition 84, Round 1, IRWM Implementation Grant Program on behalf of the Antelope Valley IRWM region. The development of the WSSP-2 Project, including recharge facilities, recovery wells, and transmission pipeline facilities, addresses the most critical need for the region by storing excess State Water Project water when it is readily available and subsequently recovering and providing it for use during times when State Water Project water is not available. The Regional Water Management Group and the Stakeholder Group for the Antelope Valley selected the WSSP-2 Project as the only project the region would submit for the limited grant funds available from Proposition 84 at this time.

If you have any questions, please contact Ms. Jessica Bunker at (626) 300-3315 or via e-mail at jbunker@dpw.lacounty.gov.

Very truly yours,

GAIL FARBER
Director of Public Works

FOR ADAM ARIKI
Assistant Deputy Director
Waterworks Division

JB:lr
LTS235

DEVELOPMENT SERVICES AGENCY ***TED JAMES, DIRECTOR***

Planning and Community Development Department · Engineering, Survey and Permit Services Department · Roads Department · DSA Administrative Services Division

Phones: (661) 862-8800
(800) 552-5376 Option 5
Fax: (661) 862-8801
TTY Relay: (800) 735-2929

2700 "M" STREET, SUITE 350
BAKERSFIELD, CA 93301-2370
E-Mail: rma@co.kern.ca.us
Web Page: http://www.co.kern.ca.us/rma

January 6, 2011

California Department of Water Resources
Division of Integrated Regional Water Management
Financial Assistance Branch
Post Office Box 942836
Sacramento, CA 94236-0001

Attn: Mr. Trevor Joseph

RE: **Support for Grant Funding of the Antelope Valley Integrated Regional Water Management Program**
Proposition 84 Implementation Grant, Round 1, Application-Antelope Valley-East Kern Water Agency (Project Proponent) Water Supply Stabilization Project (WSSP-2)

Dear Mr. Joseph:

The purpose of this letter is to inform you that the Kern County Development Services Agency has scheduled a request on January 18, 2011 for the Kern County Board of Supervisors to consider providing a letter of support for the Antelope Valley East-Kern Water Agency (AVEK) application for Proposition 84 funding to develop the Water Supply Stabilization Project (WSSP-2 Project) which is intended to improve recharge and recovery operations within the Antelope Valley Region. The Development Services Agency recognizes the importance of the proposed project in addressing future water resource needs in the region.

Upon receipt of a Board of Supervisors determination on the matter, we will forward you documentation of the Board's action with an accompanying letter. Please contact me if you have questions concerning this matter.

Sincerely,

Ted James

TED JAMES, AICP, Director
Development Services Agency

TJ:jb
I:\adm\ted\DSA\Trevor Joseph Prop 84.ltr.docx
cc Kern County Planning & Community Development Dept.
Antelope Valley East Kern Water District
Kern County Water Agency

Attachment 1 Exhibit
IRWM Plan Prioritized Project List

Appendix E

Prioritized Project List

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Antelope Valley Integrated Regional Water Management Plan

Prioritized List of Projects

As of July 2007

This Prioritized List of Projects duplicates Table 7-2 included in Section 7.0 of the AV IRWM Plan. The purpose for its inclusion within an appendix is so that the Regional Water Management Group and greater Stakeholder group can reprioritize the project list on an as-needed basis, without having to amend the Plan itself.

Priority	Project	Responsible Entity	Project Status	Project Schedule
WATER SUPPLY GROUNDWATER RECHARGE/BANKING INFRASTRUCTURE PROJECTS				
High	Antelope Valley Water Bank	WDS	Design	2001 to 2008
	Aquifer Storage and Recovery Project - Injection Well Development	LACWWD 40	Planning	2007 to 2010
	Upper Amargosa Creek Recharge, Flood Control & Riparian Habitat Restoration Project	Palmdale, AVEK	Planning	2006 to 2010
	Water Supply Stabilization Project – Westside	AVEK/AVSWCA/ LACWWD 40	CEQA/Permitting	2007 to 2009
Medium	Aquifer Storage and Recovery Project: Additional Storage Capacity	LACWWD 40	Planning	2010 to 2013
	Lower Amargosa Creek Recharge & Flood Control Project	J.Goit / Palmdale	Planning	2010 to 2013
	Water Supply Stabilization Project – Eastside Project	AVEK	Planning	2010 to 2013
WATER INFRASTRUCTURE PROJECTS				
High	Avenue K Transmission Main, Phases I-IV	LACWWD 40	Planning	2008 to 2010
	Littlerock Dam Sediment Removal Project	PWD	Planning/Design	2004 to 2009
	Waste Water Pipeline	RCSD	Planning	2008 to 2010
Low	Avenue M and 60th Street West Tanks	LACWWD 40	Conceptual	2013 to 2018
	Place Valves and Turnouts on Reclaimed Water Pipeline	RCSD	Conceptual	2013 to 2018
RECYCLED WATER PROJECTS				
High	Antelope Valley Recycled Water Project Phase 2	LACWWD 40/Palmdale/ LACSD	Planning	2007 to 2009
	Groundwater Recharge Using Recycled Water Project	Lancaster	Pilot Study	2006 to 2009
Medium	Groundwater Recharge – Recycled Water Project	PWD	Planning	2010 to 2013

Priority	Project	Responsible Entity	Project Status	Project Schedule
	KC & LAC Interconnection Pipeline	RCSD	Planning	2010 to 2013
	Regional Recycled Water Project Phase 3	LACWWD 40/Palmdale/ LACSD	Planning	2010 to 2013
	Tertiary Treated Water Conveyance & Incidental Groundwater Recharge of Amargosa Creek Avenue M to Avenue H	Lancaster	Planning	2010 to 2013
Low	Regional Recycled Water Project Phase 4	LACWWD 40/Palmdale/LACS D	Planning	2013 to 1018
WATER CONSERVATION/WATER USE EFFICIENCY				
High	Comprehensive Water Conservation/Efficient Water Use Program	AVWCC/LACWWD /PWD	Planning	2007 to 2010
WATER QUALITY PROJECTS				
High	Lancaster WRP Stage V	LACSD	Design	2007 to 2010
	Palmdale WRP Existing Effluent Management Sites	LACSD	Design	2007 to 2010
	Palmdale WRP Stage V	LACSD	Design	2007 to 2010
	Partial Well Abandonment of Groundwater Wells for Arsenic Mitigation	LACWWD/ QHWD	Design	2007 to 2010
Medium	Lancaster WRP Stage VI	LACSD	Planning	2010 to 2013
	Lancaster WRP Proposed Effluent Management Sites	LACSD	Planning	2010 to 1013
	Palmdale WRP Stage VI	LACSD	Planning	2010 to 2013
	Palmdale WRP Proposed Effluent Management Sites	LACSD	Planning	2010 to 2013
	PWD New Treatment Plant	PWD	Planning	2010 to 2013
Low	42^{nd} Street East, Sewer Installation	Palmdale	Conceptual	2013 to 2018
FLOOD MANAGEMENT PROJECTS				
High	Development of Coordinated Antelope Valley Flood Control Plan	Cities of Lancaster, Palmdale, LADPW, Kern County	Planning	2007 to 2009
Medium	Anaverde Detention Basin, Dam & Spillway at Pelona Vista Park	Palmdale	Planning	2010 to 2013
	Barrel Springs Detention Basin and Wetlands	Palmdale	Planning	2010 to 2013

Priority	Project	Responsible Entity	Project Status	Project Schedule
	Hunt Canyon Groundwater Recharge and Flood Control Basin	Palmdale	Planning	2010 to 2013
	Quartz Hill Storm Drain	LADPW	Planning	2010 to 2013
Low	45th Street East Flood Control Basin (Q-East Basin)	Palmdale	Conceptual	2013 to 2018
	Avenue Q and 20th Street East Basin (Q-West Basin)	Palmdale	Conceptual	2013 to 2018
	Storm water Harvesting	Leona Valley Town Council	Conceptual	2013 to 2018
ENVIRONMENTAL RESOURCE MANAGEMENT PROJECTS				
High	Ecosystem & Riparian Habitat Restoration of Amargosa Creek; Ave J to Ave H	Lancaster	Planning	2007 to 2008
Medium	Tropico Park Pipeline Project	RCSD	Planning	2010 to 2013
LAND USE MANAGEMENT PROJECTS				
High	Amargosa Creek Pathways Project	Lancaster	Planning	2007 to 2008
	Development of a Coordinated Land Use Management Plan	Cities of Lancaster, Palmdale, LADPW, Kern County /Antelope Valley Conservancy	Planning	2007 to 2009

Notes:
AVEK = Antelope Valley-East Kern Water Agency
AVSWCA = Antelope Valley State Water Contractors Association
AVWCC = Antelope Valley Water Conservation Coalition
LACSD = Los Angeles County Sanitation Districts
LACWWD 40 = Los Angeles County Waterworks District 40
LADPW = Los Angeles County Department of Public Works
PWD = Palmdale Water District
RCSD = Rosamond Community Services District

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ATTACHMENT 2. ADOPTED PLAN AND PROOF OF FORMAL ADOPTION

Attachment 2 includes the following files:

- File 2 of 3 - Antelope Valley Integrated Regional Water Management Plan Implementation Agreement
- File 3 of 3 - Regional Water Management Group Resolutions adopting Antelope Valley Integrated Regional Water Management Plan

Attachment 2 Exhibit
Antelope Valley Integrated Regional Water Management Plan Implementation Agreement

MEMORANDUM OF UNDERSTANDING

THIS MEMORANDUM OF UNDERSTANDING (MOU), made and entered into on this 9th day of January by and between the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and Los Angeles County Waterworks District No. 40, Antelope Valley, hereinafter referred to as "DISTRICT," and in the aggregate hereinafter referred to as "parties":

WITNESSETH

WHEREAS, the parties are designated as a "Regional Water Management Group" under the California Water Code Division 6, Part 2.2, known as the *Integrated Regional Water Management Planning Act of 2002*, hereinafter referred to as "ACT"; and

WHEREAS, Section 10531 of the ACT includes the following declarations:

(a) Water is a valuable natural resource in California and should be managed to ensure the availability of sufficient supplies to meet the State's agricultural, domestic, industrial, and environmental needs. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage their available local and imported water supplies to improve the quality, quantity, and reliability of those supplies.

(b) Improved coordination among local agencies with responsibilities for managing water supplies and additional study of groundwater resources are necessary to maximize the quality and quantity of water available to meet the State's agricultural, domestic, industrial, and environmental needs.

(c) The implementation of the Integrated Regional Water Management Planning Act of 2002 will facilitate the development of integrated regional water management plans, thereby maximizing the quality and quantity of water available to meet the State's water needs by providing a framework for local agencies to integrate programs and projects that protect and enhance regional water supplies.

WHEREAS, Section 10537 of the ACT states that "Regional Water Management Group" means a group in which three or more local public agencies, at least two of which have statutory authority over water supply, participate by means of a joint powers agreement, memorandum of understanding, or other written agreement, as appropriate, that is approved by the governing bodies of those local public agencies; and

WHEREAS, under the ACT, the parties propose to collaboratively prepare an Integrated Regional Water Management Plan for the Antelope Valley, hereinafter referred to as "PLAN," as set forth in this MOU; and

WHEREAS, the study area for the PLAN includes all, or a portion of, the service areas of the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and DISTRICT within the Antelope Valley; and

WHEREAS, the DISTRICT is willing to administer a contract ("CONTRACT") to engage a third-party consultant ("CONSULTANT") to prepare the PLAN, including preparation of a request for proposals, evaluation of CONSULTANT proposals, award of the CONTRACT, and general oversight of the CONTRACT; and

WHEREAS, the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District are willing to provide the CONSULTANT with the necessary data to prepare the PLAN and to review and comment on the draft versions of the PLAN; and

WHEREAS, the "CONSULTANT COSTS" for preparation of the PLAN consist of all amounts paid to the CONSULTANT upon completion of the PLAN; and

WHEREAS, the CONSULTANT COSTS are currently estimated to amount to $325,000 with DISTRICT'S share being $60,000, Antelope Valley-East Kern Water Agency's share being $50,000, Palmdale Water District's share being $60,000, Quartz Hill Water District's share being $5,000, Littlerock Creek Irrigation District's share being $5,000, City of Palmdale's share being $50,000, City of Lancaster's share being $45,000, County Sanitation District No. 14 of Los Angeles County's share being $22,500, County Sanitation District No. 20 of Los Angeles County's share being $22,500, and Rosamond Community Services District's share being $5,000, and

100 percent*

WHEREAS, the FINAL PLAN is defined to be the version of the PLAN that is deemed ready for adoption by ~~[illegible]~~ of the representatives from the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District, where each agency has one representative.

*Exception taken per AVEK Board action on January 09, 2007.

WHEREAS, the ADOPTED PLAN is defined to be the version of the PLAN that is adopted by the governing bodies of at least three or more member agencies to the Regional Water Management Group, two of which have statutory authority over water supply, as evidenced by resolutions substantially similar to the sample included as Exhibit A.

NOW, THEREFORE, in consideration of the mutual benefits to be derived by the parties and of the promises herein contained, it is hereby agreed as follows:

(1) ANTELOPE VALLEY-EAST KERN WATER AGENCY AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or Antelope Valley-East Kern Water Agency's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $50,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $50,000 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(2) PALMDALE WATER DISTRICT AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or Palmdale Water District's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $60,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $60,000 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(3) QUARTZ HILL WATER DISTRICT AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or Quartz Hill Water District's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $5,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $5,000 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(4) LITTLEROCK CREEK IRRIGATION DISTRICT AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or Littlerock Creek Irrigation District's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $5,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $5,000 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(5) ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or Antelope Valley State Water Contractors Association's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(6) CITY OF PALMDALE AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or City of Palmdale's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $50,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Cit of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $50,000 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(7) CITY OF LANCASTER AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or City of Lancaster's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $45,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $45,000 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(8) COUNTY SANITATION DISTRICT NO. 14 OF LOS ANGELES COUNTY AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or County Sanitation District No. 14 of Los Angeles County's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $22,500 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $22,500 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(9) COUNTY SANITATION DISTRICT NO. 20 OF LOS ANGELES COUNTY AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or County Sanitation District

No. 20 of Los Angeles County's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $22,500 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $22,500 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(10) ROSAMOND COMMUNITY SERVICES DISTRICT AGREES:

a. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

b. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or Rosamond Community Services District's comments may not be incorporated in the FINAL PLAN.

c. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

d. To provide a contribution in the amount of $5,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

e. To deposit the contribution in the amount of $5,000 with the DISTRICT within thirty (30) calendar days of execution of this MOU.

f. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(11) DISTRICT AGREES:

a. To administer a CONSULTANT CONTRACT for the PLAN, including preparation of a request for proposals, evaluation of CONSULTANT proposals, award of a CONSULTANT CONTRACT, and oversight of the CONSULTANT services.

b. To facilitate stakeholder meetings.

c. To provide and share all necessary and relevant information, data, studies, and/or documentation for the PLAN in its possession as may be requested by the CONSULTANT within thirty (30) calendar days of the request by the CONSULTANT or such information and data, should it be provided at a later date, may not be incorporated in the PLAN due to time constraints.

d. To provide each agency with copies of the draft and final versions of technical reports and the draft PLAN within seven (7) calendar days from the date of receipt of said documents from the CONSULTANT, and to transmit comments to the CONSULTANT within seven (7) calendar days from the date of receipt of said documents from each agency.

e. To review and comment on the draft and final versions of technical reports and the draft PLAN within twenty-one (21) calendar days from the date of receipt of said documents from the DISTRICT or DISTRICT's comments may not be incorporated in the PLAN.

f. To present the FINAL PLAN to its governing body for consideration and adoption within forty-five (45) calendar days from the date of receipt of the FINAL PLAN.

g. To provide a contribution in the amount of $60,000 towards the CONSULTANT COSTS collectively shared by the DISTRICT, Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

h. To prepare, review, and approve future grant applications for implementation of the ADOPTED PLAN.

(12) IT IS MUTUALLY UNDERSTOOD AND AGREED AS FOLLOWS:

a. If the governing body of the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District or DISTRICT does not adopt the PLAN within forty-five (45) calendar days from the date of receipt of the FINAL PLAN, such action or inaction shall constitute withdrawal from the Regional Water Management Group. An agency which withdraws from the Regional Water Management Group may be reinstated when the agency adopts the FINAL PLAN and agrees to any additions and/or amendments to the MOU.

b. Upon completion of the ADOPTED PLAN, the DISTRICT shall prepare a final accounting (the "Accounting") of all final actual CONSULTANT COSTS for review by the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District.

c. If the funds deposited with the DISTRICT exceed the CONSULTANT COSTS, based upon the Accounting, the DISTRICT shall refund the excess funds to the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District in proportion to their contribution towards the CONSULTANT COSTS within sixty (60) days after completion of the PLAN.

d. If the CONSULTANT COSTS exceed the funds deposited with the DISTRICT, ~~the Antelope Valley-East Kern Water Agency,~~* Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, and Rosamond Community Services District will supplement this MOU to fund the additional portion of the CONSULTANT COSTS in excess of the funds deposited with the DISTRICT in proportion to their original contributions towards the CONSULTANT COSTS.

*Exception taken per AVEK Board action on January 09, 2007.

e. This MOU may be amended or modified only by mutual written consent of all parties.

f. The Regional Water Management Group shall terminate twenty (20) years after the date of execution unless renewed by mutual written consent from all parties prior to expiration.

g. All parties agree to release the DISTRICT of any liability and in connection with all claims arising out of this MOU, including relating to the CONTRACT with the CONSULTANT, and including in connection with any and all claims by third parties relating to the CONSULTANT's work under the CONTRACT and/or any violation or alleged violation of the ACT as a result thereof, including pursuant to Civil Code Section 1542, which states:

> "A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."

h. Notwithstanding the foregoing and notwithstanding any provision of law, including as contained in the California Government Code, and including Sections 895 *et. seq.*, therein, any and all liability or expenses (including attorneys' and experts' fees and related costs) to the DISTRICT for claims by third parties or CONSULTANT and injury to third parties or CONSULTANT, arising from or relating to this MOU shall be allocated among the parties on the basis of the percent of contribution required of each party under this MOU. As an example only, the percentage of contribution of Antelope Valley-East Kern Water Agency is 15 percent. Each party shall reimburse the DISTRICT for its allocated share of the costs described herein within thirty (30) calendar days of issuance of an invoice by the DISTRICT. The term "injury" shall have the meaning prescribed by Section 810.8 of the Government Code. This provision shall survive termination of this Agreement.

i. If any provision of this MOU is held, determined or adjudicated to be illegal, void, or unenforceable by a court of competent jurisdiction, the reminder of this MOU shall be given effect to the fullest extent possible.

j. Any correspondence, communication, or contact concerning this MOU shall be directed to the following:

ANTELOPE VALLEY-EAST KERN WATER AGENCY:

Mr. Russell E. Fuller
General Manager
6500 West Avenue N
Palmdale, CA 93551

PALMDALE WATER DISTRICT:

Mr. Dennis LaMoreaux
General Manager
2029 East Avenue Q
Palmdale, CA 93550

QUARTZ HILL WATER DISTRICT:

Mr. Dave Meraz
General Manager
42141 50th Street West
Quartz Hill, CA 93536

LITTLEROCK CREEK IRRIGATION DISTRICT:

Mr. Brad Bones
General Manager
35141 North 87th Street East
Littlerock, CA 93543

ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION:

Ms. Barbara Hogan
Chairperson
c/o Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550

CITY OF PALMDALE:

Mr. Leon Swain
Public Works Director
38250 Sierra Highway
Palmdale, CA 93550

CITY OF LANCASTER:

Mr. Randy Williams
Public Works Director
44933 Fern Avenue
Lancaster, CA 93534

COUNTY SANITATION DISTRICT NO. 14 OF LOS ANGELES COUNTY:

Mr. James F. Stahl
Chief Engineer and General Manager
County Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601

COUNTY SANITATION DISTRICT NO. 20 OF LOS ANGELES COUNTY:

Mr. James F. Stahl
Chief Engineer and General Manager
County Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601

ROSAMOND COMMUNITY SERVICES DISTRICT:

Mr. Claud Seal
Assistant General Manager
3179 35th Street
Rosamond, CA 93560

DISTRICT:

Mr. Manuel del Real
Assistant Deputy Director
Waterworks & Sewer Maintenance Division
County of Los Angeles
Department of Public Works
P.O. Box 1460
Alhambra, CA 91802-1460

k. Each person signing this MOU represents to have the necessary power and authority to bind the entity on behalf of which said person is signing and each of the other parties can rely on that representation.

l. This MOU may be executed in counterparts, each counterpart being an integral part of this MOU.

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IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by ANTELOPE VALLEY-EAST KERN WATER AGENCY; and

ANTELOPE VALLEY-EAST KERN WATER AGENCY

By ______________________

APPROVED AS TO FORM:

By ______________________
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by Palmdale Water District; and

Palmdale Water District

By ______________________
General Manager

APPROVED AS TO FORM:

By ______________________
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by Quartz Hill Water District; and

Tier No. 3 Level of
Contribution - $5000.00

Quartz Hill Water District

By Dave Meraz
Dave Meraz,
General Manager

APPROVED AS TO FORM:

By ______
Legal Counsel
Brad Weeks, Esq.

By: Allen D Flick Sr.
Allen Flick, Sr.
Quartz Hill Water District
Board President

Approved at the Regular Board
Meeting, held on Thurs.,
September 14, 2006.

Attested
By: Denise E. Burks
Denise Burks,
Board Secretary

Carried: 4-0

Ayes: P.Powell, J. powell, A. Flick,
F. Tymon
Noes: Ø

Abstained: Ø

Absent: Ben Harrison, Jr.
Passed on 8-7-06

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by Littlerock Creek Irrigation District; and

Littlerock Creek Irrigation District

By ______________________________
Brad Bones, General Manager

APPROVED AS TO FORM:

By ______________________________
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION; and

ANTELOPE VALLEY STATE WATER
CONTRACTORS ASSOCIATION

By Barbara Hogan
Barbara Hogan

APPROVED AS TO FORM:

By Wayne Lemieux
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by City of Palmdale; and

City of Palmdale

By ______________________
James C. Ledford
Mayor

APPROVED AS TO FORM:

By ______________________
Wm. Matthew Ditzhazy
City Attorney

Attest:

By: Victoria L. Hancock
Victoria L. Hancock, CMC
City Clerk

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by CITY OF LANCASTER; and

APPROVED BY DEPT. HEAD ____________

CITY OF LANCASTER

By ______________________

Bishop Henry W. Hearns
Mayor

APPROVED AS TO FORM:

By ______________________
Legal Counsel

Attest:

____
City Clerk

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by County Sanitation District No. 14 of Los Angeles; and

County Sanitation District No. 14
of Los Angeles County

By James F. Stahl
Chief Engineer and General Manager

ATTEST:

By M. Alona Horwath
Secretary to the Board

APPROVED AS TO FORM:

Lewis, Brisbois, Bisgaard, and Smith LLP

By B. R. Maurer
District Counsel

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by County Sanitation District No. 20 of Los Angeles; and

County Sanitation District No. 20
of Los Angeles County

By James F. Stahl
Chief Engineer and General Manager

ATTEST:

By M. Alma Horvath
Secretary to the Board

APPROVED AS TO FORM:

Lewis, Brisbois, Bisgaard, and Smith LLP

By B.R. Marsh
District Counsel

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by ROSAMOND COMMUNITY SERVICES DISTRICT; and

ROSAMOND COMMUNITY
SERVICES DISTRICT

By ______________________

APPROVED AS TO FORM:

By ______________________
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their respective officers, duly authorized, by DISTRICT.

DISTRICT:

LOS ANGELES COUNTY
WATERWORKS DISTRICT NO. 40

By Dean D Efstathiou
for Director of Public Works

APPROVED AS TO FORM:

RAYMOND G. FORTNER, JR.
County Counsel

By Michael L Moore
Deputy

Exhibit A

RESOLUTION OF THE *[governing body of agency]*,
ADOPTING THE INTEGRATED REGIONAL WATER MANAGEMENT PLAN
FOR THE ANTELOPE VALLEY

WHEREAS, the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and Los Angeles County Waterworks District No. 40, Antelope Valley are designated as a "Regional Water Management Group" under the California Water Code Division 6, Part 2.2, known as the *Integrated Regional Water Management Planning Act of 2002*, hereinafter referred to as "ACT"; and

WHEREAS, under the ACT, the parties collaboratively prepared an Integrated Regional Water Management Plan for the Antelope Valley that meets the requirements of the ACT, hereinafter referred to as "PLAN"; and

WHEREAS, Section 10531 of the ACT includes the following declarations:

(d) Water is a valuable natural resource in California, and should be managed to ensure the availability of sufficient supplies to meet the state's agricultural, domestic, industrial, and environmental needs. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage their available local and imported water supplies to improve the quality, quantity, and reliability of those supplies.

(e) Improved coordination among local agencies with responsibilities for managing water supplies and additional study of groundwater resources are necessary to maximize the quality and quantity of water available to meet the state's agricultural, domestic, industrial, and environmental needs.

(f) The implementation of the Integrated Regional Water Management Planning Act of 2002 will facilitate the development of integrated regional water management plans, thereby maximizing the quality and quantity of water available to meet the state's water needs by providing a framework for local agencies to integrate programs and projects that protect and enhance regional water supplies.

WHEREAS, the adoption of the PLAN will allow the Antelope Valley Region to compete for State grant funding available under Proposition 50, proposed Proposition 84, and other future State and/or Federal grant programs.

NOW, THEREFORE, BE IT RESOLVED, that the *[governing body of agency]*, hereby adopts the PLAN.

The foregoing Resolution was adopted on the____day of_______, 2007, by the *[governing body of agency]*, as the governing body of the *[agency]*.

By ______________________________

APPROVED AS TO FORM:

By ______________________________
Legal Counsel

AGREEMENT ON THE IMPLEMENTATION OF THE INTEGRATED REGIONAL WATER MANAGEMENT PLAN

THIS AGREEMENT is made and entered into as of this 7th day of APRIL, 2009 by and between the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, ("Association"), City of Palmdale, City of Lancaster, County of Los Angeles, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and Los Angeles County Waterworks District No. 40, Antelope Valley, (collectively, the "parties"):

RECITALS

A. On or about January 9, 2007, the parties entered into a Memorandum of Understanding for Integrated Regional Water Management Planning and Implementation ("MOU") under the California Water Code Division 6, Part 2.2, known as the *Integrated Regional Water Management Planning Act of 2002* (the "Act").

B. The parties desire to engage the various stakeholder interests throughout the Antelope Valley in implementing the Integrated Regional Water Management Plan (IRWMP) through broad facilitated agreement.

C. The parties desire to obtain grant or other funding to supplement the costs of implementing the IRWMP.

NOW, THEREFORE, the parties agree as follows:

1. The parties to this Agreement shall be known as and referred to as the Regional Water Management Group (RWMG). If approved by all parties, new entities may join the RWMG by adopting the IRWMP, executing this Agreement, agreeing to be bound by the terms hereof, and payment of such reasonable sums as the existing RWMG members shall determine.

2. Entities that are not members of the RWMG may contribute funding or in-kind services to support the activities of the RWMG without becoming signatories to this Agreement.

3. Each party shall designate a representative and an alternate to attend meetings, work with representatives of the other parties and to formulate

proposed actions by the RWMG. Any party may change designated representatives by notification to the other parties.

4. Representatives of the RWMG shall do the following:

   a) Designate a person to serve as the central point of contact for the representatives of the RWMG and as chairperson at any meetings.

   b) Hold public meetings for interested members of the public to meet, share ideas and discuss actions taken by the parties to implement the IRWMP. These meetings will be referred to as Stakeholder Meetings and people who attend these meetings may be referred to as the Stakeholder Group. The Stakeholder Group will be encouraged to participate in Stakeholder Meetings, advocate for regional projects, and disseminate information from the Stakeholders Meetings to the general public. In order to maintain effective meetings, the Stakeholder Group will follow a Code of Conduct at the Stakeholder Meetings to:

      i. Participate fully.

      ii. Treat others with dignity and respect.

      iii. Consider new ideas and perspectives.

      iv. Share accurate facts.

   c) Promote regional cooperation among its members to implement the IRWMP.

   d) Gather, compile, and manage data, as defined in the IRWMP.

   e) Develop proposals for the voluntary funding of cooperative efforts to implement the IRWMP. The ideas and suggestions of the Stakeholder Group shall be considered in the development of such proposals.

   f) Develop a list of short-term implementation objectives. The ideas and suggestions of the Stakeholder Group shall be considered in the development of such implementation objectives.

   g) Prepare and/or disseminate to the RMWG progress reports and proposed updates to the IRWMP. This task may be delegated to the Advisory Team as defined below.

   h) Identify and recommend to the governing bodies of the parties that applications be submitted for appropriate funding opportunities.

5. The parties shall designate one party, the Association, to solicit and administer one or more contracts ("Contracts"), with one or more third-party

consultants, to assist the RWMG to promote collaboration between members of the RWMG and other stakeholders during implementation of the Plan, prepare grant applications, update the IRWMP, and manage data collected consistent with the IRWMP on behalf of the RWMG. Any contract recommended by the Association shall be subject to the written approval of each party.

6. The parties shall establish a seven-member Advisory Team to the RWMG selected by the Stakeholder Group in the following manner:

   a) The Stakeholder Group shall select seven members according to the following categories for staggered three-year terms[1].

      i. Agriculture (2010)

      ii. Conservation, Environmental, and Water Quality (2011)

      iii. Industry and Commerce (2009)

      iv. Municipalities (2010)

      v. Mutual Water Companies (2011)

      vi. Public/Land Owners/Rural Town Councils (2009)

      vii. Urban Water Suppliers (2010)

   b) Nominations for each category can be made by any member of the Stakeholder Group and must be made during a Stakeholder Meeting.

   c) If the person nominated is willing to serve on the Advisory Team as described, that person will be considered as a potential member by the Stakeholder Group.

   d) Nominations for each open category will be discussed by the Stakeholder Group during a Stakeholder Meeting. If more than one qualified nomination is made per category, the Stakeholder Group shall choose one team member per category. Selections will be made by consensus. If a selection cannot be made by consensus, a selection will be made based on simple majority vote of the members at a meeting. Each Stakeholder Group member present may cast one vote per category.

   e) If an Advisory Team position becomes vacant before the regularly-scheduled reselection year, the same selection process described in this section will be used to select a replacement.

---

[1] Members for each category will be reselected in the year shown and every three years thereafter.

f) Advisory Team members may not designate an alternate.

g) Members of the Advisory Team shall use their best efforts to make decisions by consensus. If a consensus cannot be reached on a particular matter, a simple majority vote of the members present at a meeting at which a quorum is present will be sufficient to take action. A quorum shall be half the number of members plus one.

h) If the Stakeholder Group is not satisfied with the performance of one or more Advisory Team members, one or more members of the Stakeholder Group can request that the RWMG conduct a new nomination and selection cycle for the category (or categories) involved.

7. The parties will delegate the following tasks to the Advisory Team:

   a) Schedule and facilitate Stakeholder Meetings

   b) Draft agendas and prepare minutes for the Stakeholder Meetings

   c) Distribute information to the Stakeholder Group

   d) Develop a list of short-term implementation objectives for consideration and approval by the RWMG and Stakeholder Group.

   e) Maintain a list of long-term implementation objectives for the RWMG to address and update at Stakeholder Meetings.

   f) Recommend an annual scope and budget to the RWMG

   g) Maintain the AVIRWMP website

   h) Identify grant opportunities for the RWMG or its members to apply for

   i) Review and edit grant applications submitted by the RWMG

   j) Designate a single point of contact for all AVIRWM efforts

   k) Recommend options to the RWMG to consider for establishing a long-term governance structure for integrated regional water management in the Antelope Valley

8. The parties shall designate a lead applicant for the RWMG for grant programs that require regional collaboration to contract with and receive funds from the granting agency, invoice the granting agency, fulfill the administrative responsibilities of the grant contract, and distribute the funds received from the granting agency to the specific project sponsors, subject to the written approval of each party. A party's (or parties') failure to approve a grant

application shall not prevent other parties from seeking that grant application on their own behalf.

9. Each party shall provide and share with other parties, all necessary and relevant information, data, studies, and/or documentation in its possession as necessary to further the purposes of this Agreement. To the extent allowed by law, the parties may enter into confidentiality agreements to maintain the confidentiality of any documents that are exempt from disclosure under the California Public Records Act or otherwise privileged and confidential.

10. Each party shall review and comment on draft and final versions of technical reports, grant applications, and revisions or addendums to the IRWMP within twenty-one (21) calendar days from the date of receipt of those documents from their representative.

11. Each party shall consider for adoption final versions of IRWMP revisions or addendums within forty-five (45) calendar days from the date of receipt of the document.

12. Consistent with their powers and purposes, each party shall work together in a spirit of cooperation, collaboration, and mutual respect, with the overall goal of bringing the highest possible benefit for the Antelope Valley as a hydrologic region.

13. This Agreement shall be executed in duplicate originals, one for each Party, each of which duplicate original shall be deemed to be an original, but all of which shall constitute one and the same agreement.

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by ANTELOPE VALLEY-EAST KERN WATER AGENCY;

ANTELOPE VALLEY-EAST KERN WATER AGENCY

BY David Rizzo

APPROVED AS TO FORM:

By

Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by Palmdale Water District;

PALMDALE WATER DISTRICT

Jeff A. Storm

By: Jeff A. Storm, President
Board of Directors

APPROVED AS TO FORM:

Timothy J. Gosney

By: Lagerlof, Senecal, Gosney & Kruse, LLP
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by Quartz Hill Water District;

QUARTZ HILL WATER DISTRICT

By: Allen Flick, Sr.
Board President

APPROVED AS TO FORM:

By: Brad Weeks, Esg.,
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by Littlerock Creek Irrigation District;

LITTLEROCK CREEK IRRIGATION DISTRICT

By: BJ Bones

APPROVED AS TO FORM:

By
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION;

ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION

By:

APPROVED AS TO FORM:

By:
Legal Counsel

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by City of Palmdale;

CITY OF PALMDALE

By:____________________
James C. Ledford, Jr.
Mayor

APPROVED AS TO FORM:

By:____________________
Wm. Matthew Ditzhazy,
City Attorney

ATTEST:

By: Victoria L. Hancock
Victoria L. Hancock, CMC
City Clerk

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by CITY OF LANCASTER;

CITY OF LANCASTER

By: Ronald D. Smith
Vice Mayor

APPROVED AS TO FORM

By: David R. McEwen
City Attorney

Attest:

City Clerk Geri K. Bryan, CMC
City Clerk

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by County Sanitation District No. 14 of Los Angeles;

COUNTY SANITATION DISTRICT NO. 14
OF LOS ANGELES COUNTY

By: ______________________ FEB 2 5 2009

ATTEST:

Kimberly S. Compton
By: ______________________

APPROVED AS TO FORM:

Daniel V. Hyde
By: Lewis, Brisbois, Bisgaard, and Smith LLP
District Counsel

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by County Sanitation District No. 20 of Los Angeles;

COUNTY SANITATION DISTRICT NO. 20 OF LOS ANGELES

____

FEB 2 5 2009

ATTEST:

Kimberly S. Compton
____

APPROVED AS TO FORM:

Daniel V. Hyde
____
By: Lewis, Brisbois, Bisgaard, and Smith LLP
District Counsel

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by ROSAMOND COMMUNITY SERVICES DISTRICT;

ROSAMOND COMMUNITY SERVICES DISTRICT

By: ______________________

APPROVED AS TO FORM:

By: ______________________

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by COUNTY OF LOS ANGELES:

COUNTY OF LOS ANGELES

By ______________________________

APPROVED AS TO FORM:

ROBERT E. KALUNIAN
Acting County Counsel

By________________________
Deputy

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed by their respective officers, duly authorized, by DISTRICT.
DISTRICT:

LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40

By ______________________

APPROVED AS TO FORM:

ROBERT E. KALUNIAN
Acting County Counsel

By ______________________
Deputy

Attachment 2 Exhibit

Regional Water Management Group Resolutions adopting Antelope Valley Integrated Regional Water Management Plan

RESOLUTION NO. R-07-23

A RESOLUTION OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY

APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT

WHEREAS, the California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors acting as the governing body of the Antelope Valley-East Kern Water Agency, does hereby:

1. Propose to adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group; and

2. Determine to adopt and adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

The foregoing Resolution was adopted on the 8th day of January, 2008, by the **BOARD OF DIRECTORS, as the governing body of the** ANTELOPE VALLEY-EAST KERN WATER AGENCY:

By________________________
BOARD PRESIDENT

APPROVED AS TO FORM:

By________________________
Legal Counsel

ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION RESOLUTION 08-02

RESOLUTION OF THE GOVERNING BOARD OF THE ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Commissioners of the Antelope Valley State Water Contractors Association does hereby:

1. Propose to adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group; and

2. Determine to adopt and adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED AND ADOPTED on this 17th day of January, 2008, by the Board of Commissioners, the governing body of the Antelope Valley State Water Contractors Association.

ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION

Barbara Hogan

Barbara Hogan,

Chair

ATTEST: ANDY RUTLEDGE

Secretary: Andy Rutledge

ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION RESOLUTION 08-03

RESOLUTION OF THE GOVERNING BOARD OF THE ANTELOPE VALLEY STATE WATER CONTRACTORS ASSOCIATION APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT A GROUNDWATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.75, known as the Groundwater Management Planning Act, hereinafter referred to as "ACT," provides the framework for preparation and adoption of groundwater management plans in the State; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared a Groundwater Management Plan for the Antelope Valley, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Commissioners of the Antelope Valley State Water Contractors Association does hereby:

1. Determine to adopt and adopt a Groundwater Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED AND ADOPTED on this 17th day of January, 2008, by the Board of Commissioners, the governing body of the Antelope Valley State Water Contractors Association.

ANTELOPE VALLEY STATE WATER
CONTRACTORS ASSOCIATION

Barbara Hogan

Barbara Hogan,
Chair

ATTEST: ANDY RUTLEDGE
Secretary: Andy Rutledge

RESOLUTION NO. 07-221

A RESOLUTION OF THE CITY COUNCIL OF THE
CITY OF LANCASTER, CALIFORNIA,
APPROVING THE PROPOSAL AND DETERMINATION
TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN.

WHEREAS, the California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED AND ORDERED BY THE CITY COUNCIL OF THE CITY OF LANCASTER, STATE OF CALIFORNIA, THAT:

Section 1. Propose to adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group; and

Section 2. Determine to adopt and adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED, APPROVED, and ADOPTED this 11th day of December, 2007, by the following vote:

AYES: Council Members: Jeffra, Sileo, Smith, Vice Mayor Visokey, Mayor Hearns

NOES: None

ABSTAIN: None

ABSENT: None

ATTEST:

Geri K. Bryan

GERI K. BRYAN, CMC
City Clerk
City of Lancaster

APPROVED:

HENRY W. HEARNS
Mayor
City of Lancaster

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss
CITY OF LANCASTER)

CERTIFICATION OF RESOLUTION
CITY COUNCIL

I, ____________________, ____________________ City of Lancaster, CA, do hereby certify that this is a true and correct copy of the original Resolution No. 07-221, for which the original is on file in my office.

WITNESS MY HAND AND THE SEAL OF THE CITY OF LANCASTER, on this ________ day of ______________, _______.

(seal)

____

RESOLUTION NO. 08-02

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LANCASTER, CALIFORNIA, ADOPTING A GROUNDWATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, California Water Code Division 6, Part 2.2, known as the *Integrated Regional Water Management Planning Act of 2002*, and Division 6, Part 2.75, known as the *Groundwater Management Planning Act*, hereinafter collectively referred to as "ACTS", provide the framework for preparation of integrated regional water management plans and groundwater management plans in the State; and

WHEREAS, the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and Los Angeles County Waterworks District No. 40, Antelope Valley have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACTS; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan/Groundwater Management Plan for the Antelope Valley, hereinafter referred to as "PLAN", that meets the requirements of the ACTS ; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders; and

WHEREAS, the adoption of the PLAN will improve the Antelope Valley's competitiveness for State and Federal funding including grants from Propositions 50, 84, and 1E.

WHEREAS, the City Council adopted the Integrated Regional Water Management Plan by Resolution No. 07-221 on December 11, 2007; and

WHEREAS, the Groundwater Management Plan requires that two (2) public hearings be held; one indicating intention to prepare the PLAN and the second taking testimony and determining if a majority protest exists; and

WHEREAS, said public hearings were noticed and held in accordance with the ACTS; and

WHEREAS, there was no majority protest.

NOW, THEREFORE, BE IT RESOLVED AND ORDERED BY THE CITY COUNCIL OF THE CITY OF LANCASTER, STATE OF CALIFORNIA, THAT:

Section 1. This City Council hereby adopts the Groundwater Management Plan as a member of the Regional Water Management Group.

PASSED, APPROVED, and ADOPTED this 8th day of January, 2008, by the following vote:

AYES: Council Members: Sileo, Smith, Vice Mayor Visokey, Mayor Hearns

NOES: None

ABSTAIN: None

ABSENT: Council Member: Jeffra

ATTEST:

Geri K. Bryan

GERI K. BRYAN, CMC
City Clerk
City of Lancaster

APPROVED:

HENRY W. HEARNS
Mayor
City of Lancaster

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss
CITY OF LANCASTER)

CERTIFICATION OF RESOLUTION
CITY COUNCIL

I, Britt Avrit, Deputy City Clerk City of Lancaster, CA, do hereby certify that this is a true and correct copy of the original Resolution No. 08-02, for which the original is on file in my office.

WITNESS MY HAND AND THE SEAL OF THE CITY OF LANCASTER, on this 9th day of January, 2008.

(seal)

Britt L Avrit

CITY OF PALMDALE
LOS ANGELES COUNTY, CALIFORNIA

RESOLUTION NO. CC 2008-007

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PALMDALE, CALIFORNIA APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND A GROUNDWATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

RECITALS

WHEREAS, California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, and Division 6, Part 2.75, known as the Groundwater Management Planning Act, hereinafter collectively referred to as "ACTS", provide the framework for preparation and adoption of Integrated Regional Water Management Plans and Groundwater Management Plans in the state; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACTS; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management/Groundwater Management Plan for the Antelope Valley, hereinafter referred to as "PLAN", that collectively meet the requirements of the ACTS; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, regional collaboration can promote a more efficient, comprehensive, and effective approach to water resource management while being responsive within a regional context to the needs of individual communities and jurisdictions; and

WHEREAS, the PLAN is to prepare to meet the Antelope Valley's future regional need for water supply reliability by evaluating opportunities for water recycling, water conservation, groundwater management, conjunctive use, water transfers, water quality improvement, storm water capture and management, flood management, recreation and public access, and environmental and habitat protection and improvement; and

WHEREAS, the PLAN will foster coordination, collaboration and communication among public agencies in the Antelope Valley and other interested stakeholders to achieve greater water-use efficiencies, enhance public services, and build public support for vital projects; and

WHEREAS, the adoption of the PLAN will improve the Antelope Valley's competitiveness for State and Federal funding including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group; and

WHEREAS, the PLAN is a feasibility and planning study for possible future action and no implementation or project is being adopted, approved, required or funded through the adoption of the PLAN; and

WHEREAS, implementation of the PLAN may not proceed without further discretionary approvals either by the individual public agency or jointly by the group members; and

WHEREAS, adoption of the PLAN, does not legally bind the City of Palmdale to approve or perform any implementation or project.. Furthermore, any approval of any project suggested in this PLAN, including, but not limited to the use of recycled water for direct groundwater recharge, will require full environmental and public review.

NOW, THEREFORE, the City Council hereby finds, determines, and resolves as follows:

SECTION 1: The City Council hereby specifically finds that all of the facts set forth in the Recitals and true and correct and constitute the findings of the City Council in this matter.

SECTION 2: The City Council adopts the Final Integrated Regional Water Management/Groundwater Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

SECTION 3: The City Council hereby finds as follows with respect to the Notice of Exemption prepared in connection with Final Integrated Regional Water Management/ Groundwater Management Plan for the Antelope Valley:

(a) Pursuant to the California Environmental Quality Act ("CEQA") and the City's local CEQA Guidelines, City staff determined the project to be exempt from environmental review pursuant to Section 15262 of the California Environmental Quality Act (CEQA) Guidelines, Feasibility and Planning Studies for possible future actions for which no implementation or project has been approved or funded. Thereafter, the City staff provided public notice of the determination and of the intent to find the project exempt from environmental review pursuant to Section 15272 of the CEQA Guidelines.

(b) The City Council has reviewed the Notice of Exemption and, based on the whole record before it, finds that the Notice of Exemption was prepared in compliance with CEQA. The City Council further finds that the Notice of Exemption reflects the independent judgment and analysis of the City Council. Based on these findings, the City Council hereby adopts the Notice of Exemption.

(c) The custodian of records for the Notice of Exemption, and all other materials which constitute the record of proceedings upon which the City Council's decision is based, is the Director of Planning of the City of Palmdale. Those documents are available for public review in the Planning Department of the City of Palmdale located at 38250 Sierra Highway, Palmdale, California 93550, telephone (661) 267-5200.

SECTION 4: City staff is authorized and directed to file a Notice of Exemption under Section 15262 of the California Environmental Quality Act (CEQA) guidelines on behalf of the Regional Water Management Group.

SECTION 5: The City Clerk shall certify to the adoption of this resolution.

PASSED, APPROVED and ADOPTED this 16th day of January, 2008, by the following vote:

AYES: Mayor Ledford and Councilmembers Lackey, Knight, Hofbauer, and Dispenza

NOES: None

ABSENT: None ABSTAIN: None

James C. Ledford, Jr., Mayor

Attest:

Becky Smith, Deputy City Clerk
for Victoria L. Hancock, CMC
City Clerk

Approve as to form:

for Wm. Matthew Ditzhazy
City Attorney

PALMDALE

a place to call home

38300 Sierra Highway

Palmdale, CA 93550-4798

Tel: 661/267-5100

Fax: 661/267-5122

TDD: 661/267-5167

CITY COUNCIL

CLERK'S CERTIFICATE

I, Victoria L. Hancock, CMC, City Clerk of the City of Palmdale, State of California, do hereby certify as follows:

The attached is a full, true and correct copy of Resolution No. CC 2008-007 adopted at the Regular Meeting of the City Council of the City of Palmdale duly held at the regular meeting place thereof, on January 16, 2008, at which meeting all of the members of said City Council had due notice and at which a majority thereof was present.

I further certify that I have carefully compared the same with the original Resolution No. CC 2008-007 on file and of record in my office and that said Resolution CC 2008-007 is a full, true, and correct copy of the original Resolution No. CC 2008-007 adopted at said meeting.

At said meeting, Resolution No. CC 2008-007 was adopted by the following vote:

AYES: Mayor Ledford and Councilmembers Lackey, Knight, Hofbauer, and Dispenza

NOES: None

ABSTAIN: None

ABSENT: None

WITNESS my hand and the seal of the City of Palmdale this 22nd day of January 2008.

Becky Smith, Deputy City Clerk

for Victoria L. Hancock, CMC
City Clerk

RESOLUTION OF THE BOARD OF DIRECTORS OF COUNTY SANITATION DISTRICT NO. 14 OF LOS ANGELES COUNTY TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, California Water Code Division 6, Part 2.2, known as the *Integrated Regional Water Management Planning Act of 2002* (ACT), provides the framework for preparation of integrated regional water management plans in the State; and

WHEREAS, the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and Los Angeles County Waterworks District No. 40, Antelope Valley have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan for the Antelope Valley (PLAN) that meets the requirements of the ACT; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding including grants from Propositions 50, 84, and 1E.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of County Sanitation District No. 14 of Los Angeles County hereby adopts the Integrated Regional Water Management Plan for the Antelope Valley.

The foregoing Resolution was adopted on the 23rd day of January, 2008, by the Board of Directors as the governing body of County Sanitation District No. 14 of Los Angeles County.

By ______________________________
Chairperson, County Sanitation District
No. 14 of Los Angeles County

JAN 2 3 2008

ATTEST:

By: Kimberly S. Compton
Secretary to the Boards

APPROVED AS TO FORM:

By Daniel V. Hyde
Legal Counsel

RESOLUTION OF THE BOARD OF DIRECTORS OF COUNTY SANITATION DISTRICT NO. 20 OF LOS ANGELES COUNTY TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, California Water Code Division 6, Part 2.2, known as the *Integrated Regional Water Management Planning Act of 2002* (ACT), provides the framework for preparation of integrated regional water management plans in the State; and

WHEREAS, the Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and Los Angeles County Waterworks District No. 40, Antelope Valley have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan for the Antelope Valley (PLAN) that meets the requirements of the ACT; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding including grants from Propositions 50, 84, and 1E.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of County Sanitation District No. 20 of Los Angeles County hereby adopts the Integrated Regional Water Management Plan for the Antelope Valley.

The foregoing Resolution was adopted on the 23rd day of January, 2008, by the Board of Directors as the governing body of County Sanitation District No. 20 of Los Angeles County.

By:______________________________
Chairperson, County Sanitation District No. 20 of Los Angeles County

JAN 2 3 2008

ATTEST:

By: Kimberly A. Conyton
Secretary to the Boards

APPROVED AS TO FORM:

By: Daniel V. Hyde
Legal Counsel

RECEIVED

JAN 23 2008

KENNEDY JENKS CONSULTANTS
VENTURA, CA

RESOLUTION NO. 08-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF LITTLEROCK CREEK IRRIGATION DISTRICT APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.75, known as the Groundwater Management Planning Act, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, The Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan for the Antelope Valley, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, The Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Proposition 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors for the Littlerock Creek Irrigation District, acting as the governing body, does hereby:

1. Propose to adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group; and

2. Determine to adopt and adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED, APPROVED AND ADOPTED on January 16, 2008.

Leo Thibault
President

ATTEST:

Frances Young
Secretary

(SEAL)

RESOLUTION NO. 08-03

A RESOLUTION OF THE BOARD OF DIRECTORS OF LITTLEROCK CREEK IRRIGATION DISTRICT APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT A GROUNDWATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.75, known as the Groundwater Management Planning Act, hereinafter referred to as "ACT," provides the framework for preparation and adoption of groundwater management plans in the Sate; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, The Regional Water Management Group collaboratively prepared a Groundwater Management Plan for the Antelope Valley, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, The Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Proposition 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors for the Littlerock Creek Irrigation District, acting as the governing body, does hereby:

1. Determine to adopt and adopt a Groundwater Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED, APPROVED AND ADOPTED on Janaury 16, 2008.

Leo Thibault
President

ATTEST:

Frances Young
Secretary

(SEAL)

MINUTES OF THE BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

Sachi A. Hamai, Executive Officer
Clerk of the Board of Supervisors
383 Kenneth Hahn Hall of Administration
Los Angeles, California 90012

At its meeting held December 4, 2007 the Board acting as the Governing Body of the Los Angeles County Waterworks District No. 40, Antelope Valley, took the following action:

63

At the time and place regularly set, notice having been duly given, the following item was called up:

> Hearing on proposal and determination to adopt an Integrated Regional Water Management Plan and Groundwater Management Plan for the Antelope Valley (5), to provide the framework for local agencies to coordinate programs and projects intended to address regional water supply needs, protect and improve water quality, provide flood management, protect the environment, and establish a data management system to monitor the progress of these objectives; and find that the project is exempt from the California Environmental Quality Act, as further described in the attached letter dated December 4, 2007 from the Chief Executive Officer.

Opportunity was given for interested persons to address the Board. No interested persons addressed the Board. No correspondence was presented.

On motion of Supervisor Knabe, seconded by Supervisor Antonovich, unanimously carried, the hearing was closed and the Board acting as the Governing Body of the Los Angeles County Waterworks District No. 40, Antelope Valley, took the following actions:

1. Made a finding that said action is exempt from the California Environmental Quality Act; and

(Continued on Page 2)

63 (Continued)

2. Determined that no majority protest exists against the adoption of the Groundwater Management Plan; and

3. Adopted the attached resolutions approving the proposal and determination to adopt an Integrated Regional Water Management Plan and the Groundwater Management Plan for the Antelope Valley.

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Attachments

Copies distributed:
Each Supervisor
Auditor-Controller
Chief Executive Officer
County Counsel
Director of Public Works

County of Los Angeles
CHIEF EXECUTIVE OFFICE

713 KENNETH HAHN HALL OF ADMINISTRATION
LOS ANGELES, CALIFORNIA 90012
(213) 974-1101
http://ceo.lacounty.gov

WILLIAM T FUJIOKA
Chief Executive Officer

December 4, 2007

The Honorable Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, CA 90012

Dear Supervisors:

DEPARTMENT OF PUBLIC WORKS: LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY PUBLIC HEARING FOR ADOPTION OF RESOLUTIONS FOR THE PROPOSAL AND DETERMINATION TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND A GROUNDWATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY (SUPERVISORIAL DISTRICT 5) (3 VOTES)

IT IS RECOMMENDED THAT YOUR BOARD AFTER THE PUBLIC HEARING ACTING AS THE GOVERNING BODY OF THE LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY:

1. Find that the proposed action is exempt from the provisions of the California Environmental Quality Act for the reasons cited in this letter.

2. Consider protests to the adoption of the Groundwater Management Plan and determine whether a majority protest exists. If your Board finds that the protests filed represent more than 50 percent of the assessed value of land within the Los Angeles County Waterworks District No. 40, Antelope Valley, deny adoption of the Groundwater Management Plan and refer the matter back to the Department of Public Works. If there is no majority protest, adopt the resolution for the determination to adopt a Groundwater Management Plan for the Antelope Valley.

3. Adopt the resolution for the proposal and determination to adopt an Integrated Regional Water Management Plan.

PURPOSE/JUSTIFICATION OF RECOMMENDED ACTION

The purpose of these actions is to adopt an Integrated Regional Water Management Plan and a Groundwater Management Plan (Plans) for the Antelope Valley.

The Plans were collaboratively prepared by 11 public agencies, including the Los Angeles County Waterworks District No. 40, Antelope Valley (District) in accordance with State guidelines to address regional water supply needs, protect and improve water quality, provide flood management, protect the environment, and establish a data management system to monitor the progress of these objectives. The adoption of the Plans will improve the Antelope Valley's competitiveness for State and Federal grant funds, including those authorized under Propositions 50, 84, and 1E.

Implementation of Strategic Plan Goals

The Countywide Strategic Plan directs that we provide Fiscal Responsibility (Goal 4) and Community Services (Goal 6) by improving the District's competitiveness for State and Federal grant funds and enhancing the reliability of water supply for the District's customers.

FISCAL IMPACT/FINANCING

There will be no impact to the County General Fund.

FACTS AND PROVISIONS/LEGAL REQUIREMENTS

The Integrated Regional Water Management Planning Act of 2002, as codified in California Water Code §10530 through §10546, provides the framework for preparation and adoption of Integrated Regional Water Management Plans in the State. California Water Code §10541(c) requires publication of a notice of intention to adopt an Integrated Regional Water Management Plan (IRWMP) in accordance with Government Code §6066 if three or more participants in the group propose to adopt the IRWMP. Additionally, California Water Code §10541(d) requires a determination to adopt the IRWMP after holding a public hearing.

The Groundwater Management Act, as codified in California Water Code §10750 through §10756, provides the framework for preparation and adoption of Groundwater Management Plan in the State. California Water Code §10753.5(a) requires that a local agency hold a public hearing to determine to adopt the Groundwater Management Plan. After the public hearing, the local agency shall consider protests to the adoption of the plan and determine whether a majority protest exists. Pursuant to California Water

Code §10753.6(b), the local agency must compare the names and property descriptions on the protests against the property ownership records of the County Assessors. If your Board finds that the protests filed represent more than 50 percent of the assessed value of land within the District, deny adoption of the Groundwater Management Plan and refer the matter back to Public Works. If there is no majority protest, adopt the resolution for the determination to adopt a Groundwater Management Plan for the Antelope Valley.

ENVIRONMENTAL DOCUMENTATION

The proposed action is to adopt plans collaboratively prepared by 11 public agencies including the District, in accordance with State guidelines to address regional water supply needs, protect and improve water quality, provide flood management, protect the environment, and establish a data management system to monitor the progress of these objectives. It involves only feasibility or planning studies for possible future actions, which your Board has not approved, adopted, or funded. The Plans will not have a legally binding effect on later activities and, therefore, their adoption is exempt from the California Environmental Quality Act pursuant to Section 15262 of the California Environmental Quality Act Guidelines.

IMPACT ON CURRENT SERVICES (OR PROJECTS)

The adoption of the Plans will improve the District's competitiveness for State and Federal grant funds to improve the reliability of water supply for the District's customers.

There will be no impact on current County services or projects as a result of this action.

CONCLUSION

Upon approval, please return one adopted copy of this letter and the attached resolutions to the Department of Public Works, Waterworks Division.

Respectfully submitted,

WILLIAM T FUJIOKA
Chief Executive Officer

WTF:DLW
AA:cr

Attachments (2)

c: County Counsel

A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF LOS ANGELES, CALIFORNIA, ACTING AS THE GOVERNING BODY OF THE LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY, APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT A GROUNDWATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.75, known as the Groundwater Management Planning Act, hereinafter referred to as "ACT," provides the framework for preparation and adoption of groundwater management plans in the State; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared a Groundwater Management Plan for the Antelope Valley, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors of the County of Los Angeles, acting as the governing body of Los Angeles County Waterworks District No. 40, Antelope Valley, does hereby:

1. Determine to adopt and adopt a Groundwater Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

The foregoing Resolution was adopted on the 4th day of December, 2007, by the Board of Supervisors of the County of Los Angeles acting as the governing body of the Los Angeles County Waterworks District No. 40, Antelope Valley.

SACHI A. HAMAI
Executive Officer of the
Board of Supervisors of the
County of Los Angeles

By Charlotte R. Brasfield
Deputy

APPROVED AS TO FORM:

RAYMOND G. FORTNER, JR.
County Counsel

By ______________________
Deputy
Frederick W. Pfaeffle

A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF LOS ANGELES, CALIFORNIA, ACTING AS THE GOVERNING BODY OF THE LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY, APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors of the County of Los Angeles, acting as the governing body of Los Angeles County Waterworks District No. 40, Antelope Valley, does hereby:

1. Propose to adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group; and

2. Determine to adopt and adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

The foregoing Resolution was adopted on the 4Th day of December, 2007, by the Board of Supervisors of the County of Los Angeles acting as the governing body of the Los Angeles County Waterworks District No. 40, Antelope Valley.

SACHI A. HAMAI
Executive Officer of the
Board of Supervisors of the
County of Los Angeles

By Charlotte R. Bradfield
Deputy

APPROVED AS TO FORM:

RAYMOND G. FORTNER, JR.
County Counsel

By ______________
Deputy
Frederick W. Pfaeffle

PALMDALE WATER DISTRICT
RESOLUTION 08-1

RESOLUTION OF THE GOVERNING BOARD OF THE PALMDALE WATER DISTRICT APPROVING THE PREPARATION OF AND ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group; and

WHEREAS, the adoption of the PLAN is exempt from the California Environmental Quality Act under section 15262 of the guidelines as a project involving only feasibility or planning studies for possible future actions; and

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Palmdale Water District does hereby:

1. Propose to adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group; and

2. Determine to adopt and adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED AND ADOPTED on this 23rd day of January, 2008, by the Board of Directors, the governing body of the Palmdale Water District.

PALMDALE WATER DISTRICT

Richard D. Wells,
President

ATTEST: JEFF A. STORM

Assistant Secretary: ______________

PALMDALE WATER DISTRICT
RESOLUTION 08-2

RESOLUTION OF THE GOVERNING BOARD OF THE PALMDALE WATER DISTRICT APPROVING THE PREPARATION OF AND ADOPTING A GROUNDWATER MANAGEMENT PLAN FOR THE ANTELOPE VALLEY

WHEREAS, the California Water Code Division 6, Part 2.75, known as the Groundwater Management Planning Act, hereinafter referred to as "ACT," provides the framework for preparation and adoption of groundwater management plans in the State; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared a Groundwater Management Plan for the Antelope Valley, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group; and

WHEREAS, the adoption of the PLAN is exempt from the California Environmental Quality Act under section 15262 of the guidelines as a project involving only feasibility or planning studies for possible future actions; and

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Palmdale Water District does hereby:

1. Determine to adopt and adopt a Groundwater Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED AND ADOPTED on this 23rd day of January, 2008, by the Board of Directors, the governing body of the Palmdale Water District.

PALMDALE WATER DISTRICT

Richard D. Wells,
President

ATTEST: JEFF A. STORM

Assistant Secretary: ______________________

ROSAMOND COMMUNITY SERVICES DISTRICT
RESOLUTION NO. 2008-10

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ROSAMOND COMMUNITY SERVICES DISTRICT APPROVING THE PROPOSAL AND DETERMINATION TO ADOPT AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the California Water Code Division 6, Part 2.2, known as the Integrated Regional Water Management Planning Act of 2002, hereinafter referred to as "ACT," provides the framework for preparation and adoption of integrated regional water management plans; and

WHEREAS, the Antelope Valley-East Kern Water Agency; Palmdale Water District; Quartz Hill Water District; Littlerock Creek Irrigation District; Antelope Valley State Water Contractors Association; City of Palmdale; City of Lancaster; County Sanitation District No. 14 of Los Angeles County; County Sanitation District No. 20 of Los Angeles County; Rosamond Community Services District; and Los Angeles County Waterworks District No. 40; Antelope Valley, have established a Regional Water Management Group by means of a Memorandum of Understanding in accordance with the ACT; and

WHEREAS, the Regional Water Management Group collaboratively prepared an Integrated Regional Water Management Plan, hereinafter referred to as "PLAN," that meets the requirements of the ACT; and

WHEREAS, the Regional Water Management Group solicited and incorporated input from all interested stakeholders in preparation of the PLAN; and

WHEREAS, the adoption of the PLAN is intended to improve the Antelope Valley's competitiveness for State and Federal funding, including grants from Propositions 50, 84, and 1E for all members of the Regional Water Management Group.

NOW, THEREFORE, BE IT RESOLVED, Board of Directors of the Rosamond Community Services District , **does hereby:**

1. Propose to adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group; and

2. Determine to adopt and adopt an Integrated Regional Water Management Plan for the Antelope Valley as a member of the Regional Water Management Group.

PASSED AND ADOPTED at the regular meeting of the Board of Directors of the Rosamond Community Services District held this 9th day of January, 2008.

By: ______________________________
President, Board of Directors
Rosamond Community Services District

ATTEST:

By: ______________________________
Secretary, Board of Directors
Rosamond Community Services District

03

ATTACHMENT 3. WORK PLAN

INTRODUCTION

Goals and Objectives

The Regional Water Management Group of the Antelope Valley Integrated Regional Water Management Stakeholder Group has selected to apply for a Proposition 84 IRWM Implentation Grant to fund a single project benefitting the entire Region – the Water Supply Stabilization Project No. 2 (WSSP2). The WSSP2 is a groundwater banking project that will increase the reliability of the Antelope Valley Region's water supplies by storing excess water available from the State Water Project (SWP) during wet periods and recovering it to serve it to customers during dry and high demand periods or during a disruption in deliveries from the SWP. By "banking" excess water for future use, the WSSP2 will significantly reduce the Region's dependence on constant water deliveries from the Delta. The WSSP2 will also help to stabilize the groundwater basin and preserve agricultural land and open space.

Purpose and Need

The Antelope Valley Integrated Regional Water Management Plan (AVIRWMP) established 12 objectives and planning targets for the Region. The WSSP2 will help meet 5 of the 12 objectives of the IRWMP:

1. Provide reliable water supply to meet the Antelope Valley Region's expected demand between now and 2035.
2. Establish a contingency plan to meet water supply needs of the Antelope Valley Region during a disruption of SWP water deliveries
3. Stabilize groundwater levels at current conditions
4. Preserve open space and natural habitats that protect and enhance water resources and species in the Antelope Valley Region
5. Maintain agricultural land use with the Antelope Valley Region

Water storage is a critical component of improving water supply reliability and is of particular concern in the Antelope Valley where water supplies available to the Region from the SWP vary significantly throughout the year and from year to year depending on precipitation and environmental constraints in the Bay Delta.

The AVIRWMP identified the need to store up to 250,000 acre-feet of water to meet demands during multi-dry year conditions or disruptions in the SWP. In addition, The Antelope Valley-East Kern Water AVEK (AVEK) is the third largest State Water Project Contractor in the State and, in cooperation with the other water wholesalers and retailers in the Region has analyzed the most suitable locations and methods for water storage in several technical studies and reports. Based on these studies and reports, groundwater basin banking is the most appropriate and efficient storage mechanism.

The need for groundwater storage may also increase significantly in the near future as a result of the pending adjudication of the Antelope Valley Groundwater Basin. The WSSP2 could potentially serve as a major component of the physical solution for the Antelope Valley Groundwater Basin by providing for better management of the SWP water available to the Region.

Studies conducted by the United States Geological Survey (USGS) of the project site have shown that 400 of the total 1500 acres yield the highest potential for recharge. The remaining acreage is more limited in recharge ability and will be first reserved for farming and open space.

Project List

This Proposal pertains to a single project designated as Water Supply Stabilization Project No. 2 (WSSP2). WSSP2 is a groundwater recharge and recovery project establishing an operational groundwater bank. WSSP2 includes the following components:

1. Development of 400 acres of recharge basins;
2. Increasing the output capacity of AVEK's existing West Feeder of the California Aqueduct with two new turnouts serving the recharge ponds.
3. Construction of 5 recovery wells;
4. Construction of collector pipelines from the wells;
5. Construction of a 7-mile transmission pipeline from the collector pipelines to;
6. A pump station that will pump the water into AVEK's existing potable transmission system for delivery to customers.

The recharge sites are a part of a 1,500 acre parcel owned by AVEK. The land on which the recharge area will be constructed has historically been used for growing alfalfa and row crops. The recharge area was selected based on studies performed by the USGS. Refer to file 2 of this attachment. Based on USGS's work, it is expected that the percolation rate of raw water placed in the recharge area will average about half a foot per day over the 400 acre site. Raw water will be delivered to the site through the existing West Feeder. Allowing for earthen berms between the several recharge basins that will be constructed, total recharge area will be approximately 385 acres.

It is planned to recharge four months per year (November through February)—a period of 120 days. Over 120 days, with an anticipated minimum recharge rate of 0.5 ft/Day, about 23,000 AF could be recharged over the 400 acre site. Any remaining parcels of the property will be used to grow alfalfa and/or row crops or left fallowed when water is not being recharged.

Five recovery wells will be constructed at the recharge site as part of this Project. The wells will be used to withdraw water from the bank as needed to meet water demands throughout the Region.

The seven-mile Recovered Water Transmission Pipeline will move water recovered from the wells to the steel tank at the Recovered Water Pump Station (and steel tank) which will lift the water into AVEK's existing South-North Intertie Pipeline (SNIP). The SNIP is capable of delivering potable water to all AVEK's potable water service areas. Using existing inter AVEK transfer agreements, potable water from the bank can be devliered anywhere in the Antelope Valley Region.

The project is currently at the preliminary design level; i.e., approximately 10% designed.

Integrated Elements of Projects

The WSSP2 was selected by the AVIRWM Regional Water Management Group in consultation with the local Stakeholder Group as the sole project for which the Region would seek Proposition 84 Round 1 Implementation Grant funds because it benefits every stakeholder in the entire Region. It effectively integrates millions of dollars in existing infrastructure paid for by the region. AVEK's West Feeder and SNIP Pipeline are included in the existing infrastructure. The West Feeder pipeline is a 22 mile 33 to 60-inch diameter transmission pipeline that draws raw water from the California Aqueduct and delivers it to AVEK's Rosamond Water Treatment Plant and to agricultural water users along the pipeline route. The

SNIP pipeline is a 15 mile 48-inch diameter potable pipeline capable of moving potable water to AVEK's potable water customers. As stated earlier, water can be banked at WSSP2 and served directly or through existing transfer agreements to any area of the Region.

In addition to this project, the Region has also committed over $200 million dollars of local funding to projects producing and delivering recycled water to supplement the potable supply. Once the WSSP2 is constructed, stakeholders will engage the Lahontan Regional Water Quality Control Board in regards to recharging recycled water at the WSSP2 in the future to supplement raw water supplies.

The project site for the WSSP2 will also be considered as a potential receiving point for stormwater during the development of the Integrated Flood Management Plan that has been initially recommended for funding through a Proposition 84 Planning Grant.

Regional Map

The Proposal will be implemented within the Antelope Valley Groundwater Basin. Refer to the 10% design preliminary drawings (Drawings 1 – 9) and the regional map (Files 3 and 4 of this Attachment) which identify the location of facilities of the Proposal and proposed monitoring locations.

Completed Work

- Planning – AVEK has completed a number of studies as listed in the next section of the Work Plan which have evaluated the feasibility of the WSSP2 Proposal. AVEK's officials utilized the recommendations made in these studies to plan the facilities included in the proposed Project. The planning stage of the Proposal is currently about 95% complete and will be completed by the date of award of the grant.

- Environmental – AVEK has completed the environmental review (CEQA) process with the preparation of an Initial Study which determined the need for filing of a Mitigated Negative Declaration (refer to file 5 of Attachment 3). Said Mitigated Negative Declaration (SCH No. 2008071013) and subsequent Notice of Determination (SCH No. 2008071013) were filed with the State Clearinghouse on July 2, 2008 and November 14, 2008 respectively.

- Land Acquisition – AVEK owns the land required to implement the project with the exception of some pipeline easements in Los Angeles and Kern County public roads. Acquiring encroachment permits will be included as part of this project.

- Design – AVEK has completed the upgrade of three existing turnouts and the approval of two new turnouts at the site to be able to deliver over 30,000 of recharge from the West Feeder. Additionally, AVEK has compiled a 10% preliminary design of the remaining components of the Proposal. Refer to files 3 and 6 of this attachment for the respective designs.

- Permitting – AVEK has not initiated any permit applications as of the date of this Proposal, however, much of the infrastructure for the WSSP2 will be constructed on property owned by AVEK. AVEK will coordinate with the Counties of Los Angeles and Kern to acquire necessary permits for constructing pipelines in existing road right of ways. AVEK will apply for the necessary permits from the County and State Departments of Public Health to construct and operate wells on its property.

- Bid Solicitation and Construction – AVEK has solicited and received bids to construct the two new Turnouts to the WSSP2 property from the West Feeder. The construction contract was awarded by AVEK on December 15, 2010 and construction is expected to be completed by April, 2011.

Existing Data and Studies

The following is a list of existing studies that have been done in support of this project. Any of the studies not included in other attachments can be made available to DWR upon request:

Antelope Valley Integrated Regional Water Management Plan

The AVIRWMP describes the goals and objectives to be met by this project. The IRWMP was completed in 2007 and is available online at www.avwaterplan.org.

Water Supply Stabilization Program (WSSP)

This report analyzes and describes several potential surface recharge sites. This project, WSSP2, was the selected location from the several alternatives considered. The report was prepared by Boyle Engineering Corporation in July 2007.

Initial Study for the Proposed WSSP2 Groundwater Recharge Project

This document contains the project's environmental documentation, including the CEQA checklist. The study was prepared by Hanson Environmental in June of 2008.

Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of Insitu Arsenic Removal in the North Buttes Area of the Antelope Valley

This is a technical report that looks at the feasibility of constructing and operating an artificial recharge and storage facility. The engineering values determined as part of this report will be used in the design of the WSSP2 basins and recovery wells. The report was prepared by the United States Geological Survey (USGS) in 2010.

Project Map

See Drawings 1 through 9 of file 3 of this attachment.

Project Timing and Phasing

The Project will likely be constructed under two construction contracts. As discussed in Attachment 5-Schedule-construction is expected to begin in December 2011 with all facilities needed for the Project being completed by the summer of 2013.

TASKS

Budget Category (a): Direct Project Administration Costs

AVEK will be the sole recipient of grant funds and will construct the project on behalf of the Region. This procedure has been agreed to by the RWMG members and the AVIRWM Stakeholder Group.

Task 1.1– Project Management

This task includes all effort to manage the project team during pre-design, design, and construction as well as preparation and submittal of progress reports to the Department of Water Resources.

Deliverables: Preparation of invoices, progress reports, and other deliverables as required.

Task 1.2 – Labor Compliance Program

AVEK will comply with Public Resources Code section 75075 regarding Labor Compliance Programs.

Deliverables: Submission of Labor Compliance Program.

Task 1.3 – Reporting

AVEK will comply with the reporting requirements as stipulated in the grant.

Deliverables: Submission of quarterly progress reports and a final report as specified in the grant agreement.

Budget Category (b): Right of Way / Easement Plan

AVEK previously purchased property for the recharge ponds and pump station. Easements will be required for the transmission pipeline. To the greatest extent possible, the recharge and recovery well pipeline will remain within AVEK owned property.

Task 2.1 - Preparation of Legal Descriptions

The engineering consultant will prepare plats and legal descriptions for that portion of the recovery pipeline easement that will cross each property.

Task 2.2 - Easement Acquisition

A consultant will be hired to perform appraisals of subject properties and act as a right-of-way agent to obtain the necessary easements for the project.

Deliverables: Plats, legal descriptions, and executed easements.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Task Group 3 - Project Assessment and Evaluation

Task 3.1 - Records Search

Before beginning on the project design, the engineering consultant will search through AVEK files for previous design plans, reports, and studies that will assist in the design of this project.

Deliverables: List of applicable reports, documents, and plans.

Task 3.2 – Topographic Survey

Engineering consultant will perform field surveying and aerial mapping of the project sites for aid in the design of the project and preparation of the legal descriptions and plats for the easements required for the project. It is expected that survey and aerial mapping datum will be the same as those used for the design of AVEK's existing SNIP Pipeline Project.

Deliverables: Aerial Survey with topographic and property line data.

Task 3.3 – Geotechnical Analysis

Engineering consultant will prepare a geotechnical study to define soil characteristics to design the various facilities of the project. The study should define recommendations for pipeline (e.g. thrust blocks, trench backfill, trench shoring, soil corrosion potential), pump station and tank foundations, and surface recharge embankment design.

Deliverables: Geotechnical report.

Task 3.4 - Existing Utilities Search

This task will involve activities necessary to obtain basic information about the existing facilities and utilities on sites for the pipeline, water recharge basin, and pump station. The primary task will include contacting the various public and known private utility owners in the area to determine the rough location and depth of any existing utilities.

Deliverables: Existing Utility information request letters.

Task 3.5 - Operational Plan and Hydraulic Analysis

Design hydraulics for the WSSP2 surface recharge area and the various facilities will be performed under this task. Evaluations of the reaction of the WSSP2 groundwater bank will be evaluated using computer modeling to estimate the variation of groundwater levels with various recharge and recovery operational assumptions. The design hydraulics for the wells and the pipelines will be evaluated for all critical conditions of low and high flow rates and groundwater levels effected by the WSSP2 banked water storage facility. A surge analysis of the recovery and transmission pipelines will be performed and the pump station design criteria will be established.

Deliverables: Technical memorandum summarizing Operational Plan and Hydraulic Analysis.

Task 3.6 – Feasibility Study

The work described in this task has previously been completed by AVEK in cooperation with USGS. The majority of this work was to develop a technical report with USGS that looked at the feasibility of constructing and operating an artificial recharge and storage facility. The report name is “Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of In situ Arsenic Removal in the North Buttes Area of the Antelope Valley”. The Phase I portion of this report was completed in 2010. The additional Phase II of this study includes groundwater recharge monitoring and reporting to be completed by 2014.

Deliverables: Final USGS Report, included with this Proposal.

Task 4 – Permitting

This task includes obtaining the following permits:

- Kern County Encroachment Permit
- Los Angeles County Encroachment Permit
- California Department of Public Health Water Well, Storage, and Treatment Permits
- Lahontan Regional Water Quality Control Board Construction Activities General Permit.
- California Department of Fish and Game Stream Bed Alternation Permit, if defined drainage areas are impacted by final design.
- Los Angeles County Department of Public Health Water Well Construction Permit

Deliverables: Final executed permits

Task Group 5 – Preparation of Construction Plans and Specifications (Project Design)

Task 5.1 – Recharge Basin Design

The design of the individual basins will be based on the approach of using agricultural flood irrigation methods that include shallow berms that are approximately 3 feet in height and follow the land contours.

Task 5.2 – Recharge Pipelines Network Design

This task will include the design and preparation of construction documents for the network of pipelines that will feed the various recharge basins. The design will include the two new turnouts from West Feeder. These turnouts will include metering and pressure reducing facilities and pipelines to the recharge basins.

Task 5.3 - Recovery Well Design

As part of this task, sites for new recovery wells will be selected along with estimating production capacity. After the sites for new wells have been selected the well details will be defined and construction documents will be prepared. The pumps and motors will be designed along with power supply and controls once the wells have been drilled and tested. It is anticipated that the well pump design will be non-ordinary as the water levels from which the wells will have to produce will vary significantly because of the nature of the recharge and recovery operations for WSSP2. This task also includes the design of well discharge piping.

Task 5.4 – Recovery Well Pipeline Network Design

This task will include the design and preparation of construction documents for the Recovered Water Pipeline Network. The design will include 12, 16, and 27 inch pipe from the well discharge piping to a point connecting the last branch into the Recovered Water Transmission Pipeline.

Task 5.5 – Recovered Water Transmission Pipeline Design

This task will include the design and preparation of construction documents for about 7 miles of transmission main. The design will include 36 inch pipe from the Recovery Well Pipeline Network to the proposed Recovered Water Pump Station site.

Task 5.6 – Recovered Water Pump Station and Steel Reservoir Design

This task includes the design and preparation of construction documents for the Recovered Water Pump Station facilities. For the sake of budgetary detail, the task has been broken down into the following subtasks:

Subtask 5.6.1 - Civil Design

This task includes the design of the Civil components of the pump station that will include site grading and layout, fencing, manifold piping, pump wet wells, pump selection, steel reservoir, etc.

Subtask 5.6.2 - Structural Design

This task includes the design of the structural components of the steel reservoir and pump station building components.

Subtask 5.6.3 - Mechanical Design

This task includes the design of the heating and cooling and air compressor equipment for the site.

Subtask 5.6.4 - Electrical Design

This task includes the design of the electrical components of the pump station to include power supply, pump motors, variable frequency drives (VFDs), site and building lighting, etc.

Subtask 5.6.5 - Instrumentation Design

This task includes the design of the instrumentation equipment for the pump station controls and SCADA systems.

Subtask 5.6.6 – Landscape and Irrigation Design
This task includes the design of landscaping to screen the steel reservoir and pump station entrance per the requirements of the CEQA mitigated negative declaration.

Deliverables: 30% Plans, 90% Plan and Specifications, 100% Plan and Specifications are typical deliverables for each task.

Budget Category (d): Construction/Implementation

Task 6.1 – Construction
This task includes construction of the various Proposal facilities.

Deliverables: Submission of quarterly construction progress reports documenting required construction activity as specified in the grant agreement.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 7.1 - CEQA Environmental Documentation
The CEQA documentation required as part of this project was completed in 2008 by AVEK.

Deliverable: Approved Mitigated Negative Declaration for the project.

Task 7.2 - Implementation of Environmental Mitigation Measures, Monitoring and Assessment
Per the adopted environmental documents, the required environmental mitigation measures, monitoring, and assessment will be conducted by AVEK. Refer to the attached Mitigation Monitoring and Reporting Plan in file 7 of this attachment.

Deliverables: Environmental monitoring and assessment reports.

Budget Category (f): Construction Administration

Task 8.1 - Project Bids Solicitation
This task includes all costs associated with putting the construction contracts to bid and awarding them. This work includes advertisement in both Kern County and Los Angeles County newspapers, duplicating and distribution of bid sets, responding to questions from potential bidders and issuing addenda, conducting a pre-bid meeting on-site, conduct bid opening at AVEK offices, tabulation of bid results, preparation and review of contract documents, and preparation of conformed drawings.

Deliverables: Bid package, addenda, newspaper advertisement.

Task 8.2 – Pre-Construction Meeting
The engineering consultant will conduct a pre-construction meeting at AVEK offices to begin the construction phase of the project. This meeting will be able to address such issues as mobilization, submittal schedule, and answer any questions the contractor may have.

Deliverables: Meeting agendas and minutes.

Task 8.3 – Response to RFI
The engineering consultant will respond to questions from the contractor as they arise throughout the project.

Deliverables: Response to RFI's.

Task 8.4 – Submittals

The engineering consultant will review submittals and shop drawings of materials and equipment prior to ordering.

Deliverables: Response to submittals.

Task 8.5 – Construction Observation

Construction observers will be present throughout all critical phases of construction. Engineering staff will also deal with any problems during construction such as unknown utilities and permit requirements.

Deliverables: Construction observation reports.

Task 8.6 – Materials Testing

A consultant will be hired to do testing of soil compaction and concrete compressive strength during construction. Materials testing will be done concurrently with construction observation.

Deliverables: Materials test reports.

Task 8.7 - Operational Testing and Startup

The design staff will be present during the operational testing and startup of the facilities to ensure that they are functioning within the design parameters. The systems to be tested include each of the five recovery wells, the pump station, and the SCADA system that will tie these facilities together.

Deliverables: Start up Reports.

Task 8.8 – Progress Pay Estimates

Progress pay estimates will be prepared each month for both of the two construction contracts.

Deliverables: Project pay estimates.

Task 8.9 – Project Close Out

The close out of the project includes creating record drawings, issuing a notice of completion, conducting a final inspection, and finalizing all project files.

Deliverables: Record drawings, final inspection report, finalized project files.

Monitoring and Assessment

Task 9.1 – Monitoring and Assessment

After the project is complete and in operation, annual monitoring and assessment will be conducted as described in Attachment 6. Because this is an annual rather than capital cost, monitoring and assessment is accounted for in Attachment 7 and not included in the project budget.

Deliverables: Project monitoring and assessment plan and reports.

ATTACHMENT EXHIBITS

File 2 of 7 – Report Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of Insitu Arsenic Removal in the North Buttes Area of the Antelope Valley, USGS, 2010
File 3 of 7 – 10% Preliminary Design Drawings (Sheets 1 – 9)
File 4 of 7 – IRWM Plan Regional Map
File 5 of 7 – Applicant Resolution Adopting Project Mitigated Negative Declaration
File 6 of 7 – WSSP No. 2 Turnout Project Construction Plans
File 7 of 7 – Mitigation Measures Monitoring and Implementation Plan

Attachment 3 Exhibit

Report Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of Insitu Arsenic Removal in the North Buttes Area of the Antelope Valley, USGS, 2010

USGS Report

Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of *Insitu* Arsenic Removal in the North Buttes Area of the Antelope Valley

Program: Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of *Insitu* Arsenic Removal in the North Buttes Area of the Antelope Valley

Phase 1 Results

Introduction

The Antelope Valley East Kern Water District (AVEK) is proposing to construct and operate a groundwater recharge and recovery program on about 1,500 acres of agricultural land in the North Buttes area of the Antelope Valley. AVEK plans on recharging 30,0000 to 36,000 acre-feet per year (acre-ft/yr) of imported water from the California State Water Project by infiltrating the applied water through a 250-ft thick unsaturated zone using low berm flooding. The water will be recharged during the winter months (November through February) when imported water is available and demand for water supplies is low. Only 90 percent of the water delivered for recharge will be recovered by pumping from on site wells for delivery to AVEK customers during periods when surface-water supplies are low. AVEK plans on recovering the recharged water during dry years at a rate of 26,000 to 60,000 acre-ft/yr.

In May 2009, AVEK and the U.S. Geological Survey (USGS) initiated a cooperative water-resources program to assess the feasibility of artificial recharge and storage and the effectiveness and sustainability of *insitu* arsenic removal in the North Buttes area of the Antelope Valley. The objectives of this study are to: (1) determine if the North Buttes site in the western Antelope Valley groundwater basin is suitable for artificial recharge and storage; (2) determine the effects of artificial recharge on water levels and water quality; (3) determine the effectiveness and sustainability of *insitu* arsenic removal in the unsaturated zone; (4) develop modeling tools to facilitate better management of the proposed full-scale artificial recharge and storage project.

The study objectives will be met utilizing a two-phase approach. The first phase will evaluate the feasibility of the site for artificial recharge and storage using existing or readily collected data. If the Phase 1 results indicate that artificial recharge may be feasible, a pilot-scale artificial-recharge project will be implemented to monitor the movement of the applied water through the unsaturated zone and to determine the effectiveness and sustainability of *insitu* arsenic removal by alumina, iron, and manganese oxides on unsaturated materials. High-arsenic groundwater from a nearby well will be used as the source water for the pilot-scale.

Phase 1 of the study was initiated in May 2009 and consisted of three major tasks: (1) Review existing data, (2) Collect new data, and (3) Evaluate data. The results of Phase 1 of the study are summarized by task in this document.

Task 1 – Review Existing Data

Task 1 involved reviewing and compiling available geologic, hydrologic, and water-quality data in the vicinity of the proposed North Buttes recharge and recovery site. The proposed site covers about 1,475 acres in the northwestern part of the Lancaster subbasin of the Antelope Valley groundwater basin (Figure 1).

Geohydrology

The Antelope Valley is a large sediment-filled structural depression between the Garlock and San Andreas Fault zones (Figure 1). The sediments that fill the depression form the Antelope Valley groundwater basin. The groundwater basin is underlain and surrounded by low permeability rocks, referred to herein as the basement complex. This basement complex consists of pre-Tertiary igneous rocks and Tertiary sedimentary rocks. A series of unconsolidated to partly consolidated deposits of Quaternary to Tertiary age overlies the basement complex and forms the groundwater basin. Dutcher and Worts (1963) mapped these deposits as either alluvial or lacustrine on the basis of the mode of deposition. The alluvium consists of unconsolidated to moderately indurated, poorly sorted gravels, sands, silts, and clays. The older deep units within the alluvium typically are more compacted and indurated than the shallow units (Dutcher and Worts (1963). The fine-grained lacustrine deposits consist of sands, silts, and clays that accumulated in a large lake or marsh that at times covered large parts of the Antelope Valley (Dibblle, 1967). The lacustrine deposits, as mapped by Durbin (1978) and modified by Leighton and Phillips (2003), are not present in the area of the proposed recharge site.

The lateral boundaries of the Antelope Valley groundwater basin, in most cases, are formed by faults or outcropping of the basement complex. The Antelope Valley groundwater basin has been divided into 12 groundwater subbasins on the basis of faults, exposure of the basement complex, groundwater divides, and, in some cases, arbitrary boundaries (Bloyd, 1967). The Lancaster subbasin is the largest and most developed of the subbasins. The Neenach Fault was identified by Bloyd (1967) to form the northwestern boundary of the subbasin. The proposed recharge and storage site lies just south of the Neenach Fault and north of an outcropping of the basement complex, referred to as the Antelope Buttes or North Buttes (Figure 1).

The Antelope Valley groundwater basin was divided into three major aquifers by Leighton and Phillips (2003): the upper aquifer that extends from the water table to an altitude of about 1,950 ft above sea level (asl), the middle aquifer that extends from about 1,950 to 1,550 ft asl, and the lower aquifer that extends from about 1,550 asl to the altitude at which the basement complex is encountered. In the study area, the upper aquifer consists of alluvial deposits of gravel, sand, silt, and clay, and is unconfined. Leighton and Phillips (2003) reported that the alluvial deposits become more indurated and less permeable in the middle and lower aquifers.

Leighton and Phillips (2003) estimated total transmissivity of the Antelope Valley aquifer system using specific-capacity data. They assumed that the hydraulic conductivity of the lower aquifer was 2 ft/d, and then calibrated the hydraulic conductivity of the upper and middle aquifers such that simulated water levels matched measured values and simulated total transmissivity values reasonably matched values estimated from specific-capacity data. The calibrated hydraulic conductivity values in the study area ranged from 2 to 10 ft/d in both the upper and middle aquifers and 2 ft/d in the lower aquifer, resulting in total simulated transmissivity values of about 2,600 to 5,300 ft^2/d (Leighton and Phillips, 2003).

Specific-capacity values compiled from nine existing wells on the proposed recharge site (Figure 2) range from 20 to 111 gallons per minute per foot (gpm/ft) (Table 1). Multiplying the specific capacity (in gallons per minute per foot of drawdown) by a conversion factor of 230 approximates the transmissivity in units of square feet per day (ft^2/d) 230 [the conversion factor was developed by Thomasson and others (1960) for valley-fill deposits in the Sacramento Valley of California]. Transmissivity values estimated using specific-capacity data range from 4,600 to 25,400 ft^2/d, with six of the values in excess of 9,000 ft^2/d (Table 1). These estimated transmissivity values are significantly higher than the values simulated by Leighton and Phillips (2003) for the study area.

Water Levels and Movement

Groundwater levels in the Antelope Valley are measured on a semi-annual basis by the USGS in cooperation with Antelope Valley State Water Contractors Association Joint Powers Authority (JPA). Approximately 30 wells are measured within about five miles of the proposed recharge and storage site (Figure 3). The general direction of groundwater flow in the study area is from west to east. Water levels collected in spring 2008, indicate that water levels are more than 100 ft higher in wells west of the proposed site than in wells located on our directly east of the site (Figure 3). The measured water-level differences suggest the presence of a barrier to groundwater flow. Antelope Valley contains numerous faults, which act as partial barriers to groundwater flow (Leighton and Phillips, 2003). The location of a possible fault in the vicinity of the proposed site, inferred from the large water-level differences, is shown on Figure 3.

The depth to water measured at wells on the site ranges from about 240 feet (ft) below land surface (bls) on the western side of the site to about 270 ft bls on the eastern side. Inspection of historical records indicates that water levels have declined about 100 ft in the aquifer beneath the study area since the early 1960s (Table 1).

Water Quality

Groundwater-quality data collected within the last five years are available from eight wells on the proposed site and four wells within five miles of the site (Figure 4). The total dissolved solids (TDS) concentration of samples from wells on the site ranges 260 to 393 milligrams per liter (mg/L). The TDS concentrations measured in samples from the on site wells are about 50 mg/L higher than TDS concentrations measured from samples in three of the off-site wells. Nitrate concentrations measured as nitrogen range from 1.3 to 4 mg/L in the on-site wells, generally higher than measured in the off-site wells. All nitrate concentrations are below the U.S. Environmental Protection Agency (USEPA) Maximum contaminant Level (MCL) of 10 mg/L as nitrogen (U.S. Environmental Protection Agency, 2009). The higher TDS and nitrate concentrations measured in the on-site wells could be the result of irrigation return flows reaching the water table after irrigation on the site for more than 30 years.

Arsenic concentrations ranged from 3.5 to 27.2 micrograms per liter (μg/L) in samples from the on-site wells (Figure 4). Four of the eight wells sampled on the site yielded water with arsenic concentrations in excess of the USEPA MCL of 10 μg/L (U.S. Environmental Protection Agency, 2009). Wells with high arsenic concentrations are located on the western and northeastern edges of the site. Comparison of arsenic concentrations with well depth did not indicate any obvious relationship. Depth-dependent flow and water-quality samples would help determine the source of the high arsenic concentrations; however, access to the wells was not possible during this study.

Task 2 – Collect New Data

Task 2 involved compiling and collecting data to identify the basin geometry, potential infiltration rates, and the shallow subsurface lithology of the study area.

Basin Geometry

Gravity data were compiled and collected to help determine changes in the basement geometry and to identify possible features, such as faults, that may influence groundwater flow and the recovery of recharged water. Available regional gravity data (Roberts and others, 1990) was used to produce a preliminary basement gravity model of the study area. Local gravity measurements collected during Phase 1 of the study will be incorporated with existing regional data to prepare a refined basement gravity model during Phase 2 of the study.

Regional gravity data were analyzed using standard gravity corrections, including: (a) the earth tide correction, which corrects for tidal effects of the moon and sun; (b) instrument drift correction, which compensates for drift in the instrument's spring; (c) the latitude correction, which incorporates the variation of the Earth's gravity with latitude; (d) the free-air correction, which accounts for the variation in gravity due to elevation relative to sea level; (e) the Bouguer correction, which corrects for the attraction of material between the station and sea level; (f) the curvature correction, which corrects the Bouguer correction for the effect of the Earth's curvature; (g) the terrain correction, which removes the effect of topography to a radial distance of 104 mi (166.7 km); and (h) the isostatic correction, which removes long-wavelength variations in the gravity field inversely related to topography.

The gravity field (referred to in this document as the isostatic residual gravity field) of the study area is complex, and mostly reflects the large density contrast between dense basement complex and less dense basin-fill deposits. The gravity field was analyzed to define the structural setting of the study area. The automated method of Blakely and Simpson (1986) was used to define where changes in rock density are located over a short distance, such as density contrasts cause by faults. Places where the gravity field changes the most are likely locations for vertical offsets in basement rocks, indicating the location of a possible fault. Faults are often partial barriers to groundwater flow, where they cut unconsolidated basin-fill deposits.

The thickness of the basin-fill deposits was estimated by the method of Jachens and Moring (Roberts and others, 1990). This method partitions the isostatic residual gravity field into two components—the component caused by density variations within the basement rocks (the basement gravity field) and the component caused by the low-density basin-fill deposits (the basin-fill gravity anomaly). Once the gravity data have been partitioned, the ‘basin-fill gravity anomaly’ can be modeled to yield a thickness of the basin-fill deposits throughout the study area, given knowledge of the density contrast between the basin-fill deposits and the basement rocks.

Geologic data collected from wells and test holes in the Antelope Valley were used to constrain the computed thickness of the basin-fill deposits.

The computed depth to the basement complex (thickness of the basin fill) is presented on Figure 5. The gravity data indicate that the depth to the basement complex increases from less than 1,000 ft bls on the northeastern side of the site more than 3,000 ft on the western side of the site. Directly west of the site, the gravity data show that the depth to the basement complex increases to more than 7,000 ft bls. This large change in depth to the basement complex over a short distance is likely the result of a northwest-southwest trending fault that has vertically offset the basement complex. South of the site, the gravity data indicate that the depth to the basement complex is less than 100 to 1,000 ft bls, which corresponds to the exposed basement complex in the Antelope and Little Buttes.

About 100 gravity measurements were collected for this study to improve the gravity model in the vicinity of the proposed site (Figure 1). The gravity measurements were closely spaced near the site to help determine changes in the basement geometry below the recharge facility and to identify possible features, such as faults, that might influence groundwater flow. Gravity measurements collected during this study were made using a LaCoste and Romberg Model D-79 with Aliod 100 gravity meter. The location and elevation of each gravity measurement was determined using a Trimble Real Time Kinematic (RTK) Model 4400 Global Positioning System (GPS) base and mobile receivers. This system is capable of obtaining vertical and horizontal coordinates with a precision of plus or minus 0.083 ft between receiver and base. These data will be incorporate with the regional data to develop a revised gravity model during Phase 2 of the study.

Infiltration Rate

The proposed site is located on coalescing alluvial fan deposits derived from the Tehachapi Mountains to the north and the San Gabriel Mountains to the west. Soils on the northern part of the site predominantly are classified as the Rosamond series (U.S. Department of Agriculture, 2009), and consist predominantly of loam (Rp), silty clay loam (Rt), and fine sandy loam (Ro). These soils were deposited at the distal end of the alluvial fan (the lower margin of the alluvial fan between the sloping fan and the playa) that extends from the Tehachapi Mountains (Figure 6). Soils on the southern part of the site predominantly are classified as the Hesperia (HkA and HkB) and Hanford (HbA, HbC, and HcA) series (U.S. Department of Agriculture, 2009), and consist of fine sandy loam to coarse sandy loam deposited on the alluvial fan extending from the San Gabriel Mountains (Figure 6). The reported surface saturated hydraulic conductivity of these soils ranges from 1.13 to 3.97 ft/d for the Rp and Rt soils, 3.97 to 11.9 ft/d for the Ro, HkA, HkB, HbA, HbC, and HcA soils (U.S. Department of Agriculture, 2009). The reported values were constant with depth, except for the Ro soil, which were lower (1.13 to 3.97 ft/d) below 8 inches (U.S. Department of Agriculture, 2009). On the basis of the soil description, about 250 acres of the site are considered to have a good infiltration potential (HkA, HkB, HbA, HbC, and HcA soils), about 500 acres are considered to have a fair infiltration potential (Ro soils), and about 725 acres (Rp and Rt soils) are considered to have limited infiltration potential (Figure 6).

Double-ring infiltrometer tests were completed for this study on the different soil types to more accurately evaluate the potential infiltration rate for the different soils on the site. A 4-ft-diameter double-ring infiltrometer, having a 2-ft-diameter inner ring, was used to measure the maximum rate that water could infiltrate a particular soil. Infiltrometer tests were successfully completed on the land surface at six sites, and at about 3-ft beneath the subsurface at four of these sites (Figure 7). Six additional infiltrometer tests were attempted in the northeastern part of the study; however, animal burrows at the sites prevented the successful completion of the tests. Analysis of the infiltration tests indicates that the infiltration rate ranges from 12.75 ft/d in the HkA soils measured at the surface at site 3 to near 0 ft/d in the Rp soils measured at the surface at site 4 (Figure 7 and Table 2). The infiltrometer tests collected at different depths at the same site indicate that the infiltration rates were significantly lower in the deeper tests at the same site in the HkA and Ro soils (sites 1 and 3), were about the same in the Rp soil (site 4), and were higher in the Rt soil (site 5). The infiltrometer test results support the soils property data reported by the U.S Department of Agriculture (2009), and indicate that the sandy loam soils classified as Hesperia (HkA and HkB), Hanford (HbA and HbC), and Rosamond (Ro) soils on the site have fair to good surface infiltration potential; whereas, the loam and silty clay loam soils classified as Rosamond (Rp and Rt) soils on the site have limited surface-infiltration potential.

Subsurface Lithology

Subsurface lithology data were collect for Phase 1 of the study from Cone Penetrating Testing (CPT), direct-current (DC) resistivity surveys, and test drilling.

Cone Penetrating Testing (CPT)

CPT data were collected at 23 sites to characterize the subsurface lithology to approximately 50 ft or refusal along north-south and east-west trending transects through the proposed site (Figure 8). The CPT data indicate that the percentage of silt and clay deposits is higher beneath the northern part of the site compared to the southern part of the site (Figure 9). Interpolation of the available CPT data indicates the presence of several continuous thin clay layers (< 5 ft thick) in the upper 50 ft of the subsurface beneath the northern part of the proposed recharge site (Figure 9). Core material collected from the silt and clay layers during CPT had saturated hydraulic-conductivity values ranging from 3.0×10^{-4} to 2.0×10^{-2} ft/d (Table 2), which are significantly lower than values reported for the soils by the U.S Department of Agriculture (2009). Compaction of the cores during collection may have reduced the hydraulic-conductivity values measured on the CPT cores.

Data collected at CPT01 and CPT24, completed in an area mapped as permeable HkA soil in the northeastern part of the study area (Figure 8), indicate the presence of silt and clay directly beneath the surficial sand deposits (Figure 9A). A core of the clay at 17.7 ft bls in CPT-1 had a saturated hydraulic conductivity of 0.02 ft/d (Table 2). The presence of near surface silt and clay layers in the northern part of the study area would severely limit the downward infiltration of applied recharge water. The CPT data indicate that the HkA and Ro soils in the northeastern part of the proposed recharge site probably would have limited recharge potential due to the underlying silt and clay deposits in the shallow subsurface. On the basis of the soil description and CPT data, about 385 acres of the 1,475-acre site are considered to have a fair (246 acres; Ro soils with no near-surface clay layers) to good (139 acres; Hesperia and Hanford soils with no near-surface clay layers) recharge potential by surface infiltration and about 1,090 acres are considered to have limited recharge potential by surface infiltration (Figures 8 and 9).

Undeveloped land in Section 8, directly south of the proposed site, consists of HkA, HkB, HbA, HbC, and Ro soils which have fair to good surface-infiltration potential. Lithologic data collected from CPT sites adjacent to this property and AVUZ-2 suggests that there are no near-surface clay layers that would inhibit the infiltration of applied water. Adding this land to the proposed recharge and recovery site would significantly increase the recharge potential of the proposed site.

Direct-Current (DC) Resistivity Surveys

Direct-current (DC) resistivity surveys were collected in the project area to help identify geologic structures and potential perching layers. DC resistivity data were collected along two profiles at the site using a dipole–dipole array with 25-ft electrode spacing to optimize lateral and depth resolution (Figure 8). Inverse models of the DC resistivity data along a north-south profile in the eastern part of the site indicate the presence of relatively low-resistivity material from land surface to the water table in the extreme northern part of the site (Figure 10A). In the remainder of the profile a low-resistivity unit is present from land surface to about 15 ft bls, a continuous high-resistivity unit between 15 and 80 ft bls, and a mid-resistivity unit from about 80 ft to the water table. Low-resistivity units identified by the DC resistivity data were correlated with fine-grained deposits (silt and clay) identified by the CPT, as well as with areas of recent irrigation where residual soil moisture decreased resistivity in the near-surface materials. High-resistivity to mid-resistivity units were correlated with coarse-grained deposits (sand and gravel). The almost continuous low-resistivity materials identified on the northern part of the north-south profile indicate that this part of the proposed site probably would have limited recharge potential by surface infiltration.

Inverse models of the DC resistivity data-along the southeast-northeast profile in the western part of the site indicate the presence of a high-resistivity unit from near land surface to the water table in the southwestern part of the site (Figure 10B). The high-resistivity unit probably is sand and gravel deposits from the San Gabriel Mountains. The presence of the high-resistivity unit suggests that the southwestern part of the site probably would have fair to good recharge potential by surface infiltration. In the remainder of the profile, there is a low-resistivity unit from land surface to about 15 ft bls, underlain by a relatively high-resistivity unit from about 15 ft bls to about 80 ft bls. Beneath this high-resistivity unit, there is a mid-resistivity unit to the water table beneath the southwestern half of the profile; however, this unit becomes progressively less resistive along the northeastern half of the profile. These data support the findings along the north-south profile, indicating that the unsaturated zone is finer grained in the northern part of the site, and probably would have limited recharge potential by surface infiltration.

Test-Well Drilling

Three unsaturated-zone monitoring sites (AVUZ-1, AVUZ-2, and AVUZ-3) were installed to the water table using the Overburden Drilling and Exploration (ODEX) technique along a north-south profile in the eastern part of the site to determine the lithology and hydraulic properties of the thick unsaturated zone underlying the site (Figure 11 and Table 3). Cuttings were collected at 1 ft intervals for analysis of lithology and core materials were collected at selected intervals for analysis of hydraulic properties. The specific conductance of a mixture of distilled water and soluble salts dissolved from drill cuttings was measured in the field (Figure 12). Borehole geophysical logs, including natural gamma, neutron, and electromagnetic resistivity logs also were collected and were used to help identify the lithology, moisture content, and geologic source of the alluvial deposits (Figure 12). The sites were instrumented to measure the downward movement and quality of existing irrigation return flows and proposed artificial recharge.

Methods

The monitoring sites were drilled to the water table to allow instrument installation throughout the unsaturated zone and at the water table. Cores were preserved on site to prevent changes in water content and water potential using methods described by Hammermeister and others (1986) and Izbicki and others (2000). A gamma log and a neutron log were collected from within the ODEX pipe after drilling was completed. These logs were used with lithologic and specific-conductance data from drill cuttings to guide placement of instruments within the borehole.

A water-table well, advanced tensiometers, temperature sensors, dielectric permittivity sensors, and suction-cup lysimeters were installed in the completed boreholes (Figure 12 and Table 3). The well at each site will be used to measure changes in water levels and groundwater quality resulting from recharge and also will serve as an access for an electromagnetic (EM) resistivity geophysical tool used to monitor the downward movement of water during recharge. Advanced tensiometers are used to measure matric potential and pressure head at depths in the unsaturated zone where perched water may accumulate during artificial recharge. Dielectric permittivity sensors and temperature sensors are used to measure matric potential and temperature in the unsaturated zone. These sensors are commonly placed in coarse-grained deposits or beneath layers expected to impede the downward movement of water. Suction-cup lysimeters are used to collect water samples from the unsaturated zone for laboratory analysis. Instruments were installed at depths determined on the basis of lithologic and geophysical-log data collected during drilling. Each instrument was installed in backfill material intended to ensure adequate contact with the surrounding unsaturated materials. Instruments were separated by low-permeability bentonite grout to ensure water does not move vertically through the borehole. These instruments are controlled and data recorded using a data logger installed in a vault at land surface.

Data will be collected from the advanced tensiometers, temperature sensors, and dielectric permittivity sensors in the unsaturated zone at 4-hour intervals. A period of several months is required for instruments to equilibrate with aquifer material. Therefore, not data from these instruments are presented in this document. Data collected from the instruments will be stored in data loggers and retrieved at approximately 6-week intervals. Water samples from the piezometers will be collected when data are retrieved from the data loggers and analyzed to determine differences in water quality with depth.

Results

The lithologic samples collected at the unsaturated-zone monitoring sites were generalized into three classes: sand, silt, and clay (Figure 13). Borehole data indicate that silt and clay are predominant in the unsaturated zone at in the northern part of the site (AVUZ-3); whereas, sand is predominant in the unsaturated zone at in the southern part of the site (AVUZ-2) (Figure 13). These results confirm the CPT and DC resistivity results. The silt and clay probably were deposited at the distal end of Tehachapi Mountain alluvial fan, similar to the Rosamond soils and the sand probably was deposited by the alluvial fan extending from the San Gabriel Mountains, similar to the Hesperia and Hanford soils. This indicates that through the geologic time period represented by the drill cuttings, the two alluvial fans have been coalescing at approximately the same location on the project site as they are today. Tectonic movement along the Garlock Fault Zone would result in increased erosion in the Tehachapi Mountains and subsequent increased deposition along the alluvial fans extending from the Tehachapi Mountains; similarly, tectonic movement along the San Andreas Fault Zone would result in increased erosion in the San Gabriel Mountains and subsequent increased deposition along the alluvial fans extending from the San Gabriel Mountains. Because of the relative location of the project site to the two fans, increased deposition from the Tehachapi alluvial fan generally will result in deposition of silt and clay on the project site; whereas, increased deposition from the San Gabriel alluvial fan generally will result in deposition of sand on the project site.

Clay deposits are present in the upper 25 ft of AVUZ-3, in the northern part of the site; however, clay deposits are not present until greater than 60 ft bls at AVUZ-1 and 2, in the southern part of the site. Saturated hydraulic conductivity values for core samples of clay collected from the unsaturated-zone monitoring sites range from 0.015 to 0.018 ft/d (Table 3). The presence of low-permeability clay in the near subsurface in the northern part of the site would limit the rate and volume of surface infiltration. The predominance of sand and the absence of clay layers in the near subsurface at AVUZ-1 and AVUZ-2 suggest that the southern part of the site would have a greater potential for recharge by surface infiltration than the northern part of the site.

Task 3 – Evaluate Data

AVEK plans on recharging 30,000 to 36,000 acre-feet per year of imported water from the California State Water Project by infiltrating the applied water through thick unsaturated zone at the North Buttes recharge and storage site. The water will be recharged during the winter months (November through February) when imported water is available and demand for water supplies is low. Only 90 percent of the water delivered for recharge will be recovered by pumping from on site wells for delivery to AVEK customers during periods when surface-water supplies are low. AVEK plans on recovering the recharged water during dry years at a rate of 26,000 to 60,000 acre-ft/yr. The data compiled and collected in Tasks 1 and 2 were used to develop unsaturated and saturated zone models to evaluate the suitability of the proposed site for recharge and storage at the rates and volumes estimated by AVEK.

Unsaturated-Zone Flow Model

A preliminary, two-dimensional radial flow, multi-phase solute-transport model was developed using TOUGHREACT (Xu and others, 2004) to test the potential efficacy of artificial recharge at the proposed site. TOUGHREACT is a numerical simulation program for chemically reactive non-isothermal flows of multiphase fluids in porous media. The model is radially symmetric, with all geologic layers assumed to be flat lying. The hydraulic properties within the model were estimated based on lithologic data from test drilling, geophysical log data, CPT data, surface geophysical data, and infiltrometer test results. For Phase 1 of the study, preliminary unsaturated-zone models were developed for the geohydrologic conditions present at AVUZ-2 and AVUZ-3.

The radial-flow models are 250 ft deep, extend 2,460 ft radially, and contain 5,300 grid elements. The grid telescopes radially, starting at about 100 ft increments for the initial 10 columns, and then the width of the elements increase by a factor of about 1.3 to a maximum of 180 ft at the furthest extent of the flow model. Vertically the grid for each model is divided into equal 1-ft layers. Each layer of the models was defined as a sand, silt, or clay, based on the geologic data collected during the drilling of AVUZ-2 and AVUZ-3. The vertical saturated hydraulic conductivity values used in the model for the sand, silt, and clay were based on the core data collected and analyzed for this study (table 1), and were 1.56, 0.65, and 0.0165 ft/d; respectively. The horizontal saturated hydraulic conductivity was assumed to be 100 times larger than the vertical saturated hydraulic conductivity. The porosity values used in the model for the sand, silt, and clay were 0.37, 0.49 and 0.46, respectively. The bottom boundary is the water table and the upper boundary is a standard atmospheric with specified head of zero in initial 10 columns, which represents a 100-acre circular pond.

The model was used to simulate the surface infiltration rate beneath the pond and estimate the time for the infiltrated water to reach the water table at AVUZ-2 and AVUZ-3 sites. AVUZ-2 represents the lithology underlying the southern part of the site and AVUZ-3 represents the lithology underlying the northern part of the site. The model simulates that the surface infiltration rate averages about 0.5 ft/d at AVUZ-2 and about 0.07 ft/d at AVUZ-3 after two years of artificial recharge (Figure 14). The model simulates that the infiltrated water reaches the water table after about two years of artificial recharge at AVUZ-2; whereas, the model simulates that the infiltrated water only reaches about 80 ft bls at AVUZ-3 after two years (Figure 15). Model results suggest that about 23,000 acre-ft of water could be infiltrated on the 385 acres considered to have fair to good infiltration potential and about 9,000 acre-ft could be infiltrated on the 1,090 acres considered to have limited infiltration potential during a 4-month period. The low permeability clay layers are modeled as continuous layers; therefore, the simulated infiltration rates and time for the recharge to reach the water table probably represent minimum values. However, physical and biological clogging of the pond was not simulated, which could reduce the surface infiltration rate. Proper management and maintenance of the recharge ponds could limit the effects of physical and biological clogging on surface infiltration at the site. A pilot scale recharge project, as proposed in Phase 2 of this study, is needed to determine the long-term infiltration rate and effective groundwater recharge at the two sites. The instrumented unsaturated-zone monitoring sites installed in the eastern part of the site could be used to monitor the vertical migration of the recharge water, if ponds were constructed adjacent to the sites.

Saturated-Zone Flow Model

The existing USGS Antelope Valley groundwater flow model (Leighton and Phillips, 2003) was used with particle-tracking software to estimate the effect of artificial recharge on water levels and the movement of water from the site. Of particular importance was estimating the lateral and vertical movement of the recharge water through the saturated zone over time. The three-dimensional model of groundwater flow was developed for the Antelope Valley groundwater basin for the period of 1915-95 as part of a previous USGS study (Leighton and Phillips, 2003). The model was developed using MODFLOW-88 (McDonald and Harbaugh, 1988). The groundwater flow model has been updated using MODFLOW-2005 (MF2K5) (Harbaugh, 2005) as part of an ongoing study in cooperation with Los Angeles County Department of Public Works. The model grid consists of 43 rows and 60 columns with a total of 2,580 square cells. Each cell is 5,280 ft on a side. The aquifer system was discretized vertically into three layers representing the upper, middle, and lower aquifers. The updated USGS groundwater-flow model was used with the particle-tracking software, MODPATH (Pollock, 1994), to determine the effect of artificial recharge on water levels and the movement of water from the site.

The measured water-level differences in wells neighboring the proposed artificial-recharge site compiled in Task 1 for this study suggest the presence of a barrier to groundwater flow, such as a fault (Figure 3). Leighton and Phillips (2003) attempted to simulate the observed water-level difference in the area of the proposed artificial-recharge site by using low hydraulic-conductivity values (2 ft/d) on the western part of the site and high hydraulic-conductivity values (10 ft/d) on the eastern part of the site. Inspection of the modeling results in the area of the proposed artificial-recharge site indicates that this approach did not adequately simulate the observed water-level measurements. For this study, the fault inferred from the water-level and gravity data compiled for this study was added to the model using the Hydraulic-Flow Barrier package (Hsieh and Freckleton, 1993). The conductance of the fault (hydraulic characteristic), which simulates the barrier effect of the fault, was estimated via trial error using measured water levels from nearby wells. In addition, the hydraulic conductivity values for layer 1 east of the fault were increased to 15 ft/d based on the specific-capacity data compiled as part of task 1 (Table 1). The hydraulic-conductivity values for layers 2 and 3 were unchanged from Leighton and Phillips (2003).

The updated groundwater-flow model was used to estimate the effects of artificial recharge at the proposed site. An injection well perforated in layer 1 and located at row 18 and column 20 of the model grid [referred to as model cell (18,20)] was used to simulate artificial recharge. The injection rates were varied with the constraint that simulated hydraulic heads must be at least 50 ft bls to prevent liquifaction. Injection was assumed to occur in the winter months (November-February) over five years. The maximum injection rate (recharge) was about 28,500 acre-ft/yr with a total volume of about 142,500 acre-ft. The simulated year-5 drawdown contours and particle paths are shown in Figure 16 where a negative value indicates a water-level rise. After five years, water levels were simulated to rise about 230 ft at the center of the recharge site. The shape of the recharge mound is asymmetric due to the simulated barrier effect of the Neenach Fault to the north and the unnamed fault identified by this study to the west (Figure 16). Simulated water-level rises were less than 50 ft within one mile of the site and are less than 10 ft within four miles of the site. MODPATH was used to simulate the groundwater travel times and pathlines for advective transport of the recharge water. Eight particles were tracked from the model cell (18,20)–two particles were located along each face of the model cell. The particles on the eastern side of the recharge cell moved a maximum of about 0.75 mile to the east of the site by the end of the five-year simulation period (Figure 17).

The model was used to simulate the maximum volume of water that could be pumped from the site within one year while not allowing simulated hydraulic heads to decline below hydraulic heads measured on the site prior to the artificial recharge (about 1,950 ft asl). Pumping was equally distributed between model cells (18,19) and (18,20) in layer 1. The model results indicate that about 100,000 acre-ft can be pumped from the site (50,000 acre-ft per model cell) during a 1-year period while meeting the hydraulic-head constraint (Figure 17). The simulated water levels at cell (18,20) respond more slowly than at cell (18,19) because it is farther from the simulated fault. Pumpage of 100,000 acre-ft/yr (about 62,000 gpm) would require about 31 wells pumping at a rate of 2,000 gpm. Currently there only are 10 wells on the site, with a combined capacity of less than 33,000 acre-ft/yr (20,000 gpm). Well inefficiencies and well interference would result in lower hydraulic heads then simulated by the regional model. A finer discretized model would be needed to more accurately simulate the hydraulic heads in the proposed well field.

Summary

The proposed North Buttes recharge and recovery site covers about 1,475 acres in the northwestern part of the Lancaster subbasin of the Antelope Valley groundwater basin. The depth to water measured at wells on the site ranges from about 240 ft bls on the western side of the site to about 270 ft bls on the eastern side. Inspection of historical records indicates that water levels have declined about 100 ft in the aquifer beneath the study area since the early 1960s. Groundwater-quality data collected from wells on or near the e proposed site indicate that TDS concentration of samples from wells on the site ranges 260 to 393 mg/L. Four of the eight wells sampled on the site yielded water with arsenic concentrations in excess of the USEPA MCL of 10 μg/L.

The depth to the basement complex (thickness of the basin fill) was estimated in the study area using available regional gravity data. The gravity data indicate that the depth to the basement complex increases from less than 1,000 ft bls on the northeastern side of the site more than 3,000 ft on the western side of the site. Directly west of the site, the gravity data show that the depth to the basement complex increases to more than 7,000 ft bls, suggesting the presence of a northwest-southwest trending fault that has vertically offset the basement complex. South of the site, the gravity data indicate that the depth to the basement complex is less than 100 to 1,000 ft bls, which corresponds to the exposed basement complex in the Antelope and Little Buttes.

The proposed site is located on coalescing alluvial fan deposits derived from the Tehachapi Mountains to the north and the San Gabriel Mountains to the west. Soils on the northern part of the site are predominantly Rosamond soils consisting of loam, silty clay loam, and fine sandy loam that were deposited at the distal end of alluvial fan that extends from the Tehachapi Mountains. Soils on the southern part of the site predominantly are classified as Hesperia and Hanford soils consisting of fine sandy loam to coarse sandy loam deposited on the alluvial fan extending from the San Gabriel Mountains. On the basis of the soil description, about 250 acres of the site are considered to have a good surface-infiltration potential (HkA, HkB, HbA, HbC, and HcA soils), about 500 acres are considered to have a fair surface-infiltration potential (Ro soils), and about 725 acres (Rp and Rt soils) are considered to have limited surface-infiltration potential.

Double-ring infiltrometer tests were completed for this study on the different soil types to more accurately evaluate the potential infiltration rate for the different soils on the site. The infiltrometer test results support the soils property data, and indicate that the sandy loam soils classified as Hesperia (HkA and HkB), Hanford (HbA and HbC), and Rosamond (Ro) soils on the site have fair to good surface infiltration potential; whereas, the loam and silty clay loam soils classified as Rosamond (Rp at Rt) soils on the site have limited surface-infiltration potential. The infiltrometer tests collected at different depths at the same site indicate that the infiltration rates were lower in the deeper tests at the same site in the HkA and Ro soils, about the same in the Rp soil, and higher in the Rt soil.

CPT data were collected at 23 sites to characterize the subsurface lithology to approximately 50 ft or refusal along north-south and east-west trending transects through the proposed site. The CPT data indicate that the percentage of silt and clay deposits is higher beneath the northern part of the site compared to the southern part of the site. Interpolation of the available CPT data indicates the presence of several continuous thin clay layers in the upper 50 ft of the subsurface beneath the northern part of the proposed recharge site. On the basis of the soil description and CPT data, about 385 acres of the 1,475-acre site are considered to have a fair to good surface-infiltration potential and about 1,090 acres are considered to have limited surface-infiltration potential. Undeveloped land in Section 8, directly south of the proposed site, consists of soils that have fair to good surface-infiltration potential. Lithologic data collected adjacent to this property suggests that there are no near-surface clay layers that would inhibit the infiltration of applied water. Adding this land to the proposed recharge and recovery site would significantly increase the recharge potential of the proposed site.

DC resistivity surveys were collected in the project area to help identify geologic structures and potential perching layers. Inverse models of the DC resistivity data along a north-south profile in the eastern part of the site indicate the presence of relatively low-resistivity material from land surface to the water table in the extreme northern part of the site indicating that the northeastern part of the proposed site probably would have limited recharge potential by surface infiltration. Inverse models of the DC resistivity data-along the southeast-northeast profile in the western part of the site indicate the presence of a high-resistivity unit from near land surface to the water table in the southwestern part of the site indicating that the southwestern part of the site probably would have fair to good recharge potential by surface infiltration. The resistivity beneath the northeastern part of the profile is low, indicating that the unsaturated zone is finer grained, and probably has limited potential for recharge by surface infiltration.

Three unsaturated-zone monitoring sites were installed to the water table using the ODEX technique along a north-south profile in the eastern part of the site to determine the lithology and hydraulic properties of the thick unsaturated zone underlying the site. The sites were instrumented to measure the downward movement and quality of existing irrigation return flows and proposed artificial recharge. Borehole data confirmed results of CPT and DC resistivity surveys and indicate that silt and clay are predominant in the unsaturated zone at in the northern part of the site, whereas, sand is predominant in the unsaturated zone at in the southern part of the site. Clay deposits are present in the upper 25 ft of AVUZ-3, in the northern part of the site; however, clay deposits are not present until greater than 60 ft bls at AVUZ-1 and 2, in the southern part of the site. The presence of low-permeability clay in the near subsurface in the northern part of the site would limit the rate and volume of surface infiltration. The predominance of sand and the absence of clay layers in the near subsurface at AVUZ-1 and AVUZ-2 suggest that the southern part of the site would have a greater potential for recharge by surface infiltration than the northern part of the site.

A preliminary, two-dimensional radial flow, multi-phase solute-transport model was developed using TOUGHREACT to test the potential efficacy of artificial recharge at the proposed site. The hydraulic properties within the model were estimated based on lithologic data from test drilling, geophysical log data, CPT data, surface geophysical data, and infiltrometer test results. The model was used to simulate the surface infiltration rate beneath the pond and estimate the time for the infiltrated water to reach the water table at AVUZ-2 in the southern part of the site and AVUZ-3 in the northern part of the site. The model simulates that the surface infiltration rate averages about 0.5 ft/d at AVUZ-2 and less than 0.07 ft/d at AVUZ-3 after two years of artificial recharge. The model simulates that the infiltrated water reaches the water table after about two years of artificial recharge at AVUZ-2; whereas, the model simulates that the infiltrated water only reaches about 80 ft bls at AVUZ_3 after two years.

The unsaturated-zone model results suggest that about 23,000 acre-ft of water could be infiltrated on the 385 acres considered to have fair to good infiltration potential and about 9,000 acre-ft could be infiltrated on the 1,090 acres considered to have limited infiltration potential during a 4-month period. The low permeability clay layers are modeled as continuous layers; therefore, the simulated infiltration rates and time for the recharge to reach the water table probably represent minimum values. A pilot scale recharge project, as proposed in Phase 2 of this study, is needed to determine the long-term infiltration rate and effective groundwater recharge at the two sites. The instrumented unsaturated-zone monitoring sites installed in the eastern part of the site could be used to monitor the vertical migration of the recharge water, if ponds were constructed adjacent to the sites.

The existing USGS Antelope Valley groundwater flow model was updated with data collected from this study and used with particle-tracking software to estimate the effect of artificial recharge on water levels and the movement of water from the site. The updated groundwater-flow model was used to estimate the maximum rate of water that could be recharged at the site while maintaining water levels at least 50 ft bls to prevent liquifaction. Injection was assumed to occur in the winter months (November-February) over five years. The maximum injection rate (recharge) was about 28,500 acre-ft/yr with a total volume of about 142,500 acre-ft. After five years, water levels were simulated to rise about 230 ft at the center of the recharge site. Simulated water-level rises were less than 50 ft within one mile of the site and are less than 10 ft within four miles of the site. MODPATH was used to simulate the groundwater travel times and pathlines for advective transport of the recharge water. The particles on the eastern side of the recharge cell moved a maximum of about 0.75 mile to the east of the site by the end of the five-year simulation period.

The groundwater-flow model was used to simulate the maximum volume of water that could be pumped from the site within one year while not allowing simulated hydraulic heads to decline below hydraulic heads measured on the site prior to the artificial recharge. The model results indicate that about 100,000 acre-ft can be pumped during a 1-year period while meeting the hydraulic-head constraint. Pumpage of 100,000 acre-ft/yr (about 62,000 gpm) would require about 31 wells pumping at a rate of 2,000 gpm. Currently there only are 10 wells on the site, with a combined capacity of less than 33,000 acre-ft/yr (20,000 gpm). Well inefficiencies and well interference would result in lower hydraulic heads then simulated by the regional model. A finer discretized model would be needed to more accurately simulate the hydraulic heads in the proposed well field.

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Figures

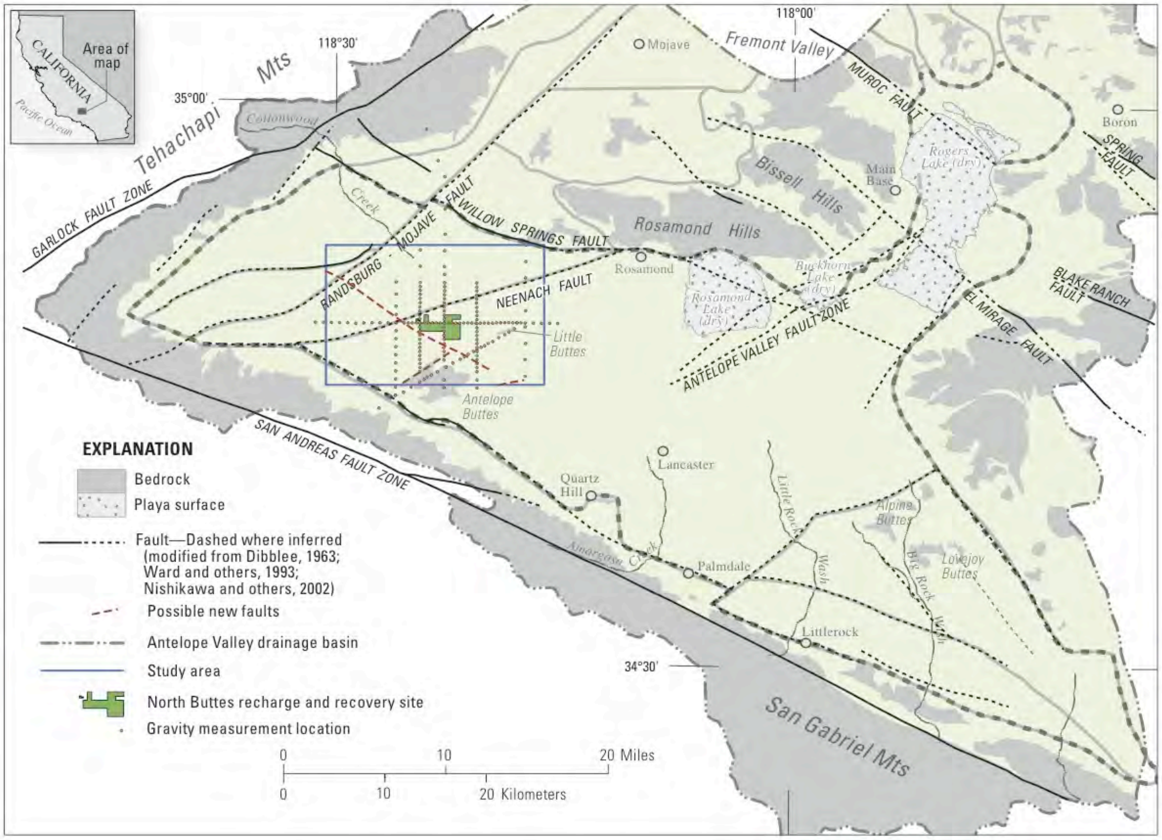


Figure 1. Location of study area and gravity measurements.

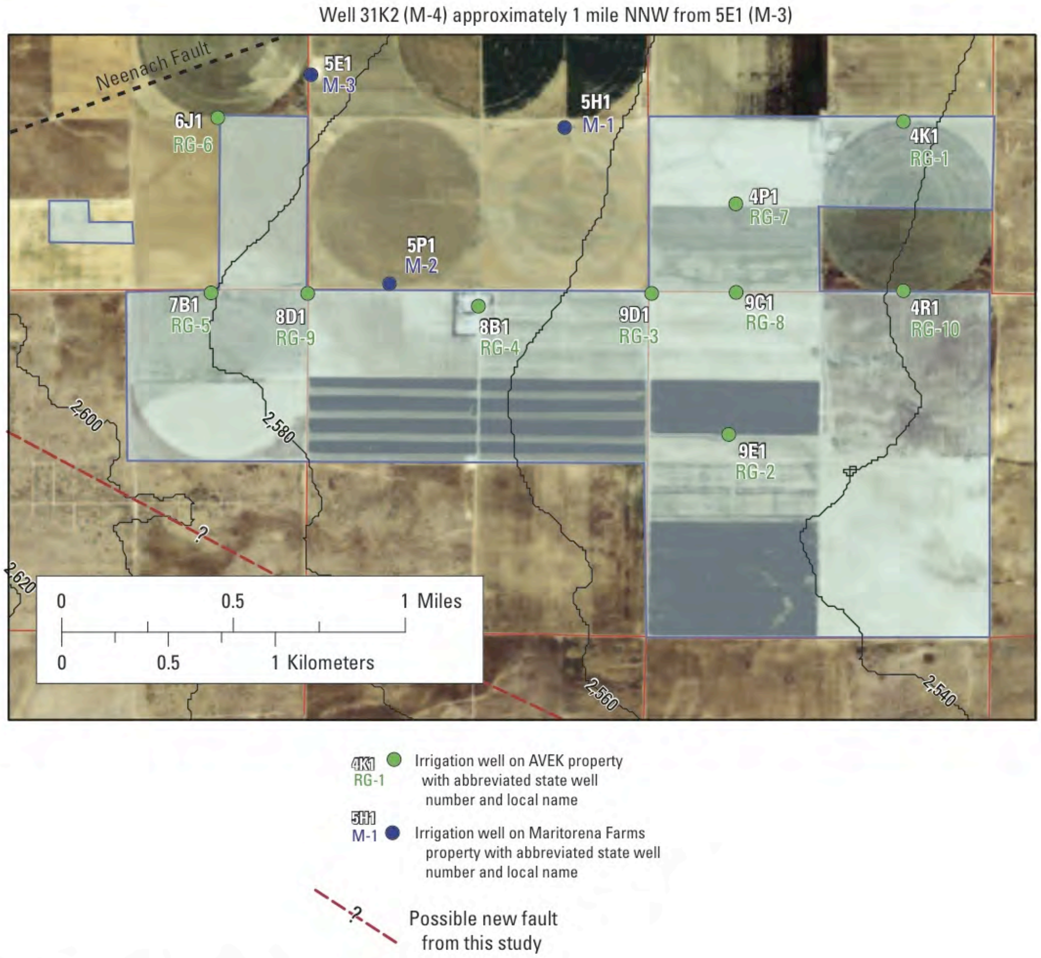


Figure 2. Location of irrigation-supply wells in the vicinity of the study area.

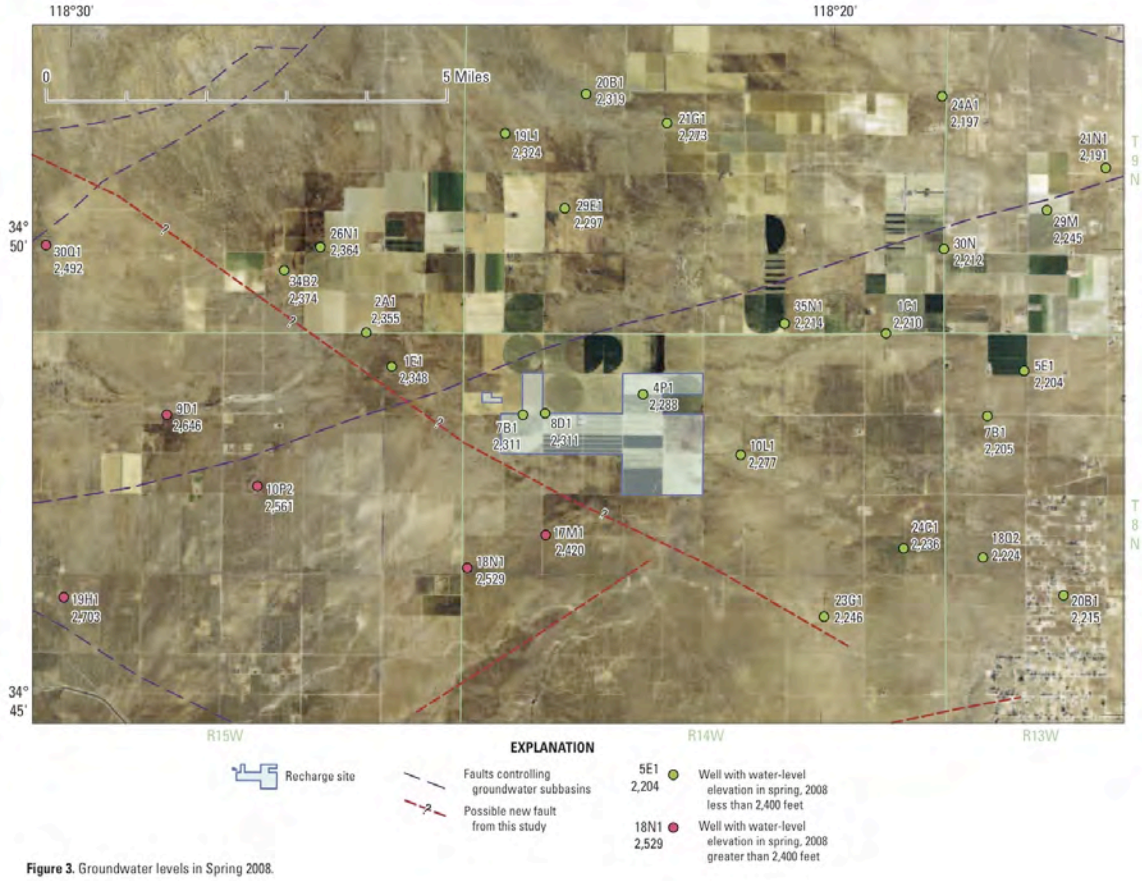


Figure 3. Groundwater levels in Spring 2008.

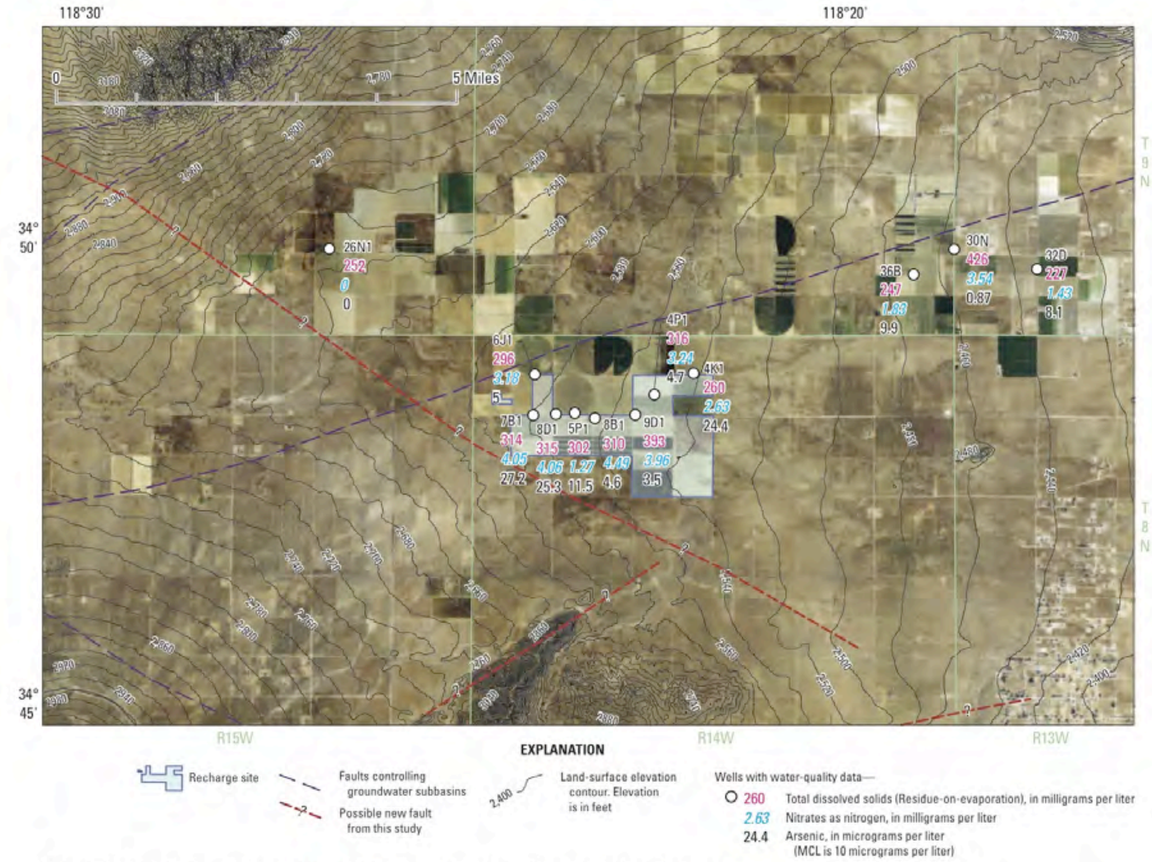


Figure 4. Total dissolved solids, nitrate as nitrogen, and arsenic concentration measured in selected wells in the study area.

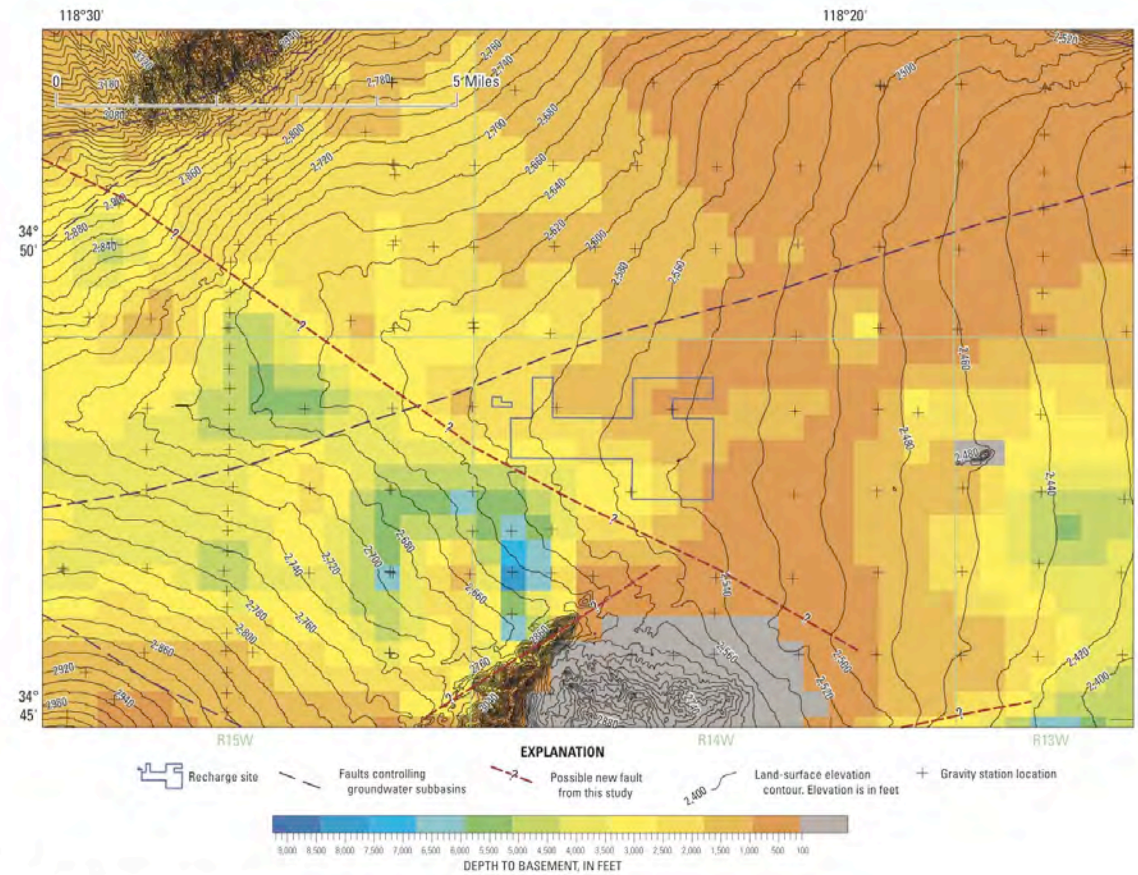
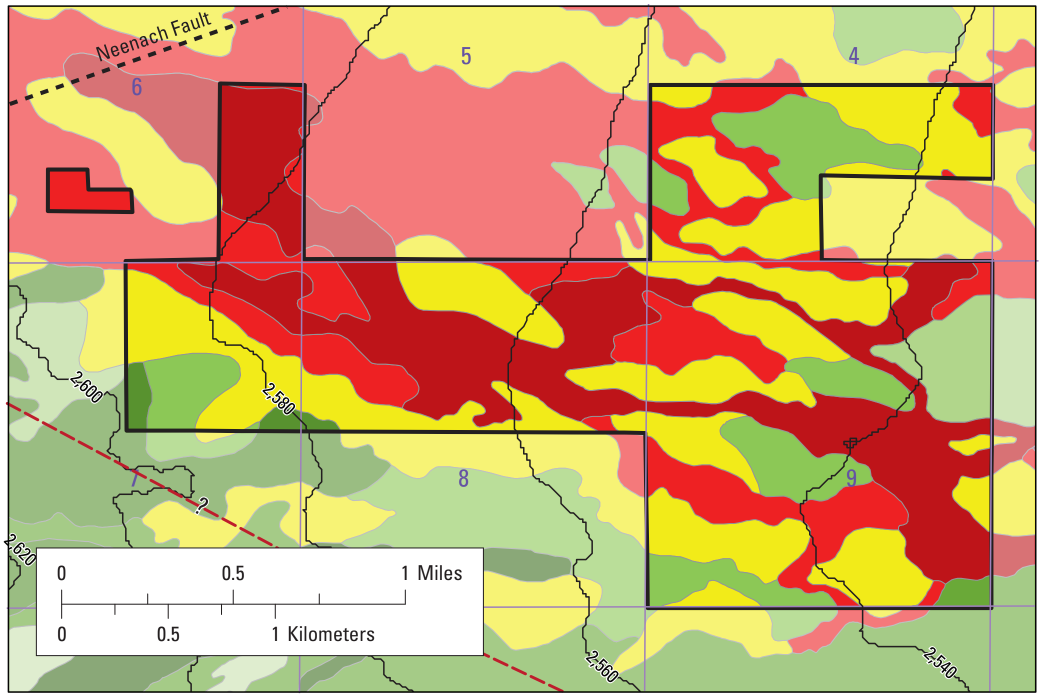


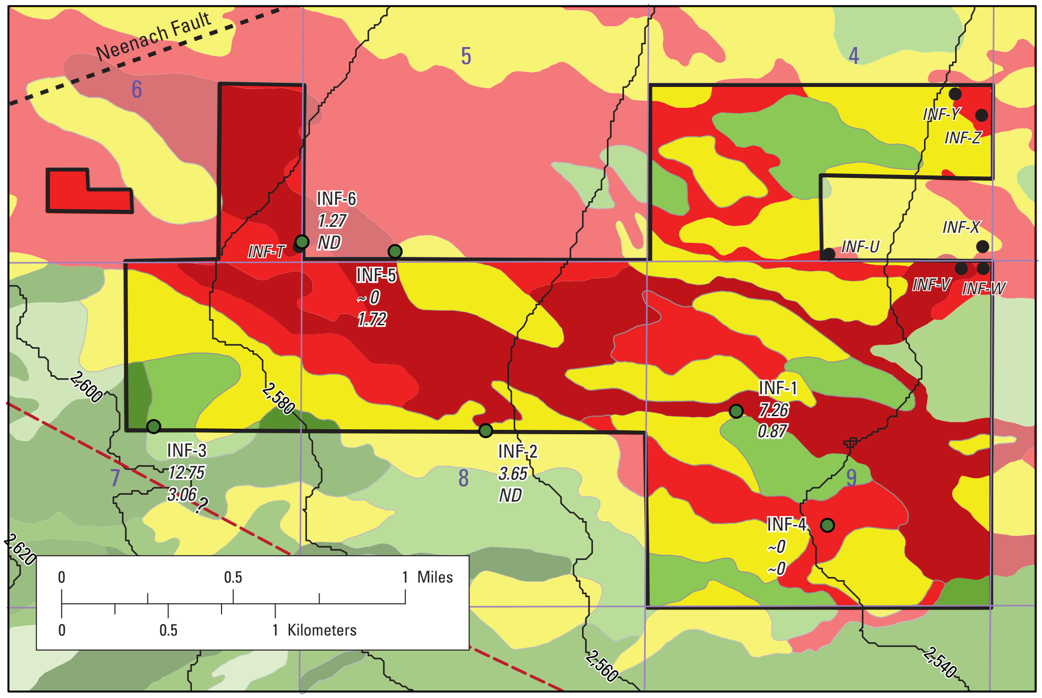
Figure 5. Depth to basement complex estimated from gravity measurements.



Soil Type	Saturated Hydraulic Conductivity	Infiltration Potential	Acres	Total Acres
HbA	7.94	GOOD	----	248
HbC	7.94		16	
HcA	7.94		8	
HkA	7.94		176	
HkB	7.94		48	
GsA			----	
Ro	3.26	FAIR	509	509
Rp	2.55	LIMITED	315	724
Rt	2.55		409	

? Possible new fault from this study

Figure 6. Soil types with associated saturated hydraulic conductivity and infiltration potential as defined by the U.S. Department of Agriculture (2009).



Infiltrometer Site	Soil Type	Surface Infiltration Rate, in feet per day	Infiltration Rate at 3 feet below Surface, in feet per day
1	Ro	7.26	0.87
2	Ro	3.65	ND
3	HkA	12.75	3.06
4	Rp	~ 0	~ 0
5	Rt	~ 0	1.72
6	Rt	1.72	ND

ND is no data

Black circles indicate sites where test attempted but no data.

? Possible new fault from this study

Figure 7. Infiltrometer locations and measured infiltration rates at land surface and three feet below land surface.

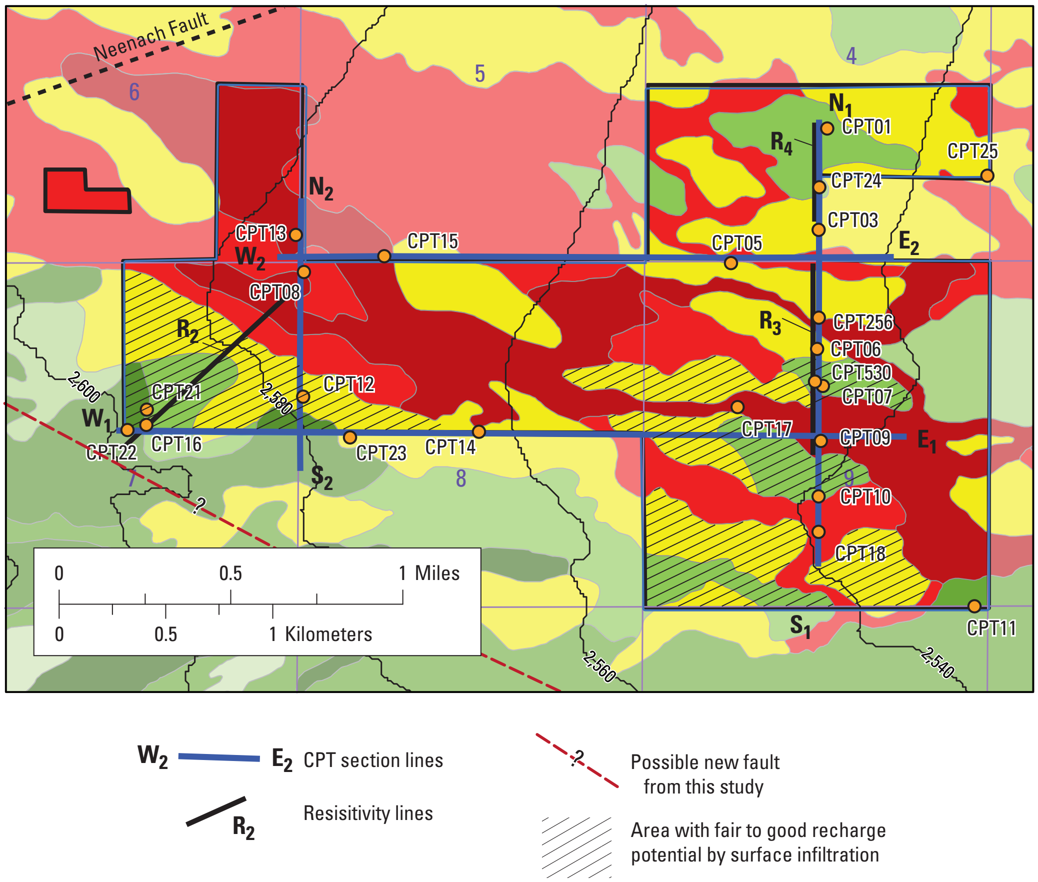


Figure 8. Location of Cone Penetration Testing (CPT) sites, geologic sections compiled from CPT data, resistivity lines, and area with fair to good recharge potential by surface infiltration.

(A)

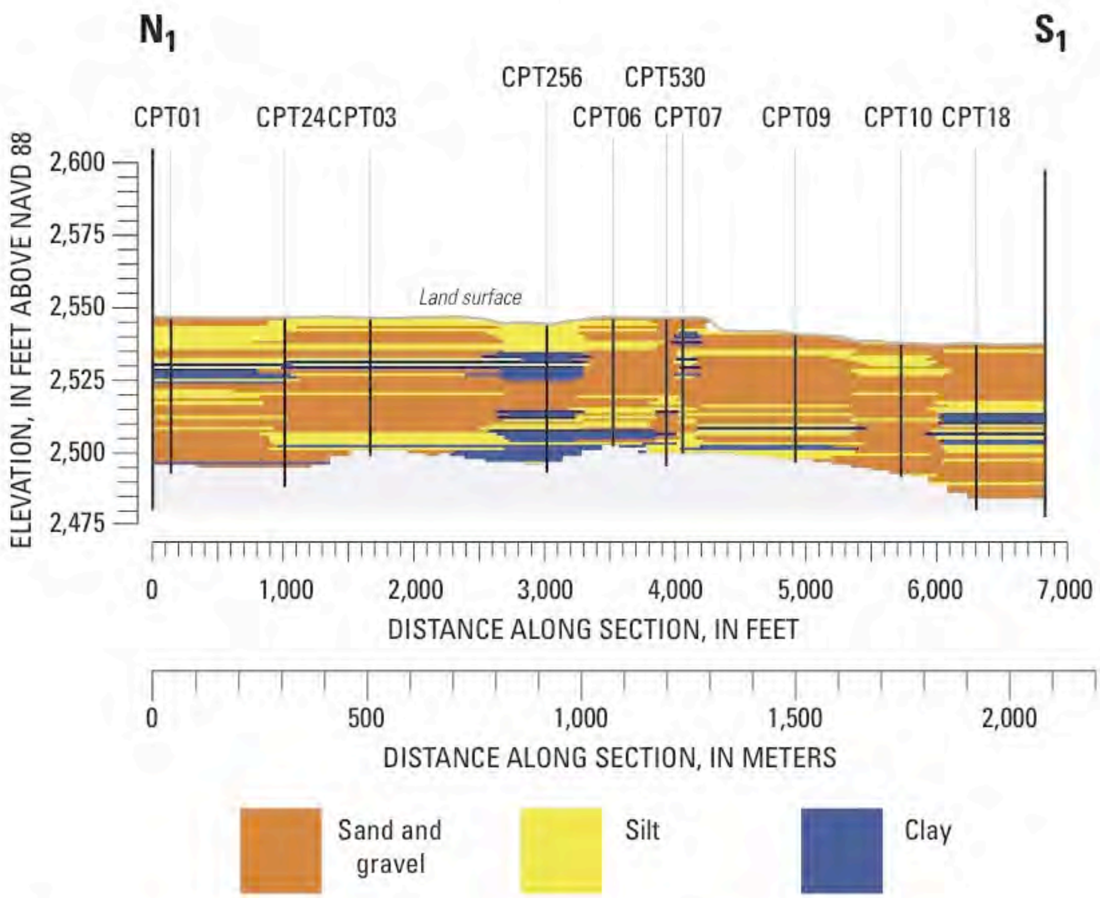
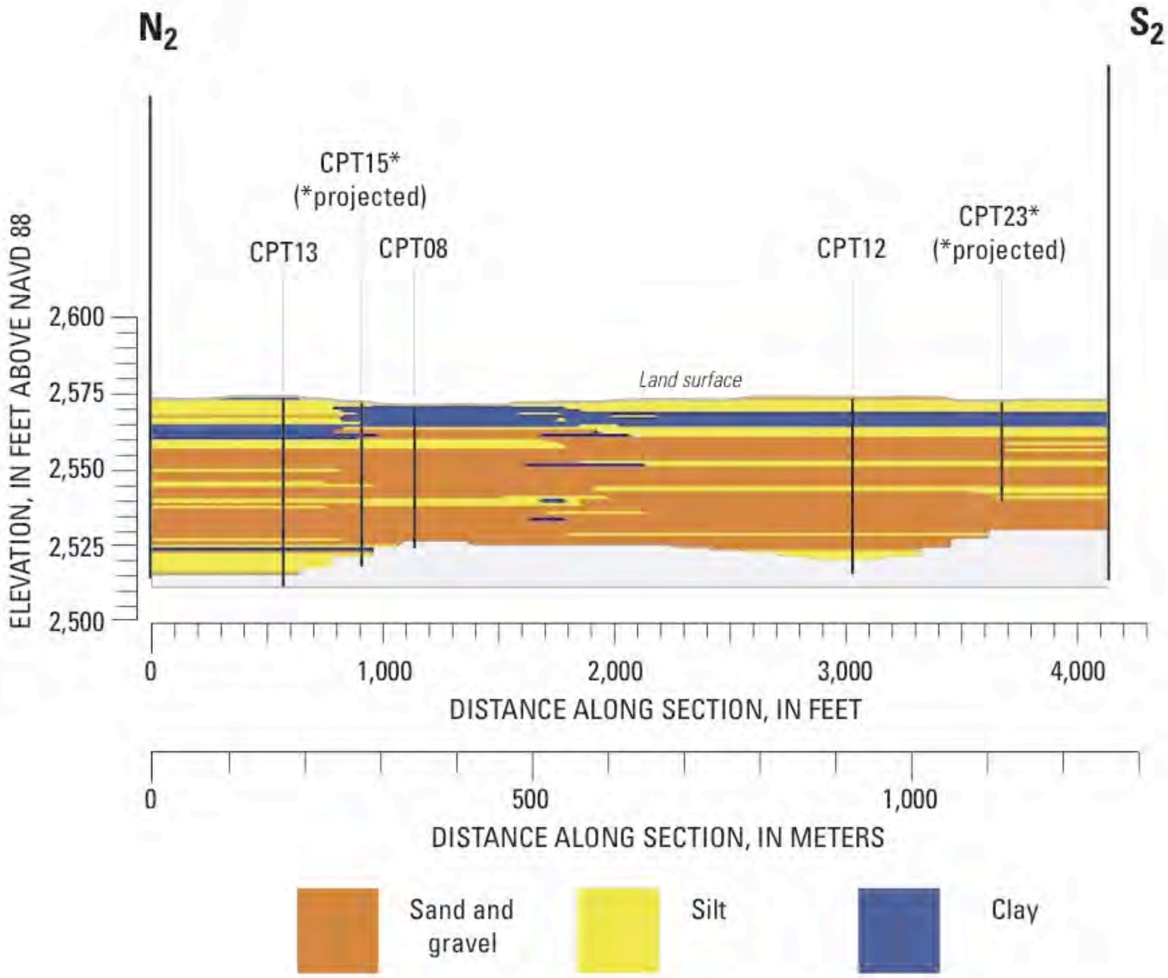


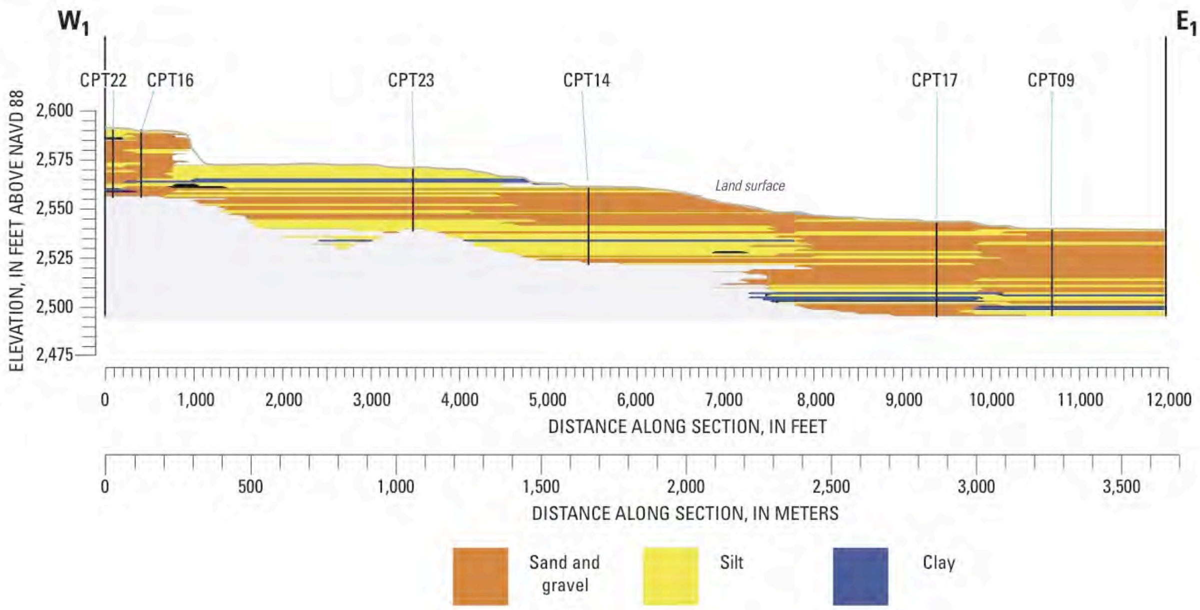
Figure 9. Geologic sections based on Cone Penetration Testing (CPT) for (A) **N_1-S_1**, (B) **N_2-S_2** (C) **W_1-E_1** and (D) **W_2-E_2**.

(B)



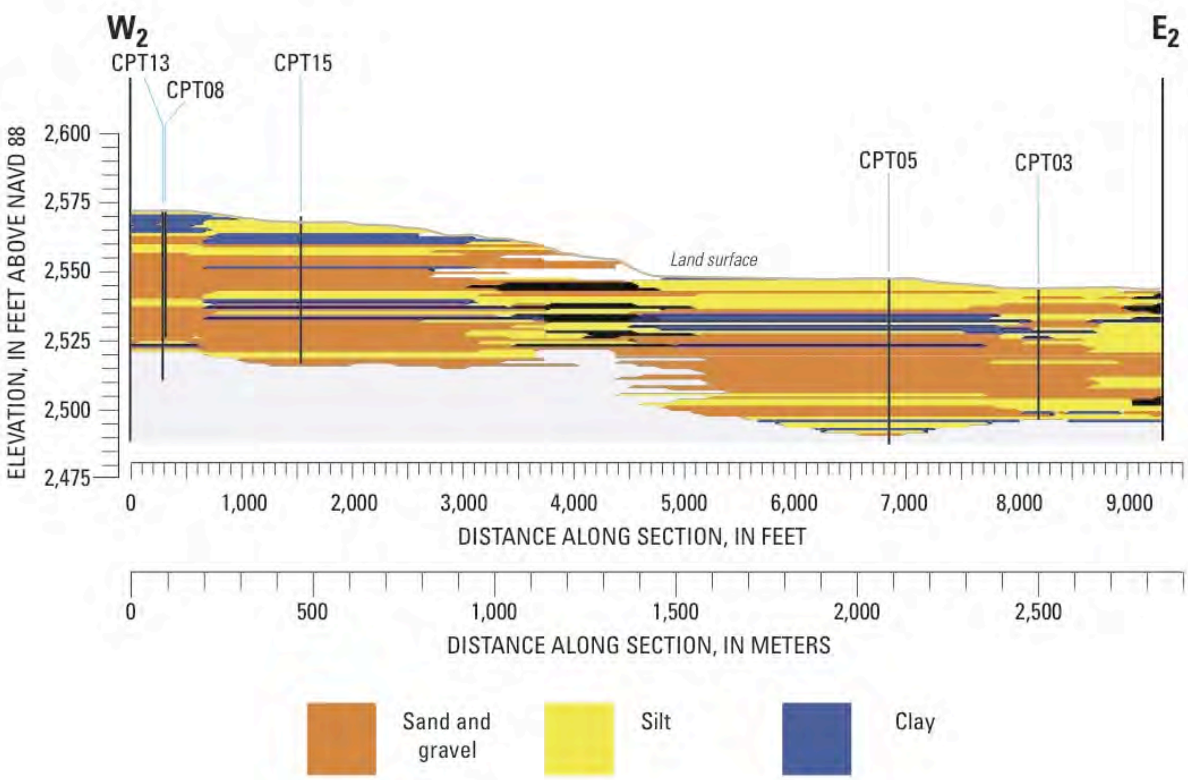
N2
S2
CPT15*
(*projected)
CPT13
CPT08
CPT12
CPT23*
(*projected)
Land surface
ELEVATION, IN FEET ABOVE NAVD 88
2,600
2,575
2,550
2,525
2,500
0
1,000
2,000
3,000
4,000
DISTANCE ALONG SECTION, IN FEET
0
500
1,000
DISTANCE ALONG SECTION, IN METERS
Sand and gravel
Silt
Clay

(C)



W1
E1
CPT22
CPT16
CPT23
CPT14
CPT17
CPT09
Land surface
ELEVATION, IN FEET ABOVE NAVD 88
2,600
2,575
2,550
2,525
2,500
2,475
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
DISTANCE ALONG SECTION, IN FEET
0
500
1,000
1,500
2,000
2,500
3,000
3,500
DISTANCE ALONG SECTION, IN METERS
Sand and gravel
Silt
Clay

(D)



W2
E2
CPT13
CPT08
CPT15
CPT05
CPT03
Land surface
ELEVATION, IN FEET ABOVE NAVD 88
2,600
2,575
2,550
2,525
2,500
2,475
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
DISTANCE ALONG SECTION, IN FEET
0
500
1,000
1,500
2,000
2,500
DISTANCE ALONG SECTION, IN METERS
Sand and gravel
Silt
Clay

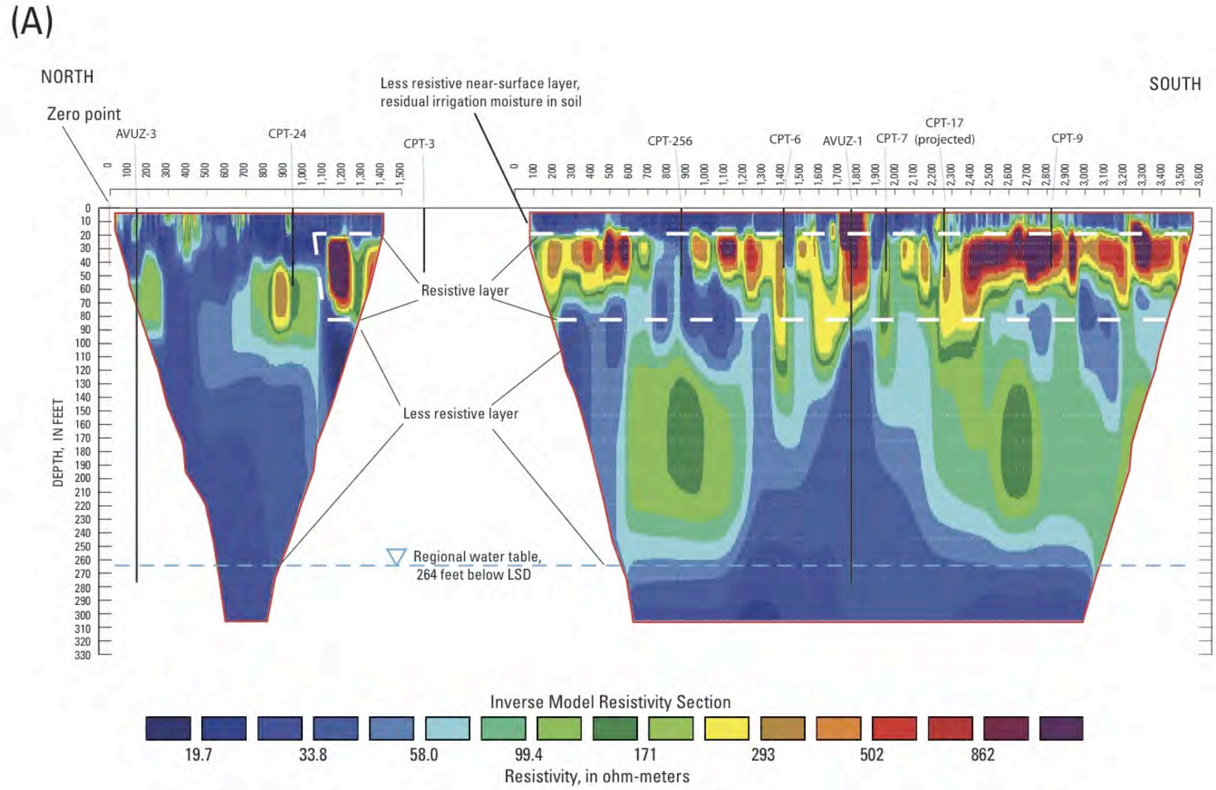
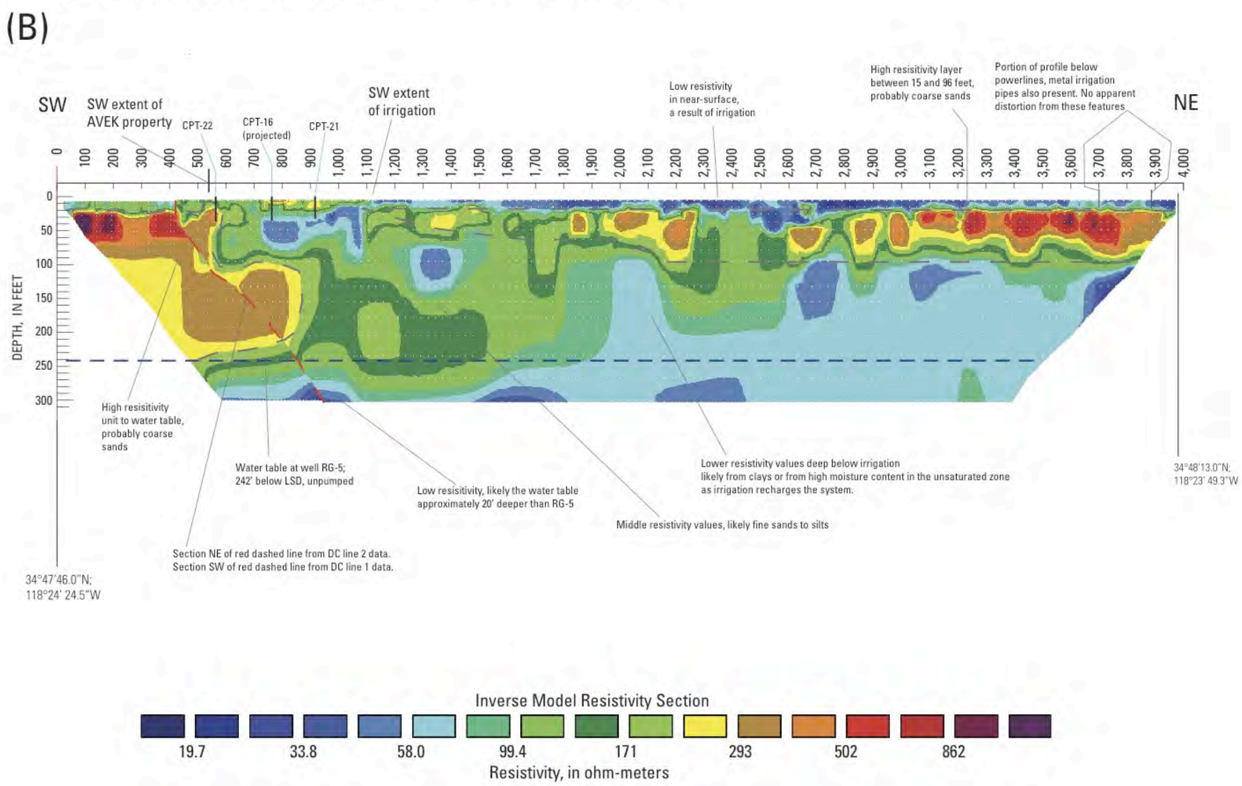
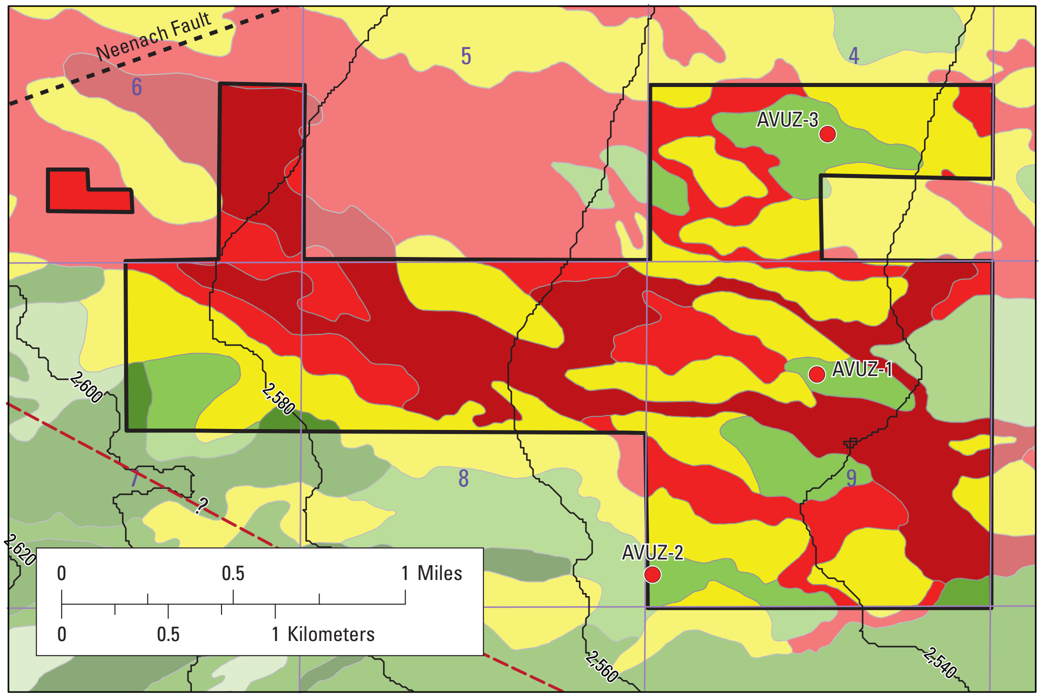


Figure 10. Resistivity profile for (A) north-south and (B) southwest-northeast resistivity lines.





Soil Type	Saturated Hydraulic Conductivity	Infiltration Potential	Acres	Total Acres
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GsA			----	
Ro	3.26	FAIR	509	509
Rp	2.55	LIMITED	315	724
Rt	2.55		409	

AVUZ-2 Unsaturated zone well and identifier

? Possible new fault from this study

Figure 11. Location of unsaturated-zone monitoring sites.

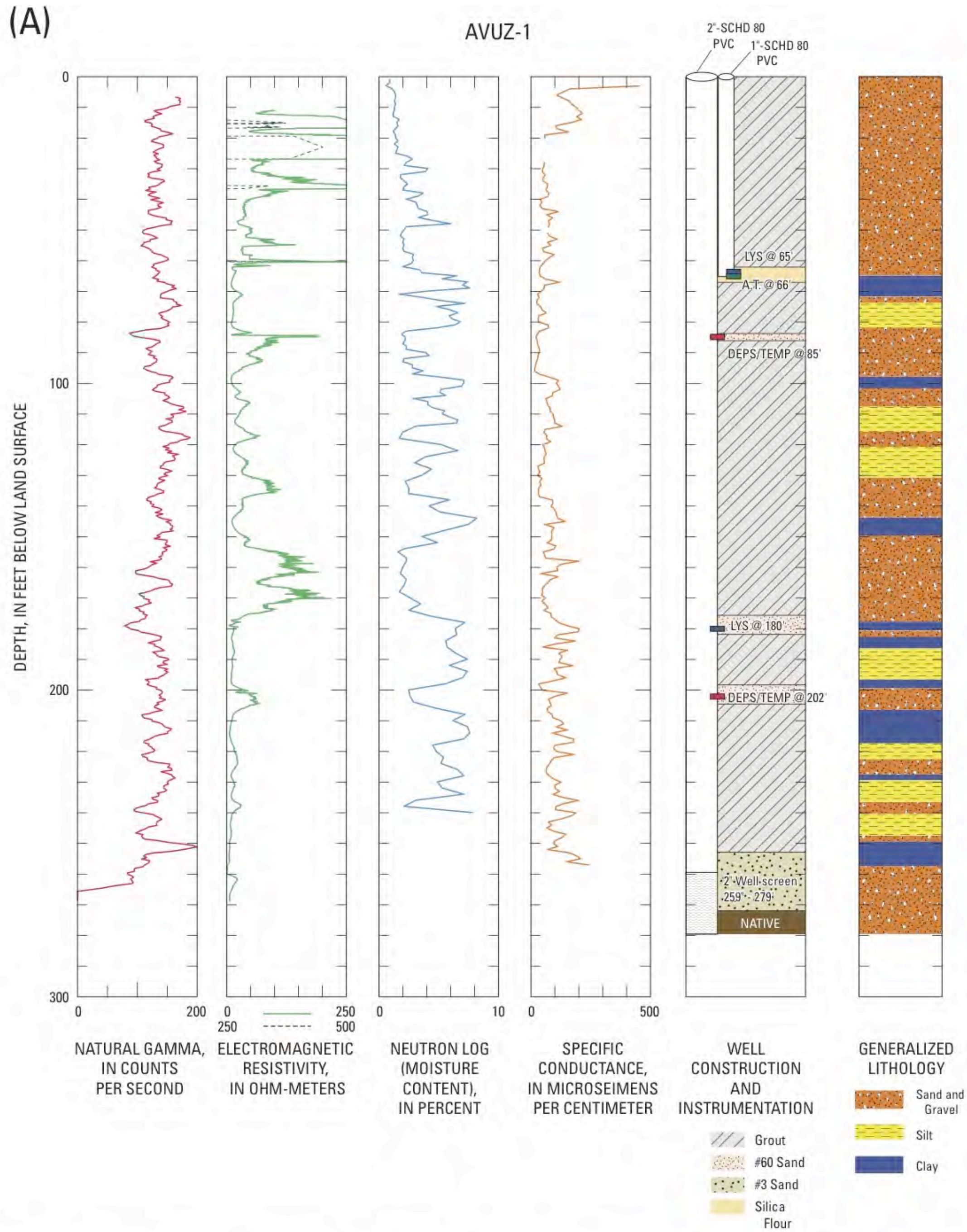
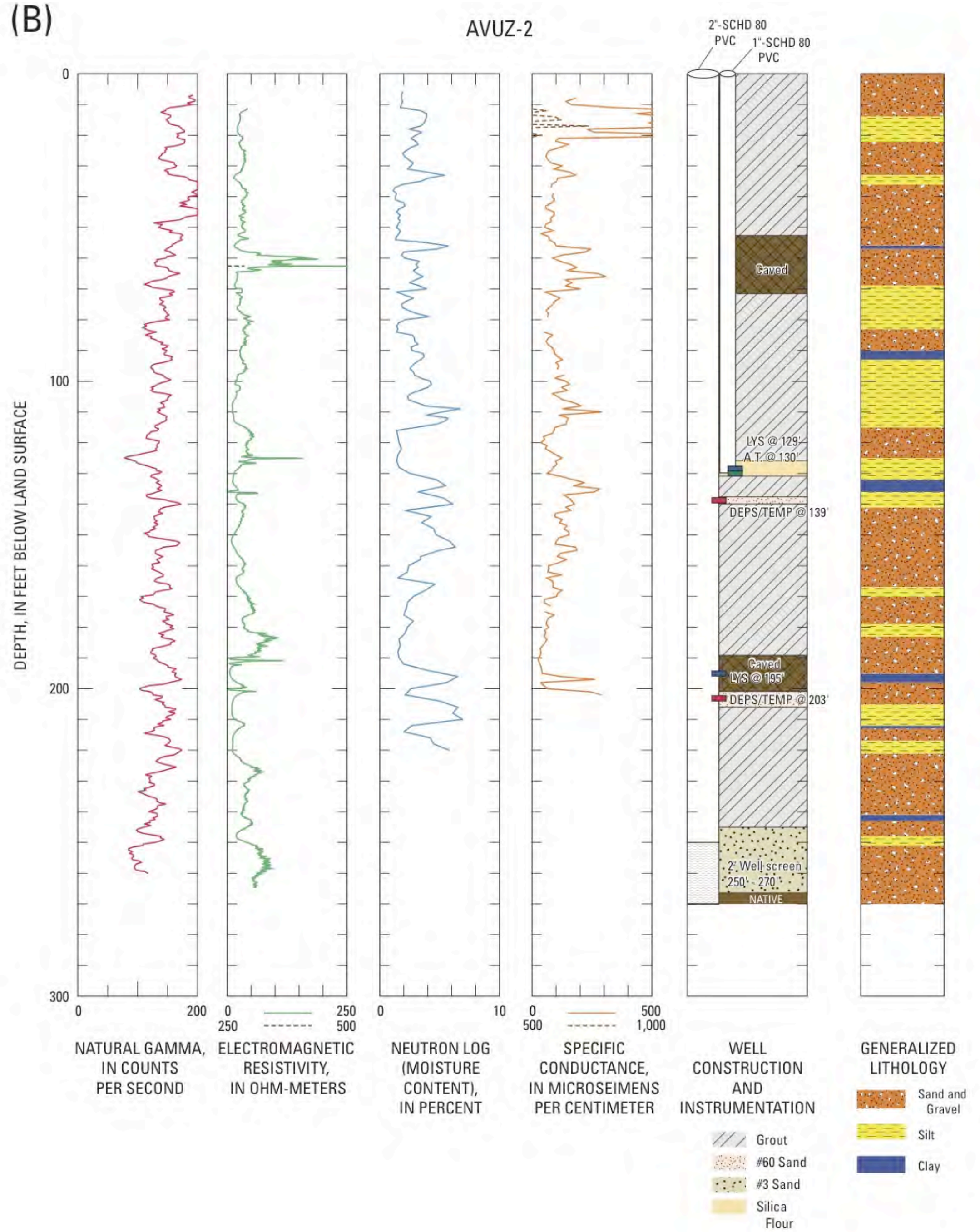
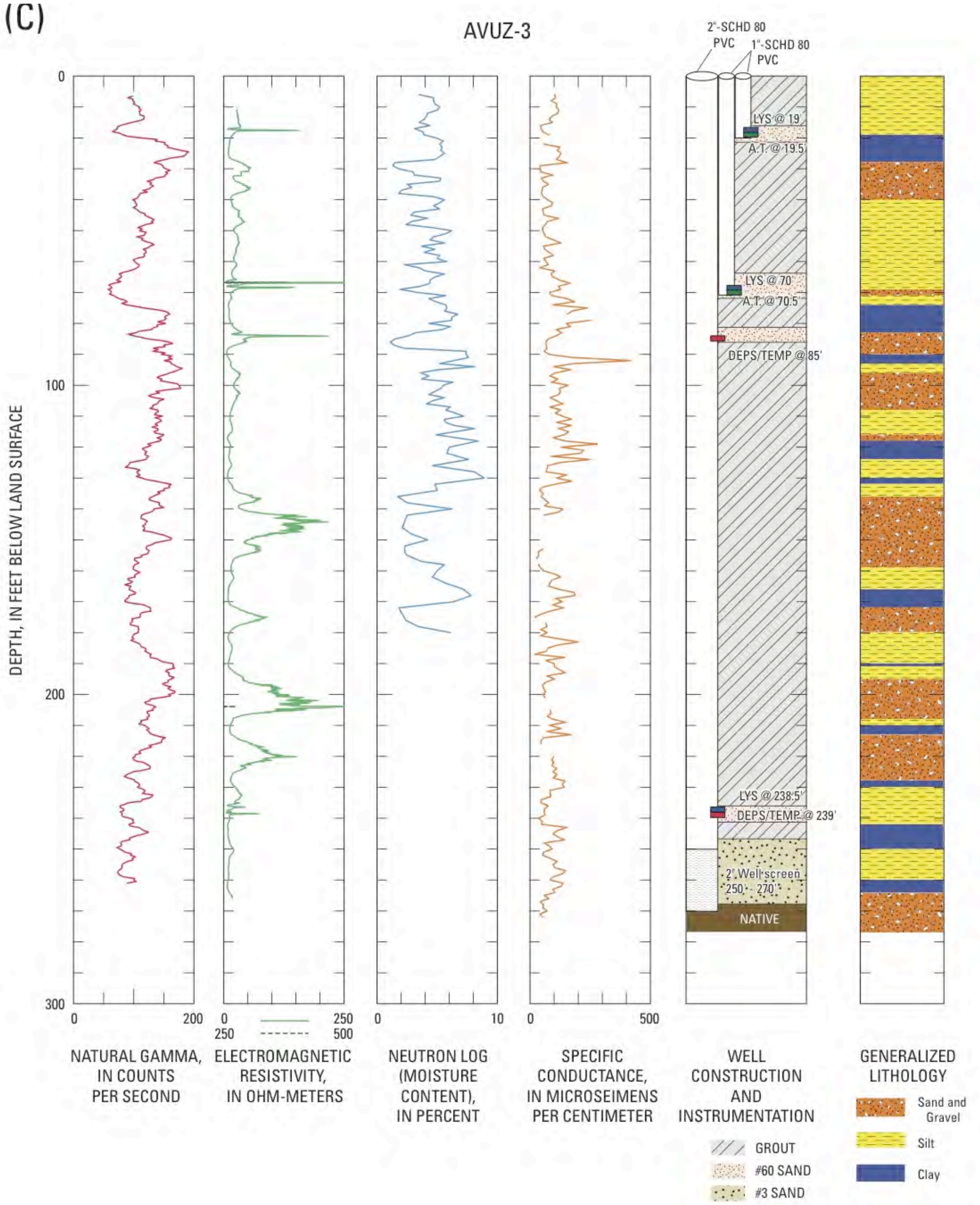


Figure 12. Generalized lithology, well construction, instrumentation, natural gamma, electromagnetic resistivity, neutron log (moisture content), and specific conductance for unsaturated-zone monitoring sites (A) AVUZ-1, (B) AVUZ-2, and (C) AVUZ-3.



(B)
AVUZ-2
2"-SCHD 80 PVC
1"-SCHD 80 PVC
DEPTH, IN FEET BELOW LAND SURFACE
0
100
200
300
0
200
NATURAL GAMMA, IN COUNTS PER SECOND
0
250
250
500
ELECTROMAGNETIC RESISTIVITY, IN OHM-METERS
0
10
NEUTRON LOG (MOISTURE CONTENT), IN PERCENT
0
500
500
1,000
SPECIFIC CONDUCTANCE, IN MICROSEIMENS PER CENTIMETER
Caved
LYS @ 129'
A.T. @ 130'
DEPS/TEMP @ 139'
Caved
LYS @ 195'
DEPS/TEMP @ 203'
2" Well screen 250' - 270'
NATIVE
WELL CONSTRUCTION AND INSTRUMENTATION
Grout
#60 Sand
#3 Sand
Silica Flour
GENERALIZED LITHOLOGY
Sand and Gravel
Silt
Clay

(C)


AVUZ-3
DEPTH, IN FEET BELOW LAND SURFACE
0
100
200
300
NATURAL GAMMA, IN COUNTS PER SECOND
ELECTROMAGNETIC RESISTIVITY, IN OHM-METERS
NEUTRON LOG (MOISTURE CONTENT), IN PERCENT
SPECIFIC CONDUCTANCE, IN MICROSEIMENS PER CENTIMETER
WELL CONSTRUCTION AND INSTRUMENTATION
GENERALIZED LITHOLOGY
2"-SCHD 80 PVC
1"-SCHD 80 PVC
LYS @ 19'
A.T. @ 19.5'
LYS @ 70'
A.T. @ 70.5'
DEPS/TEMP @ 85'
LYS @ 238.5'
DEPS/TEMP @ 239'
2" Well screen 250' - 270'
NATIVE
GROUT
#60 SAND
#3 SAND
Sand and Gravel
Silt
Clay

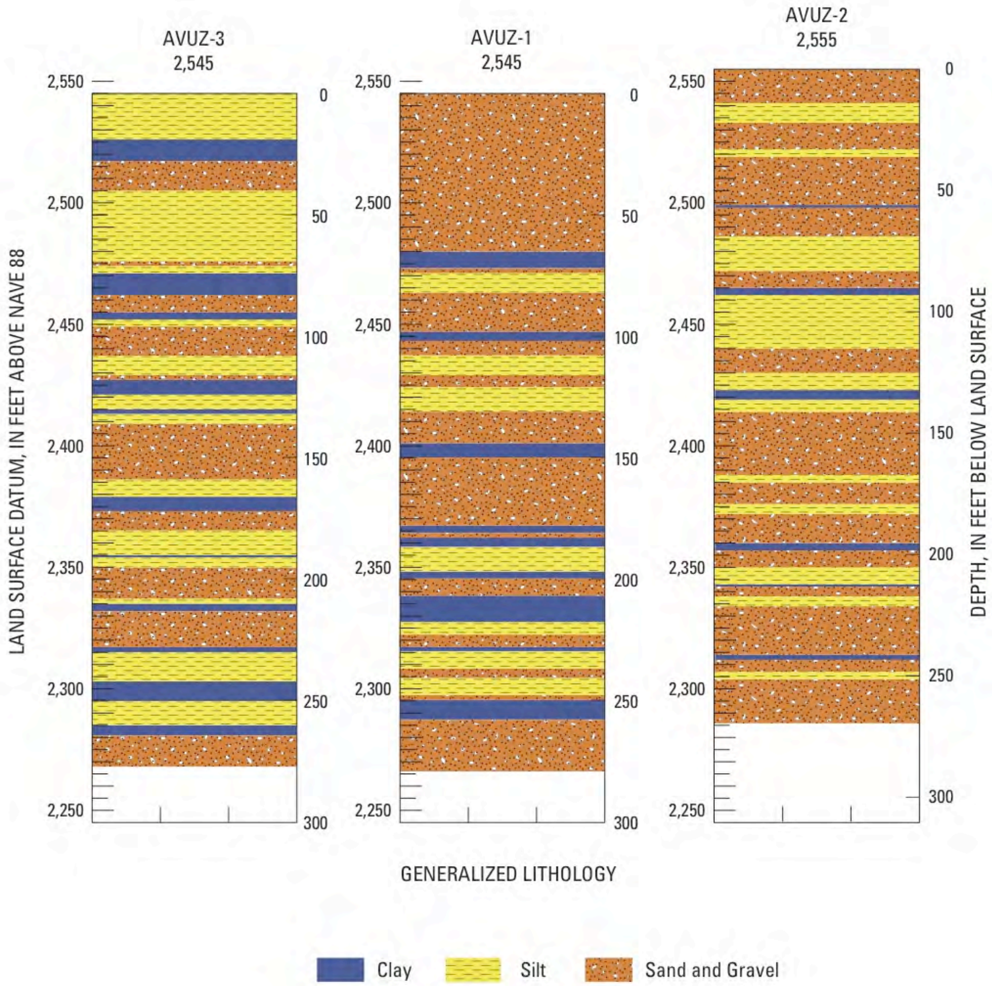


Figure 13. Generalized lithology for unsaturated zone monitoring sites (AVUZ-1, AVUZ-2, and AVUZ-3) arranged by altitude along a north-south profile.

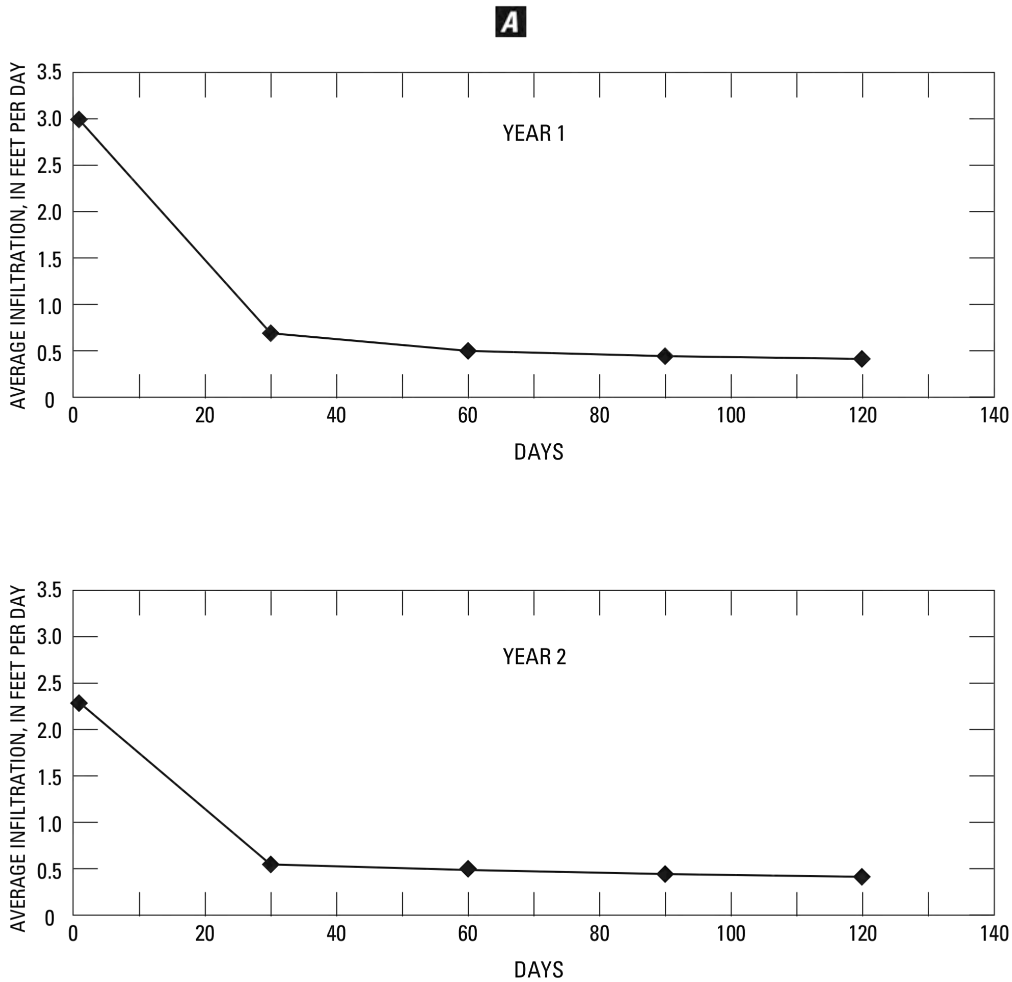


Figure 14. Simulated infiltration rates at ***A)*** AVUZ-2 and ***B)*** AVUZ3 after 2 years of recharge.

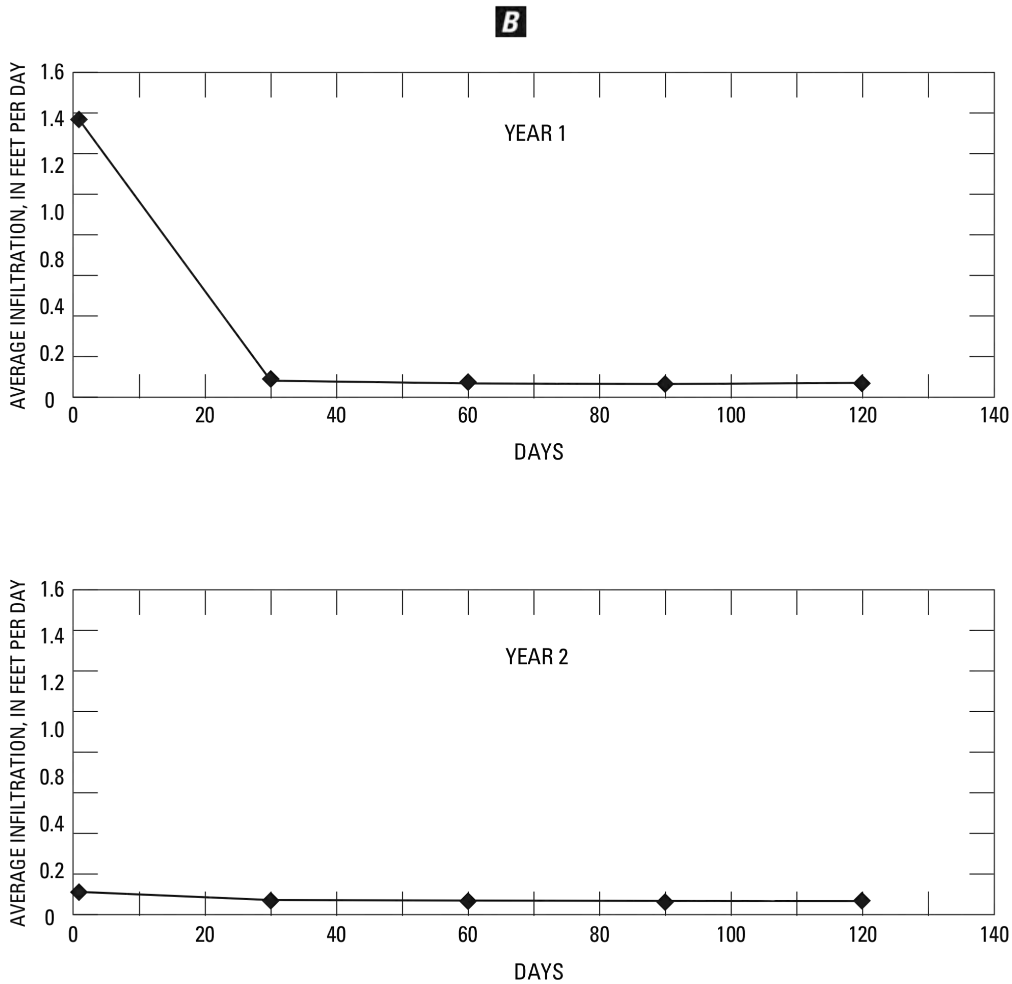


Figure 14. Simulated infiltration rates at ***A)*** AVUZ-2 and ***B)*** AVUZ3 after 2 years of recharge.

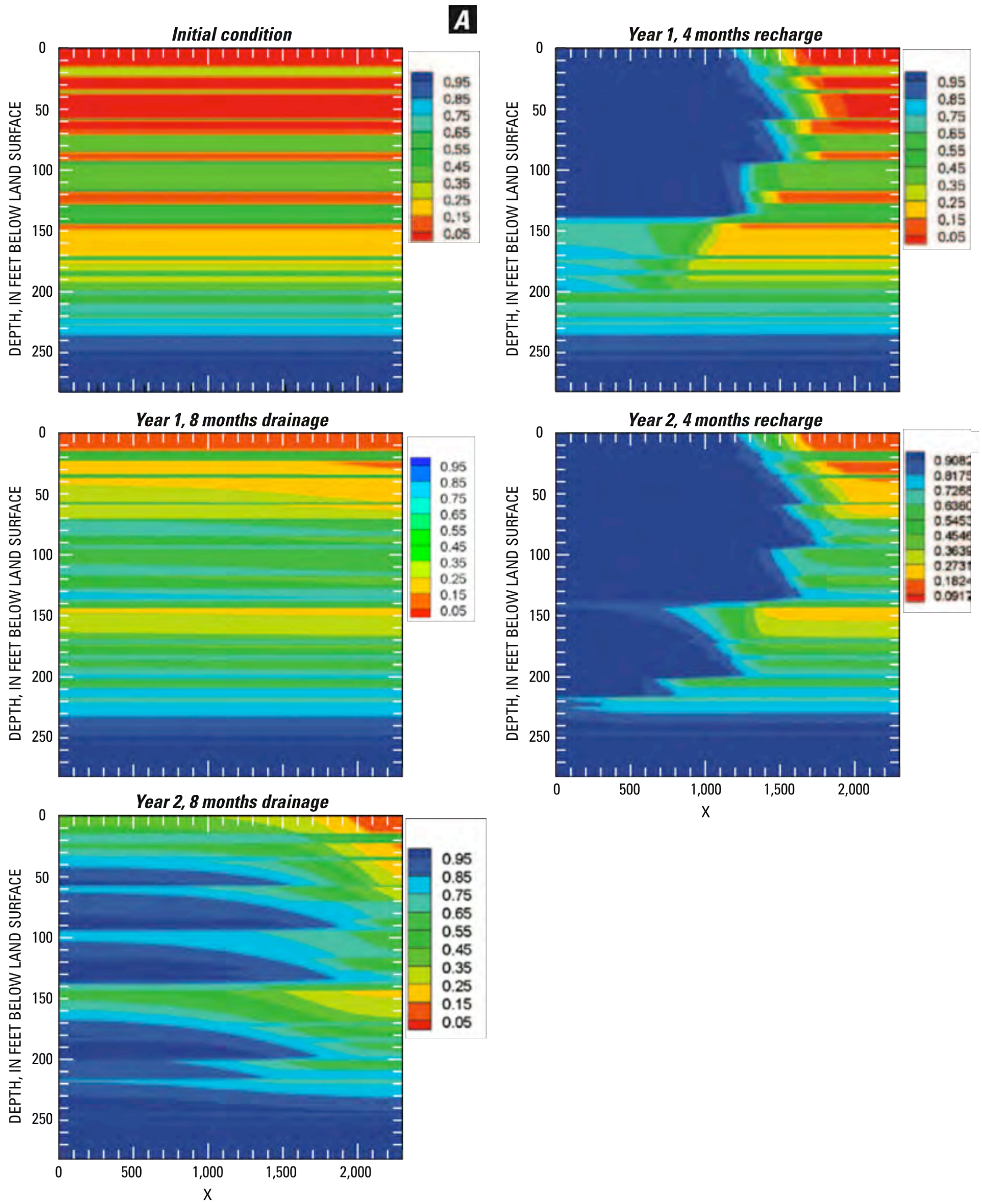


Figure 15. Simulated percent saturation at ***A)*** AVUZ-2 and ***B)*** AVUZ3 after 2 years (4 months recharge and 8 months discharge.

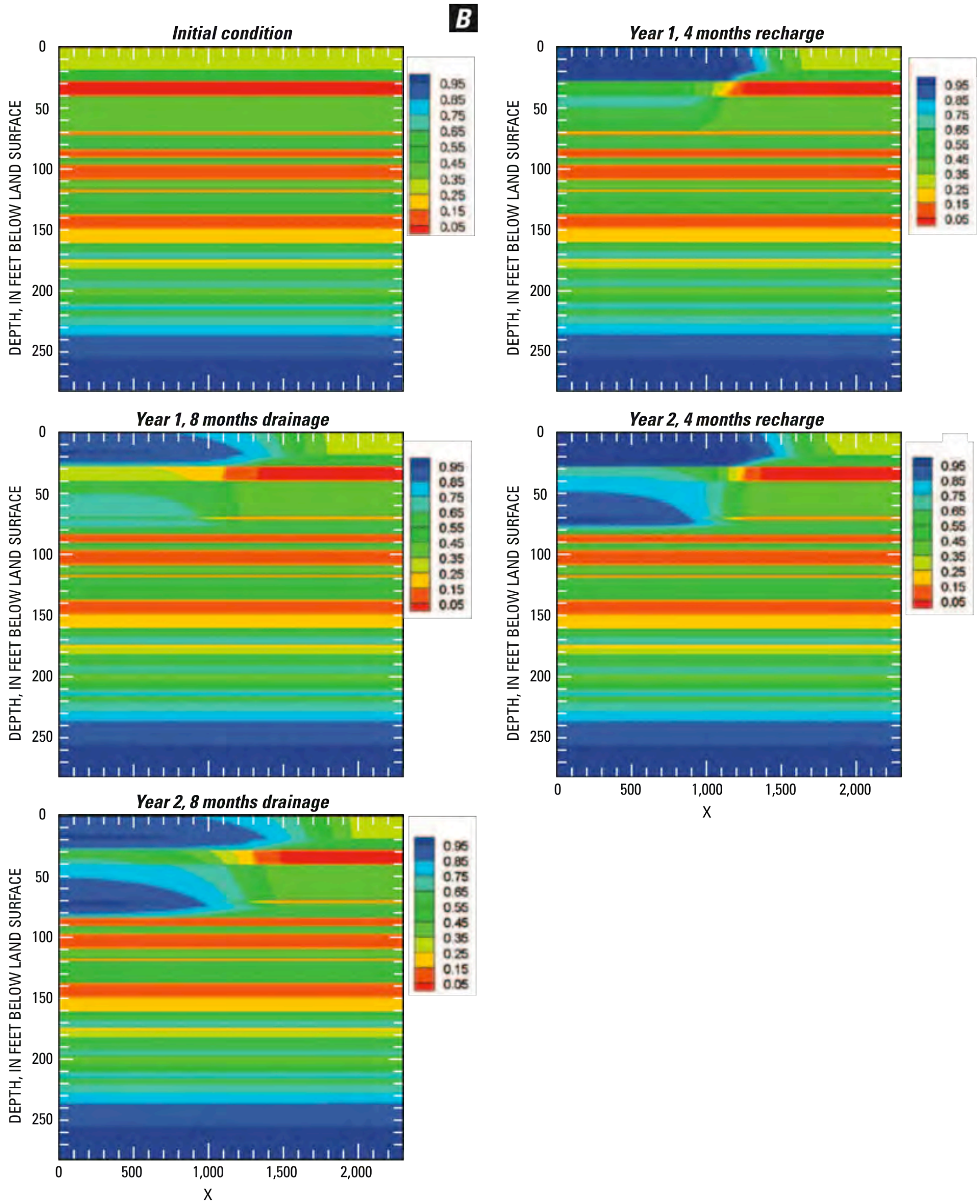


Figure 15. Continued

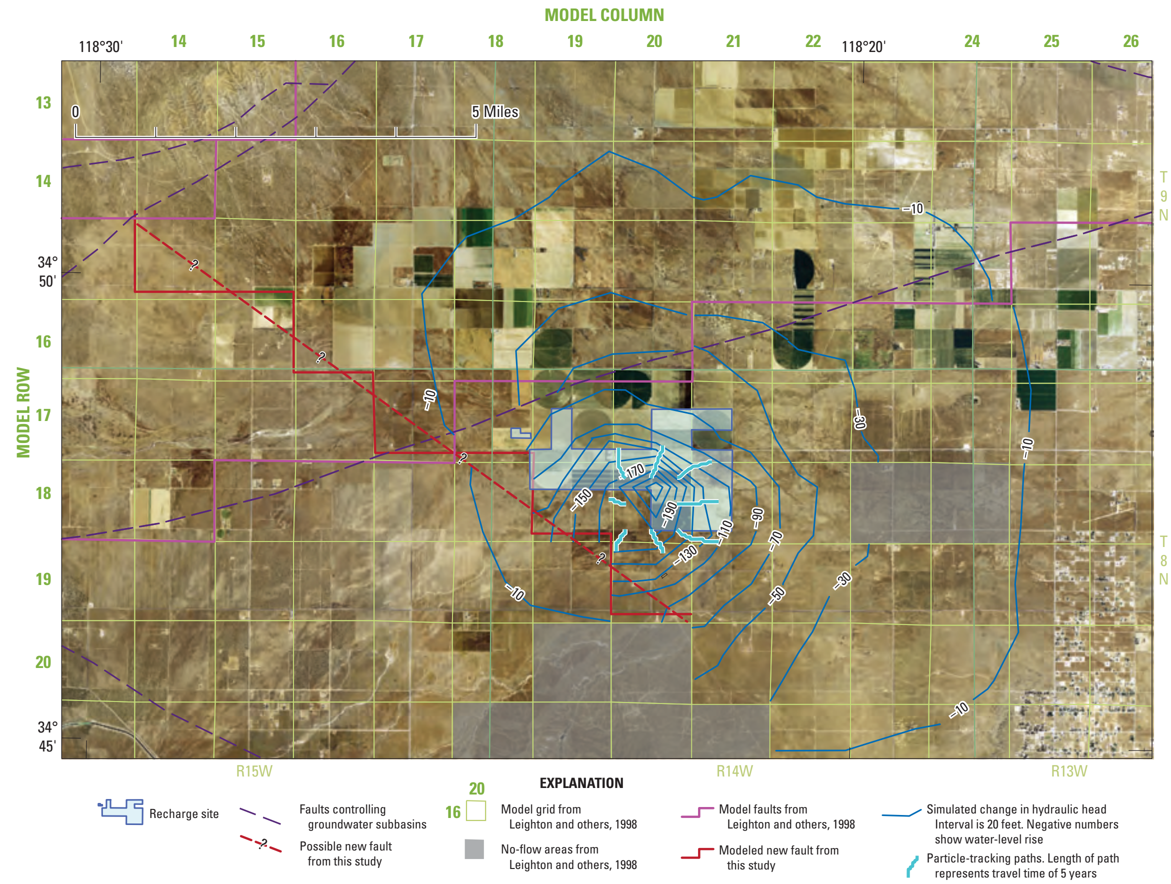


Figure 16. Simulated change in hydraulic head and particle-tracking paths after five years of recharging 28,000 acre-feet per year.

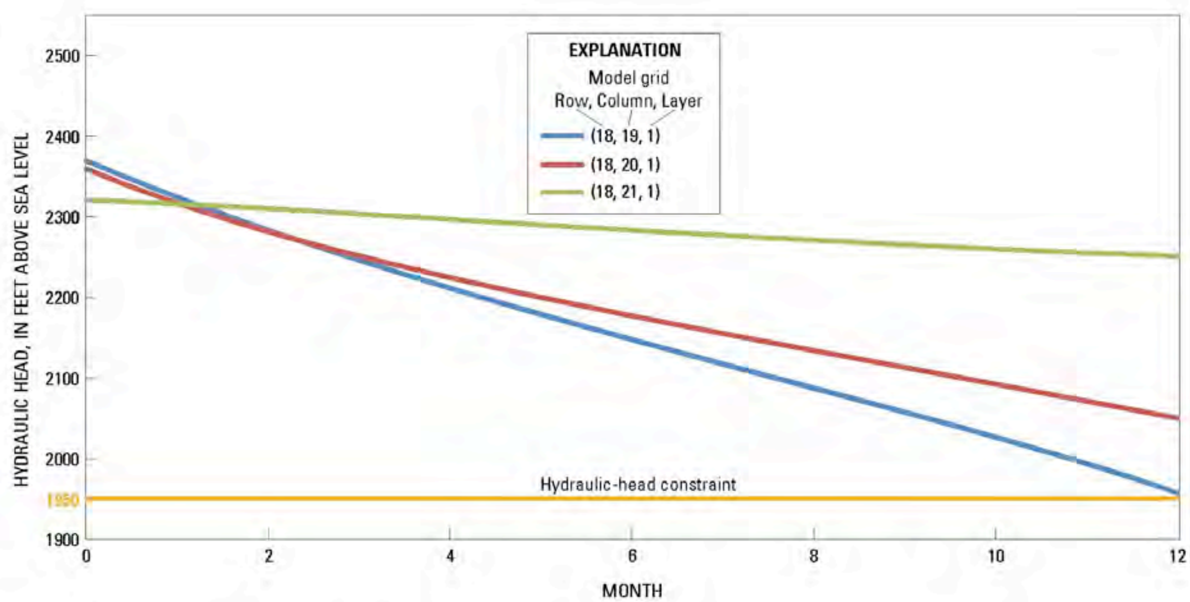


Figure 17. Simulated hydraulic head at selected model cells while pumping at a rate of 100,000 acre-feet per year for one year.

Tables

Table 1. Well construction information, specific-capacity data, and estimated transmissivity values for selected wells in the study area.

(All depths expressed in feet below land surface except where noted; source of data: USGS, U.S. Geological Survey; DL, drillers log; gpm = gallons per minute; gpm/ft = gallons per minute per foot; ft2/d = square feet per day; ft/d = feet per day; T = Transmissivity)

State Identification Number	USGS Identification Number	Common Name	Date Drilled	Land surface elevation (feet)	Well depth	Top of Screen	Bottom of Screen	Initial Water Level		Recent Water Level		Specific capacity	T	Specific capacity data source
								Date	Depth	Date	Depth	(gpm/ft)	(f^2/d)	
008N014W04K001S	344843118215601	RG-1	1963	2,542	654	254	654	1963	187	--	--	--	--	DL
008N014W04P001S	344829118222801	RG-7	--	2,550	--	--	--	--	--	--	--	--	--	DL
008N014W04R001S	344816118215701	RG-10	1969	2,534	565	282	564	1969	255	--	--	90	20,700	DL
008N014W05E001S	344849118234301	M3	1961	2,579	600	300	600	5/1/62	183.1	--	--	98	22,500	DL
008N014W05H001S	344842118225601	M1	1962	2,561	706	300	706	2/19/63	179.72	--	--	111	25,400	DL
008N014W05P001S	344817118233101	M2	--	2,571	--	--	--	--	--	--	--	--	--	DL
008N014W06J001S	344841118240301	RG-6	1974	2,586	680	280	680	1974	290	--	--	29	6,570	DL
008N014W07B001S	344815118240401	RG-5	--	2,580	--	--	--	--	--	7/22/2009	242	20	4,600	USGS
008N014W08B001S	344814118231101	RG-4	1968	2,565	1,100	437	1,037	5/28/58	175	--	--	20	4,600	DL
008N014W08D001S	344815118234601	RG-9	1963	2,573	593	247	536	1963	185	--	--	40	9,200	DL
008N014W09C001S	344816118222801	RG-8	1966	2,550	565	260	565	1966	219	10/23/09	274.00	48	11,000	DL
008N014W09D001S	344816118224001	RG-3	1964	2,556	640	240	640	1964	186	--	--	65	14,800	DL
008N014W09E001S	344755118222901	RG-2	--	2,550	--	--	--	--	--	10/26/09	273.02	--	--	DL
009N014W31K002S	344929118241701	M4	1960	2,604	600	300	600	2/19/63	229.16	--	--	--	--	DL

Table 2. Measured saturated hydraulic conductivity of core samples and ponded infiltration rates at selected sites in the study area.

[Analysis Method:duplicate analyses are noted as Run 1 and Run2; infitration tests consisted of an infiltrometer test conducted at land surface and/or at about 4 feet below land surface. ft/d = feet per day. All depths expressed in feet below land surface datum.]

Location	Surficial Soil Type	Generalized Lithology	Analysis Method	Depth Below Land Surface (feet)	Saturated Hydraulic Conductivity (ft/d)	Ponded Infiltration Rate at Land Surface (ft/d)	Ponded Infiltration Rate at 4 feet below Land Surface (ft/d)
INF1	Ro	sand	Infiltration Test	--	--	7.26	0.87
		sand	Permeameter	1	1.0827	--	--
INF2	Ro	sand	Infiltration Test	--	--	3.65	--
INF3	HkA	sand	Infiltration Test	--	--	12.75	3.06
		sand	Permeameter	3	0.984	--	--
		sand	Permeameter (Run 1)	3.5	2.953	--	--
		sand	Permeameter (Run 2)	3.5	3.051	--	--
INF4	Rp	clay	Infiltration Test	--	--	~0	~0
INF5	Rt	clay	Infiltration Test	--	--	~0	1.72
		clay	Permeameter	0.5	0.030	--	--
INF6	Rt	silt	Permeameter	6	0.656	1.72	--
CPT-1	HkA	clay	Permeameter	17.6	0.020	--	--
CPT-11	HkA	clay	Permeameter	12.6	0.002	--	--
CPT-24	Hka	sand	Permeameter	7.1	0.951	--	--
CPT-256	Ro	silt	Permeameter	1.5	0.003	--	--
CPT-530	HkA	silt	Permeameter	6.9	0.0003	--	--
		silt	Permeameter	7.7	0.0026	--	--
AVUZ-2	HkA	silt	Permeameter (Run 1)	82.5	0.240	--	--
		silt	Permeameter (Run 2)	82.5	0.225	--	--
		silt	Permeameter	102.0	0.483	--	--
AVUZ-3	HkA	silt	Permeameter (Run 1)	72.5	0.353	--	--
		silt	Permeameter (Run 2)	72.5	0.315	--	--
		clay	Permeameter (Run 1)	73.0	0.018	--	--
		clay	Permeameter (Run 2)	73.0	0.015	--	--

Table 3. Location and characteristics of unsaturated-zone monitoring sites.

[All depths expressed in feet below land surface datum except where noted. Instrument PIEZ, 2-inch piezometer; DEPS, dielectric permittivity sensor; TEMP, temperature Sensor; LYS, suction-cup lysimeter; A.T., advanced tensiometer]

Site	USGS Identification Number	State Identification Number	Land Surface Elevation (feet)	Depth Drilled	Depth to Water		Instrumentation	
					Depth	Date	Instrument	Depth
AVUZ-1	344800118221308	008N/014W-09F003SLYS	2,545	279	262	10/31/13	LYS	65
	344800118221307	--					A.T.	66
	344800118221306						TEMP	85
	344800118221305	--					DEPS	85
	344800118221304	008N/014W-09F002SLYS					LYS	180
	344800118221303	--					TEMP	202
	344800118221302	--					DEPS	202
	344800118221301	008N/014W-09F001S					PIEZ	259 - 279
AVUZ-2	344729118224308	008N/014W-09W003SLYS	2,555	270	259	11/5/13	LYS	129
	344729118224307	--					A.T.	130
	344729118224306	--					TEMP	139
	344729118224305	--					DEPS	139
	344729118224304	008N/014W-09W002SLYS					LYS	195
	344729118224303	--					TEMP	203
	344729118224302	--					DEPS	203
	344729118224301	008N/014W-09W001S					PIEZ	250 - 270
AVUZ-3	344836118221110	008N/014W-04K005SLYS	2,545	273	264	11/11/13	LYS	19
	344836118221109	--					A.T.	19.5
	344836118221108	008N/014W-04K004SLYS					LYS	70
	344836118221107	--					A.T.	70.5
	344836118221106	--					TEMP	85
	344836118221105	--					DEPS	85
	344836118221104	008N/014W-04K003SLYS					LYS	238.5
	344836118221103	--					TEMP	239
	344836118221102	--					DEPS	239
	344836118221101	008N/014W-04K002S					PIEZ	250-270

Attachment 3 Exhibit
10% Conceptual Design Drawings (Sheets 1 – 9)

PRELIMINARY
10% DESIGN

CONSTRUCTION PLANS FOR:

ANTELOPE VALLEY-EAST KERN WATER AGENCY

WATER SUPPLY STABILIZATION PROGRAM - 2

JANUARY 2011

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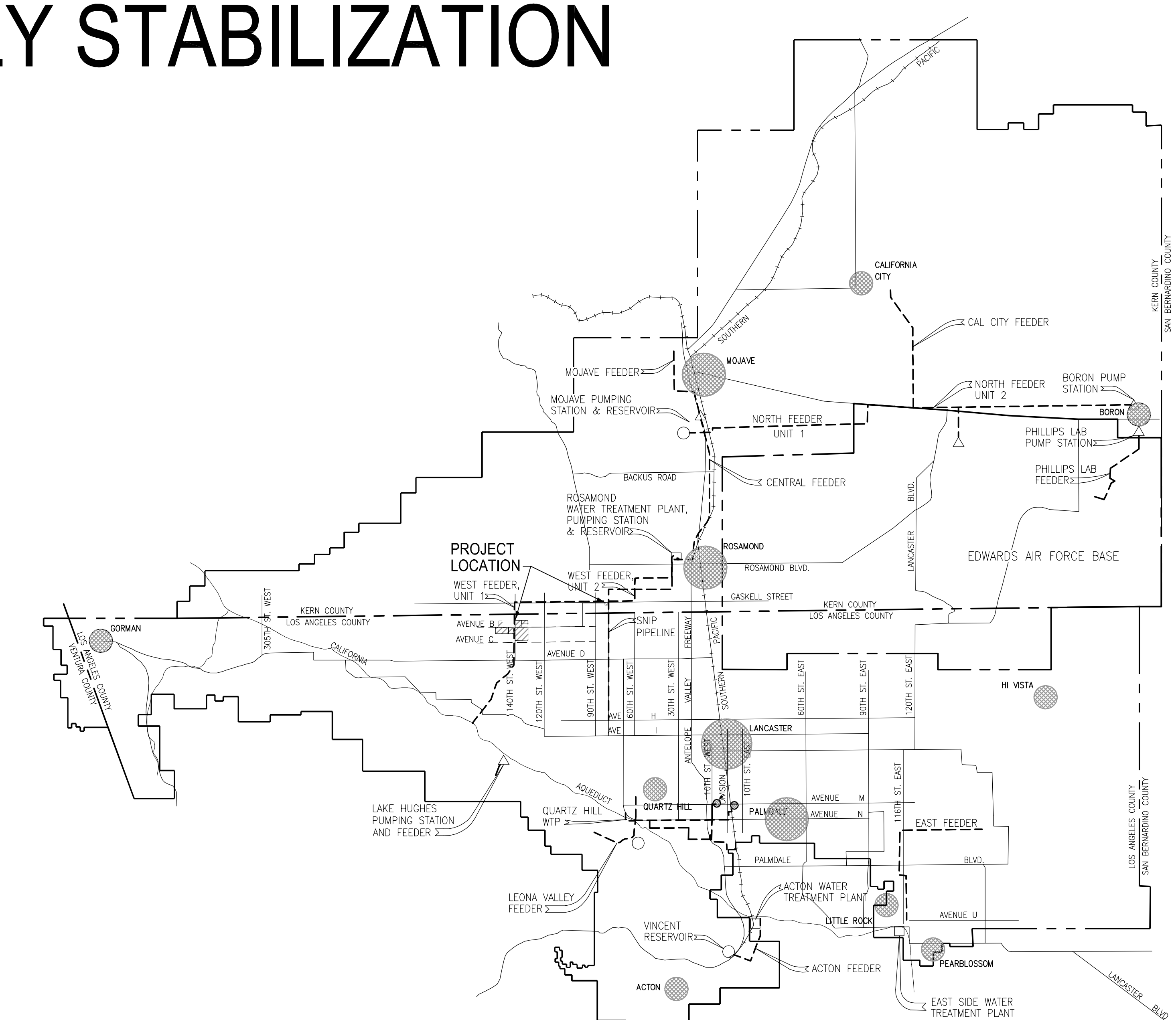

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PROJECT

WATER SUPPLY STABILIZATION PROGRAM - 2

PROJECT MANAGER - DATE

PROJECT ENGINEER - DATE

ACCOUNT NUMBER	FILE NUMBER
60182837	S-2468

SHEET NUMBER	OF	SHEETS
1		-

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SHEET INDEX

SHT.	DWG.	SHEET TITLE
1	G-01	TITLE SHEET AND LOCATION MAP
2	G-02	SHEET INDEX AND CONSTRUCTION NOTES
3	G-03	PROJECT MAP
4	C-01	RECHARGE BASIN PLAN
5	C-02	RECHARGE PIPELINES
6	C-03	WELL FIELD COLLECTOR PIPELINES
7	C-04	WELL FIELD PIPELINES
8	C-05	PUMP STATION SITE PLAN
9	C-06	PUMP STATION EXTERIOR ELEVATIONS

AGENCIES EXERCISING RESPONSIBILITY FOR SERVICES.

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ANTELOPE VALLEY–EAST KERN WATER AGENCY..........1–661–943–3201

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AT&T..1–818–373–5068

ELECTRIC
SOUTHERN CALIFORNIA EDISON....................................1–800–635–4555

USA
UNDERGROUND SERVICE ALERT....................................1–800–422–4133

BASIS OF BEARING:

THE BEARING N 88° 49' 47" E (N 88° 41' 06" E PER TRACT MAP 5092, PHASE I AS RECORDED IN BOOK 37 AT PAGE 120 OF MAPS), BEING THE CENTERLINE OF FELSITE AVENUE AND ALSO BEING THE NORTH LINE OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 9 NORTH, RANGE 12 WEST, S.B.B.&M. KERN COUNTY, CA. WAS ESTABLISHED AS THE BASIS FOR ALL BEARINGS FOR THIS PROJECT.

AERIAL VERTICAL CONTROL

SOURCE: L.A. DEPARTMENT OF PUBLIC WORKS
BENCH LIST: LANCASTER QUAD
DATUM: NAVD 88–ADJUSTED 2004
PROJECT BENCHMARK: L.A. COUNTY B.M. NO. 2244, LOCATED AT THE S.E. CORNER OF AVENUE A AND 60th STREET WEST. MARK IS 3 1/2–INCH BRASS DISK SET IN CONCRETE. ELEVATION: 2383.45–FEET. PROJECT POINT NO. 511.

PROJECT BENCH MARK"

L.A. COUNTY B.M. NO. 6434 LOCATED AT THE N.W. CORNER OF AVENUE G AND 70th STREET WEST. 2–INCH O.D. IRON PIPE FILLED WITH CONCRETE WITH CHISELED MARK ON HIGH POINT. ELEVATION: 2390.57 FEET <RECORD>, 2390.33 FEET OBSERVED) PROJECT POINT NO. 513.
TOLERANCE ± 0.25–FEET

TEMPORARY BENCH MARK (TBM):

NORTHEAST CORNER OF CONCRETE PAD OF SAMPLING STATION APPROXIMATELY 25–FEET NORTH OF THE TREATED WATER RESERVOIR, (ELEVATION OF ORIGINAL WTP SURVEY=2384.00–FEET) ELEVATION FOR THE SNIPS PUMP STATION=2386.78–FEET.

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WATER SUPPLY STABILIZATION PROGRAM - 2

SHEET INDEX AND
CONSTRUCTION NOTES

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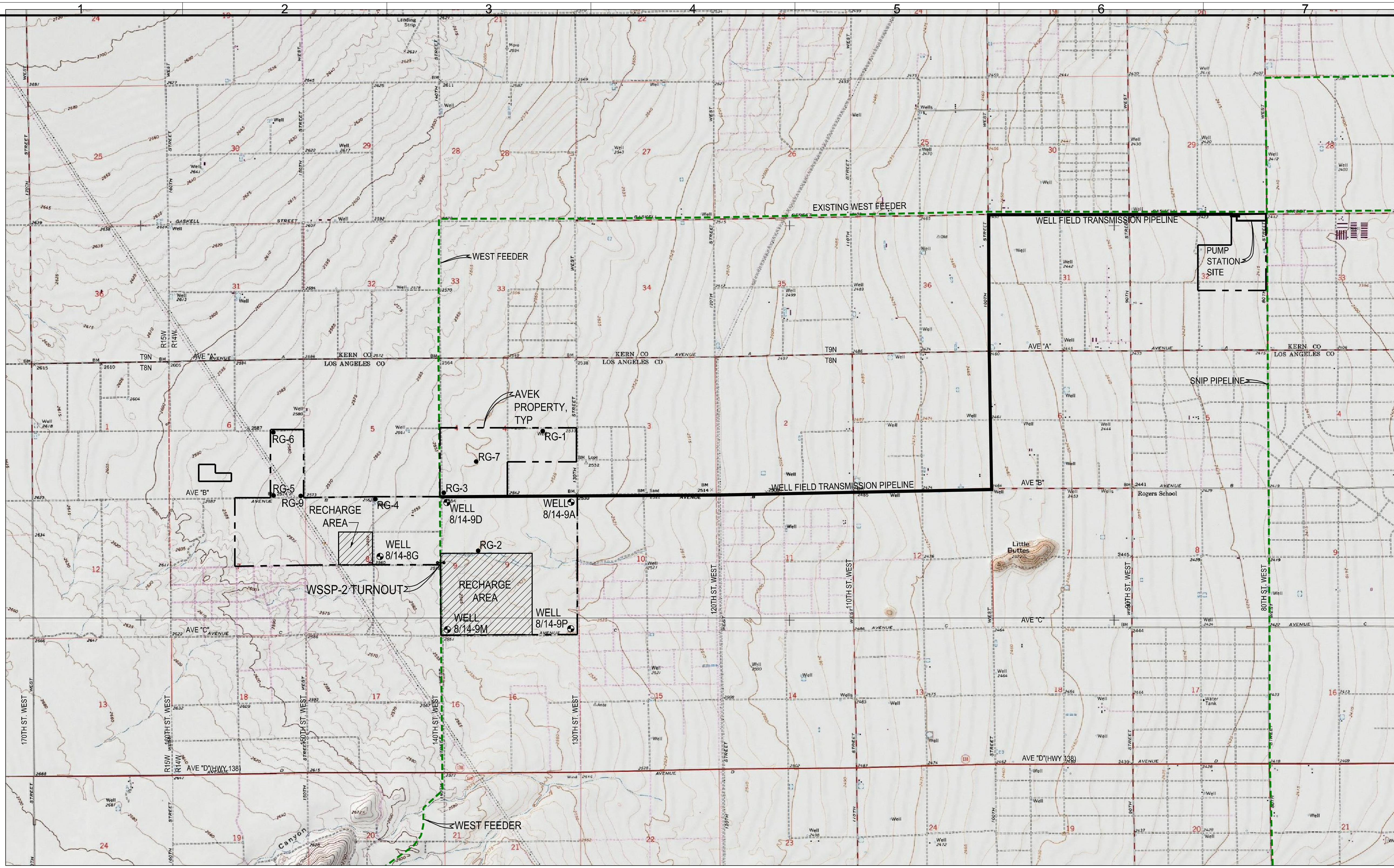
OF – SHEETS
S–2468



VICINITY MAP

LEGEND

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PROJECT MAP

DRAWING G-03
SHEET 3 OF – SHEETS
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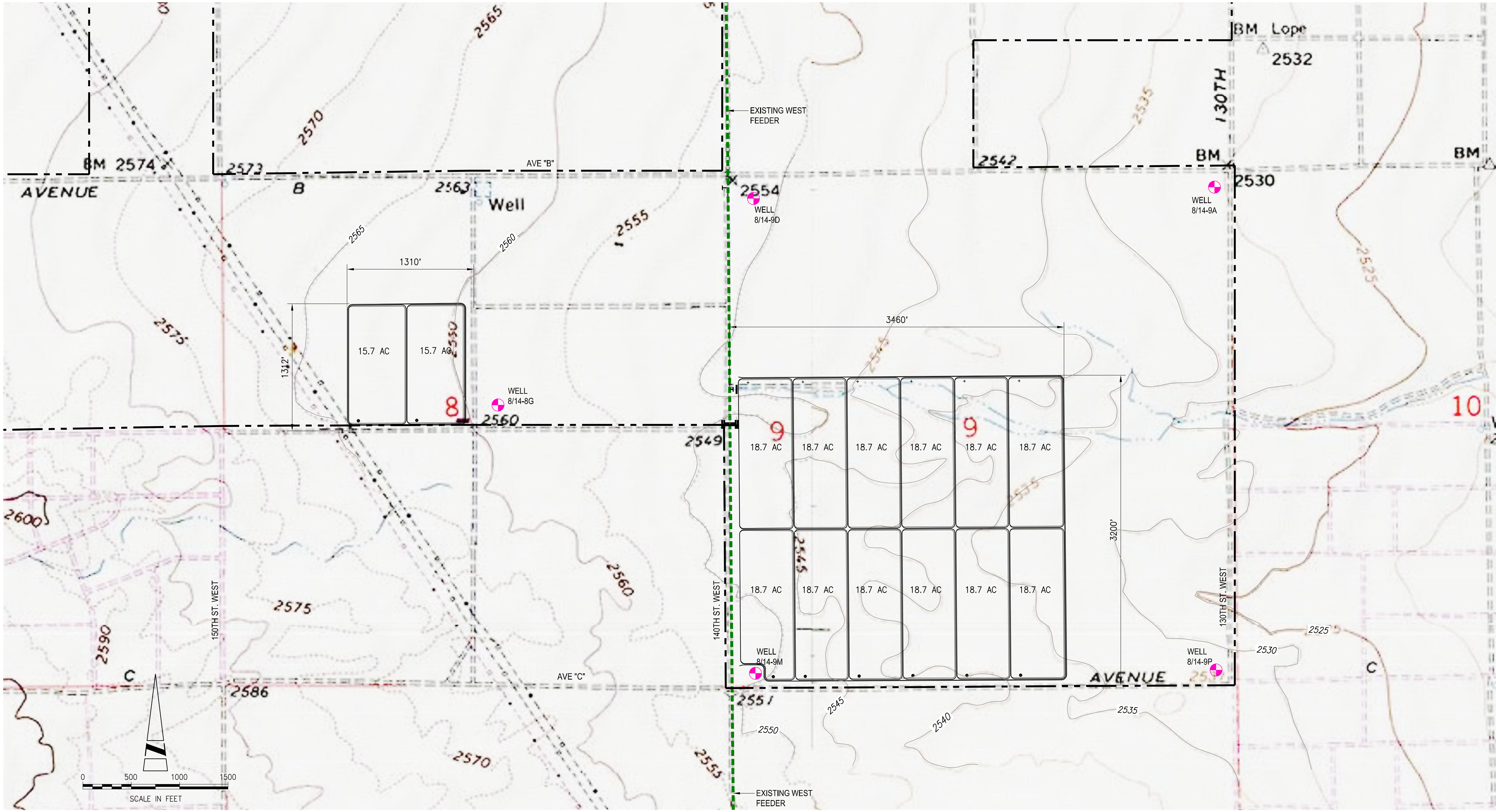

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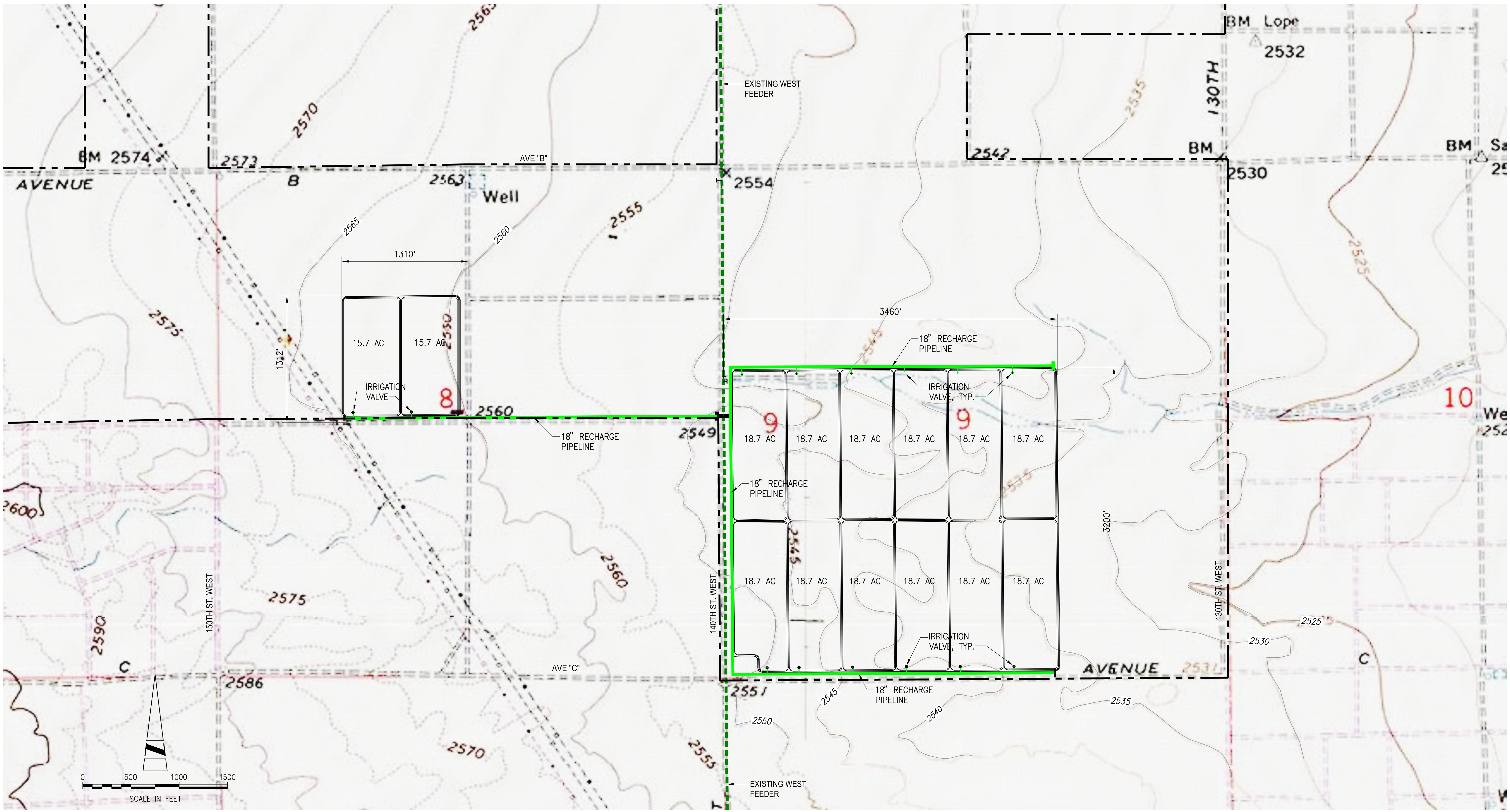
RECHARGE BASIN PLAN

DRAWING	C-01
SHEET	4
OF	– SHEETS
	S-2468



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RECHARGE PIPELINES

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SHEET: 5
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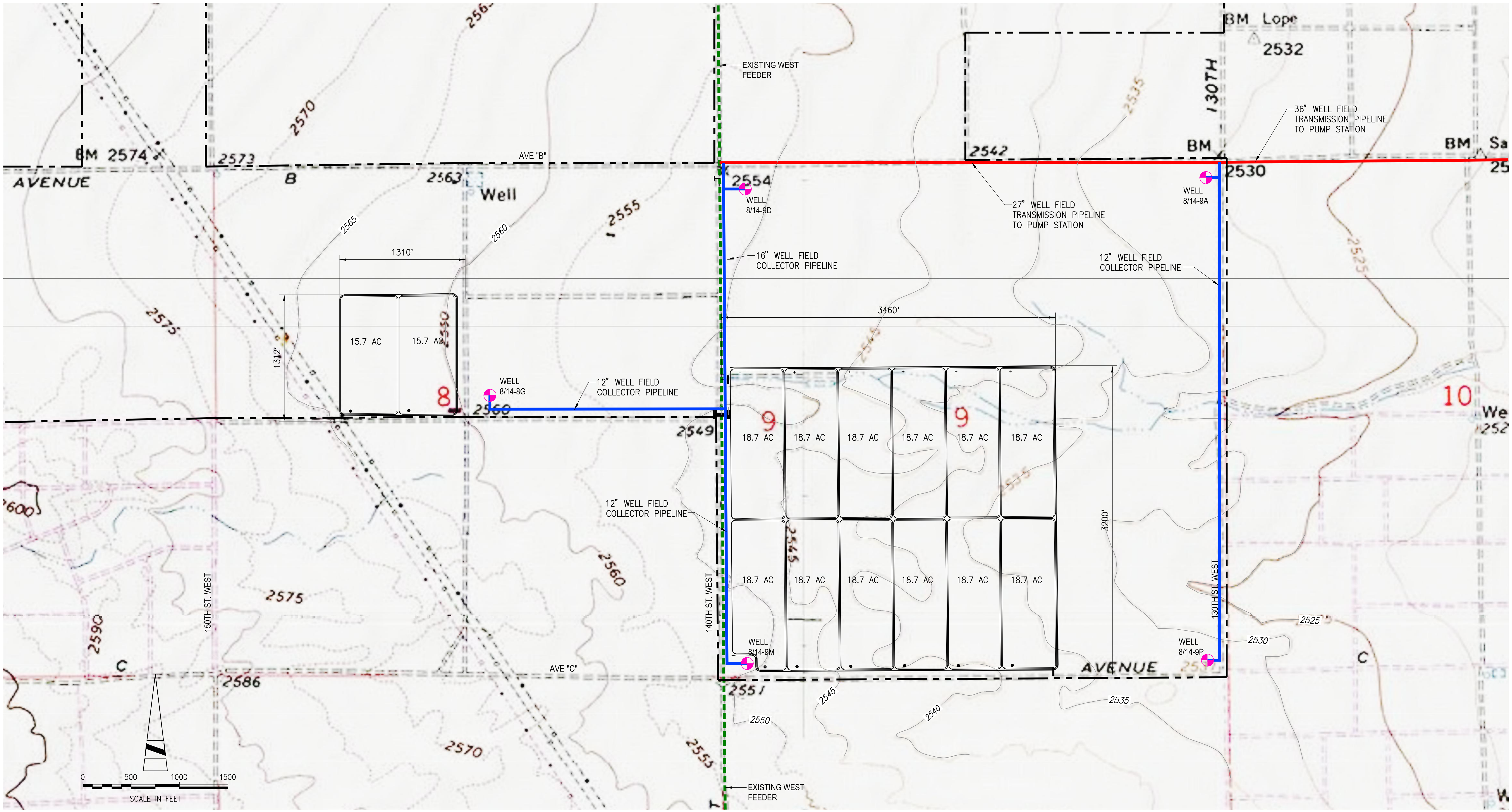

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WELL FIELD COLLECTOR PIPELINES

DRAWING: C-03

SHEET: 6 OF – SHEETS

S-2468

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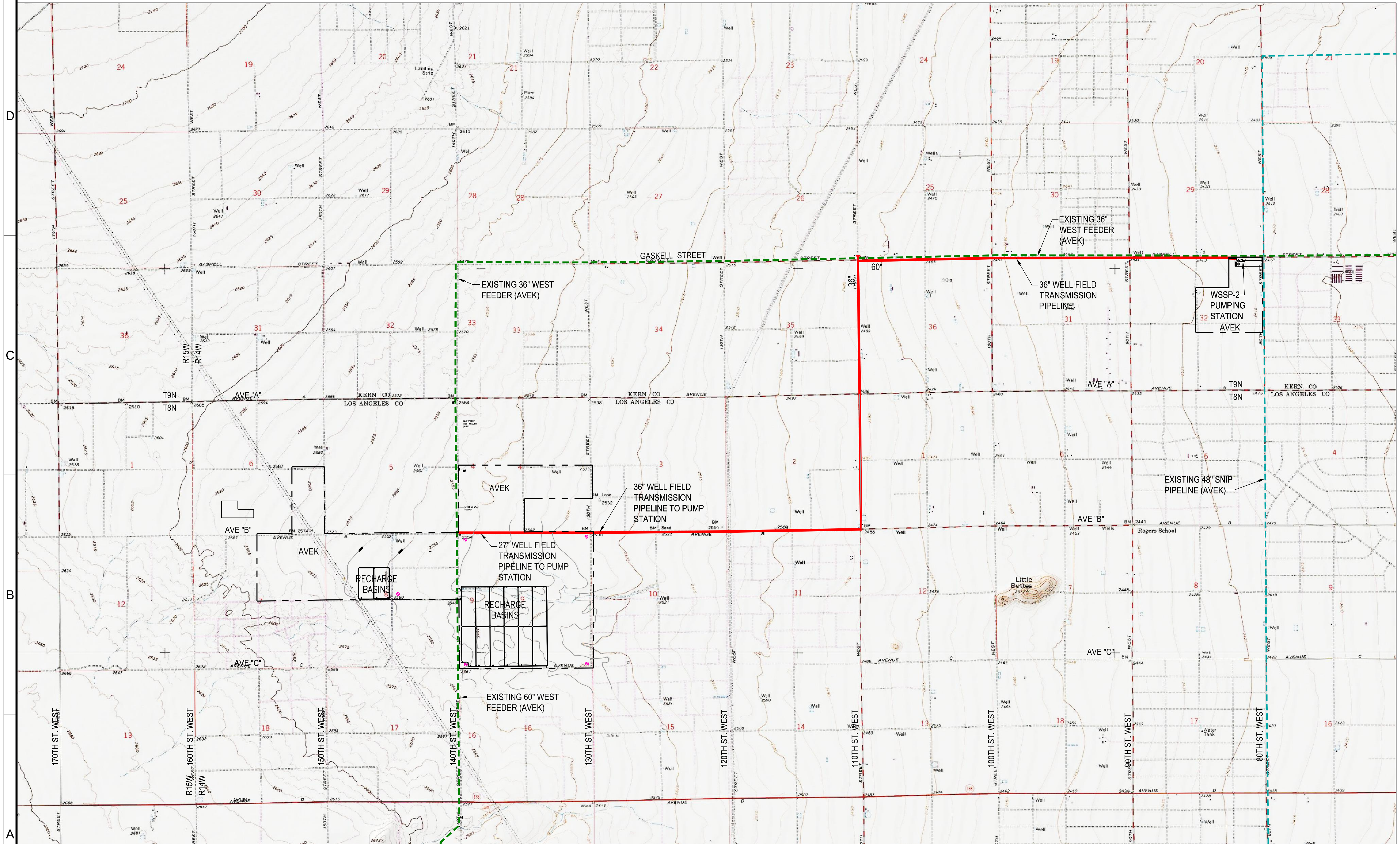

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ANTELOPE VALLEY - EAST KERN WATER AGENCY
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WATER SUPPLY STABILIZATION PROGRAM - 2

WELL FIELD TRANSMISSION PIPELINES

DRAWING C-04
SHEET 7 OF – SHEETS
S-2468

DWG: S:\A01\60182837-WSSP 2-Grant Application\CAD\Planset\S2468 C-04.dwg Layout Name: C-04 - Plotted by: Campbell, Vene Date: 12/27/2010 - 9:52 AM
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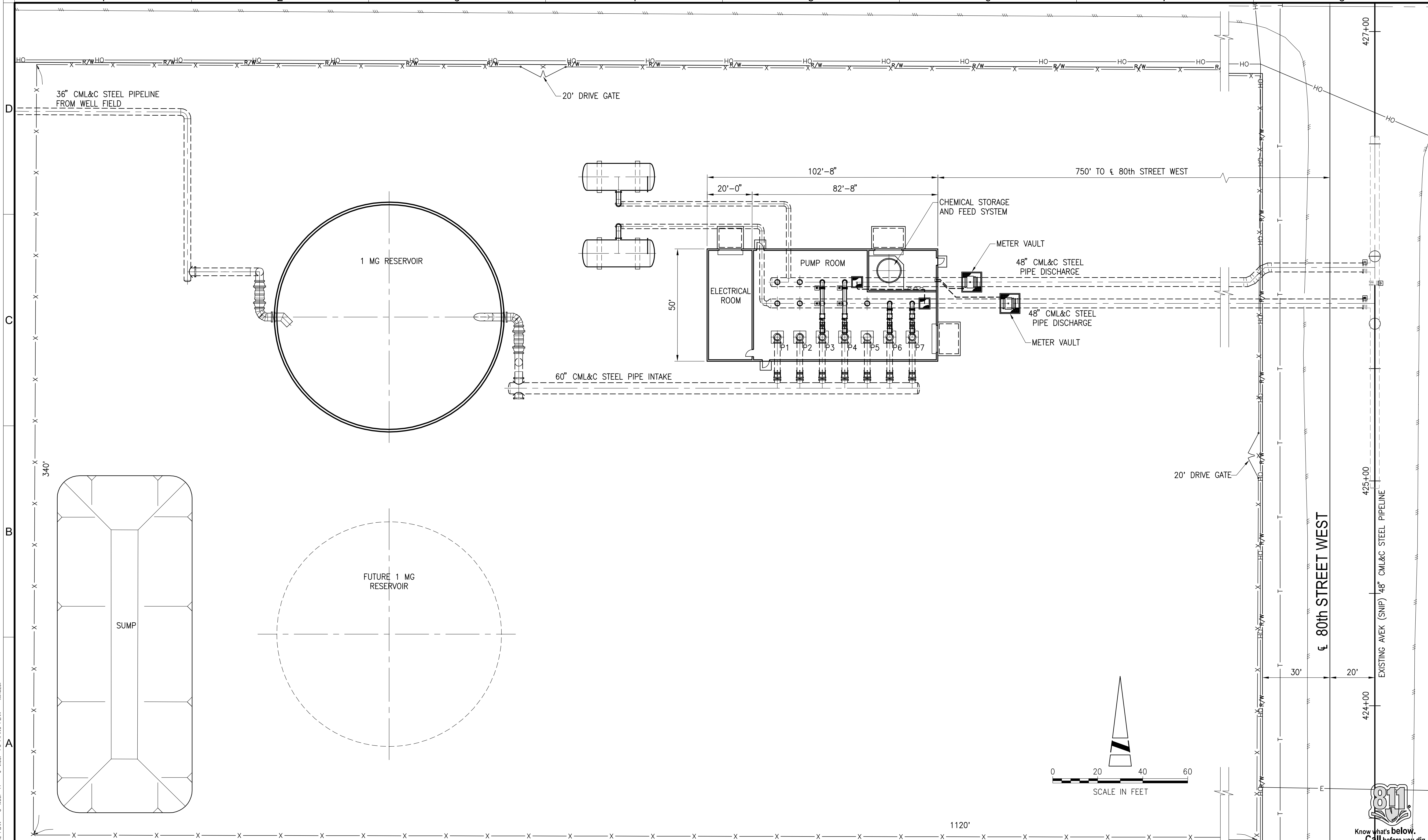

REV	DATE	DESCRIPTION	APPR
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1			

VERIFY SCALES
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DESIGNED BY BPH
DRAWN BY VENE
CHECKED BY
DATE DEC. 2010

PROJECT ENGINEER BEN P. HORN
REG NUMBER C 23028 EXP DATE 12/31/11
PROJECT NUMBER 60182837
CADD STANDARDS

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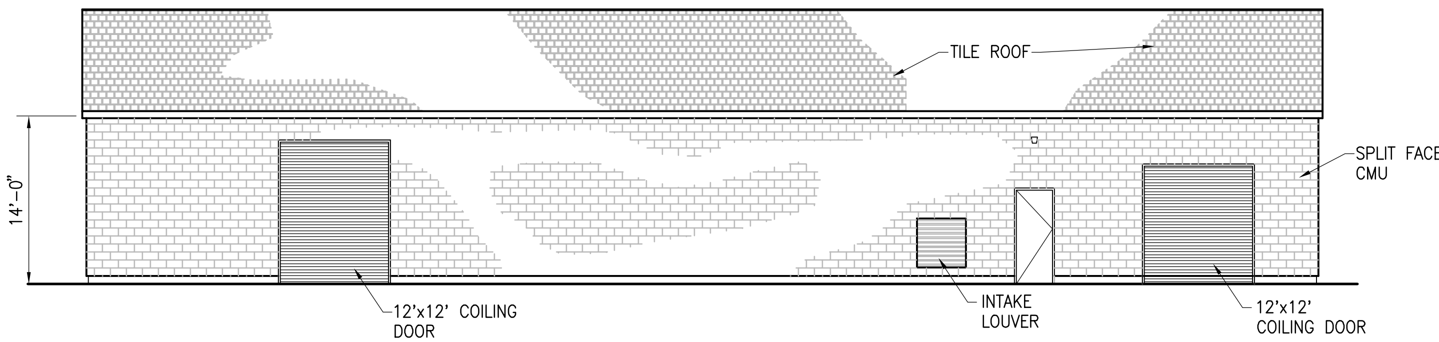
WATER SUPPLY STABILIZATION PROGRAM - 2

PUMP STATION SITE PLAN

DRAWING C-05
SHEET 8
OF - SHEETS
S-2468



NORTH ELEVATION (A/–)
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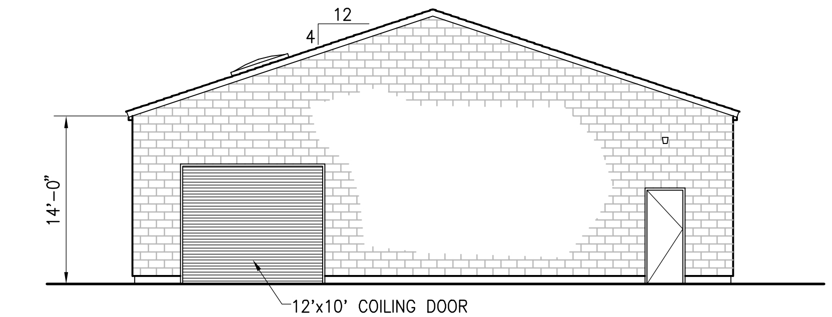
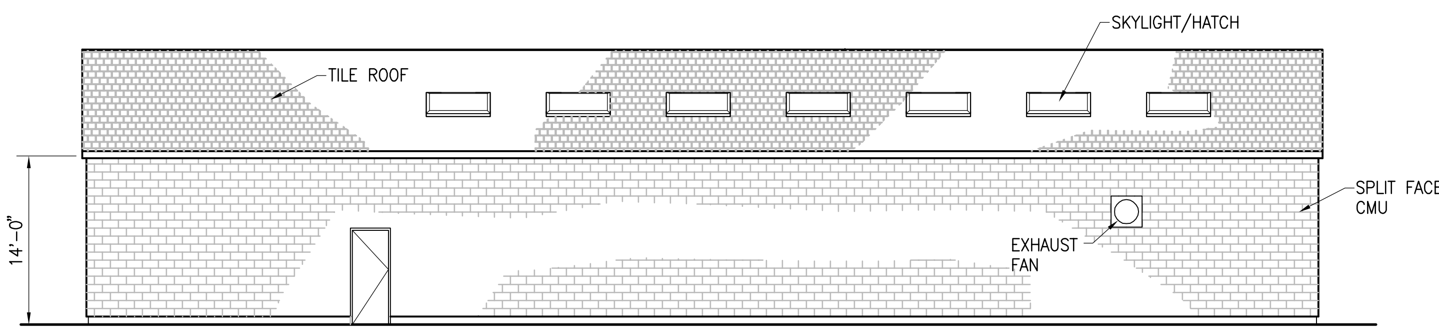
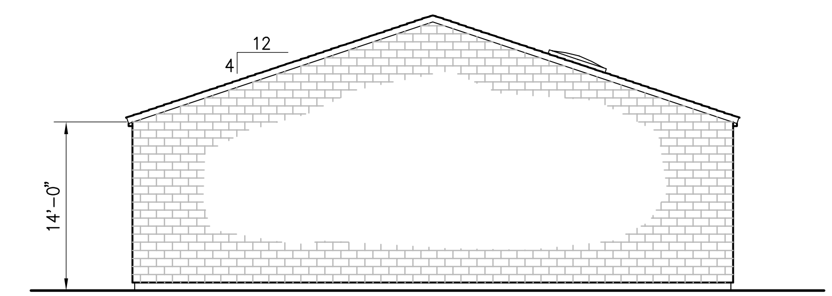


EAST ELEVATION (D/–)
SCALE: 1/4"=1'-0"



SOUTH ELEVATION (B/–)
SCALE: 1/4"=1'-0"



WEST ELEVATION (C/–)
SCALE: 1/4"=1'-0"

Know what's **below.**
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REV	DATE	DESCRIPTION	APPR
7			
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DRAWN BY: VENE
CHECKED BY: BPH
DATE: DEC. 2010

PROJECT ENGINEER: MARVIN DAN SCHMIDT
REG NUMBER: C15641 EXP DATE: 3/31/11
PROJECT NUMBER: 60182837
CADD STANDARDS

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WATER SUPPLY STABILIZATION PROGRAM - 2

PUMP STATION EXTERIOR ELEVATIONS

DRAWING: C-06
SHEET: 9
OF – SHEETS
S-2468

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<u>Attachment 3 Exhibit</u>
IRWM Plan Regional Map

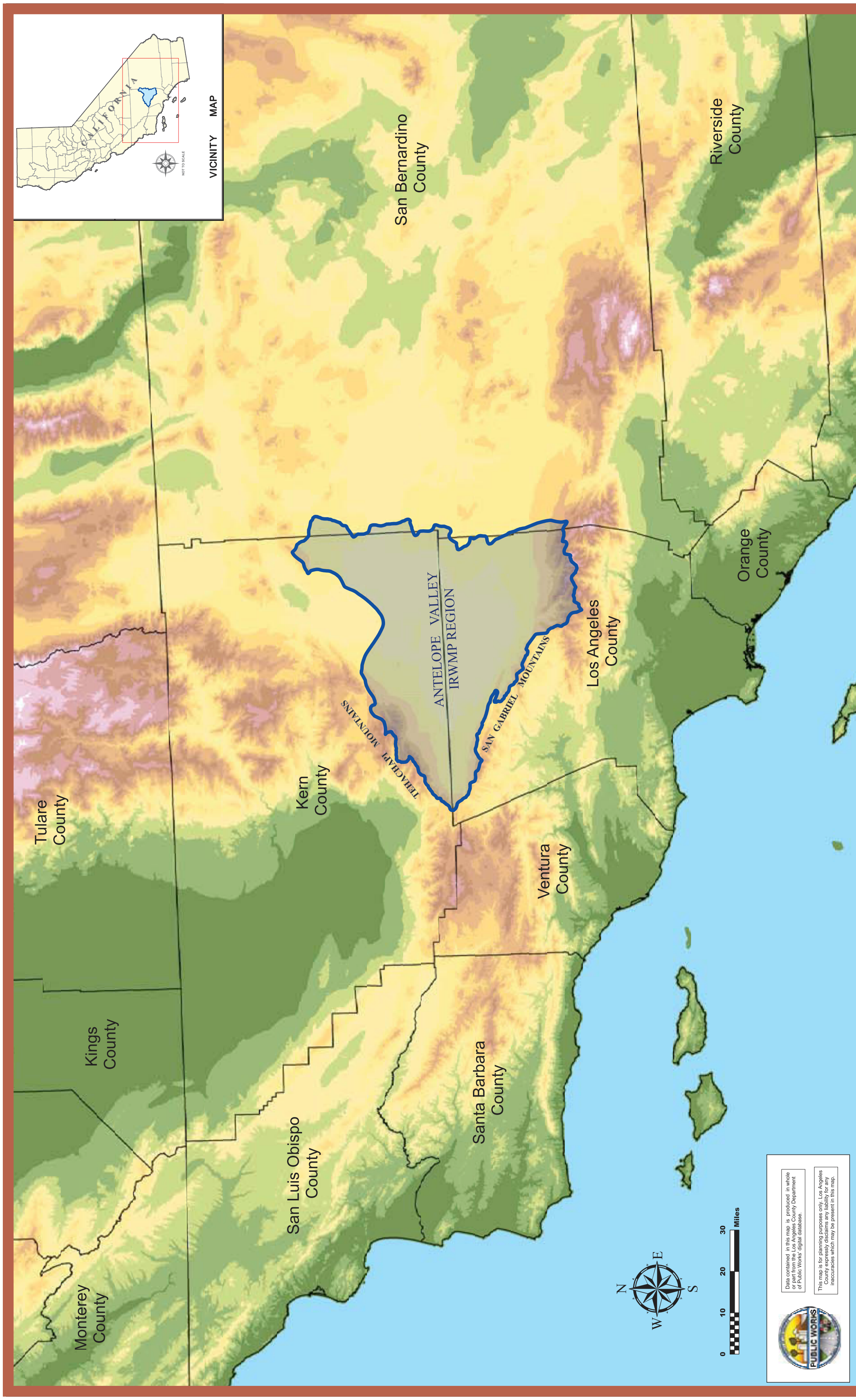


Figure 1-1 Antelope Valley Integrated Regional Water Management Plan Region

Attachment 3 Exhibit
Applicant Resolution Adopting Project Mitigated Negative Declaration

ANTELOPE VALLEY-EAST KERN WATER AGENCY

RESOLUTION NO.: R-08-20

RESOLUTION APPROVING MITIGATED NEGATIVE DECLARATION

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ANTELOPE VALLEY EAST KERN WATER AGENCY APPROVING THE MITIGATED NEGATIVE DECLARATION FOR THE AVEK WATER SUPPLY STABILIZATION PROGRAM GROUNDWATER RECHARGE PROJECT (WSSP-2), AND ADOPTING A MITIGATION MONITORING AND REPORTING PLAN

WHEREAS, it is the goal of the Board of Directors of the Antelope Valley-East Kern Water Agency (the "Agency") to stabilize water supplies for its customers during periods of drought or loss of supply due to damage or failure of State Water Project facilities by recharging the Antelope Valley Groundwater Basin using the portion of the Agency's annual allotment of State Water Project imported water and other water that may become available to AVEK that exceeds annual demand and subsequently recovering this stored water (less losses) to meet dry-year and emergency demand); and

WHEREAS, to facilitate this goal, the Agency has developed a Water Supply Stabilization Program Groundwater Recharge Project ("WSSP-2") plan to (a) recharge water on lands it owns in Los Angeles County south of West Avenue A, north of West Avenue C (b), east of 155th Street West and west of 130the Street West; (b) recover recharged supplies when needed, and (c) convey these supplies in a system of pipelines to either the AVEK West Feeder or (via a new pipeline) to a storage, treatment, and pumping plans and (following treatment) to the AVEK SNIP treated water pipeline; and

WHEREAS, the Board of Directors of the Agency has determined that the WSSP-2 is considered a project pursuant to the requirements of the California Environmental Quality Act, Public Resources Code Section 21000 et. seq. ("CEQA"), and prepared an initial study to determine potential environmental impacts; and

WHEREAS, on the basis of the initial study, which indicated that all potential environmental impacts from the WSSP-2 were less than significant, or could be mitigated to a level of insignificance, the Agency's staff, determined that a Mitigated Negative Declaration ("MND") should be prepared; and

WHEREAS, the MND was prepared pursuant to CEQA, and the California State CEQA Guidelines; and

WHEREAS, the MND was made available to the public and all interested agencies for review and comment by publishing notice of its availability in the *Antelope Valley Press* a newspaper of general circulation on July 1, 2, and 3, 2008, and by submission to the State Clearinghouse for review on or about July 2, 2008, and circulated for a period of 30 days pursuant to State CEQA Guidelines; and

WHEREAS, a public meeting of the Board of Directors of the Agency to consider the MND, initial study, and potential mitigation monitoring and reporting plan for the WSSP-2 was held on November 10, 2008; and

WHEREAS, the Board of Directors of the Agency received, considered, and responded to comments, including oral comments received from the public and other interested entities on the MND; and

WHEREAS, the Board of Directors of the Agency have carefully reviewed the MND and all other relevant information contained in the record regarding the WSSP-2; and

WHEREAS, all other legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY AS FOLLOWS:

1. <u>Compliance with the California Environmental Quality Act.</u>

The Board of Directors of the Agency have reviewed and considered the information contained in the MND, the initial study, and the administrative record for the WSSP-2, including all oral and written comments received during the comment period. The Board of Directors find that the MND and the initial study contain a complete and accurate reporting of the environmental impacts associated with the WSSP-2. The Board of Directors find that MND, initial study, and administrative record have been completed in compliance with CEQA and the California State CEQA Guidelines. The Board of Directors further find that all potential impacts in the WSSP-2 have been fully analyzed in the MND.

2. <u>Findings on Environmental Impacts.</u>

Based on the MND, the initial study, and the administrative record including all written and oral evidence presented to the Board of Directors, the Board of Directors find that all environmental impacts of the WSSP-2 are either insignificant or can be mitigated to a level of insignificance pursuant to the mitigation measures outlined in the MND and the initial study. The Board of Directors further find that there is no substantial evidence in the administrative record supporting a fair argument that the WSSP-2 may result in significant environmental impacts. The Board of Directors find that the MND contains a complete, objective, and accurate reporting of the environmental impacts associated with the WSSP-2 and reflects the independent judgment of the Agency.

3. <u>Adoption of Mitigated Negative Declaration.</u>

The Board of Directors hereby approve and adopt the Mitigated Negative Declaration.

4. **Adoption of Mitigation Monitoring and Reporting Program**.

The Board of Directors hereby approve and adopt the Mitigation Monitoring and Reporting Program prepared for the WSSP-2.

5. **Approval of WSSP-2.**

The Board of Directors hereby approve the Water Supply Stabilization Program and Groundwater Recharge Project (WSSP-2).

6. **Notice of Determination.**

The Board of Directors direct staff to fill a Notice of Determination with the **Los Angeles County Clerk** within five (5) working days of WSSP-2 approval by the Board of Directors of the Agency.

7. **Custodian of Records.**

The documents and materials that constitute the record of proceedings on which these findings have been based are located at the Antelope Valley-East Kern Water Agency, 6500 West Avenue N., Palmdale, California 93551. The custodian for these records in the General Manager of the Antelope Valley-East Kern Water Agency.

8. **Execution of Resolution.**

The President of the Board of Directors shall sign this resolution and the Secretary of the Board of Directors shall attest and certify to the passage and adoption thereof.

9. **Effective Date.**

This Resolution shall be deemed effective upon adoption.

PASSED, APPROVED, AND ADOPTED THIS 10th DAY OF NOVEMBER 2008

AYES:
NOES:
ABSTAIN:
ABSENT:

SIGNED:

President, AVEK Water Agency

ATTEST:

Secretary, AVEK Water Agency

APPROVED AS TO FORM:

William J. Brunick, AVEK General Counsel

Attachment 3 Exhibit
WSSP No. 2 Turnout Project Construction Plans

"CONFORMED DRAWINGS"
12-27-10

CONSTRUCTION PLANS FOR:

ANTELOPE VALLEY-EAST KERN WATER AGENCY

WSSP-2 TURNOUT

NOVEMBER 2010

APPROVED, AVEK
BOARD OF DIRECTORS

GEORGE M. LANE, PRESIDENT

KEITH DYAS, VICE PRESIDENT

CARL B. HUNTER, JR.

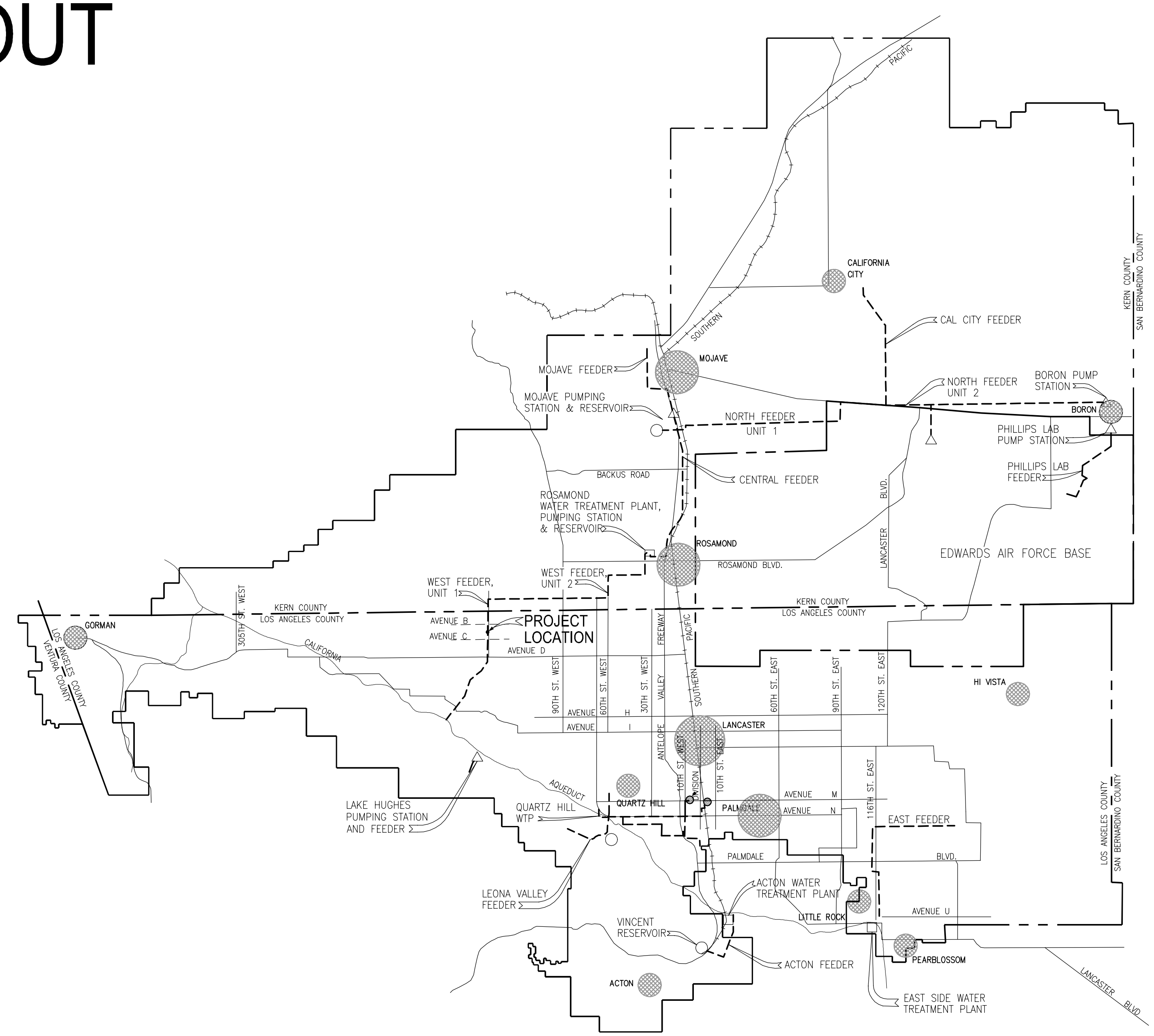
DAVID RIZZO

FRANK S. DONATO

ANDY D. RUTLEDGE

MARLON BARNES

DAN FLORY, GENERAL MANAGER



1 12-03-10 REVISED PER ADDENDUM NO. 1 – BPH

CLIENT

ANTELOPE VALLEY - EAST KERN WATER AGENCY
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PROJECT

WSSP-2 TURNOUT

REGISTERED PROFESSIONAL ENGINEER
BEN P. HORN
No. 23028
EXP. 12-31-11
CIVIL
STATE OF CALIFORNIA

PROJECT MANAGER 11-18-10 DATE

REGISTERED PROFESSIONAL ENGINEER
ERIC H. GARIBAY
No. RCE 72121
EXP. 6-30-12
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER 11-18-10 DATE

1

ACCOUNT NUMBER	FILE NUMBER
60182837	S-2465

SHEET NUMBER	OF	SHEETS
1		6

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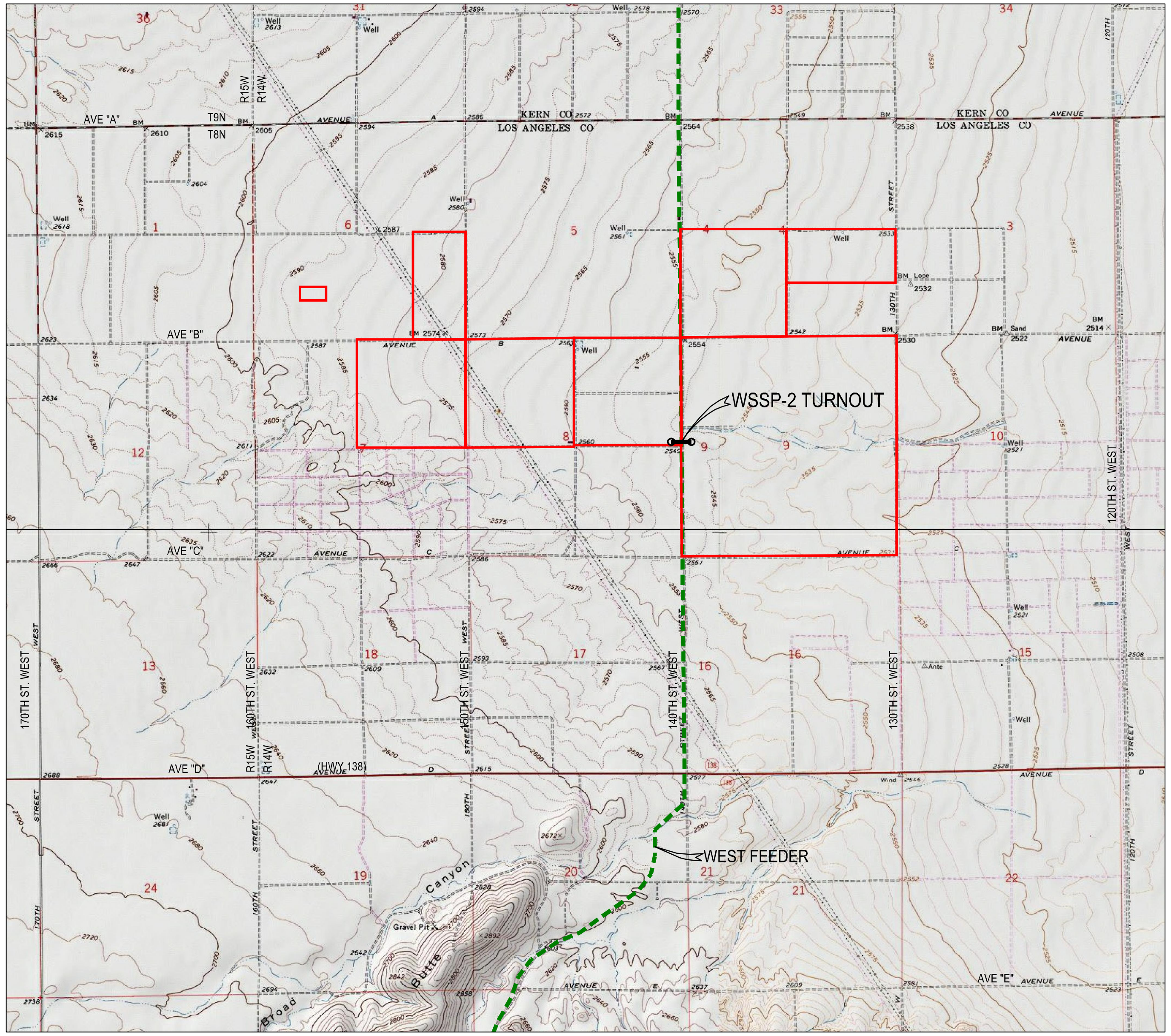

VICINITY MAP

0 2000 4000
SCALE IN FEET

GENERAL NOTES

1. ALL ELEVATIONS ARE TO THE TOP OF PIPE BARREL UNLESS OTHERWISE INDICATED.
2. ALL NATURAL AND EXISTING GROUND OR PAVEMENT ELEVATIONS ARE APPROXIMATE ONLY.
3. MINIMUM COVER OVER TOP OF PIPE SHALL BE 4.5–FEET.
4. THE INDICATED LOCATIONS OF EXISTING UNDERGROUND FACILITIES ARE FROM THE BEST AVAILABLE SOURCES, BUT MAY NOT NECESSARILY EXIST AS SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL EXPOSE ALL POTENTIAL INTERFERENCE'S AHEAD OF TRENCHING OPERATION AND SHALL IMMEDIATELY INFORM THE AGENCY'S REPRESENTATIVE IF THERE IS A CONFLICT. VERIFY LOCATION PRIOR TO PIPELINE INSTALLATION. REFER TO SPECIFICATION SECTION 020120.
5. COMPLY WITH REQUIREMENTS OF THE ENCROACHMENT PERMIT ISSUED BY THE COUNTY OF LOS ANGELES.
6. CONTACT UTILITY COMPANIES WITH SERVICES IN THE AREA FOR LOCATING UNDERGROUND LINES AND CABLES, AND SHALL COORDINATE WITH THE UTILITY FACILITIES AFFECTED BY THE PIPELINE CONSTRUCTION. PRIOR TO ANY EXCAVATION NEAR EXISTING FACILITIES, CONTACT UNDERGROUND SERVICE ALERT.
7. SURVEY MONUMENTS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED TO THEIR ORIGINAL LOCATION.
8. SIGNS AND POSTS REMOVED DURING CONSTRUCTION SHALL REPLACE TO THEIR ORIGINAL LOCATION.
9. PROVIDE FIVE (5) WORKING DAYS NOTICE PRIOR TO THE NEED FOR CONSTRUCTION STAKING.
10. VERIFY THE SIZE, TYPE, CLASS, PROTECTIVE LINING AND COATING, LOCATION AND DEPTH OF THE EXISTING WATER MAIN AND SHALL BE RESPONSIBLE FOR MAKING THE PROPER CONNECTIONS.
11. WORK SHALL BE CONFINED WITHIN LA CO. RIGHT–OF–WAY (ENCROACHMENT PERMIT) AND AVEK PROPERTY.
12. 1 BOTH 60–INCH AND 30–INCH PIPELINES SHALL BE SWEPT CLEAN FROM ALL DEBRIS PRIOR TO PLACING THE PIPELINE IN OPERATION.
13. 1 SHOP HYDROTEST ALL PIPELINE, FITTINGS, AND SPECIALS IN ACCORDANCE WITH SECTION 402001.

SHEET INDEX

SHT.	DWG.	SHEET TITLE
1	G-01	TITLE SHEET AND LOCATION MAP
2	G-02	VICINITY MAP, SHEET INDEX AND CONSTRUCTION NOTES
3	C-01	TURNOUT SITE PLAN
4	C-02	TURNOUT PLAN AND SECTION
5	C-03	TURNOUT PIPING DETAILS
6	C-04	EMS DETAILS

AGENCIES EXERCISING RESPONSIBILITY FOR SERVICES.

WATER
ANTELOPE VALLEY–EAST KERN WATER AGENCY...........1–661–943–3201

TELEPHONE
AT&T...1–818–373–5068

ELECTRIC
SOUTHERN CALIFORNIA EDISON....................................1–800–635–4555

USA
UNDERGROUND SERVICE ALERT....................................1–800–422–4133

811 Know what's below. Call before you dig.

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1	12–03–10	REVISED PER ADDENDUM NO. 1	BPH

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DRAWN BY: VENE
CHECKED BY: AR
DATE: NOV. 2010

PROJECT ENGINEER: BEN P. HORN
REG NUMBER: C 23028 EXP DATE: 12/31/11
PROJECT NUMBER: 60182837
CADD STANDARDS: AECOM

REGISTERED PROFESSIONAL ENGINEER
ERIC H. GARIBAY
No. RCE 72121
EXP. 6–30–12
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WSSP-2 TURNOUT

VICINITY MAP, SHEET INDEX AND CONSTRUCTION NOTES

DRAWING G-02
SHEET 2 OF 6 SHEETS
S–2465

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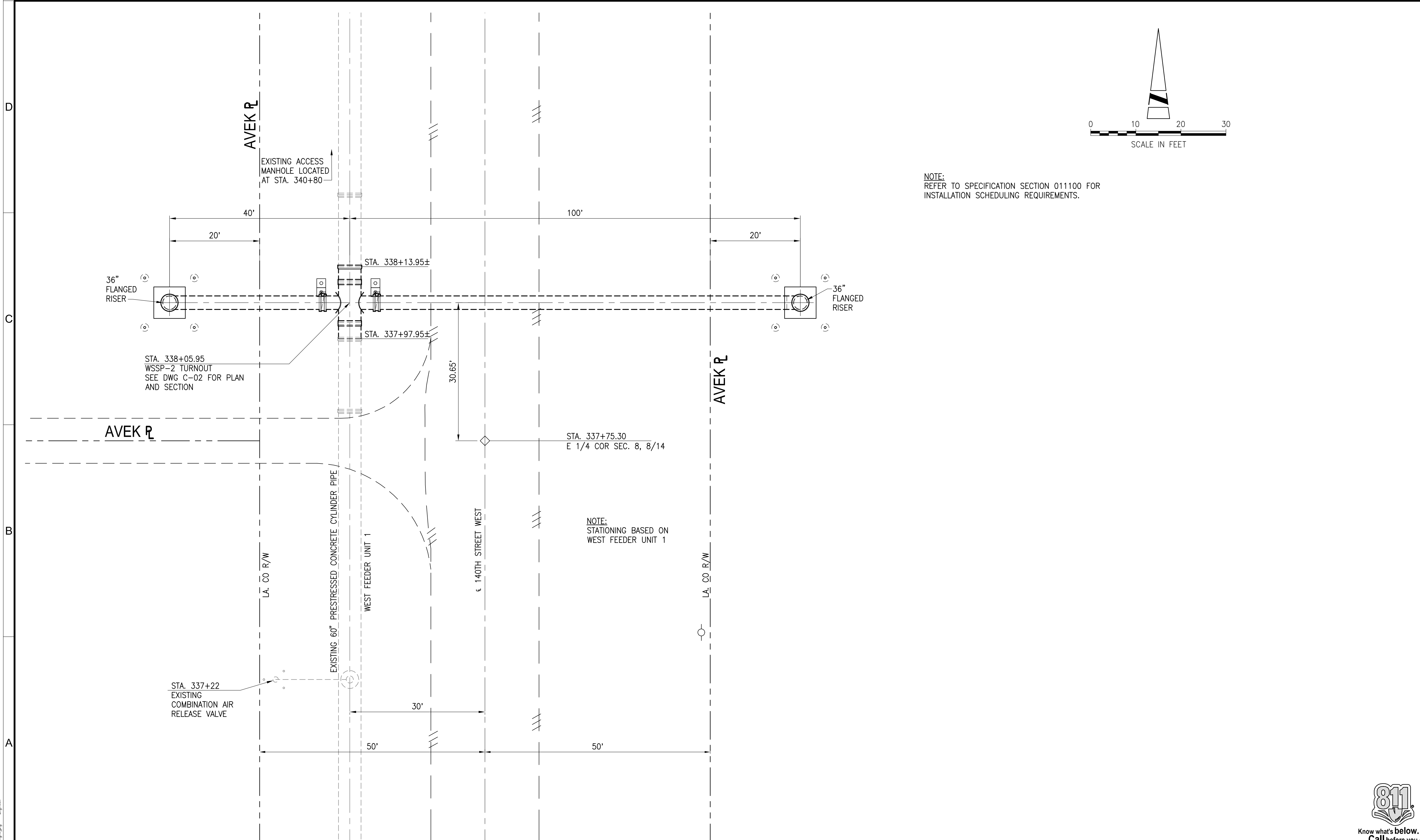

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REGISTERED PROFESSIONAL ENGINEER ERIC H. GARIBAY No. RCE 72121 EXP. 6-30-12 CIVIL STATE OF CALIFORNIA

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WSSP-2 TURNOUT

TURNOUT SITE PLAN

DRAWING: C-01
SHEET 3 OF 6 SHEETS
S-2465

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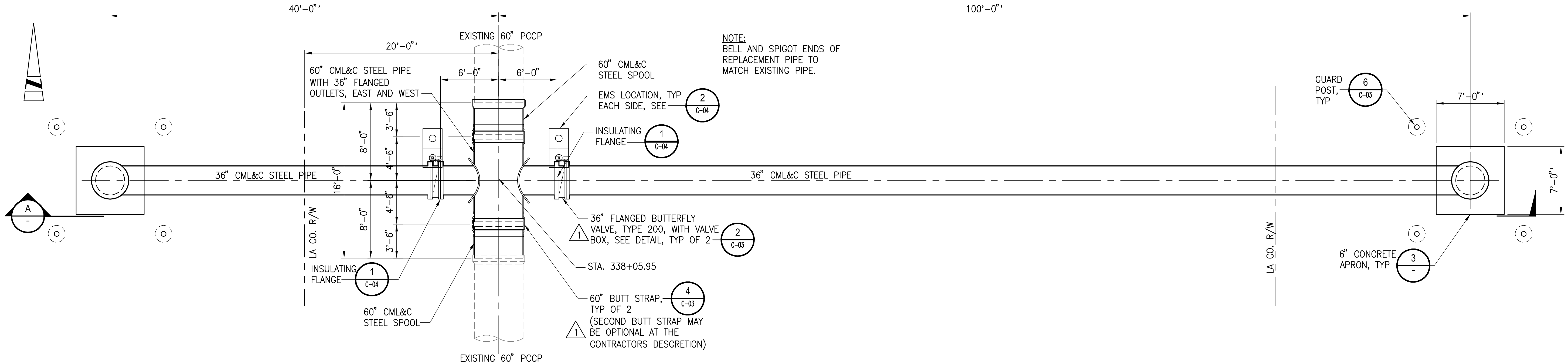

TURNOUT PLAN 1 -
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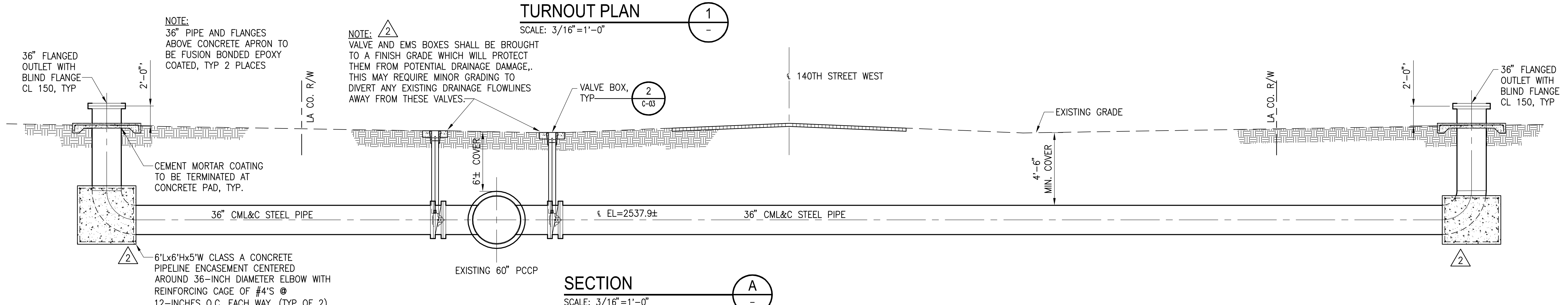

SECTION A -
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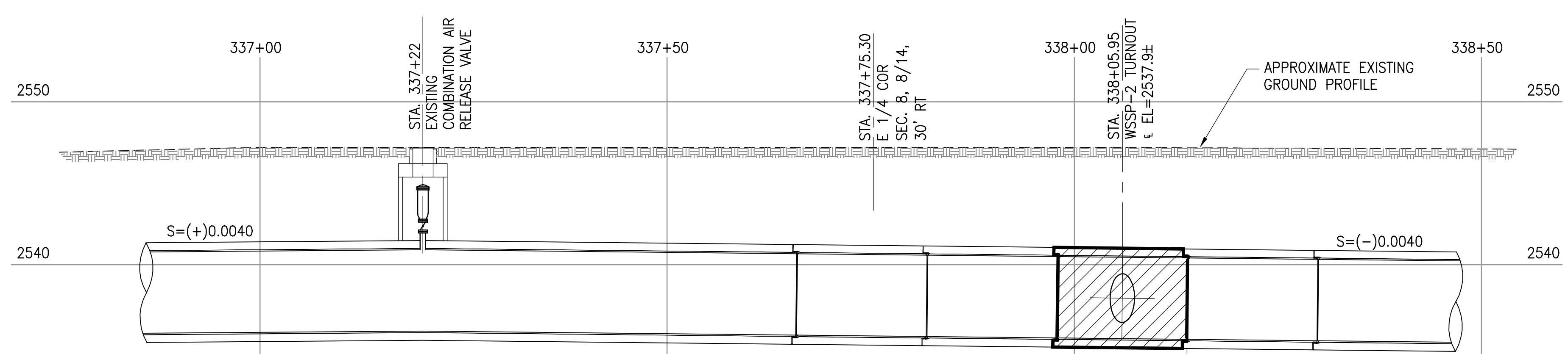
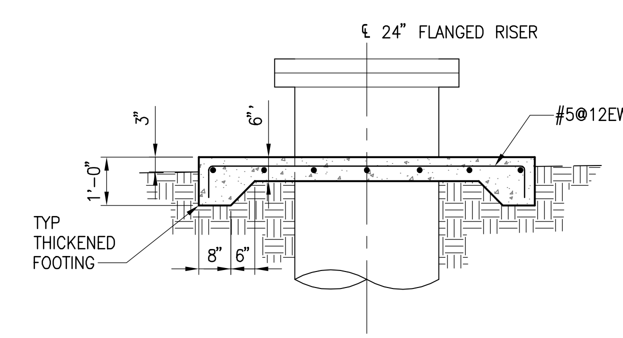


EXISTING WEST FEEDER UNIT 1 PROFILE 2 -
SCALE: HORIZ 1"=10'
VERT. 1"=5'



CONCRETE APRON 3 -
SCALE: 1/2"=1'-0"

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1	12-03-10	REVISED PER ADDENDUM NO. 1	BPH

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DESIGNED BY	BPH
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PROJECT ENGINEER	BEN P. HORN
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WSSP-2 TURNOUT

TURNOUT PLAN AND SECTION

DRAWING C-02
SHEET 4 OF 6 SHEETS
S-2465

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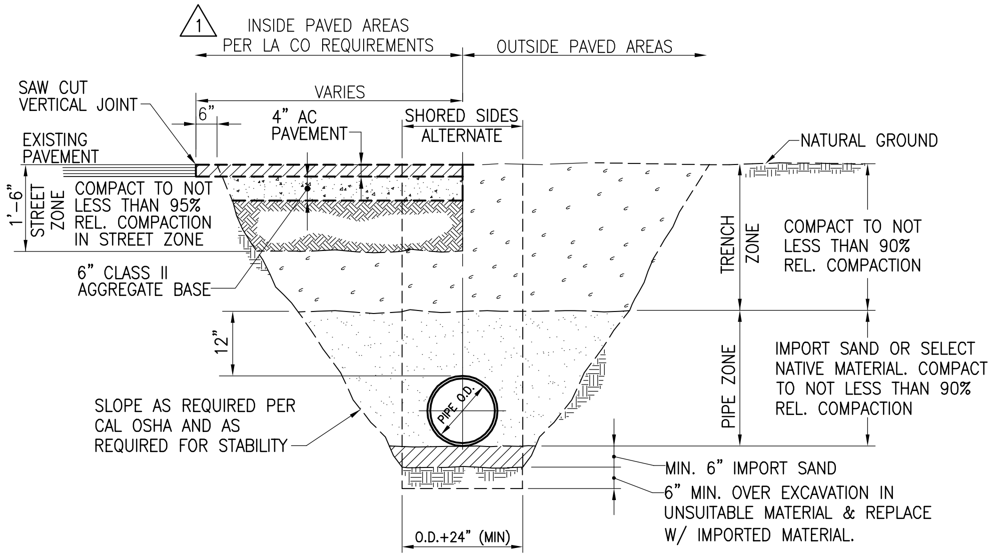
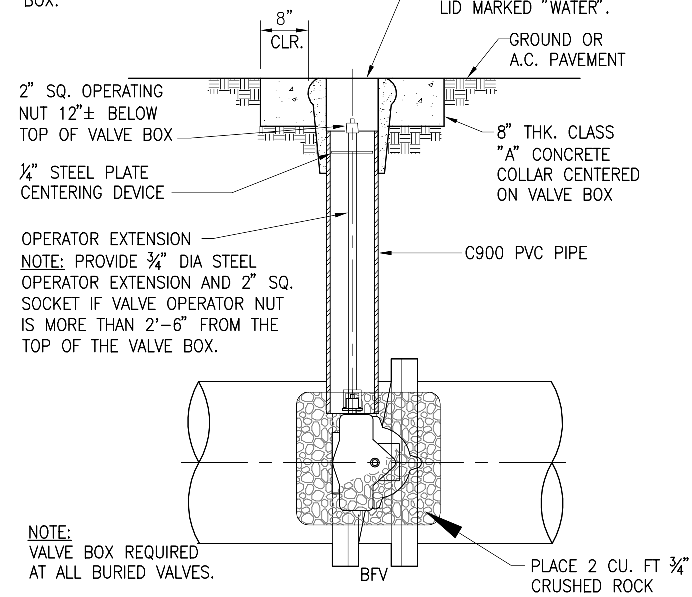


TYP. TRENCH DETAIL (1/–)

NOT TO SCALE

NOTE:
CONCRETE COLLAR SHALL BE POURED SQUARE AT A MINIMUM OF 8-INCHES CLEAR FROM THE O.D. OF THE VALVE BOX.

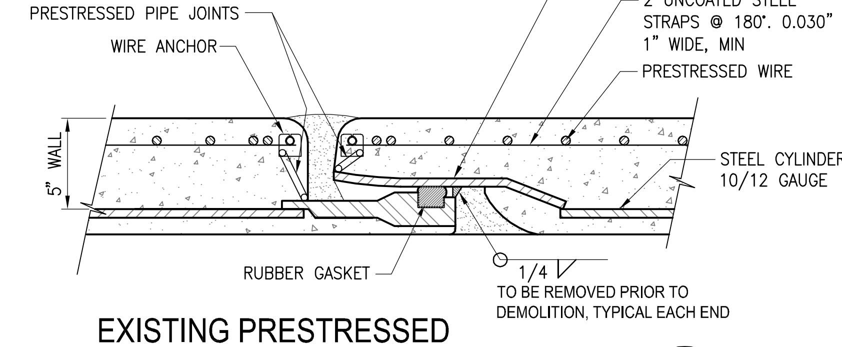


NOTE:
VALVE BOX REQUIRED AT ALL BURIED VALVES.

TYPICAL VALVE BOX (2/–)

NOT TO SCALE

NOTE:
⅜" MILD STEEL BONDS WELDED TO ANCHOR AND JOINT RINGS BY PIPE MF'R FOR ALL PRESTRESSED PIPE JOINTS



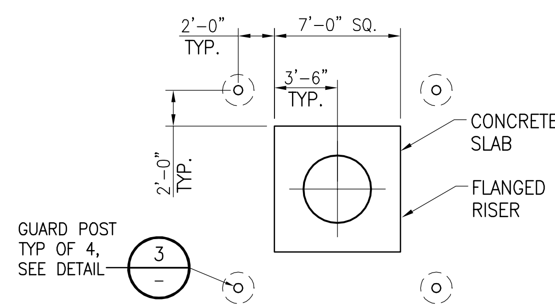
EXISTING PRESTRESSED CONCRETE CYLINDER PIPE JIONT (3/–)

NOT TO SCALE

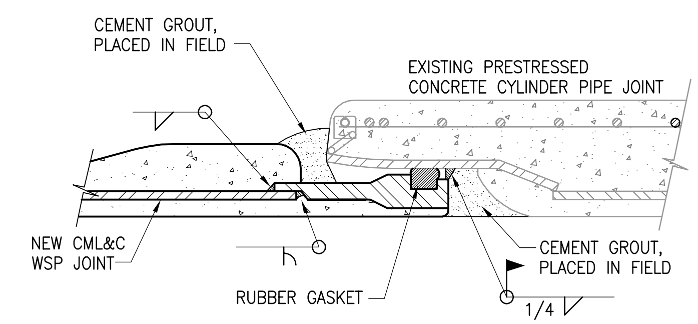
1 SEE ADDENDUM NO. 1, DRAWING C-03, TURNOUT PIPING DETAIL

NOTES:
1. REPLACE 16-FOOT JOINT OF PRESTRESSED CONCRETE CYLINDER PIPE WITH CEMENT MORTAR LINED AND COATED WELDED STEEL PIPE (PER SPECIFICATION SECTION 402063).
2. PRIOR TO FABRICATING REPLACEMENT PIPE SECTION VERIFY JOINT DETAIL AND LENGTH TO DETERMINE CML&C WSP JOINT REQUIREMENTS.
3. REMOVE 16-FOOT SECTION OF PRESTRESSED CONCRETE CYLINDER PIPE PER DWG. C-01.
NOTE-1/4-INCH FIELD WELD AT JOINT THAT WILL NEED TO BE REMOVED PRIOR TO SECTION DEMOLITION.
4. EXISTING PIPE JOINTS ON EACH END OF JOINT BEING REMOVED SHALL NOT BE DISTURBED.

NOTES:
1. PRIOR TO SUBMITTAL OF SHOP DRAWINGS CONTRACTOR SHALL VERIFY ELEVATION AND LOCATION OF EXISTING PIPE JOINT AND JOINT DETAILS TO PROVIDE PROPER CONNECTION.
2. BUTTSTRAP SHALL BE SHIPPED IN HALVES AND WELDED IN THE FIELD
3. PLATE THICKNESS SHALL BE EQUAL TO THE STEEL PIPE. MINIMUM THICKNESS SHALL BE 0.34".
4. SUBMIT SHOP DRAWINGS FOR REVIEW, CONSTRUCTION MATERIALS AND METHOD FOR TIE-IN.
5. CEMENT MORTAR COATING TO BE OMITTED IN AREA OF BUTT STRAP, MIN 6" CLEAR EACH SIDE.
6. REPAIR CEMENT MORTAR LINING AND PLACE CEMENT MORTAR COATING IN THE BUTT STRAP AREA IN ACCORDANCE WITH THE PIPE MANUFACTURERS REQUIREMENTS AND AWWA C205.



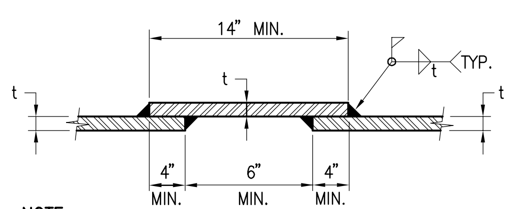
GUARD POST PLAN



REVERSE FOR OPPOSITE END OF JOINT

NEW CML&C WSP JOINT TO EXISTING PRESTRESSED CONCRETE CYLINDER PIPE JIONT (5/–)

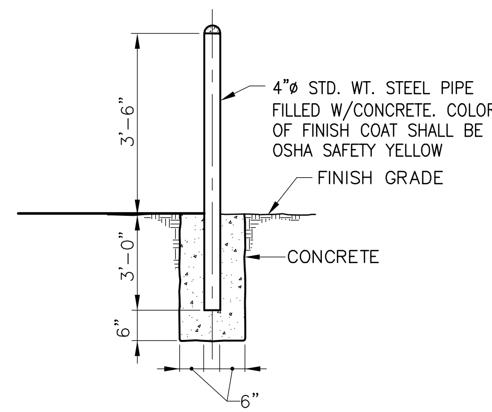
NOT TO SCALE



NOTE:
MINIMUM STEEL WALL THICKNESS AND FILLET WELD SIZE SHALL BE 0.34-INCHES

BUTT STRAP JOINT DETAIL (4/–)

NOT TO SCALE



GUARD POST (6/–)

NOT TO SCALE

Know what's below. Call before you dig.

REV	DATE	DESCRIPTION	APPR
1	12-03-10	REVISED PER ADDENDUM NO. 1	BPH

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DESIGNED BY: BPH
DRAWN BY: VENE
CHECKED BY: AR
DATE: NOV. 2010

PROJECT ENGINEER: BEN P. HORN
REG NUMBER: C 23028 EXP DATE: 12/31/11
PROJECT NUMBER: 60182837
CADD STANDARDS: AECOM

REGISTERED PROFESSIONAL ENGINEER ERIC H. GARIBAY No. RCE 72121 EXP. 6-30-12 CIVIL STATE OF CALIFORNIA

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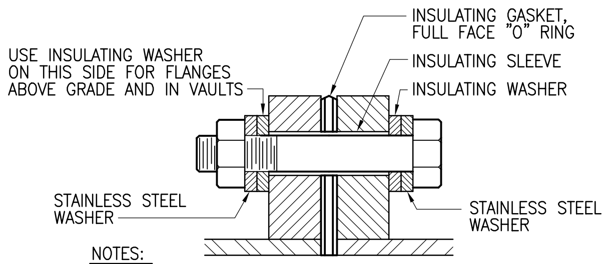
ANTELOPE VALLEY - EAST KERN WATER AGENCY
AVEK
ESTABLISHED 1959
A PUBLIC AGENCY

WSSP-2 TURNOUT
TURNOUT PIPING DETAILS

DRAWING C-03
SHEET 5 OF 6 SHEETS
S-2465

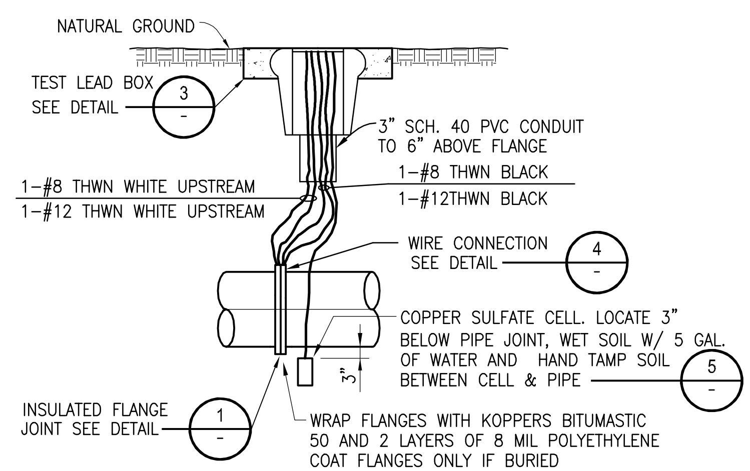
DWG: S:\A01\60182837\WSSP-2\CAD\Planset\C-01-C-04.dwg Layout Name: C-03 - Plotted by: Campbell, Vene Date: 12/27/2010 - 1:04 PM
XREFS: S2465G-BD IMAGES: cyn-sign.jpg - Sign.tif -



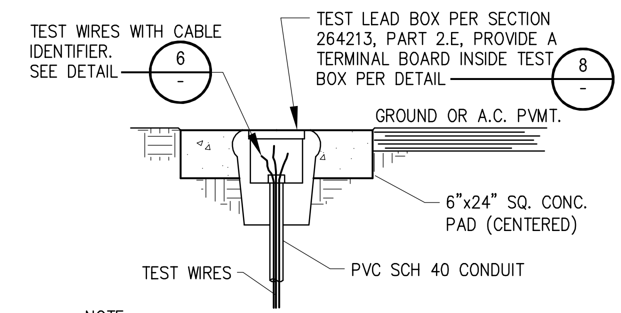
NOTES:

1. FOR CML&C STL. PIPE AND CCP STL. PIPE
2. PIPE SHALL INCLUDE E.M.S. PER DETAIL 2/– AT ALL BURIED INSULATED FLANGES.
3. PLACE NON–INSULATED FLANGE SIDE OF BOLT TOWARD VALVE
4. DO NOT APPLY METALLIC OR OTHER NON–INSULATING PAINTS TO INSULATING PARTS OR OTHER EDGES OF FLANGES
5. INSULATING SLEEVE TO BE 1/64" SHORTER THAN DISTANCE BETWEEN SST WASHERS WHEN BOLT IS FULLY TIGHTENED
6. INSULATING KIT TO BE PSI COMPANY TYPE "E" OR EQUAL.

INSULATED FLANGE 1/–
NOT TO SCALE

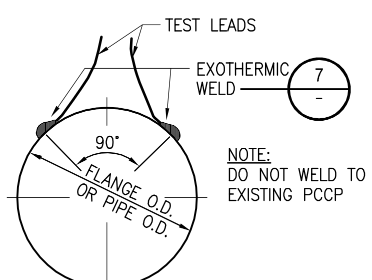


E.M.S. AT INSULATED FLANGE 2/–
NOT TO SCALE



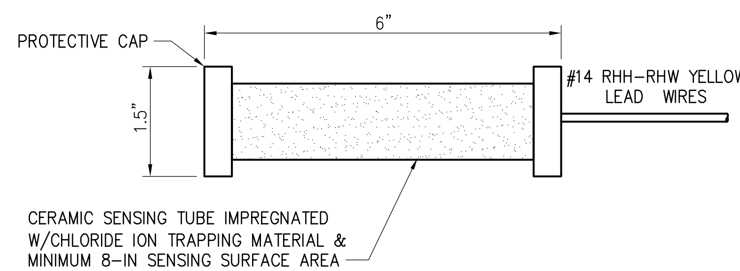
NOTE:
1. TEST BOX TO BE LOCATED ADJACENT TO VALVE BOX, SEE PLAN

TEST BOX 3/–
NOT TO SCALE

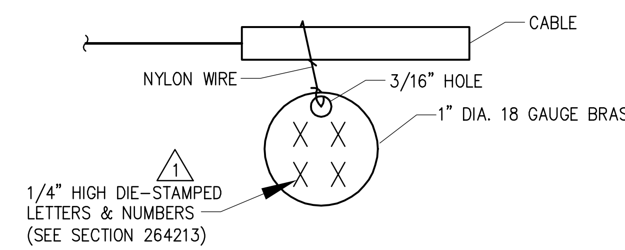


NOTE:
DO NOT WELD TO EXISTING PCCP

DETAIL 4/–
NOT TO SCALE



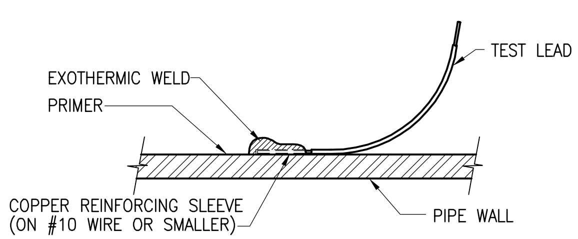
COPPER SULFATE REFERENCE CELL 5/–
NOT TO SCALE



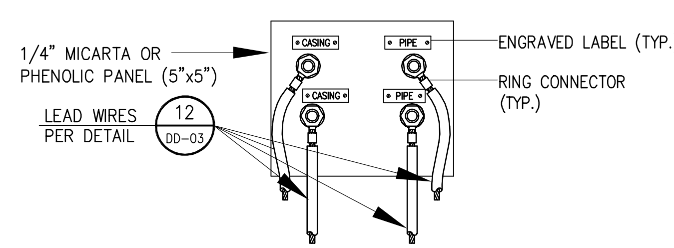
CABLE IDENTIFIER & BRASS TAG DETAIL 6/–
NOT TO SCALE

NOTES:

1. USE PROPER BRAZE ALLOY FOR STEEL
2. CLEAN PIPE TO BRIGHT METAL.
3. THERMITE BRAZE TO BE CADWELD BY ERICO PRODUCTS OR EQUAL.
4. TEST BRAZE BY STRIKING SIDE OF BRAZE SHARPLY WITH A HAMMER. IF THE BRAZE COMES OFF: RECLEAN, REWELD, AND RETEST.
5. COAT WITH MINIMUM 3/4–INCH CEMENT MORTAR.



EXOTHERMIC WIRE CONNECTION 7/–
NOT TO SCALE



E.M.S AT CASING

LEAD WIRE TERMINAL BOARDS 8/–
NOT TO SCALE

Know what's **below.** **Call** before you dig.

REV	DATE	DESCRIPTION	APPR
1	12–03–10	REVISED PER ADDENDUM NO. 1	BPH

VERIFY SCALES
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WSSP-2 TURNOUT

EMS DETAILS

DRAWING C-04
SHEET 6 OF 6 SHEETS
S–2465

Attachment 3 Exhibit
Mitigation Measures Monitoring and Implementation Plan

ANTELOPE VALLEY EAST KERN WATER AGENCY
WSSP-2: GROUNDWATER RECHARGE PROJECT

MITIGATED NEGATIVE DECLARATION
SCH#: 2008071013

Mitigation Monitoring and Reporting Program

AVEK WATER AGENCY
6500 West Avenue N
Palmdale, CA 93551-2855

August 2008

MITIGATION MONITORING AND REPORTING PROGRAM

1. General

The Mitigated Negative Declaration for the Antelope Valley-East Kern Water Agency (AVEK) WSSP-2 Groundwater Recharge Project specified a number of impact avoidance, minimization, and monitoring measures to be undertaken during implementation of the Proposed Project. During implementation, it is essential that all of these be fully complied with and that compliance be documented clearly and in a timely manner. Failure to *comply* and/or *document compliance* could result in a challenge to the project and could result in serious and costly project delays.

A Mitigation Monitoring and Reporting Program (MMRP) has this been prepared for the Project and has been adopted concurrently with these Findings. (See Pub. Resources Code, § 21081.6, subd. (a)(1)). AVEK will use the MMRP to track compliance with Project mitigation measures. The final MMRP incorporates all mitigation measures adopted for the Project. In adopting the Mitigated Negative Declaration for the Proposed Project, AVEK's Board of Directors therefore also adopt this MMRP.

2. Responsibility for Compliance and Documentation

Implementation of the MMRP will be the responsibility of AVEK, which will assign a project manager to oversee all aspects of implementation of the proposed project and ensure that the mitigation and monitoring commitments made in the MND are carried out in a timely and effective manner. In implementing the MMRP, AVEK will often rely on the expertise and staff of outside contractors. Specifically, the day-to-day implementation of construction-related mitigation, such as measures for control of dust during construction, will be delegated to the construction contractor. To ensure the effectiveness of this mitigation and monitoring, AVEK will:

- Make the MMRP an element of all project-related requests for proposals and contract specifications, specifying that construction contractors will be responsible for appropriate acquisition of permits for construction and implementation of relevant mitigation and monitoring elements, as specified in this MMRP;
- Independently review contractor compliance on a regular basis and require corrective actions in a timely manner when AVEK determines that such actions are required;
- Maintain files, open to the public for inspection, documenting compliance with the MMRP, as outlined below;
- Designate an AVEK staff member to receive and respond to all public and agency comments, complaints, and/or questions regarding compliance with the MMRP; and
- Provide regulatory agencies with appropriate and timely documentation of compliance as specified in regulatory permits issued for the proposed project.

Table 1 (General Compliance Checklist) outlines the implementation process for each element of the MMRP. When an element of the MMRP is implemented, AVEK will manage compliance and use the checklist to document that it has implemented the specific MMRP elements required by the commitments of the Mitigated Negative Declaration (MND). AVEK may modify Table 1 to suit the specific requirements of any individual MMRP requirement.

Table 1. Suggested General Compliance Checklist

MMRP REQUIREMENT	PERSON CERTIFYING COMPLIANCE	INITIALS
PROJECT ELEMENT OR SITE NAME: ___________________________		
Contact local city to obtain encroachment permit requirements		
MMRP requirements included in RFP		
MMRP requirements included in Contract Scope		
AVEK Opens compliance file		
Contractor has designated compliance contact for project		
AVEK has designated compliance contact for project		
AVEK/contractor has developed schedule for coordination with regulatory agencies		
AVEK has determined necessary pre-activity training requirements		
Pre-activity training requirements have been developed		
Pre-activity training has been conducted		

In addition, AVEK shall require that construction contractors shall designate a principal mitigation and monitoring manager (Principal) and back-up compliance manager (Alternate) for each construction site and shall ensure that at least one of these is on-site during all phases of construction. In addition, for activities which may cause fugitive dust, either the Principal or Alternate must be available on weekends to respond to fugitive dust complaints (if any) and to respond to security and other issues. These persons may perform other tasks, but shall have adequate time, training, and expertise to perform the required monitoring and documentation. The Principal shall be the contractor's construction field supervisor or assistant field supervisor. The Principal or Alternate shall independently verify compliance with required mitigation measures and shall indicate verification by filling out and signing the appropriate compliance checklist, thereby certifying compliance with all measures.

AVEK will also, at its discretion and as indicated in the MMRP, contract for specialized technical expertise related to compliance with biological resources, cultural resources, and other compliance activities which may be outside of the staff capabilities of construction contractors and/or which require independent oversight.

In addition, AVEK's contracts shall specify that AVEK may at any time inspect construction sites and construction monitoring records, which shall be available and maintained in good order on site at all times.

As part of implementation of this general strategy for implementation of the MMRP, AVEK will maintain a complete list of designated internal and contractor compliance staff in a format similar to that listed below. If required, AVEK will notify appropriate agencies of the names and contact numbers of the AVEK compliance oversight personnel for the element of the project MMRP regulated by the agency.

For example, when preparing and implementing a Fugitive Dust Plan, AVEK will notify the AVAQMD and KCAPCD of the AVEK contact points for these plans and their implementation.

Table 2. Suggested Compliance and Monitoring Staff Tracking Form

Responsible Party	Role in Project	Compliance Contact	Main Phone	Cell Phone
AVEK	Compliance oversight	Principal:		
		Alternate:		
Construction Contractors	Well Construction (Site location)	Principal:		
		Alternate:		
	Recharge Basin Const. (Site location)	Principal:		
		Alternate:		
	Pipeline Const. (Site location)	Principal:		
		Alternate:		
Independent Contractors		Principal		
		Alternate		
		Principal:		
		Alternate:		
		Principal:		
		Alternate:		
		Principal		
		Alternate		

3. Permits and Coordination

The MND identifies a number of permits which may need to be obtained for various aspects of the Proposed Project, as well as commitments to coordinate design, pre-construction, and construction activities with various local, regional, State of California, and federal agencies. Permits and coordination commitments are:

- Kern County encroachment permit for any work in the public right of way
- Los Angeles County encroachment permit for any work in the public right of way
- Caltrans encroachment permit for work along Highway 138
- California Department of Public Health Public Water System Permit for wells and water treatment facilities
- Lahontan Regional Water Quality Control Board approval of a Storm Water Pollution Prevention Plan
- California Department of Fish and Game Streambed Alteration Permit (if defined drainages are impacted)

4. Incidents and Compliance Reporting

Timely reporting of compliance and of any incidents which may result in non-compliance is essential. Contracts for construction and for independent compliance contractors shall therefore specify that, if the designated construction contractor or independent monitor for an activity determines that any aspect of construction is not in substantive compliance with the mitigation requirements for the activity, the contractor and/or monitor shall immediately take action to remedy the problem. The designated monitor shall notify AVEK within not more than 24 hours following determination that any aspect of construction activity is not in compliance with mitigation requirements, shall explain how the incident has been addressed, and shall provide any other information requested by AVEK. Following action to address the out-of-compliance incident, the designated monitor must complete an "incident report" and submit a copy of this report to the AVEK compliance manager within one week of the incident.

5. Mitigation and Monitoring Program Updates

AVEK recognizes that laws, regulations, and policies related to construction activities may change during construction. The AVEK compliance manager and/or alternate are responsible for periodically reviewing the status of laws, regulations, and guidelines applicable to their construction activity. AVEK will implement any new rules in effect at the time of approval. Updates for some aspects of the project may be obtained from:

- Air Quality: Antelope Valley Air Quality Management District and Kern County Air Pollution Prevention District
- Traffic Controls: Both Caltrans and local cities comply with the OSHA *Manual of Uniform Traffic Control Devices* (www.osha.gov/doc/highway_workzones/mutcd).
- Threatened and Endangered Species: USFWS Ventura Office; CDFG Region 6 Office in Bishop

6. Staff Awareness

Staff must be informed of mitigation and monitoring requirements prior to construction. New staff must be oriented when they come on site. The Principal/Alternate therefore needs to review compliance requirements and monitoring requirements for the job with all personnel on site to ensure that they know the requirements, know the importance of compliance, know that violations must be reported, and know that compliance is a condition of employment on this job. Similarly, a summary list of mitigation and monitoring requirements shall be posted in a conspicuous location at the job site so that they may be referred to at any time. Staff that repeatedly violate mitigation and/or monitoring requirements shall be removed from the job site.

7. Training

If specialized expertise is necessary for mitigation or monitoring, the construction contractor shall provide such training to the person responsible for compliance and/or monitoring. For example, maintenance of equipment may be required to comply with Air Quality mitigation requirements. The construction contractor shall ensure that staff with adequate expertise for this activity are available to perform it. Similarly, monitoring may require the use of specialized equipment; staff with expertise, training, and/or experience in the use of such equipment must be available on a timely basis. All staff will receive training related to cultural resources compliance and, where there is potential for construction to affect protected environmental resources, biological resources compliance.

8. On-going Documentation

Compliance will be monitored on a timely basis, depending on the nature of the activity and the mitigation requirement. For example, for control of fugitive dust, trucks hauling loads of soil, rock, and other materials that may generate dust from the construction site must be covered. It is appropriate and necessary to document that each truck has been covered prior to allowing the truck to leave the construction site.

Where appropriate. photo documentation of pre-construction conditions, of activities during construction, of any incidents that may constitute a violation of mitigation requirements, and of post construction conditions is encouraged. However, if photo documentation is adopted as a monitoring tool, then it must be used consistently to ensure that there are records of all activities for which compliance must be documented. Labels must be explanatory and contain adequate information about the photographer, date, time, and conditions when the photo was taken. Photo documentation shall be backed up with paper copies and/or records on CD/DVD.

AVEK may audit records of compliance with mitigation and monitoring requirements at any time and compliance records must be readily available and in good order. Logs of mitigation and monitoring compliance should be maintained and supporting documentation should be provided in parallel to the log, in the same file. Files should be clearly labeled by the type of compliance being monitored. AVEK and its construction manager and other contractors will maintain such records in a form suitable for the required monitoring and reporting. It is anticipated that contractors will generally have appropriate monitoring templates for typical construction activities. In other cases, the format of compliance monitoring records may be available from the regulatory agency approving the monitoring (if any).

9. Pre-Construction Training

Prior to initiation of construction activity, AVEK will review the mitigation commitments in this MMRP and will determine the need for pre-construction training. AVEK and its contractors will prepare appropriate training materials and provide appropriate training to construction staff to ensure that they fully understand compliance and reporting requirements. It is anticipated that pre-construction training may be necessary for the following:

- Activities that involve excavation (cultural, biological, dust, noise, traffic)
- Activities that involve use of heavy equipment (dust, noise)
- Activities in the vicinity of trees (biological)
- Activities in the vicinity of public and private utilities

10. Mitigation and Monitoring requirements

10.1 Aesthetics

MMRP COMMITMENT

The MND commits AVEK to implement the following measures to reduce the potential impacts of the project on local community aesthetic resources:

A-1: Design for above ground facilities compatibility. As part of the development of this facility, AVEK will develop a design and coloration for the facility which would be consistent with the community character. For example, AVEK would consider painting the water storage tank to further reduce its visual impact by making its coloration blend in with the surrounding vegetation.

A-2: Partial Tank Burial. AVEK will minimize impacts by partially burying water storage tanks to reduce their visual impact.

A-3: Screening. AVEK will plant and maintain trees and other vegetation to screen the view of water storage tanks from nearby residences and roads. Colored fencing will be used.

A-4: Lighting. AVEK will provide for any lighting to be directed away from nearby residences. Outside lighting will on during operation and maintenance during recovery operations. When personnel are not on site, outdoor lighting will be turned off.

A-5: Siting. AVEK will site its water storage, treatment, and pumping facility at least 250 yards to the west of 80th Street west.

IMPLEMENTATION

AVEK's compliance manager for the Proposed Project will incorporate these mitigations into the design and construction contracts for the project and will review plans and other design materials to ensure that these measures are implemented.

10.2 Agriculture

No mitigation was proposed or needed.

10.3. Air Quality

MMRP COMMITMENT

In the MND, AVEK committed to implement the following mitigations for project air quality impacts:

GENERAL: AVEK will comply with all applicable AVAQMD and KCAPCD rules and incorporates these rules by reference into this Mitigated Negative Declaration and will implement Best Available

Control Measures from AVAQMD (2005 and any appropriate updates) that are appropriate and applicable to the Proposed Project. AVEK will prepare a Fugitive Dust Management Plan for the project. Pending adoptions of agricultural dust control measures by the AVAQMD, AVEK and the grower will also develop an appropriate plan for reducing fugitive dust emissions during agricultural use, considering a suite of potential agricultural emissions measures shown on Table 3.

Table 3. Best Available Control Measures (BACMs) to be considered to minimize emissions from farming (San Joaquin Valley Air Pollution Control District and Imperial County APCD).

Best Available Control Measure	Description
COMBINED OPERATION	Combine equipment, to perform several operations during one pass.
CONSERVATION TILLAGE	Types of tillage that reduce loss of soil and water in comparison to Conventional Tillage
COVER CROPS	Use seeding of plants to cover soil surface. It reduces soil disturbance due to wind erosion and entrainment.
EQUIPMENT CHANGES/TECHNOLOGICAL IMPROVEMENTS	Modify the equipment such as tilling; increase equipment size; modify land planning and land leveling; matching the equipment to row spacing; granting to new varieties or other technological improvements.
PRE-HARVEST SOIL PREPARATION	Apply a light amount of water or stabilizing material to soil prior to harvest (when possible).
RESTRICTED ACCESS	Restrict public access to private roads.
SPEED LIMITS	Enforcement of speeds that reduce visible dust emissions.

Although AVEK will apply the BMP's approved by AVAQMD (2005 and subsequent) as appropriate, AVEK commits to the following specific Air Quality Mitigation measures.

Measure AIR-1: Fugitive Dust Control BMP's

AVEK will prepare and implement a Fugitive Dust Control Plan, and as applicable to the Proposed Project will adopt the following AVAQMD and KCAPCD recommended control measures for construction emissions of PM10:

1. All material excavated or graded will be sufficiently watered to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. Watering will occur a minimum of twice daily on unpaved/untreated roads and on disturbed areas with active operations.
2. All clearing, grading, earth moving and excavation activities will cease during periods when either wind speeds exceed 25 mph or dust plumes of 20 percent or greater opacity affect public roads or occupied structures.
3. All material transported off site will be either sufficiently watered or securely covered to prevent excessive dust.
4. If more than 5,000 cubic yards of fill material will be imported or exported from the site, then all haul trucks will be required to exit the site via an access point where a gravel pad or grizzly has been installed.
5. Areas disturbed by clearing, earth moving or excavation activities will be minimized at all times.
6. Stockpiles of dirt or other fine loose material will be stabilized by watering or other appropriate method to prevent wind-blown fugitive dust and covered with tarps as needed.

7. Where acceptable to the fire department, weed control will be accomplished by mowing instead of discing, thereby leaving the ground undisturbed and with a mulch covering.
8. When material are transported off-site, all material shall be covered, effectively wetted to limit visible dust emission, or at least six inches of freeboard space from the top of the container shall be maintained.
9. All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. (the use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)
10. Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
11. Traffic and speeds on unpaved roads will be limited to 15 mph.
12. Sandbags or other erosion control measures are installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.

Measure AIR-2: Vehicle Emissions Control BMPs

1. During project construction, on-site mobile equipment shall be equipped with NOx reduction equipment and/or newer NOx limited engines will be required.
2. On-site mobile equipment will be equipped with PM_{10} pollution control devices and/or newer, less polluting equipment will be required (either lower emissions diesel or alternative fuels engines).
3. On-site equipment will utilize aqueous diesel fuel.
4. AVEK will comply with all current and future Regulation VIII rules.
5. AVEK will require that all diesel engines be shut off when not in use to reduce emissions from idling.

Measure AIR 3: Coating BMPs

AVEK will adopt architectural coatings measures consistent with ARB's Suggested Control Measure (SCM) which limits the content of VOC in architectural coatings to between 100-730 g/l. ARB's SCM was adopted in June 22, 2000.

<u>IMPLEMENTATION</u>

AVEK will incorporate the above commitments into all construction and management contracts for the proposed project. For on-going operational elements of the proposed project, AVEK will appoint a compliance manager who will develop and implement monitoring and management procedures. The compliance manager will make annual reports to the Board of Directors regarding compliance with on-going commitments. The annual report will be transmitted to the AVAQMD and KCAPCD within 1 month following Board acceptance.

10.4 Biological Resources

MMRP COMMITMENT

The MND commits AVEK to implementation of the following impact avoidance and minimization measures.

Mitigation Measure BIO-1: Preconstruction surveys shall be conducted by a qualified biologist within the work area and a 250-foot buffer to locate active burrowing owl burrows. The Project will provide a qualified biologist to conduct these preconstruction surveys for active burrows according to DFG guidelines. The preconstruction surveys will include a nesting season survey and a wintering season survey the season immediately preceding construction. If no burrowing owls are detected, no further mitigation is required. If burrowing owls are detected within 250 feet of proposed construction within the Project area, the following measures will be implemented:

- Occupied burrows will not be disturbed during the nesting season (February 1–August 31).
- When destruction of occupied burrows is unavoidable during the non-nesting season (September 1–January 31), unsuitable burrows will be enhanced (enlarged or cleared of debris).
- If owls must be moved away from the Project area, passive relocation techniques (e.g., installing one-way doors at burrow entrances) will be used instead of trapping. At least 1 week will be necessary to accomplish passive relocation and allow owls to acclimate to alternate burrows.
- If avoidance is the preferred method of dealing with potential impacts, no disturbance should occur within 160 feet of occupied burrows during the non-breeding season (September 1–January 31) or within 250 feet during the breeding season.

Mitigation Measure BIO-2: If construction activities occur during the Swainson's hawk nesting season (March 1–September 15), the Project will provide a qualified biologist to conduct preconstruction surveys to locate all active nest sites within 0.5 mile of the construction area. If occupied Swainson's hawk nests are found, the Project, in consultation with DFG, shall establish a buffer zone around active Swainson's hawk nests in the vicinity of the Project area. The buffer zone shall be marked with specific identifiable flagging or fencing. Construction activities shall be restricted from the buffer around the active nests until after chicks have fledged. Whenever construction occurs within 0.25 mile of an active nest, a biological monitor shall observe the nesting hawks for stressed/detrimental behavior that threatens nest success. If there appears to be a threat to nesting success resulting from construction activity within the 0.25-mile buffer, work shall be halted until the hawk's behavior normalizes. The most obvious and dangerous "detrimental behavior" occurs when the hawk is scared off the nest. If that occurs (even momentarily), construction shall stop immediately within 0.25 mile of the nest for at least 1 hour after the hawk returns to the nest and her behavior appears to normalize. When construction resumes, if the hawk is scared off the nest a second time, construction will be prohibited within that 0.25-mile zone until having consulted with DFG to discuss further options. Other stressors/detrimental behaviors that the monitor shall look for include the hawk being off the eggs while still on the nest (e.g., circling/walking around the nest and calling). The biological monitor shall also watch for signs that the hawks are paying attention to construction instead of behaving normally (e.g., sitting calmly on the nest, watching out for or scaring away potential predators).

Mitigation Measure BIO-3. AVEK would preclude impacts to wildlife using the pipeline alignment or the area near the storage tanks as a movement corridor by isolating the area of open excavation with a mesh construction fencing. This will generally prevent animals from accessing the trench and becoming trapped. In addition, the contractor will also cover the pipeline opening before leaving the site to prevent animals from entering the pipeline and will place ramps at either end of the open trench so that any animals getting through the fence may easily escape the trench. When the new construction day begins, the crews will open the exclusion fence at each end to allow animals to escape. In addition, if construction equipment is to be stored on site overnight, AVEK will also contract with a qualified biologist to provide construction crews with training on how to recognize and avoid impacts to animals that may use the shelter of construction equipment. The training will stress that if animals are found beneath equipment, the biologist should be contacted and animals should be allowed to move away from the site before equipment is moved.

<u>IMPLEMENTATION</u>

The timing of implementation of each of the above mitigation measures is shown on Table 4

Table 4. Schedule of Biological Resources Mitigations.

Mitigation Measure	**Month when mitigation element applies**											
	J	F	M	A	M	J	J	A	S	O	N	D
BIO 1 Survey Required												
BIO-1 Nest Avoidance												
BIO-1 Non-nesting												
BIO-2 Nest Avoidance												
BIO-3 construction monitoring												

To implement these mitigation measures, AVEK's compliance manager for the project will contract with a qualified biologist for pre-construction survey and construction monitoring (as appropriate to the requirement) at least 1 month prior to initiation of construction. As needed, the biologist will provide construction staff training. The biologist will be on-call during the period when the appropriate mitigation requirement is implemented. The biologist shall have authority to halt construction activities or re-direct such activities if it is determined that construction is having an adverse impact on any protected species. AVEK will ensure that any unanticipated impacts to protected status species are immediately reported to California Department of Fish and Game and US Fish and Wildlife Service.

10.5 Cultural Resources

MMRP COMMITMENT

The MND commits AVEK to implement the following mitigation measures, which emphasize avoidance and minimization of impacts.

CR-1 Avoidance of impacts: AVEK will consult with the grower and a professional archeologist regarding the appropriate continued use of lands at Æ -AVEK 1and may allow continued farming consistent with implementation of practices that avoid impact to this site.
CR-2 Cultural Resources Testing and Evaluation: If avoidance of Æ-AVEK-1 through Æ-AVEK-5 is not a feasible management option, then Phase-II testing efforts will be conducted at each of these sites to determine the presence/absence of buried cultural deposits, the content, integrity, and data potential of these buried cultural deposits if present, and the site's eligibility for inclusion in the CRHR.
CR-3: Cultural Resources Management During Construction: Considering that the extensive cultural deposits identified at Æ-AVEK-1 appear to be emanating from a buried cultural stratum lacking surface manifestations, and these deposits are only evident within areas where ground disturbance has intruded into and/or exposed this cultural stratum, potentially significant archaeological resources lacking surface manifestations may also be encountered in buried contexts during Project construction in areas other than those already identified. If potentially significant archaeological resources are discovered during construction and implementation of the proposed Project, these resources must be inventoried and evaluated to ascertain whether the resource meets the criteria for listing on the California Register of Historical Resources. Therefore, in the event of an accidental discovery of cultural resources during Project construction and implementation, all work being conducted within the vicinity of the discovery will be halted or diverted away from the site of discovery until a qualified archaeologist can assess the potential significance of the find.
CR-4: Compliance with all applicable Regulations: AVEK will comply with Health and Safety Code 7050.5, CEQA 15064.5(e), and Public Resources Code 5097.98, which mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

IMPLEMENTATION

AVEK will engage the services of a qualified archeologist to (a) provide pre-construction training for crews and (b) be on-call during construction activities that have potential to impact cultural resources, as noted above. Archeological crews will instruct construction crews regarding (1) the possibility of unearthing cultural artifacts during construction, (2) the types of artifacts which may be unearthed and how to recognize them, and (3) the requirement that they immediately halt work when such artifacts are unearthed.

Construction contractors will develop scheduling and phasing alternatives for each project element to allow construction to proceed at another site while any archeological resources identified during construction are treated in accordance the commitments made in the MND.

AVEK will retain archeological monitors during construction for ground-disturbing activities that have the potential to impact significant archeological remains as determined by a qualified archeologist. Based on this policy and the results of literature search and field surveys, AVEK would implement the monitoring provision above for the following facilities:

- Well field delivery pipelines
- Pipelines connecting the recharge area to the storage, treatment, and pumping facility
- Excavation of the storage tank

Because previously unrecorded and/or unanticipated archaeological deposits, features, and Native American burials may be encountered during implementation of the Project, the Project Archaeologist would prepare a *Construction Phase Monitoring and Cultural Resources Treatment Plan* prior to Project construction. The purpose of this *Plan* would be to clearly outline and expedite the process by which the Mojave Water Agency will resolve any significant impacts upon newly discovered, historically significant cultural resources, including consultation with the State Historic Preservation Officer (SHPO), thereby eliminating untimely and costly delays in construction. Specifically, the *Plan* would outline the process by which cultural resource discovery notifications are made and treatment plans are implemented, describe the cultural resource classes anticipated during Project construction, describe the treatment options for each cultural resource class, and detail procedures for implementing treatment. In addition, the *Plan* would summarize the Native American involvement in the Project (including a sample Native American Burial Agreement), outline the procedures for curation of materials recovered during site treatment (including a proposed Archaeological Curation Agreement with a facility that meets California curation standards), and address report requirements. This *Plan* would be submitted to the SHPO for review and comment prior to Project construction.

10.6. Energy Use

MMRP COMMITMENT

AVEK is committed to energy conservation. In addition to the innovative approach to recharge basin design and operation, to minimize energy use associated with the project, AVEK will:

- Install electric pumps on extraction wells to take advantage of the wind-driven power generators in the AVEK area;
- Install energy efficient machinery and lighting at its in-line treatment facilities; and
- Require construction contractors to utilize efficient construction equipment and manage this use to minimize waste by turning off equipment when it has been idling for longer than 5 minutes.

IMPLEMENTATION

These commitments will be incorporated into design and construction contracts, which shall be reviewed by the project compliance manager. Construction site supervisors shall be responsible for ensuring idling restrictions are enforced.

10.7 Geology and Soils

MMRP COMMITMENT

The MND commits AVEK to implement a suite of impact avoidance and minimization measures for potential impacts to geology and soils:

Mitigation Measure GEO-1. To control water erosion during construction and operation of the Project, AVEK will prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) General Construction Permit.

Mitigation Measure GEO-2. Although the proposed project has little inherent potential for causing seismic safety effects, AVEK will ensure that all facilities are designed to withstand the anticipated seismic forces, consistent with local and state building codes and relevant regulations.

Mitigation Measure GEO-3. AVEK will install shut off valves on major pipelines and at the in-line water treatment units and monitor them (in the same manner that it presently monitors water supply operations) to minimize the potential for leakage during seismic events.

Mitigation Measures GEO-4. AVEK will store water treatment chemicals in secondary containment units to minimize the potential for leakage during seismic events.

Mitigation Measure GEO-5. Although the potential for the project to raise groundwater levels to within 30-50 feet of the ground surface is very small, to address potential impacts to local groundwater levels, AVEK, in cooperation with USGS, CDPH, and other regulatory agencies with jurisdiction over groundwater recharge recovery, will develop a monitoring program to monitor changes in water levels in the area affected by groundwater recharge operations. If monitoring identifies groundwater level rise to 75 feet below ground surface, AVEK would alter management of recharge to prevent water levels from rising to levels where liquefaction effects could occur. This commitment to cooperative monitoring extends to water quality monitoring as well.

Mitigation Measure HAZ-1. Consistent with AVEK's existing practices and recognizing that AVEK employs personnel with hazardous materials handling training, AVEK will develop and implement a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all state and federal water quality regulations. The SPCCP will be reviewed by agencies with jurisdiction over this aspect of the Proposed Project before the onset of construction activities. AVEK shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

IMPLEMENTATION

AVEK's compliance manager shall ensure that the above mitigation measures are incorporated into construction and operation contracts and/or internal AVEK manuals for operations. The compliance manager shall annually review requirements for management of hazardous materials and AVEK shall update equipment and procedures to provide for compliance.

If construction and operation result in storm water runoff with adverse consequences, AVEK will inform the RWQCB of this and shall update its SWPPP accordingly in coordination with the RWQCB.

If construction and operation result in hazardous spills, AVEK will inform the RWQCB and update its SPCCP accordingly.

10.8 Hazards and Hazardous Materials

<u>MMRP COMMITMENTS</u>

The MND commits AVEK to implement the following impact avoidance and minimization measures to address the potential for impacts related to hazardous materials spills, aircraft-bird strikes, and mosquito abatement.

Mitigation Measure HAZ-1. Consistent with AVEK's existing practices and recognizing that AVEK employs personnel with hazardous materials handling training, AVEK will develop and implement a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all state and federal water quality regulations. The SPCCP will be reviewed by agencies with jurisdiction over this aspect of the Proposed Project before the onset of construction activities. AVEK shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

The federal reportable spill quantity for petroleum products, as defined in EPA's CFR (40 CFR 110), is any oil spill that 1) violates applicable water quality standards, 2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or 3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. If a spill is reportable, the contractor's superintendent shall notify the applicant who shall inform the applicable County agency and arrange for the appropriate safety and cleanup crews to ensure the spill prevention plan is followed. A written description of reportable releases must be submitted to the Regional Water Quality Control Board and the applicable County agencies. This submittal must include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases would be documented on a spill report form. If a spill has occurred, the applicant shall coordinate with responsible regulatory agencies to implement measures to control and abate contamination.

This mitigation measure shall be applied to the 5 existing sites on the recharge alternative areas where preliminary studies indicate that there may have been spills of petroleum products or agricultural chemicals. These sites shall be remediated per the SPCCP prior to introduction of recharge waters to the affected areas.

Chemical handling for the in-line treatment units would be in accordance with best management practices. Chemicals of concern would be stored separately, with secondary containment vessels able to contain 1.5 times the volume held by the storage tanks. Chemicals transported, stored, and used in chloramination are sodium hypochlorate and ammonia. These and any other chemicals of concern would be transported in a manner consistent with all safety regulations.

Mitigation Measure HAZ-2. Several factors are incorporated into the design of the Project will discourage bird attraction, including:

- Use of a pivot to deliver water to recharge, resulting in a continuous disturbance regime at the recharge sites.
- The project involves recharge with shallow water depths which will be generally unsuitable for the larger migratory birds such as ducks, geese, and swans; and
- The project will not generally provide a crop cover in the winter that would provide for foraging habitat for other birds.

Mitigation Measure HAZ-3. For recharge using flood irrigation methods, AVEK will monitor recharge area water and if aquatic macroinvertebrates are found to be developing in large numbers and/or foraging by shorebirds is observed, AVEK will temporarily dry out recharge areas, thereby reducing the insect and aquatic macroinvertebrate forage that would attract and hold shorebirds. Forage support for wintering populations will be minimal.

Mitigation Measure HAZ-4*:* Prior to application of water to the recharge basins, the Project operator will notify the Flight Safety Office for the R-2508 Air Complex and all local airports of anticipated recharge operations.

Mitigation Measure HAZ-5*:* Whenever water is present in the recharge basins, the project operator will monitor the basins daily for bird activity. If large birds (e.g., geese, gulls, ducks, stilts, avocets, etc.) or large concentrations of small birds (e.g., horned larks, starlings, blackbirds, etc.) are observed in or near the recharge areas, the Flight Safety Office for the R-2508 Air Complex and all local airports will be notified of the potential hazard immediately.

Mitigation Measure HAZ-6*:* If flocks of large birds (e.g., geese, gulls, ducks, stilts, avocets, etc.) or large flocks of small birds (e.g., horned larks, starlings, blackbirds, etc.) are observed, the applicant or the Project operator will harass the birds to discourage use of the recharge basins using methods approved by the California Department of Fish and Game (DFG).

Mitigation Measure HAZ-7: AVEK will consult with Antelope Valley Mosquito and Vector Control District to develop a mosquito management plan and may contract with the District to assist in its implementation. The agreement will consist of a Project-specific mosquito abatement program that would include quantitative abatement thresholds. AVEK and/or the Mosquito Abatement District would monitor mosquito larvae production in the recharge basins, drainages, and distribution. Larvae populations would be tracked using methods and thresholds approved by the Mosquito Abatement District, and suppression measures would be employed when thresholds are exceeded. The primary mode of suppression would be (a) monitor for mosquito presence and (b) if mosquito larvae are found, to cycle recharge temporarily so that units of recharge would be dried at least once weekly, as recommended by the Antelope Valley Mosquito and Vector Control District in their June 18, 2007 letter to AVEK. The AVMVCD notes in its letter that “The best way to disrupt mosquito lifecycle and thereby reducing the need for pesticides is to let the field completely dry out once per week.”

IMPLEMENTATION

Prior to implementation of elements of the projects that may involve the use, handling, transport, or storage of hazardous materials, AVEK will incorporate provisions of **HAZ-1** into construction and operation contracts and internal operations manuals. During construction, AVEK's designated compliance manager will provide for crew training in the handling of hazardous materials and the construction contractor shall develop and maintain a log of all compliance issues. Any substantial hazardous material problem will be reported to appropriate county and state regulatory agencies.

During the construction period, AVEK's designated compliance manager will conduct weekly site inspections and any violations of HAZ-1 shall be noted and corrected within 1 day following inspection. The compliance manager shall keep a record of any observed violations. During construction, the Board of Directors shall be informed of any serious hazardous materials issues and the AVEK staff response to these issues at the first scheduled Board meeting following the incident.

Within 6 months following the adoption of the MND, the AVEK compliance manager, in coordination with Edwards AFB personnel, will prepare a monitoring and management protocol for the operation of recharge areas that will include monitoring and reporting of the presence, relative number, and species of birds that may use the recharge sites. The monitoring and management protocol will at a minimum implement the provisions of HAZ-2 through HAZ-6, although he compliance manager may develop other measures as deemed appropriate.

Prior to initial recharge, AVEK will, in coordination with the Antelope Valley Mosquito and Vector Control District (AVMVCD) will complete development of a mosquito abatement plan for the recharge operations. This plan will be incorporated into AVEK internal operations manuals. AVEK will designate an operations monitor to ensure that the terms and conditions of the mosquito abatement plan are implemented. An annual report shall be prepared for the Board of Directors and submitted to the AVMVCD following acceptance by the Board of Directors.

10.9 Hydrology and Water Quality

MMRP COMMITMENT

The MND commits AVEK to a comprehensive monitoring and reporting program for hydrology and water quality:

Measure HWQ-1. **Design to manage runoff.** If pivots are used, then there will essentially be no change in ground contours and no change in the management of flood flows. As noted in the project description, if agricultural flood irrigation methods are used, recharge areas would be constructed so that they would not divert sheet flooding and other runoff away from the recharge areas. This would allow floods water to flow into the recharge areas where flows would be somewhat retarded by the recharge berms. Downslope perimeter berms would also be designed to retard flood flows, but, if breached, flow would be collected in a low drainage swale outside of the perimeter berms to distribute flows laterally so that they would become sheet flow on existing the site.

AVEK has added the following to this mitigation measure: If flood irrigation type berms are constructed to contain recharge water, AVEK will monitor weather forecasts and, if substantial rainfall is expected and the berms are in place, will monitor on site and will have equipment ready to remove berms if flooding appears eminent. This will reduce the already insignificant potential for flood irrigation techniques to affect flood flows.

Measure HWQ-2. **Remove berms following recharge if needed**. If concerns are raised regarding the effects of berms on flooding, AVEK will remove them after each recharge cycle when planting the required post-recharge cover crop.

Measure HWQ-3. **Stormwater Pollution Prevention Plan (SWPPP).** To reduce or eliminate construction-related water quality effects, before onset of any construction activities, AVEK or its contractor will prepare a Storm Water Pollution Prevention Plan. The SWPPP will include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed to control erosion from disturbed areas. Measures for the control of pollutants during construction include:

- Use existing access points to minimize dust and tracking materials onto Public Streets;
- Designated Parking, Storage, and Service Area protected by silt fence and oil absorbents and sloped to control drainage;
- Minimize diesel storage;
- Stockpile spill cleanup materials;
- Regular vehicle inspection for leaks;
- Fuel off-channel with a secondary containment system for spills;
- Use quick connects when-ever possible;
- Fueling by Authorized Personnel only; and
- Spill cleanup materials readily available

Note also that a Fugitive Dust Control Plan (FDCP) will be prepared and implemented and will include extensive measures to control and manage soil erosion. The FDCP will provide for management of open soils that will contribute to management of runoff. In response to comments, the project description has been modified to indicate that parking will be either gravel or permanent pavement.

Consistent with the SWPPP and AVEK's current construction management practices, AVEK or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. AVEK will notify its contractors immediately if there is a noncompliance issue and will require compliance.

Measure HWQ-4. Spill Prevention Control and Countermeasures Plan. Prior to any construction activities and during operation of all facilities, AVEK shall develop and implement a Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities and operations. The plan and methods shall be in conformance with all state and federal water quality regulations. Los Angeles and Kern county environmental health services departments shall review the SPCCP before the onset of construction activities. Consistent with its current construction management practices, AVEK shall provide for routine inspection of the construction and operations areas to verify that the measures specified in the SPCCP are properly implemented and maintained and further ensure that contractors are notified immediately if there is a noncompliance issue and will require compliance.

The federal reportable spill quantity for petroleum products, as defined in EPA's CFR (40 CFR 110), is any oil spill that 1) violates applicable water quality standards, 2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or 3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, the contractor's superintendent shall notify the applicant who shall inform the applicable County agency and arrange for the appropriate safety and cleanup crews to ensure the spill prevention plan is followed. A written description of reportable releases must be submitted to the Regional Water Quality Control Board and the applicable County agencies. This submittal must include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases would be documented on a spill report form.

If a spill has occurred, the applicant shall coordinate with responsible regulatory agencies to implement measures to control and abate contamination. To prevent spills:

- All fuels and lubricants for construction equipment will be stored out of the channel within containment structures with a capacity of at least 1.5 times the capacity of storage tanks. Fueling operations will be conducted outside of the channel on impervious surfaces in dedicated areas at least 15 m from the interior slope of levees, sloped away from the levee; if at any time this is not feasible, drip pans will be used for all fueling. Equipment maintenance will be conducted outside of the channel if feasible in dedicated areas at least 15 m from the interior slope of the channel, sloped away from the levee; if equipment must be repaired within the channel, drip pans will be used. Fueling and equipment maintenance areas will be protected from run-on and runoff.

- Material storage areas will be cleaned routinely and appropriate cleaning materials will be stock piled to ensure their availability when needed. Construction materials will be stored on pallets and covered prior to closing the construction site each day. Concrete and equipment washout areas will be adequate in size to contain washout water, lined with PVC, and inspected daily to ensure that liners are free of punctures. On-road equipment will be washed in appropriate containment areas prior to entering the roadway. Haul loads will be covered. Trash receptacles will be provided, emptied at the end of each day, and trash hauled to a certified disposal site.

Used (empty) containers for fuel, lubricant, and other construction chemicals will be collected and removed from the site at the end of each construction day.

Chemical spills will be reported and cleaned up immediately by appropriately trained hazardous materials personnel. Any contaminated soils will be hauled from the site and disposed of at a facility authorized to take contaminated materials. Following spill clean-up, soils will be tested to ensure that contaminants have been effectively removed from the site.

Measure HWQ-5. Retention of flow on site at the storage, treatment, and pumping facility. The partial burying of storage tanks will involve net removal of about 150,000 cubic feet of soil. This will be used in landscaping and/or spread over the adjacent 80 acres. Spreading the soil over 80 acres would result in a net change in land surface elevation of 0.045 feet, or about 0.5 inches, and no significant change in land elevation is therefore anticipated. To further mitigate this minor effect, AVEK will make the spoil from excavation available to others for purposes such as landscaping and road construction. AVEK has modified this mitigation measure in response to comments and will (a) provide for retention of runoff from the water tanks and buildings on site and will not spread the excess soil, but will sell it for uses off site. There is a demand for this soil and AVEK sees no impediment to focusing on this aspect of the mitigation. Sale and removal of the soil from the site will eliminate any potential for the Proposed project to impact flood flows passing over the land adjacent to the storage, treatment, and pumping facility.

Measure HWQ-6. Protection of off-site wells. To address potential impacts to groundwater and adjacent well owners, AVEK will develop a monitoring program to monitor changes in water levels and well production in the area affected by groundwater recharge operations. The program will specify that:

- To alleviate overdraft, extractions of groundwater shall not exceed 90% of the amount of water recharged.
- Water quality in recovered water and in groundwater flowing away from the Project will be monitored to ensure that water quality remains appropriate for designated beneficial uses;
- During recharge operations, water levels in perimeter wells will be monitored and recharge operations will be suspended in the event that offsite water levels rise to within 20 feet of the ground surface; and
- During recovery operations, water levels in offsite wells will be monitored and operations will be adjusted if offsite wells are found to be adversely affected by project operations,
- If project operations are substantially affecting offsite wells, then AVEK will provide compensation, or an alternate source of water. Alternative water may be provided by allowing agricultural users to use existing AVEK facilities associated with the West Feeder and domestic users may be provided with domestic supply connections from AVEK's treated water system.

AVEK will invite the input of the local community in developing and implementing its monitoring program. Technical advice will be provided from USGS, California Department of Public Health and/or other agencies with regulatory authority over these aspects of the Proposed Project. In addition, AVEK will coordinate with the operators of the WDS Bank during recovery operations, including sharing monitoring data.

In addition, consistent with the request from the Lahontan RWQCB, AVEK will work with the RWQCB prior to implementation of the project to develop a specific and implementable monitoring plan to address mineral and chemical leaching from the vadose zone. Preliminary to this, the RWQCB requests AVEK initiate a vadose zone study to quantify potential for leaching.

Mitigation Measure HWQ-7. Management of herbicides and pesticides. AVEK will comply with all regulations of the California Department of Pesticide Regulation regarding the use of herbicides and pesticides in areas designated for groundwater recharge. AVEK will work with its agricultural lessees to provide for safe agricultural chemical containment during storage and handling for the protection of groundwater resources

IMPLEMENTATION

AVEK will incorporate design-related mitigation measures into all design and construction contracts, which will be reviewed by the designated AVEK compliance manager for the project.

Prior to initiation of operations, AVEK will develop a coordination schedule for development the detailed monitoring plan and will provide this schedule to the Board of Directors. The schedule shall include at meetings with local residents within the community and coordination with operators of the WDS Bank and with local technical advisors from USGS, CDPH, the Lahontan RWQCB, and other state and county agencies as needed. When approved, the schedule will be posted in AVEK's headquarters building and local residents win areas potentially affected by the project shall receive invitations to the specified public coordination meetings.

The detailed groundwater monitoring plan will be developed within 1 year following adoption of the MND. When completed, it will be reviewed and adopted by the Board of Directors and made available to the public. The plan will include:

- Monitoring of all production wells and smaller monitoring wells for depth, minerals, and agricultural chemicals, including fuels and other hydrocarbons, the presence of any herbicides or pesticides known to have been applied in farming operations prior to and during the operations of the water recharge project, and all mineral components for which there are current State drinking water standards. Wells will be located on site and downslope to characterize flow, depth, and water quality over a period of years.
- Prior to implementation, AVEK will initiate a monitoring program to characterize vadose zone leaching of minerals, pesticides, and herbicides. There are a variety of field methods for this type of monitoring:
    1. Drilling to obtain sample soil cores to a depth below the vadose zone allows a comparison of soil chemistry at various levels and times during before, during, and following recharge and agricultural operations. Cores taken before initial recharge will provide baseline data.
    2. Passive wick lysimeters and gravity pan samplers may also be installed to measure actual leaching rates in the vadose zone within the first 2 meters.
    3. Porous cup samplers installed in sealed vertical auger holes may also be installed to a depth of 1-3 meters to collect water percolated through the soil for sampling and analysis.

4. Shallow monitoring wells may also be drilled and perforated casing installed at different levels to measure the flow of water and chemicals through the zone between the vadose zone and the groundwater.

A program for sampling of the vadose zone and soils below the vadose zone involving these or other typically applied methods will be undertaken in cooperation with USGS and the Lahontan RWQCB. AVEK will initiate discussions the specific methods to be used and the study design immediately following adoption of the Mitigated Negative Declaration and adoption of the project.

10.10 Noise

MMRP COMMITMENT

Measure NOISE-1. General noise reduction strategies. If residences are present within the threshold distances determined above, the construction contractor will employ noise reducing construction practices so that noise from construction does not exceed noise-level standards at adjacent residences. Measures to be implemented may include the following:

- Providing construction equipment with sound-control devices no less effective than those provided on the original equipment (no equipment will have an unmuffled exhaust);
- Restricting construction to beyond 2,800 feet from residences during nighttime hours (10 p.m. to 7 a.m.) and beyond 1,200 feet at all other times; and
- In the event that construction activities occur close to sensitive noise receptors, implementing appropriate additional noise mitigation measures, including but not limited to:
    - (a) changing the location of stationary construction equipment,
    - (b) shutting off idling equipment,
    - (c) rescheduling construction activity,
    - (d) notifying adjacent residents in advance of construction work, and
    - (e) installing acoustic barriers around stationary construction noise sources.

Measure NOISE-2. Noise containment and blocking. When construction of facilities is within 200 feet of a residence, construction noise levels will be monitored at the structure. If noise levels are found to exceed 65 dBA at the structure and the property owner requests noise reduction, AVEK will provide and install temporary noise screening panels to block construction noise. These panels will be removed when construction activity is 200 feet or more from the residence. In addition, well pumps will be enclosed in a noise-reducing structure, such as block walls.

IMPLEMENTATION

AVEK will incorporate noise mitigation measures into all construction contracts and into AVEK operations manuals. AVEK's designated compliance manager will review construction contracts to ensure compliance. During construction, the contractor shall provide for noise monitoring and AVEK will provide local residents with information regarding the timing and duration of construction activities, with a telephone contact they may use to report excessive noise to AVEK. AVEK notes that the Antelope Acres Town Counsel prefers reduction structures to be placed without property owner permission, but there are few impacts along the pipelines in the vicinity of this small community, which is primarily focused on the area east of 90th Street West. AVEK will therefore notify property owners along all alignments of the potential for construction noise and request that they indicate whether they would permit the placement of noise reduction facilities between their residences and the construction zone. AVEK will then monitor as specified and follow the resident's wishes.

AVEK will respond to any report of excessive noise within 1 day following the report, will independently measure noise levels, and will modify implementation of noise management measures as needed. Noise complaints will be recorded and the Board of Directors will be informed of them in routine project progress reports.

10.11 Traffic

MMRP COMMITMENT

The MND commits AVEK to manage construction and operation related traffic in a manner consistent with local and state requirements.

Measure TR-1. Traffic Safety Plan. AVEK will require the construction contractor to prepare/implement a traffic safety plan before the onset of the construction phase of the Project. The traffic safety plan shall be reviewed and approved by the Kern County Roads Department for affected roads in Kern County and the Los Angeles County Public Works Department for affected roads in Los Angeles County. The plan shall address:

- Appropriate vehicle size and speed,
- Travel routes,
- Detour or lane-closure plans,
- Flagperson requirements,
- Locations of turnouts to be constructed,
- Coordination with law enforcement and fire control agencies,
- Coordination with California Department of Transportation personnel (for work affecting state road rights-of-way),
- Emergency access to ensure public safety, and
- Traffic and speed limit signs.

Measure TR-2. Coordination with emergency response agencies. Before beginning construction activities, the applicant or the construction contractor shall contact local emergency-response agencies (Kern County and Los Angeles County Sheriff and Fire Departments) to provide information on the timing and location of any traffic control measures required to complete the Project. Emergency-response agencies would be notified of any change to traffic control measures as the construction phases proceed so that emergency-response providers can modify their response routes to ensure that response time would not be affected.

Measure TR-3. Parking. To address parking issues, any buildings associated with the Proposed Project that will be used by operational staff shall be designed to comply with Chapter 19.82 (Off-Street Parking) of the Kern County Zoning Ordinance.

Measure TR-4. Driveway access. AVEK will notify residents along the pipeline alignments where construction may block driveway access at least 2 weeks in advance. To the extent possible, AVEK will schedule construction so that driveways will not be blocked for more than 1 day and will coordinate with residents to provide alternative access.

IMPLEMENTATION

At least 1 month prior to initiation of construction than may cause traffic impacts (primarily construction related to pipelines that are constructed within the public right-of-way along roads), AVEK's construction contractors shall provide AVEK's compliance manager with a traffic safety plan that has been reviewed and approved by the transportation department of the county in which the project activities will occur and/or California Department of Transportation, as applicable. This requirement shall be incorporated into design and construction contracts as appropriate.

Regarding driveway access, AVEKs objective is to a) avoid impacts to driveways to the extent possible and (b) if access must be affected to restrict access only during period of active construction and only during daylight hours. AVEK's designated compliance manager will develop a schedule for construction that may affect residents and shall provide residents with a written notice and copy of the schedule at least 2 weeks in advance of construction. The notice shall include reference to the above mitigation measures for traffic management. The notice shall provide residents and businesses with a contact telephone number. If driveway access is a problem, AVEK will meet with the affected residents and develop driveway access plans to minimize potential impacts.

10.12 Utilities

COMMITMENT

AVEK's commitment to avoid impacts to SCE facilities is clarified. Consistent with the request from SCE, AVEK will coordinate with SCE regarding the location of their facilities and will develop specific plans for their protection. We note that this is typically done during design.

IMPLEMENTATION

The designated AVEK compliance manager will contact SCE operations personnel within 1 month of adoption of the MND and the MMRP and will establish a coordinating group consisting of the design contractor, the compliance manager, and a representative from SCE. AVEK will request detailed maps of major SCE facilities and during design will use the maps as a guide for developing specific alignments and for developing means of avoiding impacts to existing facilities. Impact avoidance protocols for utilities will be incorporated into the various construction contracts.

04

ATTACHMENT 4. BUDGET

Attachment 4 includes the following items:

- **Project Budget** – This table summarizes project cost estimates for the grant funds requested, fund matching and percent of fund matching to perform the work detailed in the Work Plan provided in Attachment 3 within the Schedule identified in Attachment 5. Note that only one project is proposed in this proposal.
- **Budget Summary** – This table summarizes the proposal cost estimates for the grant funds requested, fund matching and percent of fund matching to perform the work detailed in the Work Plan provided in Attachment 3 within the Schedule identified in Attachment 5.
- **Consultant Fee Category Description** – This section describes the fee categories used in the project cost breakdown.
- **Project Cost Breakdown Detail** – This section provides the backup data for the project budget and budget summary.

Table 7 - Project Budget

Proposal Title: Water Supply Stabilization Project No. 2

Project Title: Water Supply Stabilization Project No. 2

	Budget Category	(a) Non-State Share* (Funding Match)	(b) Requested Grant Funding	(c) Other State Funds Being Used	(d) Total	(e) % Funding Match
(a)	Direct Project Administration Costs	$335,600	$0	$0	$335,600	**100%**
(b)	Land Purchase/Easement	$127,540	$0	$0	$127,540	**100%**
(c)	Planning/Design/Engineering/ Environmental Documentation	$2,220,252	$0	$0	$2,220,252	**100%**
(d)	Construction/Implementation	$19,823,400	$6,000,000	$0	$25,823,400	**77%**
(e)	Environmental Compliance/ Mitigation/Enhancement	$100,000	$0	$0	$100,000	**100%**
(f)	Construction Administration	$1,219,760	$0	$0	$1,219,760	**100%**
(g)	Other Costs	$0	$0	$0	$0	**0%**
(h)	Construction/Implementation Contingency	$7,747,020	$0	$0	$7,747,020	**100%**
(i)	**Grand Total (Sum rows (a) through (h) for each column)**	**$31,573,572**	**$6,000,000**	**$0**	**$37,573,572**	**84%**

(b) Land purchase total does not include costs prior to September 2008.
(h)Contingency is 30% of total Construction / Implementation cost. This recommendation is based on a Class 4 estimate as defined by the Association for the Advancement of Cost Engineering (AACE).

Table 8 - Summary Budget Proposal Title: Water Supply Stabilization Project No. 2						
Individual Project Title		Non-State Share (Funding Match)	Requested Grant Funding (DWR Grant Amount)	Other State Funds Being Used	Total	% Funding Match
(a)	WSSP-2	$31,573,572	$6,000,000	$0	$37,573,572	84%
(i)	**Grand Total (Sum rows (a) through (h) for each column)**	**$31,573,572**	**$6,000,000**	**$0**	**$37,573,572**	**84%**

Consultant Fee Category Description

The consultant fee categories can be described as follows:

- **Principal Engineer**: A senior member of the consultancy with responsibility for overall direction of the task and coordination with AVEK.
- **Senior Engineer II**: A senior staff member of the consultant firm responsible for the day-to-day execution of the work associated with each task.
- **Senior Engineer I**: A mid-level staff member of the consultant firm with specialized knowledge or expertise in a given area needed to ensure the quality completion of a particular task.
- **Associate Engineer**: A junior-to-mid level staff member of the consultant firm responsible for the compilation, review, and analysis of significant quantities of data and information under the direction of senior and principal engineers.
- **Assistant Engineer**: A junior level staff member of the consultant firm under the direction of associate, senior, and principal engineers.
- **Construction Observer**: A staff member of the consultant firm responsible for direct on-site construction observation during construction.
- **CADD Supervisor**: A senior level staff member of the consultant firm responsible for drafting construction plans and exhibits under the direction of senior and principal engineers.
- **CADD Operator**: A junior level staff member of the consultant firm responsible for drafting of construction plans and other exhibits under the direction of the CADD Supervisor.
- **Clerical**: Support staff utilized to prepare reports and graphics for delivery to AVEK, DWR, and the contractor. Also, administrative staff is utilized in the preparation of invoices and progress reports.
- **Non-Labor Fee**: These are direct project costs associated with travel costs (e.g. mileage to and from meetings and project sites), the costs of reproduction (e.g. printing reports, construction plans and specifications), and the cost of specialized subconsultants (e.g. surveyor, geotechnical engineer). Mileage between most consultant offices to the Antelope Valley are approximately 70-80 miles each way and are charged at the current IRS rate (currently $0.50/mile). Reproduction costs are assumed to be between $0.50 and $1.00 per page for printing.

Project Cost Breakdown Detail

The following is a detailed explanation for the estimation of cost for each of the tasks outlined in Attachment 3.

Budget Category (a): Direct Project Administration Costs

Task 1.1– Project Management

It is assumed that the project manager will be a principal engineer and spend, on average, 2.5 hours per week for the first 120 weeks of the project (design and construction). It is assumed that the year-long monitoring and assessment period will require 1.5 hours per week. Combining the design and construction hours (300) with the monitoring and assessment hours (78) the total number of hours for this task is estimated to be 378 hours.

Task 1.2 – Labor Compliance Program

A consultant will be hired to implement the labor compliance program. The cost to implement the program for the engineering and design phases of the project is estimated to be $10,000. The construction of the facilities is assumed to be broken into two separate contracts based upon the type of work to be performed; recharge basin grading, recovery wells, transmission pipeline, and pump station. It is assumed that it will cost $100,000 per construction contract to implement the labor compliance program. Based on this, it is estimated that the total cost to implement the labor compliance program is $210,000.

Task 1.3 – Reporting

A consultant will be hired to generate the required reporting as part of the grant. It is estimated this service will cost $50,000.

Budget Category (b): Right of Way/Easement Plan

Based upon the 10% preliminary design, which has already been completed, it is estimated that the proposed transmission pipeline will require easements across 8 parcels of land in Los Angeles County and none in Kern County. The following tasks describe the work to be done to obtain easements for those properties. Both the recharge basin and pump station properties are already owned by AVEK.

Task 2.1 - Preparation of Legal Descriptions

It is assumed that to create each plat and legal description will take 2 hours of principal time, 4 hours of senior time, 16 hours of associate time, 16 hours of drafting, and 2 hours of clerical. Printing and delivery costs associated with each easement are assumed to be $100 per easement.

Task 2.2 - Easement Acquisition

A consultant will be hired to perform appraisals of subject properties and act as a right-of-way agent. It is assumed that the appraisals will cost $5,000, the right-of-way agent will cost $20,000, and the cost to acquire the land will be $60,000.

Please note that AVEK purchased land for both the WSSP2 recharge site and pump station prior to 9/28/2008 and these costs have not been included.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Task Group 3 - Project Assessment and Evaluation

Task 3.1 - Records Search

The estimate assumes that the required information is already located in the engineering consultant's office and readily locatable.

Task 3.2 – Topographic Survey

A consultant will be hired to provide aerial photogrammetry and topographic surveys of the surface recharge site, pump station site, and alignment of the transmission pipeline. It is estimated that the survey will cost $30,000.

Task 3.3 – Geotechnical Analysis

A consultant will be hired to write a soils report which includes recommendations for pipeline (e.g. thrust blocks, trench backfill, and corrosion investigation), pump station and tank foundations, and surface recharge embankment design. It is estimated that the soils report will cost $60,000.

Task 3.4 - Existing Utilities Search

It is assumed that utility research will consist of contacting all utility companies known to be operating in the general area of the project and requesting as-built plans or atlas maps showing the location of existing facilities and visiting the sites to search for evidence of utilities in the field. To research and contact the utility companies it is estimated that it will take 24 hours of associate time, 8 hours of senior time, 2 hours of principal time, and 4 hours of clerical time. Printing and mailing costs for utility company contact is estimated to be $200. To visit the projects sites it is estimated to take 12 hours for an associate, senior, and principal engineer. Travel expenses are assumed to be $200.

Task 3.5 - Operational Plan and Hydraulic Analysis

The hours estimated to create the operational plan and hydraulic analysis is shown in the detail project budget.

Task 3.6 – Feasibility Study

This task represents the work that AVEK has done in cooperation with USGS studying the proposed project site since 9/28/2008. The majority of this work was to develop a technical report with USGS that looked at the feasibility of constructing and operating an artificial recharge and storage facility. The report name is “Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of Insitu Arsenic Removal in the North Buttes Area of the Antelope Valley” and was completed in 2010. The total cost paid by the Agency from 9/28/2008 to 12/10/2010 is $686,631.65.

The additional Phase II of this study includes groundwater recharge monitoring and reporting to be completed between 11/1/2010 and 10/31/2014 and is estimated at $896,700.

Task 4 – Permitting

The hours estimated to obtain the necessary street encroachment, well drilling, and surface recharge permits are shown in the detail project budget.

Task Group 5 – Preparation of Construction Plans and Specifications (Project Design)

The cost associated with the preparation of construction plans and specifications is estimated on a per sheet basis. The cost per sheet varies based upon the type of design work to be done. The total number of sheets for the project is estimated to be 112.

Task 5.1 – Recharge Basin Design

The design of the recharge basins is estimated to be 6 sheets of civil plans. The cost per sheet is estimated to be $3,600, for an approximate total of $21,000.

Task 5.2 – Recharge Pipelines Network Design

The design of the recharge pipelines to the basins from the West Feeder Pipeline is assumed to be 5 sheets of plan and profile piping. The cost per sheets is estimated to be approximately $4,300, for an approximate total of $21,500.

Task 5.3 - Recovery Well Design

The design of each recovery well is assumed to be the same for all five proposed wells. Because of this the recovery well design, including civil, mechanical, and electrical plans, is estimated to be 14 sheets. The cost per sheet is estimated to be approximately $3,300, for an approximate total of $46,400.

Task 5.4 - Recovery Well Pipeline Network Design

The recovery well pipeline network collects water from each of the recovery wells and connects to the transmission main pipeline. It is estimated that 11 sheets of plan and profile piping will be necessary. The cost per sheet is estimated to be approximately $4,400, for an approximate total of 48,400.

Task 5.5 – Recovered Water Transmission Pipeline Design

The recovery transmission main pipeline extends from the recovery well pipeline network to the pump station, approximately 9 miles away. It is estimated that 33 sheets of plan and profile piping will be necessary. The cost per sheet is estimated to be approximately $4,400, for an approximate total of $145,200.

Task 5.6 – Recovered Water Pump Station Design

The pump station is estimated to have 39 sheets across all disciplines for an estimated design cost of approximately $184,000. This estimate is further detailed below.

Subtask 5.6.1 - Civil Site Design

It is estimated that the civil site design, including the storage tank, disinfection system, pumps, and piping manifold, will consist of 11 sheets. The cost per sheet is estimated to be approximately $5,500, for an approximate total of 60,500.

Subtask 5.6.2 - Structural Design

It is estimated that the structural design, including tank foundation and general structural details, will consist of 10 sheets. The cost per sheet is estimated to be approximately $4,300, for an approximate total of 43,000.

Subtask 5.6.3 - Mechanical Design

It is estimated that the mechanical design, which includes the HVAC system and details, will consist of 2 sheets. The cost per sheet is estimated to be approximately $5,000, for an approximate total of $10,000.

Subtask 5.6.4 - Electrical Design

It is estimated that the electrical design will consist of 11 sheets. The cost per sheet is estimated to be approximately $4,300, for an approximate total of $47,300.

Subtask 5.6.5 - Instrumentation Design

It is estimated that the instrumentation design will consist of 5 sheets. The cost per sheet is estimated to be approximately $4,500, for an approximate total of $49,500.

Subtask 5.6.6 - Landscape and Irrigation Design

It is estimated that the landscaping and irrigation design will take a total of 3 sheets, with a cost of approximately $3,500 per sheet, for an approximate total of $10,500.

Budget Category (d): Construction/Implementation

Task 6.1 – Construction

The construction cost is estimated from the 10% design already completed by AVEK. See the Construction/Implementation Cost Estimate for additional detail.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 7.2 - Implementation of Environmental Mitigation Measures, Monitoring and Assessment

Please note that the CEQA documentation, including mitigated negative declaration, was completed prior to 9/28/2008 and is not included as part of the cost of this project.

The costs associated with implementing the environmental mitigation measures, monitoring, and assessment have been estimated on the project detail budget.

Budget Category (f): Construction Administration

The costs associated with construction administration have been estimated assuming that the project is issued in 2 separate construction contracts.

Task 8.1 - Project Bids Solicitation

It is assumed that the project will be issued in 2 construction contracts. The following table itemizes the estimated cost of bidding assistance per construction contract and provides a total estimation for both contracts.

	Principal Hours	Senior Hours	Associate Hours	CADD Hours	Clerical Hours	Non-Labor Fee
Advertisement*	2				8	$1,600
Bid Set Duplication**					24	$5,000
Respond to Questions and Issue Addenda†	16	16	24	16	16	$2,000
Pre-Bid Meeting	12	12				$200
Bid Opening	12	12				$200
Bid Tabulation	2	4	8		40	
Preparation & Review of Contract Documents	4				4	$100
Conformed Drawings	8	8	16	16	8	$1,000
Total per Contract	**56**	**52**	**48**	**32**	**100**	**$10,500**
Total for 2 Contracts	**112**	**104**	**96**	**64**	**200**	**$21,000**

* Advertisement shall be in both the Bakersfield Californian and Antelope Valley Press.
** Assumes 50 sets of bid documents.
† Assumes issuing 2 addenda.

Task 8.2 – Pre-Construction Meeting

It is assumed that the project will be issued in 2 construction contracts. It is estimated that for each construction contract a pre-construction meeting will take 12 hours of principal engineer time, 12 hours of senior engineer time, and $200 in mileage and meals.

Task 8.3 – Response to RFI

It is estimated that to respond to each RFI will take 1 hour of principal time, 2 hours of senior time, 4 hours of associate time, 2 hours of clerical time, and $25 in printing and postage. The number of RFI's for each area of work and the associated hours is estimated in the following table.

	Number of RFI's	Principal Hours	Senior Hours	Associate Hours	Clerical Hours	Non-Labor Fee
Recharge Basins	5	5	10	20	10	$125
Recovery Wells	20	20	40	80	40	$500
Transmission Pipeline	10	10	20	40	20	$250
Pump Station	20	20	40	80	40	$500
Total	55	55	110	220	110	$1,375

Task 8.4 – Submittals

It is estimated that to review each submittal will take 4 hours of principal time, 8 hours of senior time, 10 hours of associate time, 2 hours of clerical time, and $25 in printing and postage. The number of submittals for each area of work and the associated hours is estimated in the following table. Note that work done in the recharge basins is assumed to not have any submittals.

	Number of Submittals	Principal Hours	Senior Hours	Associate Hours	Clerical Hours	Non-Labor Fee
Wells	20	80	160	200	40	$500
Pipeline	10	40	80	100	20	$250
Pump Station	10	40	80	100	20	$250
Total	40	160	320	400	80	$1,000

Task 8.5 – Construction Observation

Construction observation is estimated per area of work in the following table by days of observation required. A day of observation is assumed to be 12 hours and $100 for mileage. Engineering hours are estimated to deal with issues in the field not related to the contractor (such as adjacent property owners).

	Days of Observation
Recharge Basin and Recharge Water Pipeline Network	80
Recovery Well and Recovery Collector Pipeline Network	40
Recovery Water Transmission Pipeline	120
Recovered Water Pump Station	100

Task 8.6 – Materials Testing

A consultant will be hired to do testing of soil compaction and concrete compressive strength during construction. The following estimates the cost for testing both of these items.

Compaction Testing Along the Pipeline

The project includes approximately 81,440 ft of transmission, recovery, and recharge pipe. It is assumed that compaction tests will be performed at springline, top of pipe, and pavement zone along each pipe station (every 100 ft). Using this assumption, it is estimated that there will be approximately 500 compaction tests for the pipeline.

Compaction Testing of the Recharge Basin Roads

The project includes approximately 12,000 feet of maintenance roads that surround the recharge basins. It is assumed that compaction tests will be performed for every 100 feet of road. Using this assumption, it is estimated that 120 tests will be required.

Compaction Testing for the Pump Station

It is estimated that 25 compaction tests will be required for the foundations of the storage tank, chlorination facility, and pump station structure.

Concrete Testing

It is estimated that 100 concrete compressive strength tests will be required for structural concrete in the tank foundation and pump station structures.

Testing Cost

The cost per compaction test is estimated to be $65. Using the estimated 500 tests, the estimated cost for compaction testing is about $32,500.

The cost per concrete compressive strength is estimated to be $100. Using the estimated 50 tests, the estimated cost for concrete compressive strength testing is $10,000.

Task 8.7 - Operational Testing and Startup

Start up and testing of the well is estimated to take 1 day (12 hours with travel time) per well (5 wells) for a total of 60 hours for principal, senior, and associate engineers. Start up and testing of pumps, storage tank, and chlorination facility is estimated to take 3 days (12 hours with travel time) for a total of 36 hours for principal, senior, and associate engineers. Start up and testing of the SCADA system is estimated to take 2 days (12 hours with travel time) for a total of 24 hours of principal, senior, and associate engineers. Mileage and meals are assume to be $200 per day.

	Principal Hours	Senior Hours	Associate Hours	Non-Labor Fee
Wells	60	60	60	$1,000
Pump Station	36	36	36	$600
SCADA	24	24	24	$400
Total	**120**	**120**	**120**	**$2,000**

Task 8.8 – Progress Pay Estimates

It is assumed that a progress pay estimate will be required each month for each construction contract. Assuming 22 months of construction and 2 construction contracts, 44 progress pay estimates will be required. It is estimated that each progress pay estimate will take 2 hours of principal time, 4 hours of senior time, 4 hours of clerical time, and $25 in printing and postage.

Task 8.9 – Project Close Out

The project closes out costs have been estimated in the table below for all construction contracts.

	Principal Hours	Senior Hours	Associate Hours	CADD Hours	Clerical Hours	Non-Labor Fee
Record Drawings	40	80	40	100		$500
Notice of Completion	4				4	$25
Final Inspection	12	12	12			$200
Finalize Project Files	20	40	80		40	
Total	**76**	**132**	**132**	**100**	**44**	**$725**

Budget Category (g): Monitoring and Assessment

Task 9.1 – Monitoring and Assessment

Monitoring and Assessment is on-going over project life and costs associated with this task are considered as part of operation and maintenance and are not included in this portion of the budget.

Attachment 4 Exhibit
Project Budget

Project Budget

Water Supply Stabilization Program No. 2 (WSSP2) AVEK

Task Description	Principal Engineer	Senior Engineer II	Senior Engineer I	Associate Engineer	Assistant Engineer	Const. Observer	CADD Supervisor	CADD Operator	Clerical	Total Hours	Labor	Non-Labor Fee	Total
	Personnel Hours										Budget		
Budget Category (a): Direct Project Administration Costs													
Task 1.1 - Project Management	378									378	$ 75,600		$ 75,600
Task 1.2 - Labor Compliance Program										-	$ -	$ 210,000	$ 210,000
Task 1.3 - Reporting										-	$ -	$ 50,000	$ 50,000
Subtotal	**378**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**378**	**$ 75,600**	**$ 260,000**	**$ 335,600**
Budget Category (b): Land Purchase/Easement													
Task 2.1 - Preparation of Legal Descriptions	16		32	128			128		2	306	$ 41,740	$ 800	$ 42,540
Task 2.2 - Easement Acquisition										-	$ -	$ 85,000	$ 85,000
Subtotal	**16**	**-**	**32**	**128**	**-**	**-**	**128**	**-**	**2**	**306**	**$ 41,740**	**$ 85,800**	**$ 127,540**
Budget Category (c): Planning/Design/Engineering/Environmental Documentation													
Task Group 3 - Project Assessment and Evaluation										-	$ -		$ -
Task 3.1 - Records Search	4	4	8	8	16		4		4	48	$ 6,600		$ 6,600
Task 3.2 - Topographic Survey										-	$ -	$ 30,000	$ 30,000
Task 3.3 - Geotechnical Analysis										-	$ -	$ 60,000	$ 60,000
Task 3.4 - Existing Utilities Search	14		20	36					4	74	$ 11,320	$ 500	$ 11,820
Task 3.5 - Operational Plan and Hydraulic Analysis	20	40	30	40	30		20		10	190	$ 28,300		$ 28,300
Task 3.6 - Feasibility Study										-	$ -	$ 1,583,332	$ 1,583,332
Task 4 - Permitting	20		40	40	20				20	140	$ 19,800		$ 19,800
Task Group 5 - Project Design												$ 500	$ 500
Task 5.1 - Recharge Basin Design	10		40	20	10		60	20		160	$ 21,600		$ 21,600
Task 5.2 - Recharge Pipelines Network Design	10		40	20	10		60	20		160	$ 21,600		$ 21,600
Task 5.3 - Recovery Well Design	20		78	50	28		117	59		352	$ 46,780		$ 46,780
Task 5.4 - Recovery Well Pipeline Network Design	38	12	88	25	12		118	57		350	$ 48,640		$ 48,640
Task 5.5 - Recovered Water Transmission Pipeline Design	112	38	264	77	38		356	173		1,058	$ 146,840		$ 146,840
Task 5.6 - Recovered Water Pump Station Design													
Subtask 5.6.1 - Civil Site Design	20	40	70	70	24		149	75		448	$ 60,460		$ 60,460
Subtask 5.6.2 - Structural Design	60	10	40	20	10		112	56		308	$ 43,240		$ 43,240
Subtask 5.6.3 - Mechanical Design	4	24	8				22	10		68	$ 10,040		$ 10,040
Subtask 5.6.4 - Electrical Design	60	40	30	20	14		112	56		332	$ 47,520		$ 47,520
Subtask 5.6.5 - Instrumentation Design	40	20	10	5	5		48	24		152	$ 22,660		$ 22,660
Subtask 5.6.6 - Landscape and Irrigation Design	8	10	10	10	6		20	10		74	$ 10,520		$ 10,520
Subtotal	**440**	**238**	**776**	**441**	**223**	**-**	**1,198**	**560**	**38**	**3,914**	**$ 545,920**	**$ 1,674,332**	**$ 2,220,252**
Budget Category (d): Construction/Implementation													
Task 6.1 - Construction										-	$ -	$ 25,823,400	$ 25,823,400
Subtotal	-	-	-	-	-	-	-	-	-	-	**$ -**	**$ 25,823,400**	**$ 25,823,400**

Project Budget

Water Supply Stabilization Program No. 2 (WSSP2) — AVEK

Task Description	Personnel Hours										Budget		
	Principal Engineer	Senior Engineer II	Senior Engineer I	Associate Engineer	Assistant Engineer	Const. Observer	CADD Supervisor	CADD Operator	Clerical	Total Hours	Labor	Non-Labor Fee	Total
Budget Category (e): Environmental Compliance/Mitigation/Enhancemen													
Task 7.2 - Implementation of Environmental Mitigation Measures, Monitoring and Assessment										-	$ -	$ 100,000	$ 100,000
Subtotal	-	-	-	-	-	-	-	-	-	-	**$ -**	**$ 100,000**	**$ 100,000**
Budget Category (f): Construction Administration													
Task 8.1 - Project Bids Solicitation	112		104	96			64		200	576	$ 74,160	$ 21,000	$ 95,160
Task 8.2 - Pre-Construction Meeting	24		24							48	$ 8,640	$ 400	$ 9,040
Task 8.3 - Response to RFI	55		110	220					110	495	$ 67,100	$ 1,375	$ 68,475
Task 8.4 - Submittals	160		320	400					80	960	$ 144,800	$ 1,000	$ 145,800
Task 8.5 - Construction Observation	50		200	100	50	4,080				4,480	$ 490,400	$ 34,000	$ 524,400
Task 8.6 - Materials Testing										-	$ -	$ 186,000	$ 186,000
Task 8.7 - Operational Testing and Startup	120		120	120						360	$ 60,000	$ 2,000	$ 62,000
Task 8.8 - Progress Pay Estimates	88		176						176	440	$ 58,080	$ 2,200	$ 60,280
Task 8.9 - Project Close Out	76		132	132				100	44	484	$ 67,880	$ 725	$ 68,605
Subtotal	**685**	**-**	**1,186**	**1,068**	**50**	**4,080**	**64**	**100**	**610**	**7,843**	**$ 971,060**	**$ 248,700**	**$ 1,219,760**
Total	**1,519**	**238**	**1,994**	**1,637**	**273**	**4,080**	**1,390**	**660**	**650**	**12,441**	**$ 1,634,320**	**$ 28,192,232**	**$ 29,826,552**

Personnel Category	$/HR
Principal Engineer	$200.00
Senior Engineer II	$180.00
Senior Engineer I	$160.00
Associate Engineer	$140.00
Assistant Engineer	$120.00
Const. Observer	$105.00
CADD Supervisor	$120.00
CADD Operator	$100.00
Clerical	$70.00

Attachment 4 Exhibit
Construction / Implementation Cost Estimate

Antelope Valley - East Kern Water Agency
Water Supply stabilization Project No. 2
Construction / Implementation Cost Estimate (10% Design)

Item No.		Description	Unit Quantity		Unit Price	Total Price
1		*Recharge Basins*				
	a	Clearing, Stripping, Grubbing, and Earthwork	400	AC	$2,500	$1,000,000
	b	Maintenance Road Construction	1	LS	$450,000	$450,000
	c	Recharge Pipeline Connection to West Feeder	1	LS	$197,000	$197,000
	d	Recharge Metering Turnout from West Feeder	2	EA	$60,000	$120,000
	e	18-inch Recharge PVC Pipelines	13,100	LF	$80	$1,048,000
	f	Recharge Basin Valved Inlets	14	EA	$10,000	$140,000
					Subtotal	**$2,955,000**
2		*Recovery Wells*				
	a	Site Clearing Stripping, Grubbing, and Grading	1	LS	$25,000	$25,000
	b	Chain Link Fencing and Gate	1000	LF	$30	$30,000
	c	Well Drilling and Development	5	EA	$270,000	$1,350,000
	d	Well Pump and Motor	5	EA	$130,000	$650,000
	e	Well Discharge Steel Piping, Valves, and Appurtenances	5	EA	$50,000	$250,000
	f	Well Electrical and Instrumentation Equipment	5	EA	$80,000	$400,000
					Subtotal	**$2,705,000**
3		*Recovered Water Pipeline Network*				
	a	12-inch CML&C Steel Pipe	15,840	LF	$110	$1,742,400
	b	16-inch CML&C Steel Pipe	2,640	LF	$150	$396,000
	c	27-inch CML&C Steel Pipe	5,280	LF	$200	$1,056,000
	d	36-inch CML&C Steel Pipe	36,960	LF	$225	$8,316,000
					Subtotal	**$11,510,400**
4		*Water Storage , Treatment, and Pumping Station*				
	a	Clearing, Stripping, Grubbing, and Grading	1	LS	$150,000	$150,000
	b	Chain Link Fencing and Gate	1,600	LF	$30	$48,000
	c	1 MG Steel Water Storage Tank	1	LS	$1,200,000	$1,200,000
	d	CMU Block Building	1	LS	$650,000	$650,000
	e	24, 48, and 60-inch Steel Manifold Piping	1	LS	$1,000,000	$1,000,000
	h	48-inch Meter and Precast Concrete Vaults	2	EA	$40,000	$80,000
	i	Wet well, Suction, and Discharge Piping, Assemblies	7	EA	$350,000	$2,450,000
	j	Vertical Turbine Pump and Motors	4	EA	$200,000	$800,000
	k	Variable Frequency Drives (VFDs)	4	EA	$400,000	$1,600,000
	l	Chlorination System	1	LS	$100,000	$100,000
	m	Surge Control System	2	EA	$200,000	$400,000
	n	Pump Station Electrical and Instrumentation Equipment	1	LS	$125,000	$125,000
	o	Site Landscaping and Irrigation	1	LS	$50,000	$50,000
					Subtotal	**$8,653,000**
					Total	**$25,823,400**

The above noted cost estimate has been prepared using bid tabulations of similar projects. These bid tabulations include unit costs which combine costs for labor, materials, and equipment and thus we feel prudent to use the same format as this is the basis of this cost estimate.

05

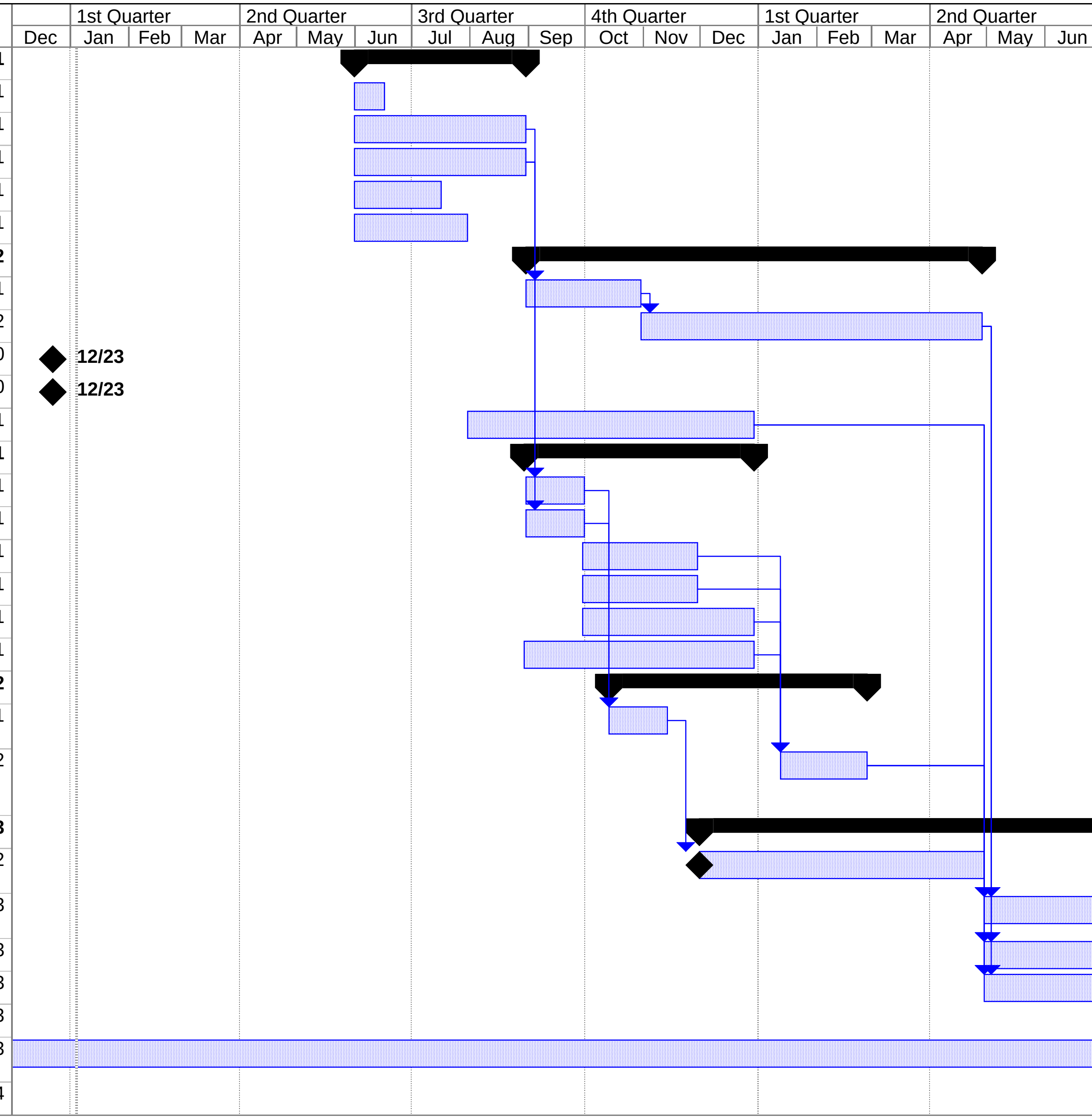
ATTACHMENT 5. SCHEDULE

The schedule on the following page shows:

1. Design surveying, geotechnical investigation, utility research (for potential interferences with project facilities) and operational plan and hydraulic analysis work will begin upon authorization from AVEK;
2. Design, including preparation of construction bid documents (plans and specifications) will begin as soon as survey and geotechnical information is received;
3. Bids for construction of the recharge basins will be solicited about October 14, 2011;
4. Construction of the recharge basins will begin about December 1, 2011;
5. Bids for construction of the recovery wells, pipeline, and pump station will be solicited about January 13, 2012;
6. Construction of the remaining facilities will start on or about April 30, 2012;
7. All construction should be completed on or about August 23, 2013; and
8. Start-up/testing will be done during September 2013.

Attachment 5 Exhibit
Project Schedule

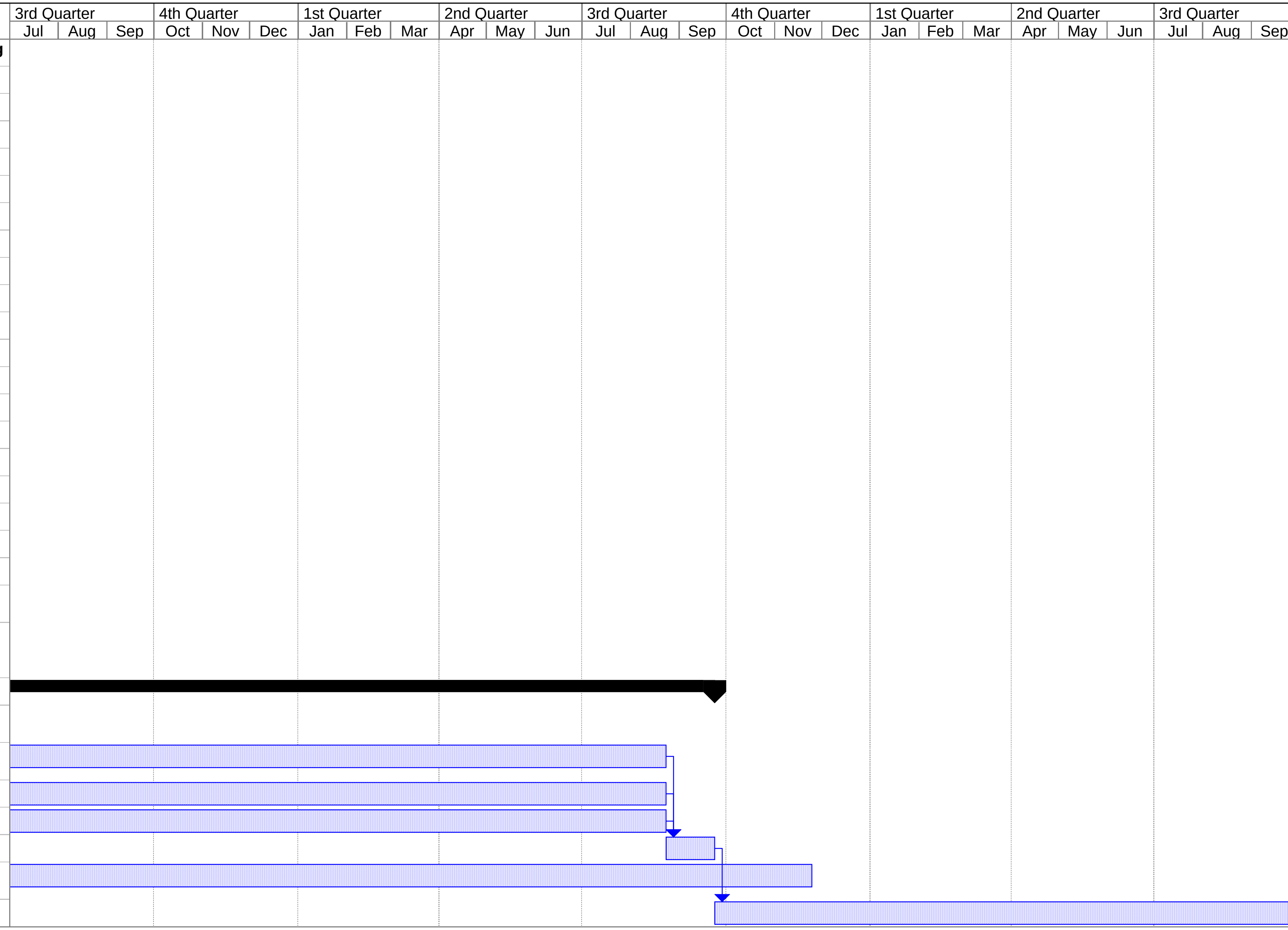
ID	Indicators	Task Name	Duration	Start	Finish
1		**Project Assessment and Evaluation (Project Planning**	**91 days**	**Wed 6/1/11**	**Tue 8/30/11**
2		Records Search	16 days	Wed 6/1/11	Thu 6/16/11
3		Topographic Survey	91 days	Wed 6/1/11	Tue 8/30/11
4		Geotechnical Analysis	91 days	Wed 6/1/11	Tue 8/30/11
5		Existing Utilities Search	46 days	Wed 6/1/11	Sat 7/16/11
6		Operational Plan and Hydraulic Analysis	60 days	Wed 6/1/11	Sat 7/30/11
7		**Right-of-Way / Easement Plan**	**242 days**	**Wed 8/31/11**	**Sat 4/28/12**
8		Preparation of Legal Documents	61 days	Wed 8/31/11	Sun 10/30/11
9		Easement Acquisition	181 days	Mon 10/31/11	Sat 4/28/12
10	✓	**CEQA Environmental Documentation (completed)**	0 days	Thu 12/23/10	Thu 12/23/10
11	✓	**Financing Development (not required)**	0 days	Thu 12/23/10	Thu 12/23/10
12		**Permitting**	152 days	Sun 7/31/11	Thu 12/29/11
13		**Project Design**	**122 days**	**Tue 8/30/11**	**Thu 12/29/11**
14		Recharge Basin Design	31 days	Wed 8/31/11	Fri 9/30/11
15		Recharge Pipeline Network Design	31 days	Wed 8/31/11	Fri 9/30/11
16		Recovery Well Design	61 days	Fri 9/30/11	Tue 11/29/11
17		Recovery Well Pipeline Network Design	61 days	Fri 9/30/11	Tue 11/29/11
18		Recovery Well Transmission Main Design	91 days	Fri 9/30/11	Thu 12/29/11
19		Pump Station Design	122 days	Tue 8/30/11	Thu 12/29/11
20		**Project Bids Solicitation**	**137 days**	**Fri 10/14/11**	**Mon 2/27/12**
21		Recharge Basin and Recharge Water Pipeline Network	31 days	Fri 10/14/11	Sun 11/13/11
22		Recovery Wells, Recovery Collector Pipeline Network, Recovery Water Transmission Main, and Pump Station	46 days	Fri 1/13/12	Mon 2/27/12
23		**Project Construction**	**663 days**	**Thu 12/1/11**	**Mon 9/23/13**
24		Recharge Basin and Recharge Water Pipeline Network	151 days	Thu 12/1/11	Sun 4/29/12
25		Recovery Well and Recovery Collector Pipeline Network	481 days	Mon 4/30/12	Fri 8/23/13
26		Recovery Water Transmission Main	481 days	Mon 4/30/12	Fri 8/23/13
27		Pump Station	481 days	Mon 4/30/12	Fri 8/23/13
28		Operational Testing and Start Up	31 days	Sat 8/24/13	Mon 9/23/13
29		**Implementation of Environmental Mitigation Measures**	1090 days	Wed 12/1/10	Sun 11/24/13
30		**Monitoring and Assessment**	366 days	Tue 9/24/13	Wed 9/24/14



Project: AV Grant Application MSProje
Date: Tue 1/4/11

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

ID	Task Name
1	**Project Assessment and Evaluation (Project Planning**
2	Records Search
3	Topographic Survey
4	Geotechnical Analysis
5	Existing Utilities Search
6	Operational Plan and Hydraulic Analysis
7	**Right-of-Way / Easement Plan**
8	Preparation of Legal Documents
9	Easement Acquisition
10	**CEQA Environmental Documentation (completed)**
11	**Financing Development (not required)**
12	**Permitting**
13	**Project Design**
14	Recharge Basin Design
15	Recharge Pipeline Network Design
16	Recovery Well Design
17	Recovery Well Pipeline Network Design
18	Recovery Well Transmission Main Design
19	Pump Station Design
20	**Project Bids Solicitation**
21	Recharge Basin and Recharge Water Pipeline Network
22	Recovery Wells, Recovery Collector Pipeline Network, Recovery Water Transmission Main, and Pump Station
23	**Project Construction**
24	Recharge Basin and Recharge Water Pipeline Network
25	Recovery Well and Recovery Collector Pipeline Network
26	Recovery Water Transmission Main
27	Pump Station
28	Operational Testing and Start Up
29	**Implementation of Environmental Mitigation Measures**
30	**Monitoring and Assessment**



Project: AV Grant Application MSProje
Date: Tue 1/4/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

06

ATTACHMENT 6. MONITORING, ASSESSMENT, AND PERFORMANCE MEASURES

PURPOSE OF PROJECT

The Water Supply Stabilization Project No. 2 (WSSP2) is a groundwater basin banking project that will increase the reliability of the Antelope Valley Region's water supplies through recharge and recovery of State Water Project water supplies. The purpose of the WSSP2 is to recharge and store SWP water in the groundwater basin when water is available and recover the stored water as needed. The WSSP will reduce the Antelope Valley Region's critical dependence on water deliveries from the Delta and reduce over-drafting of the groundwater basin.

INFORMATION SOURCE USED TO PREPARE THIS ATTACHMENT

A report prepared by the USGS, entitled Assessing the Feasibility of Artificial Recharge and Storage and the Effectiveness and Sustainability of Insitu Arsenic Removal in the North Buttes Area of the Antelope Valley prepared in 2010 was the source of the information given below. (A copy of the USGS report is included as File 2 of Attachment 3.)

MONITORING AND ASSESSMENT GUIDANCE

Expected Recharge Rate

The Antelope Valley is a sediment filled depression between the Garlock Fault on the North and the San Andreas Fault on the South. The groundwater basin has been divided into 12 sub-basins. The recharge basins to be constructed as part of WSSP2 will be located in the northwestern part of the Lancaster Sub-basin of the Antelope Valley which is the largest of the 12 sub-basins.

At the proposed recharge pond site, the ground surface slopes down gradient to the east across the recharge pond site from about elevation 2570 feet to elevation 2530 feet. The depth to groundwater, as measured by the USGS, was about 240 feet on the west and 270 feet on the east. This information places the groundwater surface elevations at about 2330 feet on the west side and 2260 feet on the east side of the recharge basins.

Historical records indicate that the groundwater level has declined about 100 feet in the vicinity of the recharge basins since the 1960s.

A USGS model was used to estimate the recharge rate and the changes in groundwater elevation during recharge. The model predicted that about 23,000 AF could be percolated into the underlying groundwater basin over the planned four months per year recharge cycle (November through February). The recharge pond area used in the modeling effort was 385 acres. The proposed gross recharge pond area is about 400 acres with a net percolation area of about 385 acres.

Back-calculating indicates that the average percolation rate over the 120 days in the four month recharge cycle is about six inches per day. Reported percolation rates for the soils at the recharge basin sites exceed two feet per day.

Direction of Groundwater Movement

The groundwater movement is generally from west to east as would be expected considering the groundwater surface on the east side of the recharge basins is about 70 feet lower than the groundwater elevation on the west side of the basins.

Expected Changes in Groundwater Surface Elevation

The USGS model was also used to predict changes in groundwater elevation resulting from the recharge project. The following data was input to the model:

1. Recharge four months per year (November through February) for five years;
2. Recharge rate = 28,500 AFY;
3. Total recharged over five years = 142,500 AF.

The computer model predicted increases in groundwater elevation after five years were as follows:

1. 230 feet at the center of the recharge basins;
2. 50 feet within one mile of the recharge basins; and,
3. 10 feet within four miles of the recharge basins.

Water Quality

Based on water analyses on samples taken from existing agricultural wells at the recharge site, the native groundwater is generally of potable quality. The Total Dissolved Solids (TDS) concentration was found to range from about 260 to 400 mg/L. Nitrate concentrations were found to be less than one-half of the MCL for drinking water. Some arsenic was found on the western and northeastern edges of the site. It should be noted that the “site” covers about 1500 acres and the recharge basins will cover about 400 acres some distance from the areas where arsenic was found.

Expected Recovery

It is planned to recharge an average of 23,000 AFY. It is expected that about 90% of the water recharged will be recovered.

Existing Monitoring Wells

The USGS constructed three monitoring wells using the Overburden Drilling and Exploration (ODEX) technique on the project site as part of their investigative study. The wells were drilled to the water table to allow instrument installation throughout the unsaturated zone and at the water table. Cores were preserved on site to prevent changes in water content and water potential. A gamma log and a neutron log were collected from within the ODEX pipe after drilling was completed. These logs were used with lithologic and specific conductance data from drill cuttings to guide placement of instruments within the borehole.

A water-table well, advanced tensiometers, temperature sensors, dielectric permittivity sensors, and suction-cup lysimeters were installed in the completed boreholes. The well at each site will be used to measure changes in water levels and groundwater quality resulting from recharge and also will serve as an access for an electromagnetic (EM) resistivity geophysical tool used to monitor the downward movement of water during recharge. Advanced tensiometers are used to measure matric potential and pressure head at depths in the unsaturated zone where perched water may accumulate during artificial recharge. Dielectric permittivity sensors and temperature sensors are used to measure matric potential and temperature in the unsaturated zone. These sensors are commonly placed in coarse-grained deposits or beneath layers expected to impede the downward movement of water. Suction-cup lysimeters are used to collect water samples from the unsaturated zone for laboratory analysis. Instruments were installed at depths determined on the basis of lithologic and geophysical-log data collected during drilling. Each instrument was installed in backfill material intended to ensure adequate contact with the surrounding unsaturated materials. Instruments were separated by low permeability bentonite grout to ensure water does not move vertically through the borehole. These instruments are controlled and data recorded using a data logger installed in a vault at land surface.

Data will be collected from the advanced tensiometers, temperature sensors, and dielectric permittivity sensors in the unsaturated zone at 4-hour intervals. Data collected from the instruments will be stored in data loggers and retrieved at approximately 6-week intervals. Water samples from the piezometers will be collected when data are retrieved from the data loggers and analyzed to determine differences in water quality with depth.

In addition to these three ODEX wells, AVEK will utilize five existing irrigation wells on the 1,500 acre site to monitor groundwater levels and water quality.

PERFORMANCE MEASURES

The following measurements will be made to determine performance:

1. Volumes of water delivered to recharge basins will be measured by meters installed on the turnouts into the recharge basins from AVEK's existing West Feeder. AVEK anticipates delivering up to 23,000 acre-feet of water per year.
2. Infiltration rates of water placed into the recharge basins will be measured using the EM resistivity geophysical tool and temperature gages. The anticipated average infiltration rate is 0.5 feet per day.
3. Changes in water chemistry during recharge as constituents are adsorbed or absorbed in the soil column or dissolved from the soil during recharge will be monitored using the suction cup lysimeters and water samples collected from the piezometers. AVEK anticipates that the soil column in the unsaturated zone will provide sufficient filtering for the recharged surface water that it will meet or exceed all drinking water standards by the time it reaches the groundwater table. AVEK also anticipates that the concentration of any constituents dissolved from the soil column during recharge will also remain below all drinking water standards.
4. Rates and volumes of water pumped from recovery wells will be measured by meters installed on the discharge piping from each well.
5. Groundwater surface elevations will be measured using five existing agricultural water and two monitoring wells constructed by USGS during the course of their study. In addition, the USGS has an on-going program of measuring the depth to ground water on wells throughout the Antelope Valley. Monitoring groundwater levels is also included in the Antelope Valley East Kern Water Agency WSSP-2: Groundwater Recharge Project, Mitigated Negative Declaration (SCH# 200807013), Mitigation Monitoring and Reporting Program prepared by AVEK, dated August 2008. ((A copy of this document is included as File 7 of Attachment 3.) AVEK anticipates that groundwater levels will rise as described above as a result of the project.
6. Quality of the recovered water will be ascertained by taking and analyzing samples from each of the recovery wells per California Title 22 drinking water regulations.

7. Quality of the SWP water delivered to the recharge basins will be measured under AVEK's existing SWP water quality sampling/analytical program (AVEK owns and operates four water treatment plants that treat SWP water).

The parameters which will indicate the success of the Project include:

1. Measured volumes of water recharged with a goal of at least 23,000 AF over the four month recharge period (November through February).
2. The volume of water recovered via the recovery wells with a goal of recovering 90% of the volume of water recharged.
3. Changes in groundwater levels under the property with a goal of an increase in the groundwater table which is consistent with the findings of the USGS Study. .
4. The quality of recovered water with a goal to meet all drinking water standards.
5. Infiltration rates of recharged water with a goal of at least a half a foot per day during periods of recharge.

07

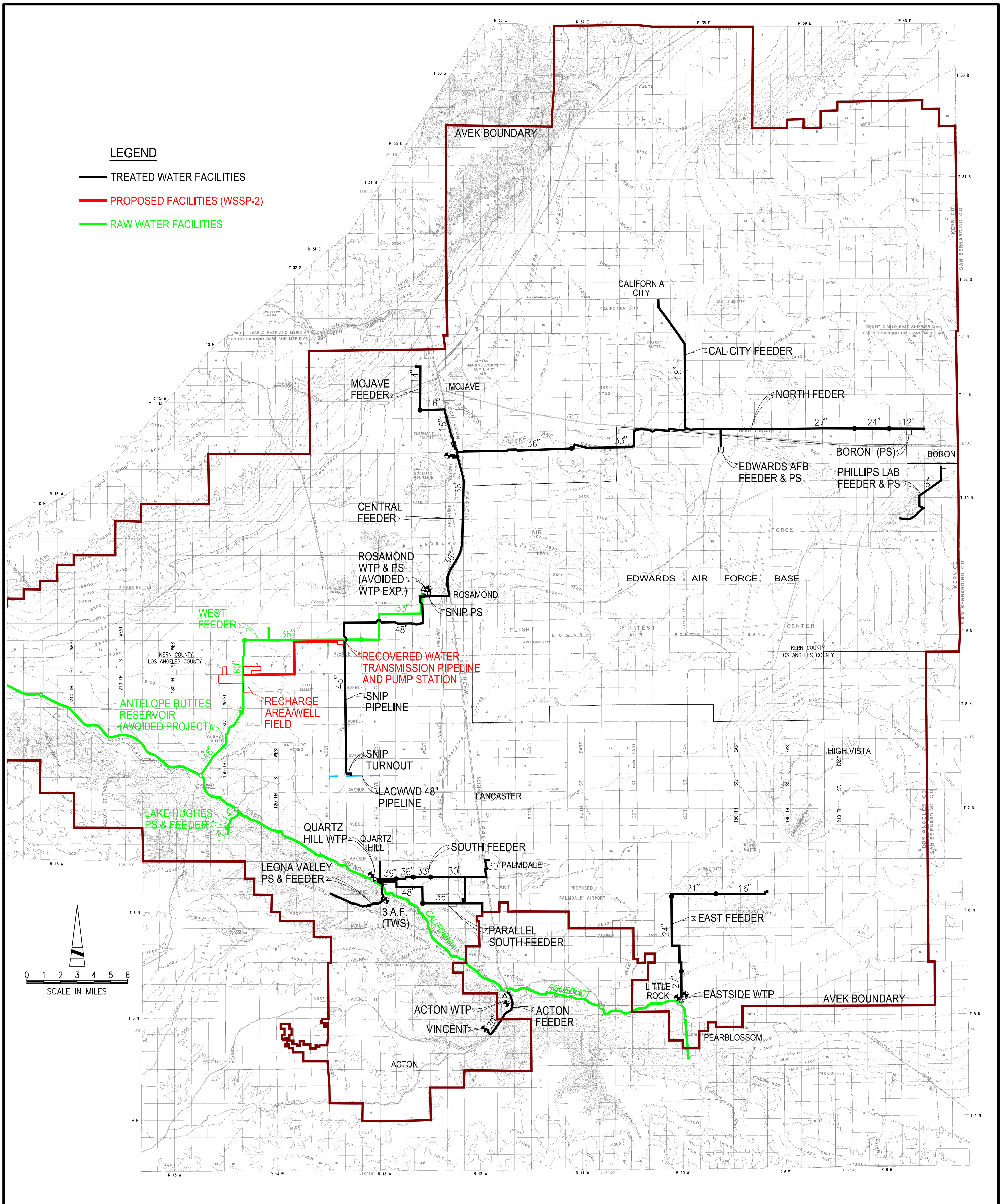
ATTACHMENT 7. ECONOMIC ANALYSIS: WATER SUPPLY COSTS AND BENEFITS

This Attachment provides estimates of capital and operation & maintenance (O&M) costs for the proposed Project (WSSP2) and an avoided project that would accomplish the same results at a higher cost.

The WSSP2 water banking project provides regional benefits in both water storage and water treatment. The Project avoids the construction of the Buttes Reservoir (for storage) and expansion of the existing AVEK Rosamond Water Treatment Plant (for treatment). Both of these projects have been previously studied by AVEK and not implemented because of cost. The Antelope Buttes Reservoir would store raw water from the California Aqueduct in a surface reservoir. Expanding the existing water treatment plant would provide capacity to treat water stored in the reservoir for potable use.

The locations of the proposed WSSP2 project facilities and the Antelope Buttes Reservoir and water treatment plant expansion are shown on Figure 1. From the Figure, it can be seen that of AVEK's four water treatment plants, three (Quartz, Acton, and Eastside) are located adjacent to the California Aqueduct. The Rosamond Water Treatment Plant receives SWP water through the West Feeder and provides treated water to Edwards Air Force Base and the northern portion of AVEK. Treated water can also be supplied to the Los Angeles County Waterworks District through the South-North Intertie Pipeline (SNIP).

WSSP2 would provide additional treated water for the northern portion of AVEK including Edwards Air Force Base. WSSP2 could also provide treated water to the Los Angeles County Waterworks District through the SNIP.



	ANTELOPE VALLEY-EAST KERN WATER AGENCY	AECOM PROJECT NO.	FIGURE
	PROPOSITION 84 FACILITIES	60182837	1

DWG: S:\A01\60182837-WSSP_2-Grant_Application\CAD\Planset\AGENCY FACILITIES FIG 1.dwg Layout Name: FIG 1 - Plotted by: Campbell, Vene Date: 1/6/2011 - 11:35 AM
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Proposed Project Description

This Proposal pertains to a single project designated as Water Supply Stabilization Project No. 2 (WSSP2). WSSP2 is a groundwater recharge and recovery project establishing an operational groundwater bank. WSSP2 includes the following components:

1. Development of 400 acres of recharge basins;
2. Increasing the output capacity of AVEK's existing West Feeder of the California Aqueduct with two new turnouts serving the recharge ponds.
3. Construction of 5 recovery wells;
4. Construction of collector pipelines from the wells;
5. Construction of a 7-mile transmission pipeline from the collector pipelines to;
6. A pump station that will pump the water into AVEK's existing potable transmission system for delivery to customers.

Annual Costs of Proposed Project (WSSP2)

Following is a detailed description of the annual costs involved with constructing WSSP2.

Administration

AVEK already has staff and administration throughout the region. The increase in administrative duties as part of this project is assumed to be negligible.

Operation

Electricity

Electrical demand is dependent upon the volume of water to be pumped each year through the wells and pump station. The anticipated amount of water to be pumped as part of this proposal is 20,000 acre-feet per year. Assuming a system head of 600 feet (250 feet static lift and 350 feet transmission loss), the power required is approximately 12,300,300 kWh/year. Assuming an electrical cost of $0.15 per kWh, the annual electricity cost would be approximately $1.84 million. This cost is equal to $92 per acre-foot.

Chlorination

The recovered water requires chlorination prior to being pumped into the distribution system. The chlorination costs are estimated based on a chlorine dose of 3 mg/L at $1.50 per pound of chlorine. Using this assumption, chlorine will cost about $250,000 per year.

Staff

It is assumed that operation will require one staff member one day per week for an annual cost of $25,000.

Variable Water Charge

There is a charge levied by the SWP to deliver water through the system to AVEK. A large portion of this cost is the electricity required to pump the water to AVEK turnout. This fee is variable and changes from year to year. On average, the cost to AVEK is $180 per acre-foot. Using this average, the cost to take 20,000 AF would be $3.6 million.

Maintenance

Annual maintenance for the facilities is assumed to be 1% of capital costs. The cost for maintenance includes the costs associated with monitoring and assessment as described in Attachment 6.

Replacement

All the pumps and motors in the project, both at the recovery wells and at the pump station, have a life of 20-years. Because of this, it will be necessary to replace each of pieces of equipment once during a 40-year period. It is assumed that replacement costs will equal the original installation costs.

The remaining facilities, including the pipeline and structures, are assumed to have a design life of 40-years or greater and will not require replacement.

Other

No other costs are anticipated.

Contingency

The contingency for the proposed project is estimated to be 30%. This estimate is based on a Class 4 estimate as defined by the Association for the Advancement of Cost Engineering (AACE), which is the same as previously used for capital costs in Attachment 4.

Summary

The following table summarizes the annual costs for the proposed project.

Administration	
	$0
Operation	
Staff	$25,000
Variable Water Charge	$3,600,000
Electricity	$1,840,000
Disinfection	$250,000
Contingency	$1,714,500
Total	**$7,429,500**
Maintenance	
Total	**$366,769**
Replacement	
Well Pump	$650,000
Pipeline Pump	$2,400,000
Contingency	$915,000
Total	**$3,965,000**
Other	
	$0

Table 11. Annual Cost of Project

Table 11 summarizes the estimated 40-year life cycle cost of the project.

Table 11- Annual Cost of Project (All costs should be in 2009 Dollars) Project: Water Supply Stabilization Project No. 2									
	Initial Costs	Operations and Maintenance Costs [1]						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009	$0	$0	$0	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	$0	$0	$0	0.943	$0
2011	$37,573,572	$0	$0	$0	$0	$0	$37,573,572	0.890	$33,440,479
2012	$0	$0	$0	$0	$0	$0	$0	0.840	$0
2013	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.792	$6,174,645
2014	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.747	$5,823,813
2015	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.705	$5,496,370
2016	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.665	$5,184,519
2017	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.627	$4,888,261
2018	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.592	$4,615,391
2019	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.558	$4,350,318
2020	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.527	$4,108,634
2021	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.497	$3,874,746
2022	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.469	$3,656,450
2023	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.442	$3,445,951
2024	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.417	$3,251,044
2025	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.394	$3,071,730
2026	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.371	$2,892,416
2027	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.350	$2,728,694
2028	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.331	$2,580,565
2029	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.312	$2,432,436
2030	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.294	$2,292,103
2031	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.278	$2,167,363
2032	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.262	$2,042,622
2033	$0	$0	$7,429,500	$366,769	$3,965,000	$0	$11,761,269	0.247	$2,905,033
2034	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.233	$1,816,531
2035	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.220	$1,715,179
2036	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.207	$1,613,828
2037	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.196	$1,528,069
2038	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.185	$1,442,310
2039	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.174	$1,356,551
2040	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.164	$1,278,588
2041	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.155	$1,208,422
2042	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.146	$1,138,255
2043	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.138	$1,075,885
2044	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.130	$1,013,515
2045	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.123	$958,941
2046	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.116	$904,367
2047	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.109	$849,793
2048	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.103	$803,016
2049	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.097	$756,238
2050	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.092	$717,257
2051	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.087	$678,275
2052	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.082	$639,294
2053	$0	$0	$7,429,500	$366,769	$0	$0	$7,796,269	0.077	$600,313
Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									$133,518,209
Comments:									

(1) The incremental change in O&M costs attributable to the project.

AVOIDED PROJECTS DESCRIPTION

If the proposed Project is not constructed the alternative would be to construct separate storage and treatment facilities—essentially two projects would be needed to obtain the same benefits as the proposed Project. The two projects that would be needed if the proposed Project is not built are:

- The Antelopes Butte Reservoir for water storage; and,
- Expansion of the existing AVEK Rosamond Water Treatment Plant.

Both of these projects were the subjects of feasibility studies prepared for AVEK. Neither project was constructed because of their cost.

ANNUAL COSTS OF AVOIDED PROJECTS

If the proposed WSSP2 project is not constructed the alternative would be to construct storage and treatment facilities as a single project. The cost detail for the avoided project is separated into two parts for explanation purposes only. The storage facility would be a new surface reservoir, Antelope Buttes Reservoir. The treatment facility would be an expansion of AVEK's existing Rosamond Water Treatment Plant.

Antelope Buttes Reservoir

Since 1965 AVEK has considered constructing a surface reservoir for the purpose of storing water delivered from the California Aqueduct. Several feasibility studies were conducted for a site between the Antelope and Fairmount Buttes, about 15 miles west of the City of Lancaster in the Antelope Valley. The proposed reservoir would have a maximum storage capacity of 31,000 acre-feet and a water surface area of 630 acres. The southern end of the reservoir would have an earthen dike and the northern end would have the main dam. Based on preliminary studies and evaluations, AVEK determined the proposed site had favorable geology for dam construction with minimal environmental concerns.

Capital Costs

In 2001 AVEK conducted a feasibility study which estimated construction costs for the reservoir and related pump facilities at $50 million. Using an update factor of 1.21, the estimated cost would be $60.5 million in 2009 dollars.

Operation and Maintenance Costs

For the purposes of this avoided cost estimate, annual operation and maintenance costs are assumed 2% of the capital construction costs.

Replacement Costs

It is assumed that the design life of the reservoir will be greater than 40-years. Because of this, replacement costs are not included.

Electrical Costs

The operation cost considered is the electricity required to pump raw water from the reservoir to the AVEK Rosamond Water Treatment Plant. It is assumed that the pumping requirements for the reservoir will be equal to the pumping requirements for the proposed groundwater recharge project ($1.84 million per year).

Variable Water Charge

The cost to import water to AVEK is the same as previously estimated with the annual costs ($3.6 million). Reservoir evaporation losses are discussed in Annual Other Water Supply Benefits.

Contingency

The contingency for the avoided project is estimated to be 30%. This estimate is based on a Class 3 estimate as defined by the Association for the Advancement of Cost Engineering (AACE), which is the same as previously used in Attachment 4 for the proposed project contingency.

Avoided Cost Summary for Antelope Buttes Reservoir

The following table summarizes the avoided capital, replacement, and annual operations and maintenance costs associated with constructing the Antelope Buttes Reservoir.

Capital Cost	
Reservoir	$60,500,000
Contingency	$18,150,000
Total	**$78,650,000**
Replacement Cost	
Total	**$0**
Annual Operation & Maintenance Cost	
Electrical	$1,840,000
Maintenance	$1,190,000
Variable Water Charge	$3,600,000
Contingency	$1,989,000.0
Total	**$8,619,000**

Expansion of Rosamond Water Treatment Plant

AVEK's existing Rosamond Water Treatment Plant was designed for a future expansion of 14 MGD treated capacity. The following avoided cost estimate looks at the capital, replacement, operation and maintenance costs associated with this avoided project.

Capital Costs

- **Filtration Equipment.** In 2004 AVEK explored the possibility of this expansion using membrane filtration. AVEK received a proposal from Pall Water Processing to supply the necessary equipment for the plant, which would have cost $4.6 million for 14 MGD if it had been constructed. Using an update factor of 1.13, the plant equipment would cost $5.2 million in 2009 dollars.
- **Plant Facilities.** It is estimated that the cost of constructing building, piping, and other systems to operate the treatment plant is approximately twice the cost of the membrane filters, or $10.4 million. It is assumed that these facilities will have a 40-year life and will not require replacement.
- **Granular Activated Carbon Treatment.** GAC Treatment to remove DBP precursors would be need if the Antelope Buttes Reservoir were constructed (see Attachment 8).

Replacement Costs

The filters have a life of 20-years, at which point they must be replaced. If the project is analyzed over a 40-year period, a single replacement would be required. It is assumed that the replacement cost equal the original installation cost.

Annual Operation & Maintenance Costs

- **Electrical.** It is estimated that to treat 14 MGD using membrane filtration would require a pressure of 50 psi. Assuming a plant efficiency of 75%, the required pump power would be 285 KW. Assuming an electrical cost of $0.15 per kWh, estimated power cost would be $375,000 per year (assuming 24-hour operation each day) to operate the pumps. Note that these costs are to pump water through the treatment plant and into the distribution system only. Pumping raw water into the treatment plant is accounted separately with the Antelope Buttes Reservoir.
- **Disinfection.** The cost to chlorinate will be the same as previously estimated ($250,000 per year).
- **Staff.** As this is would be an expansion of an existing facility, the administration and management costs of the facility are not expected to increase. It is estimated that 2 full time equivalent staff would be required to operate the plant expansion. Assuming an annual cost of $125,000 per year per person, it would cost $250,000 per year to staff.
- **Maintenance.** It is estimated that maintenance will cost approximately 2% of the total capital cost, which equals $600,600 per year.

Contingency

The contingency for the avoided projects is estimated to be 30%. This estimate is based on a Class 3 estimate as defined by the Association for the Advancement of Cost Engineering (AACE), which is the same as previously used in Attachment 4 for the proposed project contingency.

Avoided Cost Summary for Expansion of Rosamond Water Treatment Plant

The following table summarizes the avoided capital, replacement, and annual operations and maintenance costs associated with constructing the expansion of the existing Rosamond Water Treatment Plant.

Capital Cost	
Filtration Equipment	$5,200,000
Plant Facilities	$10,400,000
Contingency	$4,680,000
Total	**$20,280,000**
Replacement Cost	
Plant Equipment	$5,200,000
Equipment Life	20 years
Facility Life	40 years
Contingency	$1,560,000
Total	**$6,760,000**
Annual Operation & Maintenance Cost	
Staff	$250,000
Electrical	$375,000
Maintenance	$600,600
Disinfection	$250,000
Contingency	$442,680
Total	**$1,918,280**

Avoided Cost Summary

The following table summarizes the avoided capital and operation & maintenance costs associated with the Antelope Buttes Reservoir and the expansion of the Rosamond Water Treatment Plant.

	Antelope Buttes Reservoir	Expansion of Rosamond Water Treatment Plant	Total
Capital Cost	$78,650,000	$20,280,000	$98,930,000
Replacement Cost	$0	$6,760,000	$6,760,000
Annual Operation & Maintenance Cost	$8,619,000	$1,918,280	$10,537,280

Table 13. Annual Costs of Avoided Projects

Table 13 summarizes the 40-year life cycle cost for constructing, operating, and maintaining the avoided projects.

Table 13 - Annual Costs of Avoided Projects
(All avoided costs should be in 2009 dollars)
Project: Water Supply Stabilization Project No. 2

	Costs				Discounting Calculations	
(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**
YEAR	Alternative (Avoided Project Name): Antelope Buttes Reservoir & Rosamond Water Treatment Plant Expansion *Avoided Project Description: Construct a new surface reservoir with 31,000 AF of storage and expand an existing treatment plant by 14 MGD.*				Discount Factor	Discounted Costs (e) x (f)
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2009	$0	$0	$0	$0	1.000	$0
2010	$0	$0	$0	$0	0.943	$0
2011	$98,930,000	$0	$0	$98,930,000	0.890	$88,047,700
2012	$0	$0	$0	$0	0.840	$0
2013	$0	$0	$10,537,280	$10,537,280	0.792	$8,345,526
2014	$0	$0	$10,537,280	$10,537,280	0.747	$7,871,348
2015	$0	$0	$10,537,280	$10,537,280	0.705	$7,428,782
2016	$0	$0	$10,537,280	$10,537,280	0.665	$7,007,291
2017	$0	$0	$10,537,280	$10,537,280	0.627	$6,606,875
2018	$0	$0	$10,537,280	$10,537,280	0.592	$6,238,070
2019	$0	$0	$10,537,280	$10,537,280	0.558	$5,879,802
2020	$0	$0	$10,537,280	$10,537,280	0.527	$5,553,147
2021	$0	$0	$10,537,280	$10,537,280	0.497	$5,237,028
2022	$0	$0	$10,537,280	$10,537,280	0.469	$4,941,984
2023	$0	$0	$10,537,280	$10,537,280	0.442	$4,657,478
2024	$0	$0	$10,537,280	$10,537,280	0.417	$4,394,046
2025	$0	$0	$10,537,280	$10,537,280	0.394	$4,151,688
2026	$0	$0	$10,537,280	$10,537,280	0.371	$3,909,331
2027	$0	$0	$10,537,280	$10,537,280	0.350	$3,688,048
2028	$0	$0	$10,537,280	$10,537,280	0.331	$3,487,840
2029	$0	$0	$10,537,280	$10,537,280	0.312	$3,287,631
2030	$0	$0	$10,537,280	$10,537,280	0.294	$3,097,960
2031	$0	$0	$10,537,280	$10,537,280	0.278	$2,929,364
2032	$0	$0	$10,537,280	$10,537,280	0.262	$2,760,767
2033	$0	$6,760,000	$10,537,280	$17,297,280	0.247	$4,272,428
2034	$0	$0	$10,537,280	$10,537,280	0.233	$2,455,186
2035	$0	$0	$10,537,280	$10,537,280	0.220	$2,318,202
2036	$0	$0	$10,537,280	$10,537,280	0.207	$2,181,217
2037	$0	$0	$10,537,280	$10,537,280	0.196	$2,065,307
2038	$0	$0	$10,537,280	$10,537,280	0.185	$1,949,397
2039	$0	$0	$10,537,280	$10,537,280	0.174	$1,833,487
2040	$0	$0	$10,537,280	$10,537,280	0.164	$1,728,114
2041	$0	$0	$10,537,280	$10,537,280	0.155	$1,633,278
2042	$0	$0	$10,537,280	$10,537,280	0.146	$1,538,443
2043	$0	$0	$10,537,280	$10,537,280	0.138	$1,454,145
2044	$0	$0	$10,537,280	$10,537,280	0.130	$1,369,846
2045	$0	$0	$10,537,280	$10,537,280	0.123	$1,296,085
2046	$0	$0	$10,537,280	$10,537,280	0.116	$1,222,324
2047	$0	$0	$10,537,280	$10,537,280	0.109	$1,148,564
2048	$0	$0	$10,537,280	$10,537,280	0.103	$1,085,340
2049	$0	$0	$10,537,280	$10,537,280	0.097	$1,022,116
2050	$0	$0	$10,537,280	$10,537,280	0.092	$969,430
2051	$0	$0	$10,537,280	$10,537,280	0.087	$916,743
2052	$0	$0	$10,537,280	$10,537,280	0.082	$864,057
2053	$0	$0	$10,537,280	$10,537,280	0.077	$811,371
Total Present Value of Discounted Costs (Sum of Column (g))						$223,656,786
(%) Avoided Cost Claimed by Project						100%
Total Present Value of Discounted Avoided Project Costs Claimed by alternative Project (Total Present Value of Discounted Costs x % Avoided Cost Claimed by Project)						$223,656,786
Comments:						

Annual Other Water Supply Benefits

The WSSP2 is a water banking project allowing the Antelope Valley Region to import excess water supplies allocated to the Region or available during abnormally wet periods and store them in the local groundwater basin. These supplies will then subsequently be available for recovery and use during dry and high demand periods. The Region is currently dependent on the year-to-year allocations of State Water Project (SWP) water that fluctuate considerably as a result of weather patterns in the SWP watershed and environmental constraints in the Bay Delta.

Currently, during dry years when SWP supplies are curtailed, the Region is forced to negotiate with willing sellers of water and pay a premium for these supplies to be imported in order to meet the Region's annual water needs. In addition, in years where the amount of SWP water allocated to the Region exceeds the current demands, the Region is unable to store these supplies in reserve for subsequent dry periods or future demands, effectively forfeiting millions of dollars worth of water available to the Region.

The three State Water Project Contractors that serve the Antelope Valley have a combined Table A, or maximum, allocation of SWP supplies of 165,000 acre-feet (AF). DWR estimates that during normal years the SWP will be able to deliver 60% of Table A amounts to Contractors, representing a yearly supply for the Region of less than 100,000 AF. During a single-dry year event, or the worst case SWP water supply scenario, DWR estimates the SWP will be able to deliver 7% of Table A amounts to Contractors, or less than 12,000 AF for the Antelope Valley. During such an event, the State Water Project Contractors that serve the Antelope Valley must, therefore, purchase up to 90,000 AF from a willing seller in order to be able to deliver the same volume of water that is available to the Region during normal years.

Reduced Storage Capacity from (Avoided) Antelope Buttes Reservoir

The WSSP2 provides the mechanism for the Region to begin to address this problem. The WSSP2 will have the capacity to store 20,000 AF of water annually up to a total of 150,000 AF in the local groundwater basin when supplies exceed demands. The avoided Antelope Buttes Reservoir would have a fixed storage capacity of only 31,000 AF. In this scenario, if demand exceeds the 31,000 AF storage capacity (assuming the reservoir was initially full), additional water would have to be purchased to make up the deficit. It is estimated that 120,000 AF of water would need to be purchased over 12-years or 10,000 AFY during the 40-year project life.

Water which is sold by a willing seller is referred to as "Dry-Year" water. This Dry-Year water would require a special purchase of water from AVEK. Dry-Year Water is only available when farmers with allocated water supply chose to sell that water rather than use it for agricultural operations. Typically this occurs when the value of that water is greater than the value of the agricultural commodity. On average, it costs AVEK an additional $300/AF to purchase Dry-Year Water when it is available along with the Variable Water Charge of $180 /AF to transport it.

The cost of purchasing and transporting 10,000 AF in a single year would be about $4.8 million.

Evaporation Losses from (Avoided) Antelope Buttes Reservoir

The previously described avoided project, Antelope Buttes Reservoir, would be located in an arid desert environment where surface evaporation is a major concern. According to a 2003 USGS report (Simulation of Ground-Water Flow and Land Subsidence, Antelope Valley Ground-Water Basin, California) the pan evaporation rate in Antelope Valley is 114 inches per year. With a reservoir water surface area of 630 acres, approximately 6,000 AFY will be lost due to evaporation. To maintain the water level in the reservoir, additional water would be required beyond AVEK's standard Table A allocation from the SWP.

As previously mentioned, on average, it costs AVEK an additional $300/AF to purchase Dry-Year Water when it is available along with the Variable Water Charge of $180 /AF to transport it.

The annual cost of maintaining the reservoir level (replacement of 6,000 AFY) would cost $2.88 million.

Table 14. Annual Other Water Supply Benefits

Table 14 summarizes the 40-year life cycle cost for purchasing needed water that would be avoided by constructing WSSP2.

Table 15. Total Water Supply Benefits

Table 15 summarizes the 40-year life cycle cost for both the avoided projects and annual other water supply benefits.

Table 14 - Annual Other Water Supply Benefits (All benefits should be in 2009 dollars) Project: Water Supply Stabilization Project No. 2					
(a)	(b)	(c)	(d)	(e)	(f)
Year	Type of Benefit	Description of Benefit	Annual Benefits ($) (1)	Discount Factor (1)	Discounted Benefits (d) x (e) (1)
2009			$0	1.000	$0
2010			$0	0.943	$0
2011			$0	0.890	$0
2012			$0	0.840	$0
2013	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.792	$1,948,320
2014	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.747	$3,585,600
2014	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.747	$1,837,620
2015	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.705	$1,734,300
2016	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.665	$1,635,900
2017	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.627	$3,009,600
2017	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.627	$1,542,420
2018	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.592	$1,456,320
2019	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.558	$1,372,680
2020	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.527	$2,529,600
2020	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.527	$1,296,420
2021	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.497	$1,222,620
2022	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.469	$1,153,740
2023	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.442	$2,121,600
2023	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.442	$1,087,320
2024	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.417	$1,025,820
2025	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.394	$969,240
2026	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.371	$1,780,800
2026	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.371	$912,660
2027	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.350	$861,000
2028	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.331	$814,260
2029	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.312	$1,497,600
2029	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.312	$767,520
2030	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.294	$723,240
2031	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.278	$683,880
2032	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.262	$1,257,600
2032	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.262	$644,520
2033	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.247	$607,620
2034	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.233	$573,180
2035	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.220	$1,056,000
2035	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.220	$541,200
2036	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.207	$509,220
2037	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.196	$482,160
2038	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.185	$888,000
2038	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.185	$455,100
2039	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.174	$428,040
2040	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.164	$403,440
2041	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.155	$744,000
2041	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.155	$381,300
2042	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.146	$359,160
2043	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.138	$339,480
2044	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.130	$624,000
2044	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.130	$319,800
2045	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.123	$302,580
2046	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.116	$285,360
2047	a	Cost of water that cannot be stored in the avoided Antelope Buttes Reservoir.	$4,800,000	0.109	$523,200
2047	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.109	$268,140
2048	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.103	$253,380
2049	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.097	$238,620
2050	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.092	$226,320
2051	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.087	$214,020
2052	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.082	$201,720
2053	b	Cost of water to offset evaporation from avoided Antelope Buttes Reservoir.	$2,460,000	0.077	$189,420
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (f) for all Benefits shown in table)					$50,886,660
Comments:					

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 15. Total Water Supply Benefits (All benefits should be in 2009 dollars)			
Project: Water Supply Stabilization Project No. 2			
Total Discounted Water Supply Benefits (a)	Total Discounted Avoided Project Costs (b)	Other Discounted Water Supply Benefits (c)	Total Present Value of Discounted Benefits (d) (a) + (c) or (b) + (c)
$0	$223,656,786	$50,886,660	$274,543,446
Comments: The avoided project includes both the construction of the Antelope Buttes Reservoir and expansion of the existing Rosamond Water Treatment Plant Expansion.			

08

ATTACHMENT 8. WATER QUALITY AND OTHER EXPECTED BENEFITS

Water Quality Benefits

Aquifer storage of imported water will improve water quality for AVEK'S consecutive system (the consecutive system includes those water systems served by AVEK) by:

- Reducing disinfection byproduct (DBP) precursors and DBPs
- Improving mineral quality

State Water Project (SWP) water contains certain organic materials that, when combined with chlorine used for disinfection of public water supplies, produces DBPs. Regulated DBPs include trihalomethanes (THMs) and halo-acetic acids (HAAs). As a result of recent changes in DBP regulations, certain locations in the AVEK consecutive system no longer meet the regulations. This has caused AVEK to modify some treatment plants and consider modification of disinfection methods.

Granular Activated Carbon (GAC) Treatment

AVEK has considered adding DBP treatment to the existing Rosamond Water Treatment plant, consisting of granular activated carbon (GAC) treatment. GAC is a common water treatment method used to remove organic materials, and is comprised of vessels containing the GAC, which is a specially treated granular carbon material with extremely high specific surface area. As water passes through the GAC, organic materials (which are typically hydrophobic) adsorb onto the surface of the GAC and are removed from the water. GAC has a specific capacity for the organic materials which eventually becomes exhausted, at which time the GAC must be replaced.

Aquifer Storage Benefits In-Lieu of GAC Treatment

Aquifer storage has been documented as being capable of reducing both DBPs and DBP precursors (Singer et al., J. AWWA, 1993; McQuarrie et al., J. Env. Eng., 2003; Pyne et al., AWWARF, 1996), presumably by microbial degradation, although mixing with native supplies also appears to play a role. Thus, storing SWP water underground can be expected to reduce DBP formation in the AVEK consecutive system, allowing AVEK to forego installation of equipment to reduce DBP formation. This equipment would most likely consist of GAC treatment, and its cost is presented in Table 16.

In addition to DBP benefits, aquifer storage provides benefits in reducing concentrations of certain minerals. The "Initial Study for the proposed WSSP-2 Groundwater Recharge Project" prepared in June 2008 notes "Recharge and recovery reduce groundwater levels of arsenic, boron, chromium, fluoride, and nitrates…".

Estimated Cost With Project

Construction of WSSP2 will reduce THMs through aquifer storage without the need to construct and operate a GAC treatment facility. For this reason, there is no cost associated with improving water quality as a result of this project.

Estimated Cost Without Project

If WSSP2 is not constructed, a GAC treatment facility will be required to be constructed and operated. It is assumed that this treatment facility will be located at the existing AVEK Rosamond Water Treatment

Plant. The cost for this facility is divided into two parts, capital costs and annual operation & maintenance costs.

Capital Costs

Construction of the GAC treatment facility will include contact vessels, a pump station, and a backwash facility. It is estimated that such a facility would cost $0.50 per gallon treated per day. Assuming a treatment capacity of 20 MGD, construction cost would be about $10,000,000 not including contingencies.

Annual Operation & Maintenance Costs

Operation and maintenance of the GAC treatment facility will include electrical costs and equipment repair associated with operation of the pump station and backwash facility. The GAC media will also require regular replacement as it is expended. It is estimated that operation and maintenance of the GAC treatment facility would cost $50 per acre-foot, or about $1,000,000 per year assuming 20,000 AFU is treated.

Contingency

The contingency for the avoided projects is estimated to be 30%. This estimate is based on a Class 3 estimate as defined by the Association for the Advancement of Cost Engineering (AACE), which is the same as previously used in Attachment 4 for the proposed project contingency.

Summary

The following table presents a summary of the estimated costs without the proposed WSSP2 project.

	Base Cost	**Contingency**	**Total**
Capital Cost	$10,000,000	$3,000,000	$13,000,000
Annual Operation & Maintenance Cost	$50	$15	$65

Table 16 - Water Quality and Other Expected Benefits
(All benefits should be in 2009 dollars)
Project: Water Supply Stabilization Project No. 2

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (d) – (e)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009							$0	1.000	$0
2010							$0	0.943	$0
2011	Capital Costs	Each	1	0	1	$11,570,000	$11,570,000	0.890	$10,297,300
2012							$0	0.840	$0
2013	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.792	$1,029,600
2014	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.747	$971,100
2015	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.705	$916,500
2016	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.665	$864,500
2017	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.627	$815,100
2018	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.592	$769,600
2019	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.558	$725,400
2020	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.527	$685,100
2021	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.497	$646,100
2022	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.469	$609,700
2023	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.442	$574,600
2024	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.417	$542,100
2025	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.394	$512,200
2026	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.371	$482,300
2027	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.350	$455,000
2028	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.331	$430,300
2029	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.312	$405,600
2030	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.294	$382,200
2031	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.278	$361,400
2032	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.262	$340,600
2033	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.247	$321,100
2034	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.233	$302,900
2035	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.220	$286,000
2036	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.207	$269,100
2037	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.196	$254,800
2038	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.185	$240,500
2039	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.174	$226,200
2040	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.164	$213,200
2041	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.155	$201,500
2042	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.146	$189,800
2043	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.138	$179,400
2044	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.130	$169,000
2045	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.123	$159,900
2046	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.116	$150,800
2047	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.109	$141,700
2048	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.103	$133,900
2049	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.097	$126,100
2050	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.092	$119,600
2051	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.087	$113,100
2052	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.082	$106,600
2053	Treatment	AF	20,000	0	20,000	$65	$1,300,000	0.077	$100,100
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									$26,821,600

Comments: Capital Costs represent the cost to construct the facilities. Treatment represents the operation and maintenance costs associated with treating the water.

09

ATTACHMENT 9. ECONOMIC ANALYSIS: FLOOD DAMAGE REDUCTION

The Water Supply Stabilization Project No. 2 (WSSP2) is a groundwater banking project that will increase the reliability of water supplies in the Region and will have some direct and indirect flood damage reduction benefits in and outside of the project area. The proposed recharge basins primary purpose is to accept water from the SWP for recharging the groundwater basin, these recharge basins will provide some level of flood damage mitigation for local floods and floods in other areas of the State such as Kern County.

The WSSP2 recharge basins are located in the 500 year floodplain uphill relative to developed areas to the east. Floods are characterized by FEMA as “Shallow Flooding” with no flood depth information provided. The floodplain in the area is over 8 miles in width and floods spread out and drain from the southwest to the east. The sites have relatively flat slopes with elevation differences ranging from 20 to 25 ft per mile. These slopes will most likely result in relatively low flood velocities.

It is expected that during a flood event, flood waters would enter the recharge basins, temporarily be constrained by the low berms, would then wash out these small berms and flow to the next set of berms, where this process would repeat itself. The berms would temporarily detain the flood waters with an approximate capacity of 800 Acre Feet. During the process of detention, some of the flood water would be percolated into the groundwater basin. As noted in other Attachments of this Proposal, it is expected that about a half a foot a day can be percolated into the ground.

Some of the indirect flood reduction benefits include those benefits in other areas of the State such as Kern County which under flood conditions of the Kern River diverts flood waters into the California Aqueduct. This excess water can then be taken by AVEK and placed in the WSSP2 recharge basins. Additionally, there are future plans to incorporate the WSSP2 site as a potential receiving point for stormwater during the development of the Integrated Flood Management Plan that has been initially recommended for funding through a Proposition 84 Planning Grant.

The flood reduction benefits can only be defined as qualitative. Without knowing the actual flood characteristics and potential damage it is difficult to add a cost to the benefits identified above.

10

ATTACHMENT 10. COST AND BENEFITS SUMMARY

Attachment 10 includes the following items:

- **Proposal Project Costs and Benefits Summary** – Table 20 summarizes the costs and benefits for the proposed project.

Table 20 - Proposal Project Costs and Benefits Summary Proposal: Water Supply Stabilization Project No. 2 Agency: Antelope Valley-East Kern Water Agency							
Project	Agency	Total Present Value Project Costs (1)	Total Present Value Project Benefits				B/C Ratio
			Water Supply (2)	Flood Damage Reduction (3)	Other (4)	Total	
(a)	(b)	(c)	(d)	(e)	(f)	(g) (d) + (e) + (f)	(h) (g) / (c)
WSSP2	AVEK	$133,518,209	$274,543,446	$0	$26,821,600	$301,365,046	**2.3**
TOTAL		**$133,518,209**	**$274,543,446**	**$0**	**$26,821,600**	**$301,365,046**	**2.3**

(1) From Exhibit C, Table 11, column (i). Or from Exhibit #, Table 17, column (i). If project is a multi-purpose project, avoid double-counting costs.

(2) From Exhibit C, Table 15, column (d)

(3) From Exhibit E, Table 19, row (e)

(4) From Exhibit D, Table 16, column (j)

11

ATTACHMENT 11. PROGRAM PREFERENCES

The Water Supply Stabilization Project No. 2 (WSSP2) will meet most of the Program Preferences identified in the Proposition 84 Integrated Regional Water Management Guidelines. Listed below are the specific Program Preferences the WSSP2 will meet and a description of how it will meet them.

INCLUDE REGIONAL PROJECTS

The WSSP2 is, by design, a high priority regional project identified in the Antelope Valley IRWMP. It will store excess water for any entity in or even outside of the Region for later use. Transfer agreements have already been established between the three State Water Project Contractors that serve the Region, namely AVEK, Palmdale Water District, and Littlerock Creek Irrigation District, so that water can be stored at the WSSP2 on behalf of any entity and later recovered and served to any entity either directly or through exchanges.

As previously discussed, the WSSP provides the nexus between two of AVEK's largest regional projects – the West Feeder and the South-North Intertie Pipeline (SNIP). Raw water can be diverted from the State Water Project to the West Feeder and will be delivered and recharged at the WSSP2. When needed, water will be recovered through new groundwater wells, moved through the new Recovered Water Transmission Pipeline to the Recovered Water Pump Station and Steel Reservoir, and lifted into the SNIP. The SNIP is capable of delivering treated water to anywhere in AVEK's service area.

Existing agreements would also allow Palmdale Water District or Littlerock Creek Irrigation District to take delivery of AVEK's entitlement from the State Water Project in exchange for AVEK recovering a like amount of water from the WSSP2.

RESOLVE WATER CONFLICTS

The source of the most conflict in the Antelope Valley Region is, without question, the pending adjudication of the groundwater basin. The WSSP2 will provide a mechanism for all parties to the adjudication to more effectively utilize the imported water supplies available to the Region, thereby increasing the overall water supply portfolio for the Region and lessening the impact of anticipated curtailments in groundwater use following adjudication. The WSSP will increase the supply available to the Region by 150,000 AF every 10 years by simply providing the ability to store excess water during times of plenty for use during times of drought. It will serve as a physical solution for the Region to efficiently use the available water resources.

CONTRIBUTE TO ATTAINMENT OF OBJECTIVES OF THE CALFED BAY-DELTA PROGRAM

The WSSP2 will reduce the Antelope Valley Region's yearly dependence on water supplies imported from the Bay-Delta. The project allows the Region to take delivery of water from the Bay Delta through the State Water Project during periods when there is excess water available. In turn, the Region will be less dependent on receiving water supplies from the Bay Delta in subsequent years when reduced precipitation and environmental constraints restrict the amount of water that can be moved through and/or exported out of the Bay Delta.

EFFECTIVELY INTEGRATE WATER MANAGEMENT WITH LAND USE PLANNING

All local jurisdictions in the Antelope Valley recognize that effectively managing water supplies is the key to continued development in the Region. In addition to the WSSP2, and other water supply management projects, the cities of Palmdale and Lancaster have established new development standards to require the efficient use of water by end users. Together, the stakeholders in the Region have worked together to improve the reliability and efficient use of the available and limited water supplies. To improve the reliability of the Region’s water supplies, AVEK and other water entities have worked with the local municipalities to establish fees assessed to new development in the Region to fund water storage and banking projects. Much of the local funding for the WSSP2 comes from funds accumulated through the assessment of these fees.

DROUGHT PREPAREDNESS

Projections by the DWR indicate that over the long term, SWP contractors may only receive about 60% of their contractual entitlements. In “dry years”, the volume of SWP water could be as low as 7%.

The proposed recharge area was identified by and includes about 400 acres of recharge basins. Based on the USGS study, it is expected to recharge at least 23,000 AFY over a four month period from November through February and is anticipated that about 20,000 AFY will be available for recovery. AVEK owns a total of 1,500 acres at the recharge site.

Since AVEK supplies water to the Antelope Valley Region, the Project will increase the reliability of the water supply for all of the customers in the Region.

USE AND REUSE WATER MORE EFFICIENTLY

The WSSP2 accomplishes the two objectives of increasing water supply reliability and adapting to climate change. The project will allow the Region to more efficiently use or store its available water supply every year thereby improving reliability. The available SWP water that cannot immediately be used by customers during exceptionally wet periods will be stored so that it can instead be used when other supplies are curtailed during dry or high demand periods. In addition, there is considerable uncertainty surrounding the long term impacts of climate change on the Antelope Valley. While insufficient research has been conducted to determine the changes in when water supplies will be available to the Region, the WSSP2 will allow the Region to store these supplies whenever they are available so that they can be beneficially used when they are needed.

EXPAND ENVIRONMENTAL STEWARDSHIP

The Project will beneficially impact the environment by replenishing the local groundwater basin. The groundwater surface has declined about 100 feet since the 1960s. The WSSP2 is part of the overall plan to manage water resources (SWP and local surface and groundwater) to meet the water needs of the Antelope Valley and improve the condition of the groundwater basin.

Protect Surface Water and Groundwater Quality

The Project will protect groundwater quality by replenishing the aquifer with good quality water from the SWP. As noted earlier, the Antelope Valley Groundwater Basin is over drafted. One result typically seen when groundwater basins are over drafted is decline of the groundwater quality. Recharging the groundwater with SWP water will reduce the potential for degradation of the groundwater quality.

Assuming that the groundwater adjudication proceedings now under way result in reductions in groundwater pumping, the addition of SWP to the groundwater basin will have a positive impact on the groundwater quality.

Ensure Equitable Distribution of Benefits

The Project will supplement the water naturally recharged to the groundwater basin with SWP water. Besides increasing the amount of water recharged, the Project will increase the reliability and volume of water available to all residents of Antelope Valley including residents of disadvantaged communities..

Climate Change

The WSSP2 will assist in meeting several facets of the state priority referred to as Climate Change Response Actions. Brief discussions of what these beneficial impacts are expected to be are given in the following paragraphs.

Water Management

Reduction of GHG and Reduced Power Consumption—Greenhouse gas production will be reduced if the proposed Project is implemented for the following reasons:

1. Approximately 20,000 AFY of drinkable water will be provided by the groundwater recovery wells. Thus, the need for treatment of “surface water”, as is currently provided by AVEK’s four water treatment plants that treat SWP water will be reduced by 20,000 AFY. Surface water treatment involves such things as chemicals, electricity, and generation of filter backwash water which requires treatment so that it can be recovered and used.
2. Reduced chemical consumption will result in lower demand for chemical production.
3. Power consumption for production of chemicals and treatment plant operations will be reduced.

Expand Conjunctive Management of Multiple Water Supply Sources

Recharging the groundwater basin and then recovering the recharged water is a conjunctive use project that will enable better management of the both the groundwater and the SWP water. Recharge of SWP water during the winter months when water demand is less than during other months of the year will provide an opportunity to increase the annual volume of water that can be delivered by the SWP. The recharged groundwater can be recovered to supplement SWP deliveries.

Use Water More Efficiently

The avoided Buttes Reservoir storage project discussed in Attachment 7 would have a surface area of about 630 acres. The annual evaporation in Antelope Valley is about 5.5 feet and the water lost by evaporation from the Buttes Reservoir would be about 3500 AFY.

The proposed groundwater recharge basins will have a water surface area of less than 400 acres. Recharge is planned for the four months of November through February with the total evaporation during these four months at about 0.5 feet. The evaporation loss from the recharge basins would be about 200 AFY.

The proposed Project will reduce the evaporation loss by more than 3,000 AFY as compared to the alterative Buttes Reservoir.

12

ATTACHMENT 12. DISADVANTAGED COMMUNITY ASSISTANCE

The proposed project will not directly address the critical needs of disadvantaged communities. Indirectly, the proposed project will help DAC's by increasing the reliability of AVEK's water supply.

13

Attachment 13. AB 1420 and Water Meter Compliance Information

Attachment 13 includes the following Exhibits:

- Certification for Compliance with Water Metering Requirements
- AB 1420 Self- Certification Statement
- AVEK’s 2008 Urban Water Management Plan

Attachment 13 Exhibit
Certification for Compliance with Water Metering Requirements

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

CERTIFICATION FOR COMPLIANCE WITH WATER METERING REQUIREMENTS FOR FUNDING APPLICATIONS

In 2004, Assembly Bill 2572 added section 529.5 to the Water Code, providing that, commencing January 1, 2010, urban water suppliers must meet certain volumetric pricing and water metering requirements in order to apply for permits for new or expanded water supply, or state financial assistance for the following types of projects:

1. wastewater treatment projects
2. water use efficiency projects (including water recycling projects)
3. drinking water treatment projects

For the purposes of compliance with Section 529.5, a "water use efficiency project" means an action or series of actions that ensure or enhance the efficient use of water or result in the conservation of water supplies.

Please consult with your legal counsel and review sections 525 through 529.7 of the Water Code before completing this certification.

Applicants Affected
This requirement applies to urban water suppliers.

"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers.

When Certification is Required
State Water Resources Control Board (SWRCB): The application for financial assistance must include a completed and signed certification form demonstrating compliance with the water metering requirements.

Department of Water Resources (DWR) funding applications: This certification must be completed and submitted with the funding application. Check the specific proposal solicitation package for directions on applicability and submittal instructions.

Department of Public Health (DPH) Safe Drinking Water State Revolving Fund Program: This certification must be completed and submitted with the executed Notice of Acceptance of Application (NOAA).

California State Water Resources Control Board
California Department of Water Resources
California Department of Public Health

**CERTIFICATION FOR
COMPLIANCE WITH WATER METERING REQUIREMENTS
FOR FUNDING APPLICATIONS**

Funding Agency name: California State Department of Water Resources

Funding Program name: Integrated Regional Water Management Prop 84 Implementation Grant, Round 1

Applicant (Agency name): Antelope Valley – East Kern Water Agency

Project Title (as shown on application form): Water Supply Stabilization Project No. 2 Implementation Grant Proposal

Please check one of the boxes below and sign and date this form.

☐ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the agency is not an urban water supplier, as that term is understood pursuant to the provisions of section 529.5 of the Water Code.

☒ As the authorized representative for the applicant agency, I certify under penalty of perjury under the laws of the State of California, that the applicant agency has fully complied with the provisions of Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive) and that ordinances, rules, or regulations have been duly adopted and are in effect as of this date.

I understand that the Funding Agency will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Certification Statement may result in loss of all funds awarded to the applicant for its project. Additionally, for the aforementioned reasons, the Funding Agency may withhold disbursement of project funds, and/or pursue any other applicable legal remedy.

DAN FLORY

Name of Authorized Representative (Please print)

[signature]

Signature

GENERAL MANAGER

Title

12/30/2010

Date

Recycled Paper

Attachment 13 Exhibit
AB 1420 Self- Certification Statement

AB 1420 Self- Certification Statement Table 1

Note: Table 1 documents Status of Past and Current BMP implementation.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1, and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1, and Table 2 and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory *Dan Flory* Title of Signatory *General Manager* Signature of signatory *Dan Flory* Date *1/6/2011*

Application Date: *1/7/2011*

Proposal Identification Number: *Antelope Valley* **CUWCC Member? Yes/No** *No*

Has Urban Water Supplier submitted a 2005 Urban Water Management Plan? Yes/No *Yes* See Note (4) **Is the UWM Plan Deemed Complete by DWR? Yes/No** *No* See Note (4)

Applicant Name: *Antelope Valley-East Kern Water Agency (AVEK)*

Project Title: *Water Supply Stabilization Project No. 2 (WSSP2)*

Applicant's Contact Information: **Name:** *Tom Barnes* **Phone:** *661-943-3201* **E-mail:** *tbarnes@avek.org*

Participants:

Retailer (List Below)	*Wholesaler (List Below)*
	Antelope Valley-East Kern Water Agency (AVEK)

C1

C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
			BMP Implemented by Retailers and/or Wholesalers / BMP			**Compliance Options/Alternative Conservation Approaches (1)**			**BMP Is Exempt (2)**			**BMP Implementation Requirements Met**				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 1 Water Survey for Single/Multi-Family Residential Customers														
	✓	BMP 2 Residential Plumbing Retrofit														
✓	✓	BMP 3 System Water Audits, Leak Detection		*No*									*No*		*N/A*	*No*
✓	✓	BMP 3 Leak Repairs		*No*									*No*		*N/A*	*No*
	✓	BMP 4 Metering with Commodity Rates for All New connections														
	✓	BMP 4 Retrofit of Existing Connections														

C1

C2	C3	C4	C5	*C6	C7	**C8	**C9	**C10	C11	C12	C13	C14	C15	C16	C17	C18
			BMP Implemented by Retailers and/or Wholesalers / *BMP*			**Compliance Options/Alternative Conservation Approaches (1)**			**BMP Is Exempt (2)**			**BMP Implementation Requirements Met**				
BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	CUWCC MOU Requirement Met: Retailer *Yes/No*	CUWCC MOU Requirement Met: Wholesaler *Yes/No*	Date of BMP Report Submitted to CUWCC for (2007-2008) (MOU Signatories)	Date BMP Implementation Data Submitted to DWR in CUWCC Format (Non MOU Signatories) (3)	All Supporting Documents have been Submitted Yes/No
	✓	BMP 5 Large Landscape Conservation Programs and Incentives														
	✓	BMP 6 High-Efficiency Washing Machine Rebate Programs														
✓	✓	BMP 7 Public Information		*No*									*No*		*N/A*	*No*
✓	✓	BMP 8 School Education		*No*									*No*		*N/A*	*No*
	✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts														
✓		BMP 10 Wholesale Agency Assistance Programs		*No*									*No*		*N/A*	*No*
	✓	BMP 11 Conservation Pricing														
✓	✓	BMP 12 Conservation Coordinator		*No*									*No*		*N/A*	*No*
	✓	BMP 13 Water Waste Prohibitions														
	✓	BMP 14 Residential ULFT Replacement Programs														

***C6:** Wholesaler may also be a retailer (supplying water to end water users)
****C8, **C9, **, and C10:** Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.

(1) For details, please see: http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, and lack of legal authority criteria as detailed in the CUWCC MOU
(3) Non MOU signatories must submit to DWR reports and supporting documents in the same format as CUWCC.

(4) Both 2005 and 2008 Urban Water Management Plans have been submitted to DWR. 2010 UWMP will be submitted per latest DWR requirements.

AB 1420 Self- Certification Statement Table 2

Provide Schedule, Budget, and Finance Plan to Demonstrate Commitment to Implement All BMP's to Become in Compliance with BMP Implementation - Commencing Within 1st Year of Agreement for Which Applicant Receives Funds.

Self-Certification Statement: The Urban Water Supplier and its authorized representative certifies, under penalty of perjury, that all information and claims, stated in this table, regarding compliance and implementation of the BMPs, including alternative conservation approaches, are true and accurate. This signed AB 1420 Self-Certification Statement Table 1 and Table 2 are the basis for granting funds by the Funding Agency. Falsification and/or inaccuracies in AB 1420 Self Certification Statement Table 1 and Table 2, and in any supporting documents substantiating such claims may, at the discretion of the funding agency, result in loss of all State funds to the applicant. Additionally, the Funding Agency, in its sole discretion, may halt disbursement of grant or loan funds, not pay pending invoices, and/or pursue any other applicable legal remedy and refer the matter to the Attorney General's Office.

Name of Signatory *Dan Flory* Title of Signatory *General Manager* Signature of signatory *Dan Flory* Date *1/6/2011*

Application Date: *1/7/2011*

Proposal Identification Number:	*Antelope Valley*	**CUWCC Member?**	**Yes/No**	*No*
Applicant Name:	*Antelope Valley-East Kern Water Agency (AVEK)*	**Is the UWM Plan Deemed Complete by DWR?**	**Yes/No**	*No*
Project Title:	*Water Supply Stabilization Project No. 2 (WSSP2)*			See Note (3)
Applicant's Contact Information:	Name *Tom Barnes, 661-943-3201, tbarnes@avek.org*			

	Retailer *(List Below)*		
Participants:			

C1	C2	C3	C4	C5	*C6	C7	C8	**C9	**C10	**C11	C12			C13	C14	C15	C16	C17	C18	C19
				BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer Yes/No	Wholesaler Yes/No	Regional Yes/No	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
	1. Utility Operations Programs																			
1.11	✓	✓	BMP 12 Conservation Coordinator		*No*									*Dec-11*	*0*	*Mar-12*	*$ 9,500.00*	*General Fund*	*Yes*	*No*
1.12		✓	BMP 13 Water Waste Prohibitions																	
1.13	✓	✓	BMP 10 Wholesale Agency Assistance Programs		*No*									*Mar-12*	*0*	*Oct-12*	*$ 12,000.00*	*General Fund*	*Yes*	*No*
1.20	✓	✓	BMP 3 System Water Audits, Leak Detection/**Repair**		*No*									*Dec-11*	*0*	*Jun-12*	*$ 8,500.00*	*General Fund*	*Yes*	*No*
1.30		✓	BMP 4 Metering with Commodity Rates for All New/**Retrofit of Existing** connections																	
1.40		✓	BMP 11 Conservation Pricing																	
	2. Educational Programs																			
2.10	✓	✓	BMP 7 Public Information		*No*									*Dec-11*	*0*	*Aug-12*	*$ 14,000.00*	*General Fund*	*Yes*	*No*
2.20	✓	✓	BMP 8 School Education		*No*									*Mar-12*	*0*	*Oct-12*	*$ 8,000.00*	*General Fund*	*Yes*	*No*
	3. Residential																			
3.11		✓	BMP 1 **Indoor** Water Survey for Single/Multi-Family Residential Customers																	
3.12			BMP 1 **Outdoor** Water Survey for Single/Multi-Family Residential Customers																	
3.20		✓	BMP 2 Residential Plumbing Retrofit																	
3.30		✓	BMP 6 High-Efficiency Washing Machine Rebate Programs																	

				BMP Implemented by Retailers and/or Wholesalers				Compliance Options / Alternative Conservation Approaches (1)			BMP is Exempt (2)			Implementation Scheduled to Commence within 1st Year of Agreement						
CUWCC 2010 Flex Track BMPs	BMPs required for Wholesale Supplier	BMPs required for Retail Supplier	BMPs	Retailer *Yes/No*	Wholesaler *Yes/No*	Regional *Yes/No*	Alternative Conservation Approaches Yes/No	BMP Checklist	Flex Track	Gallons Per Capita Per Day GPCD	Not Cost Effective	Lack of Funding	Lack of Legal Authority	Start Date (MM/YR)	Completion Level (%)	BMP Completion Date (MM/YR)	Budget (Dollars)	Funding Source & Finance Plan to Implement BMPs	Meets CUWCC Coverage Yes/No	Funds Requested, if Available. (See AB 1420 Compliance Table 3) Yes/No
3.40		✓	BMP 14 Residential ULFT Replacement Programs																	
	4. Commercial, Industrial, Institutional																			
4.00		✓	BMP 9 Conservation programs for Commercial, Industrial, and Institutional (CII) Accounts																	
	5. Landscape																			
5.00		✓	BMP 5 Large Landscape Conservation Programs and Incentives																	

*C6: Wholesaler may also be a retailer (supplying water to end water users)
**C9, ** C10, and **C11: Agencies choosing an alternative conservation approach are responsible for achieving water savings equal or greater than that which they would have achieved using only BMP list.
(1) For details, please see http://www.cuwcc.org/mou/exhibit-1-bmp-definitions-schedules-requirements.aspx.
(2) BMP is exempt based on cost-effectiveness, lack of funding, or lack of legal authority, as detailed in the CUWCC MOU.

(3) Both 2005 and 2008 Urban Water Management Plans have been submitted to DWR. 2010 UWMP will be submitted per latest DWR requirements.

Attachment 13 Exhibit
AVEK's 2008 Urban Water Management Plan

Antelope Valley-East Kern Water Agency, California
Urban Water Management Plan

2008 URBAN WATER MANAGEMENT PLAN

A PUBLIC AGENCY

Table Of Contents

List of Tables

List of Figures

List of Appendices

Antelope Valley-East Kern Water Agency
2008 Urban Water Management Plan
Contact Sheet

Date plan submitted to the Department of Water Resources: **February 3, 2009**

Name of person preparing this plan: **Russell Fuller, General Manager**
Phone: **(661) 943-3201**

Fax: **(661) 943-3204**

E-mail address: **avekwa@aol.com**

The Water supplier is a: **State Water Project Contractor**

The Water supplier is a: **Wholesaler to potable water purveyors & Retailer of untreated agricultural water**

Utility services provided by the water supplier include: **Water**

Is This Agency a Bureau of Reclamation Contractor? **No**

Section 1. Introduction

1.1 Purpose

The California Urban Water Planning Act requires urban water suppliers to describe and evaluate sources of water supply, efficient uses of water, demand management measures, implementation strategy and schedule, and other relevant information and programs. This information is used by the urban water supplier for development of an Urban Water Management Plan (UWMP) which is submitted to the California Department of Water Resources (DWR) every five years.

Section 2. Adoption and Implementation of Plans

Law

> 10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published … After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

2.1 Public Participation

The Antelope Valley-East Kern Water Agency (AVEK) has actively encouraged community participation in its urban water management planning efforts by encouraging attendance and participation in the Board of Directors (BOD) public meetings held twice each month. Public hearings were held on January 13, 2009 for review of plan and to receive comments on the draft plan before the AVEK's BOD approval.

A special effort was made to include community and public interest organizations. Legal public notices for each meeting were published in the local newspapers and posted at Agency facilities. Copies of the draft plan were available at Agency office and on the internet at the Agency's website: www.avek.org. See Appendix A for participation list.

2.1.1 Plan Adoption

AVEK prepared the initial draft of its Urban Water Management Plan during spring 2008. The final plan was adopted by the BOD on January 13, 2009 and submitted to the California Department of Water Resources within 30 days of BOD approval. Attached to the cover letter addressed to the Department of Water Resources and as Appendix B are copies of the signed Resolution of UWMP Adoption. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

2.2 Agency Coordination

Law

> 10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.
>
> 10620 (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.
>
> 10621 (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.
>
> 10621 (b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan…..

2.2.1 Interagency Coordination

AVEK views "interagency coordination" in at least 2 ways, one with respect to the development of UWMP and the second concerns the development of additional water sources such as imported water stored in the groundwater basin. AVEK's draft UWMP was posted on its website www.avek.org for public access and review. AVEK's outreach efforts concerning this UWMP are outlined in Table 1.

Table 1

Coordination and Public Involvement

	Coordination and Public Involvement Actions by AVEK				
Entities	**Contacted for Assistance (2005 UWMP)**	**Attended public meetings (2005 UWMP)**	**Sent notice of available draft for review**	**Commented on the draft**	**Sent notice of intention to adopt (Hearing)**
Boron CSD			✓		✓
City of California City		✓	✓		✓
MPUD			✓		✓
Rosamond CSD	✓	✓	✓		✓
California Water Service			✓		✓
Los Angeles County WWD	✓	✓	✓		✓
Palm Ranch ID			✓		✓
Palmdale Water District			✓		✓
Littlerock Creek ID			✓		✓
Quartz Hill Water District			✓		✓
Calif. Dept. of Water Resources	✓		✓		✓
City of Palmdale			✓		✓
City of Lancaster			✓		✓
Los Angeles County San	✓		✓		✓
County of Los Angeles			✓		✓
County of Ventura			✓		✓
County of Kern			✓		✓

With respect to the second issue, it should be recognized that AVEK is a supplier of imported water from the State Water Project (SWP) for the Antelope Valley region and that it is not a primary source but a secondary source. Since AVEK wholesales water to area retail purveyors, water sales volumes and predicted future treated and untreated water quantities are the only tools and products available for distribution. See Appendix C for Rate Stabilization Fund Discussion. The water provided by DWR through AVEK is used by area consumers in lieu of or in addition to pumped groundwater. The UWMP seeks to optimize water assets and plans for future water shortages. AVEK attempts to maximize use of its surface water product by encouraging retail purveyors to utilize surface water instead of pumped groundwater whenever possible and utilize groundwater recharge as a method for banking water during wet years. AVEK is reducing over drafting of the area aquifers by providing as much of its allocated DWR water to consumers as possible.

Currently, AVEK is actively involved with the planning stages and coordination of a fully regional water banking program. The proposed water banking program would function under a Joint Power Association format and treat all area-wide water interests equally by offering participation to all customers if desired. AVEK currently has a Water Supply Capacity Charge that funds system improvements that will be required for the anticipated growth of AVEK's customers over the next 20 years. See Appendix D for list of proposed facility expansions. An improvement identified as a proposed facility expansion includes California Aqueduct turnouts, raw water pipelines and basin inlets that could be used for groundwater recharge.

To develop a successful groundwater banking and storage program, AVEK believes a myriad of issues concerning such a program (eg, legal, technical, financial, policy, etc.) should be addressed at the earliest possible stage by creating a comprehensive institutional framework for the program. Formulating such a framework should create as many stakeholders as possible. AVEK will encourage that appropriate steps be taken to facilitate discussions about this matter among stakeholders.

Finally, AVEK's efforts to conserve and optimize its water resources have been the focus and will continue to be the focus on such programs as 1) provide treated and untreated surface water to area water retailers and farmers for a reasonable cost while maintaining their facilities and trained personnel; and 2) seek to institute programs and policies that deal with the water allocations during the inevitable dry years and spans of dry years. AVEK may assist, when possible, all area retailers in developing their own water conservation methods and policies as well as providing information about water conserving techniques.

AVEK also participated in the preparation of the Antelope Valley Integrated Regional Water Management Plan (See Appendix J) that contains information to help take action to meet shared objectives for long term water management for the Antelope Valley. Further water conservation efforts are supported by AVEK through their participation in the Antelope Valley Water Conservation Coalition.

2.2.2 Intra-Agency Coordination

Each year, the Agency considers the outlook for the water supplies for the Agency for the next 12 months. See SECTION 2.4 for more information on the outlook for water supply for the Antelope Valley.

2.3 Supplier Service Area Information with 20 Year Projections

Law

> 10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

2.3.1 Demographic Factors

The Antelope Valley is located in the western part of the Mojave Desert, about 50 miles northeast of Los Angeles. The valley is triangular shaped, topographically closed basin covering about 2,200 square miles. Groundwater is an important component of water supply in the Antelope Valley (Leighton, USGS, 1999). Estimates of average natural annual groundwater recharge range from about 40,000 to 58,000 AFY (Snyder, 1955; Bloyd, 1967; Durbin, 1978). Pumping in the valley, primarily for agricultural purposes, peaked in the 1950's when production may have exceeded 400,000 AF annually (Snyder, 1955). Increased urban growth in the 1980's resulted in an increase in the demand for water and an increase in groundwater use. Long-term groundwater withdrawals have caused some land subsidence.

2.3.1.1 Service Area

AVEK has played a major role in the Valley's water system since it was granted a charter by the State legislature in 1959. It succeeded the AV-Feather River Association, which was formed in 1953 to encourage importation of water from the Feather River in northern California. See Appendix E for AVEK Boundary Location Map.

In 1962 the AVEK Board of Directors signed a water supply contract with the State Department of Water Resources (DWR) to assure delivery of imported water to supplement Antelope Valley groundwater supplies. AVEK has the third largest allotment of 29 State Water Project (SWP) water agencies in California, following the Metropolitan Water District and the Kern County Water Agency. See Appendix F for SWP map. SWP facilities are not fully constructed and until full built-out, SWP facilities are only capable of delivering annually about 72% of the project's 4.1 million acre-feet.

Financed by a $71 million bond issue, AVEK constructed the Domestic Agricultural Water Network (DAWN), which consists of four water treatment plants with clear water storage and more than 100 miles of pipelines. Four 8-million gallon water storage reservoirs near Mojave and one 3-million gallon reservoir at Vincent Hill Summit complete the DAWN network. The bulk of the imported water is treated and distributed to customers throughout its service area. See Appendix G for current list of water purveyors that AVEK serves. The network also provides delivery of untreated water from the Aqueduct to local farmers and ranchers.

The Quartz Hill water treatment plant is capable of producing 90 million gallons per day (mgd) of treated aqueduct water. The Eastside water treatment plant is capable of producing 10 mgd. The Rosamond water treatment plant can produce 14 mgd while the most recently added treatment plant in Acton can make 4 mgd of treated water.

Additional surface water allotments from the SWP exist in the Antelope Valley for Palmdale Water District and Littlerock Creek Irrigation District.

2.3.1.2 Population Projections

Lancaster and Palmdale are the largest cities in the Antelope Valley with Mojave, Edwards Air Force Base, Boron, and Littlerock being the larger of the fewer than 10,000 population centers.

AVEK provides service to incorporated and unincorporated areas of Antelope Valley. The population projections include inhabitants from Lancaster, Palmdale, Acton, and Lake Los Angeles of Los Angeles County and California City, Rosamond, Edwards Air Force Base, Mojave, and Boron of Kern County. Since AVEK only serves a portion of Palmdale, the projected values for Palmdale have been adjusted and then included in Table 2.

Table 2 indicates population growth projections within the service areas of AVEK. The projections are based on data from California Department of Finance, the Greater Antelope Valley Economic Alliance, and the Southern California Association of Governments. See Appendix H for information from these sources on projected growth.

Table 2
Population – Current and Projected
(AVEK Area) [1]

Population	2008	2012	2017	2022	2027
Service Area Population	303,073	349,638	402,212	456,119	506,555

2.3.2 Past Drought, Water Demand, and Conservation Information

During drought periods, the Agency has met most of its customers' needs through special programs including turn back pool water, dry year water purchases, etc., and by utilizing larger reductions to agricultural users. AVEK has been unable to fulfill demands for SWP water only two times since its formation. See Appendix F for a list of the annual SWP water deliveries to AVEK.

Since 1995, the water demand for all water sources has increased by a growth rate of about 4% per year, due in part to a general acceleration in the region's economy. From 1990 to 2000, the population within AVEK's service area increased and new water demand has kept pace with the growth. The area continues to have a modest but growing industrial sector located principally in Palmdale and Lancaster. The commercial sector is increasing more rapidly due to increased numbers of consumers in the area and the general desire to shop closer to home. The agricultural economy is based on carrots, alfalfa, onions, peaches, pears, apple, vineyards and other stone type fruits becoming more common.

2.3.3 Climate

The area encompassed by AVEK is primarily desert. Vegetation is typical of the western Mojave Desert that includes creosote and desert shrubs. Certain portions of the valley contain large stands of Joshua Trees. Summer temperatures can reach 112^{o}F while winter temperatures have been known to drop to about 10ºF. Typical annual average rainfall is 7 to 8 inches. The perimeter of the Antelope Valley includes low brush covered hills transitioning into the Tehachapi Mountains and San Gabriel Mountains to the west and south. The surface water runoff drainage channels and courses are active only during times of runoff due to precipitation. The water tables are well below the levels needed to sustain year round flowing streams. The area is known for its daily winds, usually from the west. Table 3 illustrates average rates of evapo-transpiration, temperature, and precipitation of the service area.

[1] Population growth projections include only a portion of the City of Palmdale.

Table 3
Climate

	Jan	Feb	Mar	Apr	May	June
Standard Monthly Average EvapoTranspiration (Eto)	**1.86**	**2.80**	**4.65**	**6.00**	**8.06**	**9.00**
Average Rainfall (inches)	**1.49**	**1.82**	**1.35**	**0.36**	**0.12**	**0.05**
Average Temperature (Fahrenheit)	**44.3**	**47.5**	**52.7**	**58.3**	**66.7**	**75.2**

Table 3 (continued)
Climate

	July	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average (Eto)	**9.92**	**8.68**	**6.60**	**4.34**	**2.70**	**1.86**	**66.5**
Average Rainfall (inches)	**0.10**	**0.14**	**0.19**	**0.35**	**0.48**	**1.05**	**7.51**
Avg. Temperature (Fahrenheit)	**81.1**	**79.7**	**73.3**	**62.6**	**50.4**	**43.2**	**61.3**

Rainfall and temperature records based on data reported at the Lancaster station by NOAA. EvapoTranspiration data based on data reported from CIMIS station zone 17 – High Desert Valleys.

DWR's Draft Water Plan includes an assessment of the impacts of global warming on the State's water supply using a series of computer models and based on decades of scientific research. Model results indicate increased temperature, reduction in Sierra snow depth, early snow melt, and a rise in sea level. These changing hydrological conditions could affect future planning efforts which are typically based on historic conditions. Difficulties that may arise include:

- Hydrologic conditions, variability, and extremes that are different than current water systems were designed to manage

- Changes occurring too rapidly to allow sufficient time and information to permit managers to respond appropriately

- Requiring special efforts or plans to protect against surprises and uncertainties

As such, DWR will continue to provide updated results from these models as further research is conducted.

2.4 Water Supply Sources

Law

> 10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data are available.]

2.4.1 Imported Water

AVEK sells imported water from the DWR California Aqueduct as part of the SWP. Currently, AVEK has an allocation for purchasing up to 141,400 acre-feet of water per year from the SWP.

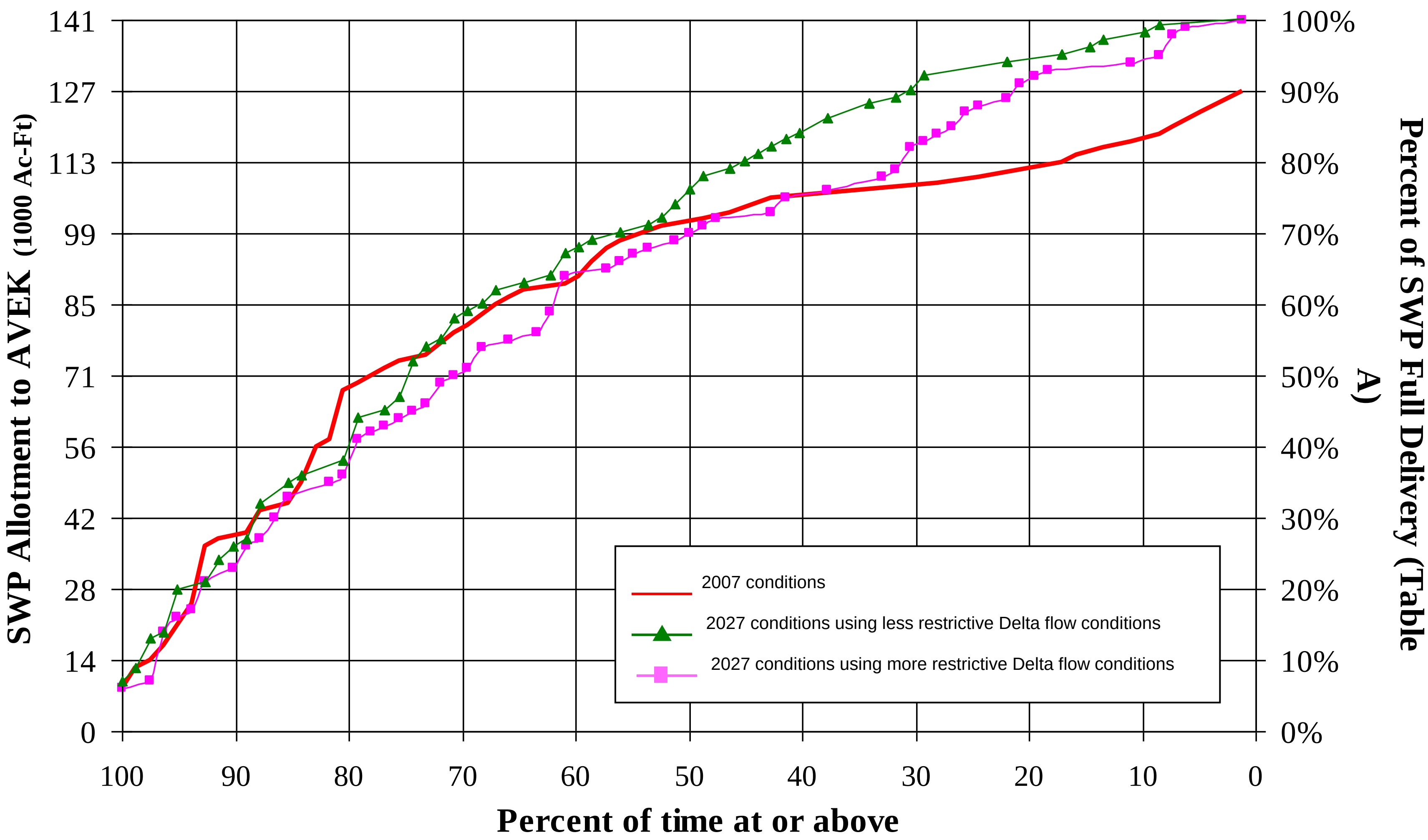
Each year, the Agency considers the outlook on the water supplies for the Agency for the next 12 months. Figure 1 indicates AVEK's DWR water deliveries under different availability conditions. Figure 1 includes information provided by the DWR 2007 State Water Project Delivery Reliability Report (DWR Report) and indicates the probability that a given SWP Table A amount will be delivered from the Delta. Each line is constructed by ranking 83 annual delivery values from lowest to highest and calculating the percentage of values equal to or greater than the delivery value of interest. For a complete description of the scenarios please refer to the DWR Report.

The scenarios developed by DWR include predictions of climate change developed under two different models, the GFDL and PCM models. They also include predictions based upon modifications to Delta flow patterns dictated by environmental concerns. A total of 13 scenarios were developed, using combinations of these models and Delta flow modifications. Figure 1 depicts three of these scenarios:

1. 2007 conditions
2. 2027 conditions using less restrictive Delta flow conditions
3. 2027 conditions using more restrictive Delta flow conditions

Other future (2027) scenarios are similar to the two presented in Figure 1

Figure 1. SWP Delivery Reliability



Data taken from DWR 2007 Delivery Reliability Report, Tables B.3, B.4, and B.5

(12/07)

2.4.2 Groundwater

AVEK does not have production groundwater wells but may include groundwater pumping as a water supply in the future. In previous years, AVEK has made efforts to utilize groundwater to offset imported water deficiencies. These efforts were unwelcomed by several of the larger AVEK purveyors.

2.4.3 Recycled Water

AVEK does not provide recycled water. Reference is made to Section 7.1.1, AVEK's Recycled Water Use Capabilities.

2.4.4 Current and Projected Water Supplies

Water supplies will have different historical dry year sequences and different yields during multiple year drought conditions based on hydrology, average storage, contract entitlements, etc. Currently, AVEK's only source of water is SWP water. For planning purposes, Table 4 reflects the Future Conditions with average year Table A delivery from the Delta in five-year intervals.

Table 4
Current and Planned Water Supplies (AF/Y)

Water Supply Sources	2007	2012	2017	2020	2027
SWP Allocation	141,400	141,400	141,400	141,400	141,400
Projected Delivery Percentages[2]	63%	64-65%	65-66%	66-68%	66-69%
Projected Delivery by DWR[3]	89,082	90,496	91,910	93,324	93,324
AVEK produced surface water	0	0	0	0	0
Transfers/Exchanges	0	0	0	0	0
Total	89,082	90,496	91,910	93,324	93,324

[2] Projected delivery percentages are based on low and high projections from the DWR 2007 SWP Reliability Report. The average projected delivery percentage for years 2007 and 2027 were taken from Table 7.1. Projected percentages for years 2012 – 2022 were derived by linear interpolation of the percentage values of year 2007 to year 2027. See Appendix F.

[3] Projected Delivery is the product of the SWP Allocation of 141,400 AF/Y and the Projected Delivery Percentages provided by the DWR models. For example, in year 2012 the projected delivery of 90,496 AF/Y is the product of 141,400 AF/Y multiplied by the projected delivery percentage of 64%.

Section 3. Reliability Planning

Law

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable and provide data for each of the following:

(1) An probable water year;
(2) A single dry water year; and,
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

3.1 Reliability

AVEK considers two aspects of reliability. First, the source reliability is only as reliable as the occurrences of the winter weather storms that deposit snow pack in the higher Sierra Nevada elevations that are part of the SWP watershed. Once the winter rain and snow season have been completed, the snow pack is measured and projected annual water volumes are given to SWP users. Prior to that, a specific volume of water is unpredictable. Based on previous experience, the predicted water values given by the State in the spring have been conservative.

The second aspect of "reliability" is what AVEK forecasts as the available water allocated for each of the water purveyors. AVEK also strives to be as informative as possible on the annual water allocations, and distributes information from the SWP projections to the water purveyors in a timely manner. The demand by water purveyors is greater in the summer months compared to the winter months. AVEK charges higher water rates in peak months to offset water supply deficiencies as a demand management measure.

Reliability planning requires information about: (1) the expected frequency and severity of shortages that occur because of reduction in SWP allocation and failure of transportation facilities; and (2) how available contingency measures can reduce the impact of shortages when they occur.

3.2 Frequency and Magnitude of Supply Deficiencies

The current and future supply projections through 2027 are shown in the above Table 4. The future supply projections assume normal inflows from the Sacramento Delta for the SWP. See Figure 1 for SWP delivery reliability.

According to SWP Delta Table A Delivery Reliability Probability for Year 2007, AVEK is projected to receive an average delivery of 63% of full Table A under current conditions. The percentage of SWP Table A amounts projected to be available is referenced from Table 7.1 of DWR's "The State Water Project Delivery Reliability Report 2007" (August, 2008). AVEK has used the lowest allocation of 6% from Table 7.1, which includes revised current demands, for calculation of AVEK's single dry year supplies. The multiple dry year demand was based on the 4-year drought values also presented in Table 7.1 titled, "SWP Average and Dry Year Table A Delivery from Delta in Five-Year Intervals for Studies 2007 and 2027". Based on the SWP allotment for AVEK, 63% of full delivery translates to about 89,082 acre-feet of water per year. For the remainder of this study, the value of 89,082 ac-ft will be defined as the baseline supply for a probable year.

3.3 Reliability Comparison

Table 5 details estimated water supply projections associated with several water supply reliability scenarios. Multiple-year drought periods correspond with the with the lowest water deliveries that were available from DWR. For further information on the data, see Section 6, Water Shortage Contingency Plan.

Table 5
Supply Reliability

Unit of Measure: Acre-feet/Year		**Multiple Dry Water Years**		
Probable Water Year	**Single Dry Water Year**	**2-year**	**4-year**	**6-year**
89,082	8,484	48,076	49,490	49,490
% of Maximum	**6%**	**34%**	**35%**	**35%**

Table 6
Basis of Water Year Data[4]

Water Year Type	**Base Year(s)**
Probable Water Year	**(see footnote)**
Single Dry Year	**1977**
2-Year	**1976-1977**
4-Year	**1931-1934**
6-Year	**1987-1992**

3.4 Factors Resulting in Inconsistency of Supply

The likeliest interruptions would be:

1. Reduction of annual SWP allocation due to low precipitation.
2. Reduction in conveyance of annual SWP allocation due to regulatory restrictions in the Delta.
3. A result of loss of power or facility failure in the aqueduct.
4. Failure of Delta levee system.
5. Earthquake
6. Power loss

Response by the agency to any of the above factors will always include contact and coordination with AVEK's customers. Additionally, in the event of power loss AVEK has permanent emergency power generation that automatically starts to maintain water treatment operations. In the event of an earthquake, AVEK personnel will survey and assess damage and respond accordingly with shutdowns and repairs.

[4] A probable water year scenario is defined as 63% of the full SWP allocation (141,400 ac-ft), or 89,082 ac-ft per historical reliability (Fig.1). This value coincides with the average percent of SWP allocation delivered as predicted in Table 7.1 (2007) of the DWR 2007 SWP Delivery Reliability Report. The model assumes parties entitled to SWP water have adequate storage for capturing excess supplies during wet years. Actual volume of water available may be less if adequate storage is not available. Single and Multiple Dry Years data are cited from Table 7.1 (2007) of the DWR report.

3.5 Transfer or Exchange Opportunities

Law

> 10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

3.5.1 Water Transfers

The Agency has in past explored and implemented dry year water transfer options to increase reliability. For example, additional water was acquired by AVEK in 2001; AVEK purchased 3,000 acre-feet of Table A water from Tulare Lake Irrigation District. It is estimated that additional water could be purchased by the Agency as emergency water supply if requested by water purveyors. Other sources of water available to AVEK include the turnback pool, Article 21, and dry-year purchase programs; water that could be acquired for customer use.

Section 4. Water Use Provisions

Law

10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof;

(2) Agricultural.

(3) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

4.1 Water Use by Customer Type – Past, Current, and Future

Table 7 details water purveyors' deliveries for M&I. The future water uses shown in the tables were based on the DWR SWP Delivery Reliability (Figure 1) of 63% of Table A deliveries.

Table 7 Total Water Use (M&I)						
Water Distributed	**2002**	**2007**	**2012**	**2017**	**2022**	**2027**
Billiton Exploration U.S.A.	22	14	26	27	28	28
Boron CSD	280	350	655	674	692	711
City of California City	163	801	1500	1542	1584	1626
Desert Lake CSD	63	161	301	310	318	327
Desert Sage Apartments	6	6	11	12	12	12
Edgemont Acres MWC	26	18	34	35	36	37
Edwards AFB	2140	1986	3718	3823	3927	4032
FPL Energy	1438	1251	2342	2408	2474	2540
Mojave Public Utility District	217	41	77	79	81	83
Rosamond CSD	1512	1111	2080	2138	2197	2256
US Borax	1625	1828	3422	3519	3615	3711
Antelope Valley Country Club	151	193	361	371	382	392
California Water Service Co	236	313	586	602	619	635
El Dorado MWC	387	60	112	115	119	122
Landale MWC	26	0.5	1	1	1	1
Los Angeles County Waterworks Districts	31794	38581	72227	74261	76296	78330
Palm Ranch Irrigation District	650	445	833	857	880	903
Quartz Hill Water District	3217	4099	7674	7890	8106	8322
Shadow Acres MWC	218	299	560	576	591	607
Sunnyside Farms MWC	290	293	549	564	579	595
Westside Park MWC	108	71	133	137	140	144
White Fence Farms MWC	731	755	1413	1453	1493	1533
Lake Elizabeth MWC	500	950	1778	1829	1879	1929
Sales to water purveyors (AF/Y)	45,800	89,082	91,910	93,324	96,152	97,566

Table 8 details the additional water uses and losses

Table 8 Additional Water Uses and Losses (AF)						
	2002	**2007**	**2012**	**2017**	**2022**	**2027**
Raw Water	24,302	7,625	7,625	7,625	7,625	7,625
Unaccounted-for system losses	2,103	1,001	3,046	3,132	3,220	3,311
Total	26,405	8,626	10,667	10,757	10,845	10,936

In case of rationing, the Agency will be able to use its customer database for implementing any possible water reductions.

4.1.1 Agricultural Sector

Agricultural water demand from AVEK's system is projected to have minimal growth in the next ten to fifteen years with a possible decrease over the next twenty to thirty years. The water deliveries indicated in Table 8 show consistent amounts through 2027. Agricultural land use within the Agency's area is currently increasing in quantity. Even so, it is projected that in the long term, more agricultural land will eventually be converted to urban uses.

Section 5. Demand Management Measures

Law

> 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
> (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: …

AVEK is committed to implementing water conservation where applicable[5]. This Section discusses water conservation.

For responding to the Urban Water Management Planning Act, the Agency will address the 14 Demand Management Measures. Descriptions of the Agency's water conservation programs are below. The Agency has, in good faith, tried to address and comply with all of the BMP targets listed in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU) where applicable, even though the Agency is not signatory to the MOU regarding Urban Water Conservation or a member of CUWCC.

(A) DMM 1 – Water Survey Programs for Single-Family and Multi-Family Residential Customers

IMPLEMENTATION DESCRIPTION: All services of this type are provided by the water purveyor customers of AVEK. AVEK will assist in information research and dissemination when appropriate.

(B) DMM 2 – Residential Plumbing Retrofit

IMPLEMENTATION DESCRIPTION: All services of this type are provided by the water purveyor customers of AVEK. AVEK will assist in information research and dissemination when appropriate.

(C) DMM 3 – System Water Audits, Leak Detection and Repair

IMPLEMENTATION DESCRIPTION: AVEK has no formal leak detection or pipeline survey program. AVEK does however audit system losses monthly as part of its normal billing procedures. Pipelines are driven regularly as part of water sample runs during which personnel will note leaks if observed. System losses of less than 3% of total deliveries are considered within the margin of error and normal. The agency repairs leaks promptly on average about twice per year. Below is a table of results.

Results	**2003**	**2004**	**2005**	**2006**	**2007**
% of Unaccounted Water	2.1	1.3	1.2	1.9	1.6
Miles Surveyed	100	100	100	100	100
Miles Repaired	<1	<1	<1	<1	<1
Actual Expenditures - $	10,000	10,000	10,000	10,000	10,000
Actual Water Saved - AF/Y	<1	<1	<1	<1	<1

[5] It should be recognized that Section 10620(c) of the Urban Water Management Planning Act provides that a water wholesaler need not address or implement certain planning elements described in the UWMP Act that are more applicable to water retailers (eg, water demand management measures).

(D) DMM 4 – Metering with Commodity Rates

IMPLEMENTATION DESCRIPTION: The Agency charges all water purveyor customers based on metered readings and established rate schedules developed by the Agency. All current and new connections including temporary connections are required to be metered and billed per volume-of-use. AVEK has never operated unmetered connections. Additionally, existing meters are checked on a regular basis for leaks and accuracy.

(E) DMM 5 – Large Landscape Conservation Programs and Incentives

IMPLEMENTATION DESCRIPTION: Landscaping requirements and conservation incentives are provided by AVEK's water purveyor customers and mandated by city and other governmental agencies.

(F) DMM 6 – High-efficiency washing machine rebate programs

IMPLEMENTATION DESCRIPTION: These programs are administered by water purveyor customers of AVEK. AVEK will disseminate information when appropriate.

(G) DMM 7 – Public Information Programs

IMPLEMENTATION DESCRIPTION: The Agency maintains an active public information program. The Agency promotes water conservation and other resource efficiencies in coordination with other utilities by distributing public information through brochures and through community speakers, paid advertising, and some special events every year. The Agency has been actively providing information to the public for over 20 years and is currently a participant within the Antelope Valley Water Conservation Coalition.

IMPLEMENTATION SCHEDULE: The Agency will continue to provide public information services and materials to remind the public about water and other resource issues.

METHODS TO EVALUATE EFFECTIVENESS: The Agency will solicit feedback from customer purveyors regarding the information provided.

CONSERVATION SAVINGS: AVEK has no method to quantify the savings of this DMM but believes that this program is in the public's interest.

(H) DMM 8 – School Education Programs

IMPLEMENTATION DESCRIPTION: The Agency continues to work with school districts to promote water conservation and other resource efficiencies at school facilities and to educate students about these issues.

The Agency solicits advice from various local schools to help implement this program. AVEK provides educational materials to several grade levels, State and County water system maps, posters, workbooks, interactive computer software, videos, and tours (for example water treatment plants).

IMPLEMENTATION SCHEDULE: The Agency will continue to implement this DMM at the levels described.

METHODS TO EVALUATE EFFECTIVENESS: The Agency will continue to survey the institutions and educators on the number of programs, materials and attendance at water conservation activities.

CONSERVATION SAVINGS: The Agency has no method to quantify the savings of this DMM but believes that this program benefits the general public in their awareness of water conservation.

(I) DMM 9 – Conservation Programs for Commercial, Industrial, and Institutional Accounts

IMPLEMENTATION DESCRIPTION: These services are provided by AVEK's water purveyor customers, and AVEK will disseminate information when appropriate.

(J) DMM 10 – Wholesale Agency Programs

IMPLEMENTATION DESCRIPTION: AVEK is a wholesale agency for water and the DMM's are identified and discussed in this section.

Existing Programs	**Number of agencies assisted/Estimated AF per Year Savings**				
Program Activities	2003	2004	2005	2006	2007
Water Surveys					
Residential Retrofit					
System Audits	1/1000	1/1000	1/1000	1/1000	1/1000
Metering-Commodity Rates	55/55	55/55	55/55	55/55	55/55
Landscape Programs					1/100
Washing Machines					
Public Information	1/10	1/10	1/10	1/10	2/50
School Education					
Water Waste					
CII WC / ULF					
Pricing					
WC Coordinator					20/20
Water Waste					
ULFT Replacement					
Actual Expenditures - $	$13,000	$13,000	$13,000	$13,000	$18,000

Planned Programs	**No. of agencies to be assisted/ Est AF per Year Savings**				
Program Activities	2008	2009	2010	2011	2012
Water Surveys	0/0	0/0	0/0	0/0	0/0
Residential Retrofit	0/0	0/0	0/0	0/0	0/0
System Audits	N/A	N/A	N/A	N/A	N/A
Metering-Commodity Rates	55/55	55/55	55/55	55/55	55/55
Landscape Programs	1/100	1/100	1/100	1/100	1/100
Washing Machines	0/0	0/0	0/0	0/0	0/0
Public Information	2/50	2/50	2/50	2/50	2/50
School Education	0/0	0/0	0/0	0/0	0/0
Water Waste	0/0	0/0	0/0	0/0	0/0
CII WC / ULF	0/0	0/0	0/0	0/0	0/0
Pricing	N/A	N/A	N/A	N/A	N/A
WC Coordinator	20/20	20/20	20/20	20/20	20/20
Water Waste	0/0	0/0	0/0	0/0	0/0
ULFT Replacement	0/0	0/0	0/0	0/0	0/0
Actual Expenditures - $	$18,000	$18,000	$18,000	$18,000	$18,000

(K) DMM 11 – Conservation Pricing

IMPLEMENTATION DESCRIPTION: AVEK does not have a conservation pricing structure. AVEK maintains a standard pricing structure to all water purveyor customers regardless of water usage but does have water pricing structures that include variations in pricing based on time of year (winter versus summer). The winter versus summer pricing is to encourage use of AVEK imported water during the off peak time of year instead of purveyors using groundwater. AVEK does not provide sewer service.

Table K2 - WHOLESALERS	
Water Rate Structure	None
Year rate effective	N/A

(L) DMM 12 – Water Conservation Coordinator

IMPLEMENTATION DESCRIPTION: AVEK does have a designated water conservation coordinator.

Table L2 - Planned					
Table L2 - Planned	2008	2009	2010	2011	2012
# of full-time positions					
# of part-time staff	1	1	1	1	1
Pos.supplied by other agency					
Projected Expenditures - $	$7,000	$7000	$7000	$7000	$7000

(M) DMM 13 – Water Waste Prohibition

IMPLEMENTATION DESCRIPTION: These services are provided by AVEK's water purveyor customers, the retail water purveyors.

(N) DMM 14 – Residential Ultra-low Flush Toilet Replacement Programs

IMPLEMENTATION DESCRIPTION: These services are provided by AVEK's water purveyor customers, the retail water purveyors. AVEK will disseminate information when appropriate.

5.1 Agricultural Water Conservation Programs

AVEK does not implement any agricultural water conservation programs, but encourages their agricultural customers to participate in water conservation.

5.2 Planned Future Supply Projects

AVEK does not currently have any planned future projects to increase water supply.

Non-implemented & Not scheduled DMM / Planned Water Supply Project Name	Per-AF Cost ($)
N/A	**N/A**

Development of Desalinated Water

Due to the agency's distance from coastal areas, AVEK does not have the opportunity to implement a desalination program.

Section 6. Water Shortage Contingency Plan

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

6.1 Stages of Action

6.1.1 Rationing Stages and Reduction Goals

The Agency has developed delivery reduction goals to curb demand during water shortages. In the event of water supply shortages the Agency will make water delivery reductions per the Agency law for allocations. Reference is made to Appendix B, which includes Ordinance O-07-2, AVEK Water Shortage Contingency Plan.

Stage No.	Water Supply Conditions	% Shortage
1	Reduction in SWP Allocation Below Current Demand	1 %
2	Reduction in SWP Allocation Below Current Demand	50%

6.1.2 Estimate of Minimum Supply for Next Three years

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (b) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.

Table 9 presents minimum projected 3-year supply.

Table 9
Supply Reliability (Ac-Ft) [1]

Source	Year 1	Year 2	Year 3	Normal
State Water Project	49,490	49,490	49,490	89,082

[1] Based on the years 1931, 1932, and 1933 as reported in Table 7.1 of the DWR 2007 SWP Delivery Reliability Report.

6.2 Preparation for Catastrophic Water Supply Interruption

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

6.2.1 Water Shortage Emergency Response

Since the Agency began selling water to retailers, AVEK has maintained emergency contingency plans for activities required in the event there is an interruption in the DWR water supply or there is a major mechanical or electrical failure in one of the water treatment plants. The emergency activities that are undertaken by AVEK depend upon the severity of the problem and how quickly the problem can be remedied.

6.2.2 SWP Emergency Outage Scenarios

The Department of Water Resources has faced several potential outages along various parts of the SWP, mainly the California Aqueduct, since construction of the SWP in the early 1970s. Notable examples include slippage of side panels into the Aqueduct near Patterson in the mid-1990s, the Arroyo Pasajero flood event in 1995 (which also destroyed part of Interstate 5 near Los Banos), and various subsidence repairs needed along the East Branch of the Aqueduct since the 1980s.

All of these outages were short-term in nature (on the order of weeks or months), and DWR's Operations and Maintenance Division worked diligently to devise methods to keep the Aqueduct in operation while repairs were made. Thus, the SWP contractors experienced no interruption in deliveries.

One of the great design engineering features of the State Water Project is the ability to isolate parts of the system. If one reservoir or portion of the Aqueduct (the Aqueduct is divided into "pools") is damaged in some way, other portions of the system can still remain in operation. Since September 11, 2001, DWR has made significant investments in the security measures protecting all SWP facilities. Security is now coordinated with the California Highway Patrol.

Events could transpire that could result in significant outages and potential interruption of service. Examples of possible nature-caused events include a levee breach in the Sacramento San Joaquin Delta near the Harvey O. Banks Pumping Plant, a; flood or earthquake event that severely damaged the Aqueduct along its San Joaquin alley traverse, or an earthquake event along either the West or East Branches. Such events could impact all the SWP Contractors south of the Delta.

AVEK and other SWP Contractors response to such events would be highly dependent on where along the SWP an event occurred. Three scenarios are described herein that could impact AVEK's SWP deliveries. For these scenarios it is assumed that a 100 percent reduction for six months would result from these catastrophic events.

Scenario 1: Levee Breach near Banks Pumping Plant

As demonstrated by the June 2004 Jones Tract levee breach, the Delta's levee system is extremely fragile. The SWP's main pumping facilities are located in the southern Delta. Should a major levee in the Delta near these facilities fail catastrophically, salt water from the eastern portions of San Francisco Bay would rush into the Delta, displacing the fresh water runoff that supplies the SWP. All pumping would be disrupted until water quality conditions stabilized and returned to pre-breach conditions. The re-freshening of Delta water quality would require large amounts of additional Delta inflows, which might not be immediately available depending on the timing of the levee breach. The Jones Tract repairs took several weeks to accomplish and months to complete; a more severe breach could take much longer, during which time pumping might not be available on a regular basis.

Annual SWP operations consist of filling San Luis Reservoir, the major SWP storage facility south of the Delta, during the winter and spring months. South of Delta Contractors then take deliveries through San Luis Reservoir for the remainder of the year. Supplies are also stored in Pyramid and Castaic Lakes along the West Branch, as well as in a variety of groundwater banking programs in the southern San Joaquin Valley. Assuming that Banks Pumping Plant would be out of service for six months and that all southern Contractors had to take their supplies from the three reservoirs and from banking programs, coordination between DWR and Contractors would be required.

Scenario 2: Complete Disruption of the Aqueduct in the San Joaquin Valley

The 1995 flood event at Arroyo Pasajero demonstrated vulnerabilities of the Edmund G. "Pat" Brown portion of the California Aqueduct (that portion that traverses the San Joaquin Valley from San Luis Reservoir to Edmonston Pumping Plant). Should a similar flood event or an earthquake damage this portion of the aqueduct, deliveries from San Luis Reservoir could be interrupted for a period of time. DWR has informed the contractors that a four-month outage could be expected in such an event. AVEK's assumption is a six-month outage.

Scenario 3: Complete Disruption of the Aqueduct East Branch

The East Branch of the California Aqueduct begins at a bifurcation of the Aqueduct in the Tehachapi Mountains south of Edmonston Pumping Plant. From the point of bifurcation, it is an open canal.

If a major earthquake (an event similar to or greater than the 1994 Northridge earthquake) were to damage a portion of the East Branch, deliveries could be interrupted. The exact location of such damage along the East Branch would be key to determining emergency operations by DWR and the southern California contractors. For this scenario, it is assumed that the East Branch suffered a single-location break and would not be available for deliveries.

If the shortage problem can be resolved within the available water storage time frame, only a few of the larger consumers need to be notified of the temporary decrease in water supply. If there will be a stoppage in the raw water deliveries to the various treatment plants, all customers (M&I and agriculture) will be notified of the stoppage and how soon water deliveries may be resumed.

If raw water deliveries to water treatment plants are temporarily stopped, treated water from other plants may be rerouted to the affected areas in some instances via interconnecting pipeline systems. Damages to the aqueduct will be repaired by DWR. Damaged Agency treatment plant components, whether mechanical or electrical, can usually be circumvented due to the duplicity of pumping and operations systems or the availability of manual over-ride controls. The magnitude of reduced water deliveries and length of time before resumption of full water availability will determine the extent of customer (M&I and agriculture) notification and activities required by the AVEK staff.

Possible Catastrophe:

- Power Outage
- Aqueduct Failure due to Earthquake or other circumstances
- Agency Treatment Plant Shutdown due to vital component failure
- Delta Levee Failure
- Local Earthquake

The following summarizes the actions the water agency will take during a water supply catastrophe.

Response by the agency to a catastrophic event will always include contact and coordination with AVEK's customers. Additionally, in the event of power loss AVEK has permanent emergency power generation that automatically starts to maintain water treatment operations. In the event of an earthquake, AVEK personnel will survey and assess damage and respond accordingly with shutdowns and repairs.

Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions
Regional power outage	Automatic switch to emergency power; contact customers, assess and respond
Earthquake	Automatic switch to emergency power (if needed); contact customers, assess
Other (name event)	and respond
Other (name event)	

6.3 Prohibitions, Consumption Reduction Methods and Penalties

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
>
> 10632 (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
>
> 10632 (f) Penalties or charges for excessive use, where applicable.

6.3.1 Mandatory Prohibitions on Water Wasting

AVEK believes that their customers are in the best position to implement no-waste policies. AVEK can and will make recommendations to assist its customers in monitoring water wasting, if AVEK's assistance is requested.

6.3.2 Excessive Use Penalties

Penalties for excessive use are imposed by water purveyor customers of AVEK. It is anticipated agricultural users will economize their water usage as required. AVEK has in place provisions for pre-paid ordering as a method of penalizing users who do not take the delivery requested. AVEK does not have powers to implement penalties for excessive use by a retailer's customer but encourages all retailers to have such penalties in place.

6.3.3 Implementation

AVEK relies on its water retailers to implement water consumption reduction methods to their customers in order to cope with water supply shortages.

6.4 Revenue and Expenditure Impacts and Measures to Overcome Impacts

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments

Revenues collected by the Agency are currently used to fund operation and maintenance of the existing facilities and fund new capital improvements. The Agency will estimate projected ranges of water sales versus shortage stage to best understand the impact each level of shortage will have on projected revenues and expenditures.

Revenue reduction and an increase in expenditure may occur due to reduced sales from implementing the abovementioned programs. The magnitude of the revenue reduction and expenditure increase will be dependent on the severity of the water shortage, with larger and longer water shortages having greater impact on revenues. For minor events, the Agency may be able to absorb the revenue shortfall/increase in expenditures by reallocating existing funds, such as delaying some capital projects. For large events, the Agency may enact a rate adjustment to its customers.

6.5 Shortage Contingency Ordinance/Resolution

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (h) A draft water shortage contingency resolution

6.5.1 AVEK Water Shortage Response/Priority by Use

AVEK has a plan of action in its existing rules and regulations in the event it is necessary to declare a water shortage emergency. AVEK reserves the right at any time if the quantity of water available to the Agency pursuant to the Water Supply Contract between the DWR and AVEK is less than the aggregate of all consumer requests to allocate the quantity of water available to AVEK to the extent permitted by law. See Appendix B for Ordinance O-07-2 to Adopt a Water Shortage Contingency Plan.

6.5.2 Health and Safety Requirements

These requirements will be left to the retailing water purveyor agencies. AVEK has no direct control of the final water user actions and activities.

6.5.3 Water Shortage and Triggering Mechanisms

AVEK will attempt to provide the minimum health and safety water needs of the service area. It must be recognized that AVEK's water supply is not considered a primary source of water and it is a secondary source of water. The water shortage response plan was designed based on the assumption that during a long term drought DWR will have a reduction in water deliveries.

Rationing stages may be triggered by a shortage in the DWR water source. Although an actual shortage may occur at any time during the year, a shortage (if one occurs) is usually forecasted by the Department of Water Resources on or about April 1 each year. If it appears that it may be a dry year and the water supplies will be reduced, AVEK contacts its agricultural customers in March with confirmation follow up in April, so that the customers can minimize potential financial impacts.

Currently, the Agency's sole water source is imported surface water. Rationing stages may be triggered by a supply shortage or by contamination.

6.6 Reduction Measuring Mechanism

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

6.6.1 Mechanism to Determine Reductions in Water Use

Under non-emergency water supply conditions, potable water production figures are recorded daily. Totals are reported daily to the Water Treatment Facility Supervisor. Totals are reported monthly to the Board of Directors and incorporated into the water supply report.

During water shortage periods, the Agency will review daily the water demands versus the established reduction goals. Reference is made to Appendix B, Ordinance O-07-2 to Adopt Water Storage Contingency Plan. The Agency will take appropriate steps to reduce their deliveries to meet the reduction goals.

Section 7. Recycled Water Plan

Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area, including quantification of the amount of wastewater collected and treated methods of wastewater disposal.

10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.

10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

7.1 Wastewater Quantity, Quality, and Current Uses

7.1.1 AVEK's Recycled Water Use Capabilities

AVEK does not collect or treat wastewater and has no plan to use recycled water as part of their deliveries. The Agency provides service to retail and water purveyors and agricultural customers that may have the opportunity to utilize recycled water as part of deliveries. The Agency supports customers' plans that would utilize recycled water within AVEK boundaries. The use of recycled water by AVEK customers is an important part of reducing the demand on AVEK's available water. Los Angeles County Water Works District has estimates for the future availability and location of recycled water and they are included in Appendix I.

7.2 Potential and Projected Use, Optimization Plan with Incentives

Law

> 10633 (d) A description and quantification of the potential uses of recycled water. …, and a determination with regard to the technical and economic feasibility of serving those uses.
>
> 10633. (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
>
> 10633 (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
>
> 10633 (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacle to achieving that increased use.

7.2.1 AVEK's Recycled Water Use Philosophy

AVEK does not collect or treat wastewater and has no plan to use recycled water as part of their deliveries. AVEK's customers should investigate, develop, and implement recycled water usage programs. The Agency encourages the use of recycled water. For example, AVEK is presently assisting both the cities of Lancaster and Palmdale, and the County of Los Angeles with local recycled water projects.

Section 8. Water Quality Impacts on Reliability

Law

> 10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Currently, the Agency water supply is solely provided by the State Water Project, and its water quality is maintained and governed by the standards established by the Department of Water Resources. As such, the Agency does not expect fluctuation in the water quality that will affect agency water management strategies. See Appendix I for the DWR Sanitary Survey Update Report 2001 information and DWR website for State Water Project water quality information.

Section 9. Water Service Reliability

Law

> 10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.

9.1 Projected Water Supply and Demand

The following compares current and projected water supply and demand. This information is based on continued commitment to conservation programs, conjunctive use programs and use of groundwater and recycled water, by the water purveyors. Probable supply totals for the year 2007 are based on the Agency receiving 63% of its delivery amount from the State Water Project, which is about 89,082 acre-feet of water per year. The projection gradually increases to 66% or 98,324 acre-feet of water per year by 2027. These projections are shown in Table 10. The 2007 and 2027 projections are based on data provided in Table 7.1 of the DWR 2007 SWP Delivery Reliability Report. The projected probable 5-year water supplies for the other years are derived from a linear interpolation of the 2007 supply totals up to the 2027 supply totals.

Active water efficiency improvements and additional water supply will be necessary to meet the Agency's projected water demand. The Agency will continue to examine supply enhancement options, such as groundwater recharge for Antelope Valley and conjunctive water use as discussed in Section 2.2.1, Interagency Coordination.

Projected demand totals are calculated based on population growth projection shown in Table 2. It was assumed that a household of 3.5 people requires 1.2 acre-foot of water per year. The assumed water usage rates are based on demand history for single-family dwellings in the area. New housing construction and related landscaping in the area does not appear to be different from existing housing development. The following tables will show water demand projection based on population projections from Table 2.

Table 10
Projected Probable 5-Year Water Supply AF/Y

	2007	2012	2017	2022	2027
Supply totals	89,082	90,496	91,910	93,324	93,324
% of SWP Full Allotment	63%	64%	65%	66%	66%

Table 11 Projected Probable 5-Year Water Demand AF/Y[6]					
Demand	**2007**	**2012**	**2017**	**2022**	**2027**
Retail Purveyors	**97,871**	**115,030**	**135,640**	**160,033**	**188,915**
Agriculture[7]	**7,625**	**7,625**	**7,625**	**7,625**	**7,625**
TOTAL	**105,496**	**122,655**	**143,265**	**167,658**	**196,540**

Table 12 Projected Probable 5-Year Supply and Demand Comparison AF/Y					
	2007	**2012**	**2017**	**2022**	**2027**
Supply totals	**89,082**	**90,496**	**91,910**	**93,324**	**93,324**
Demand totals	**105,496**	**122,655**	**143,265**	**167,658**	**196,540**
Difference (shortfall)	**(16,414)**	**(32,159)**	**(51,355)**	**(74,334)**	**(103,216)**
Difference as % Supply	**18%**	**36%**	**56%**	**80%**	**111%**
Difference as % Demand	**16%**	**26%**	**36%**	**44%**	**53%**

The comparison of the projected probable year supply and demand indicates a shortfall starting in the year 2007. This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

9.2 Projected Single Dry Year Supply and Demand Comparison

Table 13 Projected Single Dry Water Year Supply AF/Y					
	2007	**2012**	**2017**	**2022**	**2027**
Supply totals	**8,484**	**8,484**	**9,898**	**9,898**	**9,898**
% of SWP Full Allotment	**6%**	**6%**	**7%**	**7%**	**7%**

The 2007 and 2027 projected single dry water year percentages were based on the minimum delivery by the DWR as reported in Table 7.1 of the DWR 2007 SWP Delivery Reliability Report. The projected single dry water year percentages for the other years are derived from a linear interpolation of the 2007 supply totals up to the 2027 supply totals.

Table 14 Projected Single Dry Year Supply and Demand Comparison AF/Y					
	2007	**2012**	**2017**	**2022**	**2027**
Supply totals	**8,484**	**8,484**	**9,898**	**9,898**	**9,898**
Demand totals	**105,496**	**122,655**	**143,265**	**167,658**	**196,540**
Difference (shortfall)	**(97,012)**	**(114,171)**	**(133,367)**	**(157,760)**	**(179,572)**
Difference as % Supply	**1144%**	**1346%**	**1347%**	**1594%**	**1814%**
Difference as % Demand	**92%**	**93%**	**93%**	**94%**	**91%**

[6] Projected five-year water demand is for all water sources available in the area.
[7] The projected probable demand by agriculture is only an estimate of their demand since a record of their groundwater usage is not available.

The comparison of the projected probable year supply and demand indicates a shortfall that started in the year 2007. This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

In any dry year, the Agency will notify its customers of the potential water shortage for the year.

It is up to the purveying customers of AVEK to direct rationing program and policies to consumers. Therefore, expected changes to demand due to dry years will be provided by the purveying customers.

9.3 Projected Multiple Dry Year Supply and Demand Comparison

The following tables identify the projected minimum water supply based on the four-year drought historic sequence for water supply as presented in Table 7.1 of the DWR 2007 SWP Delivery Reliability Report.

Table 15
Projected Supply During Multiple Dry Year Ending in 2012 - AF/Y

	2008	2009	2010	2011	2012
Supply	31,179	31,179	31,179	31,179	31,179
Projected Normal	89,082	89,082	89,082	89,082	89,082
% of Projected Normal	35%	35%	35%	35%	35%

Table 16
Projected Demand During Multiple Dry Year Ending in 2012 - AF/Y

	2008	2009	2010	2011	2012
Demand	115,791	119,149	122,604	126,160	129,818
% of Projected Demand	100%	100%	100%	100%	100%

Table 17
Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2012 - AF/Y

	2008	2009	2010	2011	2012
Supply totals	31,179	31,179	31,179	31,179	31,179
Demand totals	115,791	119,149	122,604	126,160	129,818
Difference (shortfall)	(84,612)	(87,970)	(91,426)	(94,981)	(98,640)
Difference as % Supply	271%	282%	293%	305%	316%
Difference as % Demand	73%	74%	75%	75%	76%

Table 18 Projected Supply During Multiple Dry Year Ending in 2017 - AF/Y					
	2013	**2014**	**2015**	**2016**	**2017**
Supply	30,769	30,769	30,769	30,769	31,249
Projected Normal	90,496	90,496	90,496	90,496	91,910
% of Projected Normal	34%	34%	34%	34%	34%

Table 19 Projected Demand During Multiple Dry Year Ending in 2017 - AF/Y					
	2013	**2014**	**2015**	**2016**	**2017**
Demand	133,583	137,457	141,443	145,545	149,766
% of Projected Demand	100%	100%	100%	100%	100%

Table 20 Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2017 - AF/Y					
	2013	**2014**	**2015**	**2016**	**2017**
Supply totals	30,769	30,769	30,769	30,769	31,249
Demand totals	133,583	137,457	141,443	145,545	149,766
Difference (shortfall)	(102,815)	(106,688)	(110,675)	(114,777)	(118,517)
Difference as % Supply	334%	347%	360%	373%	379%
Difference as % Demand	77%	78%	78%	79%	79%

Table 21 Projected Supply During Multiple Dry Year Ending in 2022 - AF/Y					
	2018	**2019**	**2020**	**2021**	**2022**
Supply	31,249	31,249	31,249	31,249	30,797
Projected Normal	91,910	91,910	91,910	91,910	93,324
% of Projected Normal	34%	34%	34%	34%	33%

Table 22 Projected Demand During Multiple Dry Year Ending in 2022 - AF/Y					
	2018	**2019**	**2020**	**2021**	**2022**
Demand	154,109	158,578	163,177	167,909	172,779
% of Projected Demand	100%	100%	100%	100%	100%

Table 23 Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2022 - AF/Y					
	2018	**2019**	**2020**	**2021**	**2022**
Supply totals	31,249	31,249	31,249	31,249	30,797
Demand totals	154,109	158,578	163,177	167,909	172,779
Difference (shortfall)	(122,860)	(127,329)	(131,928)	(136,660)	(141,982)
Difference as % Supply	393%	407%	422%	437%	461%
Difference as % Demand	80%	80%	81%	81%	82%

Table 24 Projected Supply During Multiple Dry Year Ending in 2027 - AF/Y					
	2023	**2024**	**2025**	**2026**	**2027**
Supply	30,797	30,797	30,797	30,797	29,864
Projected Normal	93,324	93,324	93,324	93,324	93,324
% of Projected Normal	33%	33%	33%	33%	32%

Table 25 Projected Demand During Multiple Dry Year Ending in 2027 - AF/Y					
	2023	**2024**	**2025**	**2026**	**2027**
Demand	177,789	182,945	188,251	193,710	199,327
% of Projected Demand	100%	100%	100%	100%	100%

Table 26 Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2027 - AF/Y					
	2023	**2024**	**2025**	**2026**	**2027**
Supply totals	30,797	30,797	30,797	30,797	29,864
Demand totals	177,789	182,945	188,251	193,710	199,327
Difference (shortfall)	(146,992)	(152,148)	(157,454)	(162,913)	(169,464)
Difference as % Supply	477%	494%	511%	529%	567%
Difference as % Demand	83%	83%	84%	84%	85%

This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

It is up to the purveying customers of AVEK to direct rationing program and policies to their consumers. Therefore, expected changes to demand due to dry years will be provided by the purveying customers. The development and use of other water sources, such as groundwater, conjunctive uses, the use of recycled water, and the storage of Article 21 water when available, are essential measures necessary to meet long-term demands.

9.3.1 Three Year Minimum Water Supply Alert

Based on experiences during reductions of State Water Project water, AVEK recognizes that it is better to enter into a water shortage alert early, to establish necessary programs and policies, to gain public support and participation, and to reduce the likelihood of more severe shortage levels later. Improved water use efficiency does mean that water supply reserves must be larger since water use efficiency improvements will be minimal. Water shortage responses must be made early to prevent severe economic and environmental impacts.

In May of each year, the Agency forecasts the minimum water supply availability for its water, and projects its total water supply for the current and three subsequent years. Based on the water shortage, a water shortage condition may be declared. Because shortages can have serious economic and environmental impacts, the Agency will make every effort to provide accurate predictions of water shortages.

APPENDIX A

- **LIST OF GROUPS WHO PARTICIPATED IN THE DEVELOPMENT OF THIS PLAN**
- **NOTIFICATION LETTER**
- **FAX/MAILING LIST**

List of Groups Who Participated In the Development of This Plan

AVEK board members and staff
Boyle Engineering Corporation
Retail water purveyor customers (2005 UWMP)
Members of the public, advisory groups, etc. (2005 UWMP)

Notification Letter

ANTELOPE VALLEY - EAST KERN WATER AGENCY
AVEK
ESTABLISHED 1959
A PUBLIC AGENCY

December 23, 2008

To: AVEK UWMP Notification List
Re: AVEK DRAFT Urban Water Management Plan 2008

Antelope Valley – East Kern Water Agency (AVEK) has updated their Urban Water Management Plan (UWMP) for 2008 and has set a Public Hearing for January 13, 2009 in the consideration of its adoption. AVEK has actively encouraged community participation in its urban water management planning efforts by encouraging attendance and participation in the Board of Directors (BOD) public meetings held twice each month.

This Public Hearing on January 13, 2009 will offer the opportunity for you and/or your agency to submit comments on the draft plan before AVEK BOD approval. To assist with this, AVEK has posted the Draft UWMP 2008 on our website for public access and review at: www.avek.org/2008uwmp.pdf.

Public Hearing Information:
AVEK Public Hearing – UWMP 2008
January 13, 2009, 6:30 PM
AVEK Administration Building, Board Room
6500 West Avenue N
Palmdale, Ca 93551

In order to help further with your review of the draft plan, a Summary of Revisions is attached for reference. This can be used to quickly determine the draft changes made to date relative to the previously adopted plan from 2005.

If you would like to submit comments on the plan prior to the Public Hearing on January 13th, you may do so by contacting Tom Barnes at AVEK. Please have all comments submitted by 5:00 PM on January 13, 2009.

Contact:
Tom Barnes, Resources Manager
AVEK Water Agency
661-943-3201 Ph.
661-943-3204 Fax
tbavekwa@aol.com

Thank you,

Tom Barnes
Resources Manager
AVEK Water Agency

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Fax/Mailing List

UWMP Notification Fax/Mailing List:

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Edwards Air Force Base
Mike Keeling, Directorate of Contracting
Fax: 661-275-9656

City of Lancaster
Randy Williams, Public Works
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Fax: 723-6182

Los Angeles County
Department of Public Works
Dean Efstathiou, Chief Deputy Director
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900 S. Fremont Avenue
Alhambra, CA 91802
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City of Palmdale
Attn: Steve Williams
38250 N. Sierra Highway
Palmdale, CA 93550
Fax: 661-267-5292

Building Industry Association
Gretchen Gutierrez
43423 Division Street, Suite 401
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Fax: 848-6090

Kern County Planning Department
Lorelei Oviatt, Division Chief
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SOUTH FEEDER

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Department of Health Services

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Contact Person:	Susanna Cohen
Phone:	(213) 580-5723

White Fence Farms MWC #3 (Treated/M&I)
2606 West Avenue N-8
Palmdale, CA 93551

Billing

Contact:	Frank Anley
Phone:	(661) 266-8850
Fax:	(661) 266-8850
E-mail:	f.e.anley@att.net

Emergency

Contact 1:	Frank Anley
Day Phone:	(661) 266-8850
Night Phone:	(661) 947-3240
Contact 2:	Philip Anley
Day Phone:	(661) 224-6087
Night Phone:	(661) 943-5600

Department of Health Services

System #:	1900523
Contact Person:	Grazyna Newton
Phone:	(213) 580-5734

EAST FEEDER

Los Angeles County Waterworks Districts (Treated/M&I)
PO Box 7508
Alhambra, CA 91802-7508

Billing

Contact:	Ramy Gindi
Phone:	(626) 300-3357
Fax:	(626) 300-3385
E-mail:	rgindi@ladpw.org

Emergency

Contact 1:	Craig David
Day Phone:	(661) 886-1673
Night Phone:	
Contact 2:	Ken Rosander
Day Phone:	(661) 400-3835
Night Phone:	(661) 722-4099
Contact 3:	Adam Arriki
Day Phone:	
Night Phone	

Department of Health Services

System #:	1910203	(24-4,33-3)
Contact Person:	James Ko	
Phone:	(213) 977-6808	
System #:	1910005	(38-4,38-5,38-6)
Contact Person:	Steve Sung	
Phone:	(213) 580-5723	

ACTON FEEDER

Los Angeles County Waterworks Districts (Treated/M&I)
PO Box 7508
Alhambra, CA 91802-7508

Billing

Contact:	Ramy Gindi
Phone:	(626) 300-3357
Fax:	(626) 300-3385
E-mail:	rgindi@ladpw.org

Emergency

Contact 1:	Craig David
Day Phone:	(661) 886-1673
Night Phone:	
Contact 2:	Ken Rosander
Day Phone:	(661) 400-3835
Night Phone:	(661) 722-4099
Contact 3:	Adam Arriki
Day Phone:	
Night Phone	

Department of Health Services

System #:	1910248	(37-10)
Contact Person:	Jeremy Chen	
Phone:	(213) 977-7372	

Lake Hughes Feeder (Willow PS)

Lake Elizabeth MWC (Untreated/M&I)
14960 Elizabeth Lake Rd
Elizabeth Lake, CA 93532

Billing
- Contact: Tom Guy
- Phone: (661) 724-1806
- Fax: (661) 724-1281
- E-mail: lakeelizabethwater@verizon.net

Emergency
- Contact 1: Tom Guy
- Day Phone: (661) 724-1806
- Night Phone:
- Contact 2: Kenneth Gray
- Day Phone: (661) 724-1806
- Night Phone: (661) 724-9274

APPENDIX B

- **RESOLUTION R-09-6: ADOPTION OF THE URBAN WATER MANAGEMENT PLAN.**
- **ORDINANCE O-07-2: AVEK WATER SHORTAGE CONTINGENCY PLAN.**

Resolution R-09-6: Adoption of the Urban Water Management Plan

ANTELOPE VALLEY-EAST KERN WATER AGENCY

RESOLUTION NO. R-09-6
TO ADOPT THE 2008 URBAN WATER MANAGEMENT PLAN

The Board of Directors of the Antelope Valley-East Kern Water Agency ("AVEK") do hereby resolve as follows:

I.
RECITALS

WHEREAS, the Antelope Valley-East Kern Water Agency was formed in 1959 by an act of the State Legislature. AVEK's powers, duties, authorities and other matters are set forth in its enabling act, which is codified at California Water Code, Uncodified Acts, Act 9095 (the "AVEK Enabling Act"); and

WHEREAS, AVEK's jurisdictional boundaries cover portions of three counties, Los Angeles, Ventura County and Kern County, and is more particularly described in Appendix E in the 2008 Urban Water Management Plan ("AVEK's Jurisdictional Boundaries"); and

WHEREAS, AVEK was formed for the purpose of providing water received from the State Water Project ("SWP") as a supplemental source of water to retail water purveyors and other water interests within AVEK's Jurisdictional Boundaries on a wholesale basis; and

WHEREAS, in order to effectuate the above-referenced purpose, AVEK, among other things, entered into a contract with the Department of Water Resources ("DWR"), which operates the SWP, in order for AVEK to receive water from the SWP ("SWP Water"); and

WHEREAS, AVEK has entered into contracts with various retail purveyors and other water interests in AVEK's Jurisdictional Boundaries that govern AVEK's delivery of SWP Water to those purveyors and other water interests (the "AVEK's Water Supply Contracts"). Article 19 in those contracts provide that "substantial uniformity" in those contracts is "desirable" and that AVEK will "attempt to maintain such uniformity" between such contracts; and

WHEREAS, AVEK does not provide SWP Water directly to any person or entity for domestic or municipal purposes; and

WHEREAS, AVEK does not own or operate any facilities that can produce reclaimed water from any area in AVEK's Jurisdictional Boundaries, and neither does AVEK possess any contractual right or matured water right to produce such waters; and

WHEREAS, the Urban Water Management Planning Act, California Water Code Section 10610 *et seq.* ("UWMP Act"), mandates that every supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan; and

WHEREAS, the UWMP Act further provides that such plans shall be periodically reviewed and updated by the supplier once every five years no later than December 31st of each calendar year ending in zero and five; and

WHEREAS, AVEK has reviewed and updated its UWMP based on the impacts of the State Water Project reliability presented in the Department of Water Resources' 2007 State Water Project Reliability Report; and

WHEREAS, AVEK has circulated drafts of its proposed 2008 Urban Water Management Plan ("2008 UWMP") to the public for review and comment; and

WHEREAS, AVEK's Board of Directors ("AVEK Board") held a duly noticed public hearing on its proposed 2008 UWMP on January 13, 2009; and

WHEREAS, the AVEK Board received no written or verbal testimony or evidence from the public or others concerning its proposed 2008 UWMP; and

WHEREAS, AVEK retained technical and legal consultants to provide expert assistance concerning its 2008 UWMP; and

WHEREAS, AVEK has adopted Ordinance No. O-07-2 that adopts a water shortage contingency plan.

II.
FINDINGS

THEREFORE, AVEK finds as follows:

1. AVEK's 2008 UWMP complies with all applicable laws and regulations, including but not limited to the UWMP Act, the AVEK Enabling Act, and the Guidebook To Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan issued by the DWR and dated as of January 18, 2005.

2. AVEK's 2008 UWMP is consistent with the intent and terms of the AVEK's Water Supply Agreements.

3. The AVEK Board's adoption of the 2008 UWMP is supported by substantial evidence, which evidence is contained in the administrative record received by the AVEK Board for this matter.

4. Each of the recitals contained in this Resolution is approved as a finding of fact.

III.

ADOPTION OF 2008 UWMP

THEREFORE, be it resolved and ordained by the AVEK Board as follows:

1. The 2008 UWMP is approved and adopted. The President of the AVEK Board authorized and directed to file the 2008 UWMP with the entities specified in the UWMP Act by the dates specified therein.

ADOPTED this 13th day of January 13, 2009, by the following vote:

AYES: 6 **NOES:** 0 **ABSENT:** 1 **ABSTAIN:** 0

Andy D. Rutledge

Andy D. Rutledge
President of the Board of Directors
Antelope Valley-East Kern Water Agency

ATTEST: Mag L. Mer
Agency Secretary

Ordinance O-07-2: AVEK Water Shortage Contingency Plan

ANTELOPE VALLEY-EAST KERN WATER AGENCY
ORDINANCE NO. O-07-2

AN ORDINANCE OF THE ANTELOPE VALLEY-EAST KERN WATER AGENCY TO ADOPT A WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Board of Directors of the Antelope Valley-East Kern Water Agency ("AVEK") hereby finds:

I.
RECITALS

WHEREAS, the Antelope Valley-East Kern Water Agency was formed in 1959 by an act of the State Legislature. AVEK's powers, duties, authorities and other matters are set forth in its enabling act, which is codified at California Water Code, Uncodified Acts, Act 9095 (the "AVEK Enabling Act"); and

WHEREAS, AVEK's jurisdictional boundaries cover portions of three counties, Los Angeles, Ventura County and Kern County, and is more particularly described in Appendix E in the 2005 Urban Water Management Plan ("AVEK's Jurisdictional Boundaries"); and

WHEREAS, AVEK was formed for the purpose of providing water received from the State Water Project ("SWP") as a supplemental source of water to retail water purveyors and other water interests with AVEK's Jurisdictional Boundaries on a wholesale basis; and

WHEREAS, in order to effectuate the above-referenced purpose, AVEK, among other things, entered into a contract with the Department of Water Resources ("DWR"), which operates the SWP, in order for AVEK to receive water from the SWP ("SWP Water"); and

WHEREAS, AVEK has entered into contracts with various retail purveyors and other water interests in AVEK's Jurisdictional Boundaries that govern AVEK's delivery of SWP Water to those purveyors and other water interests (the "AVEK's Water Supply Contracts"). Article 19 in those contracts provides that "substantial uniformity" in those contracts is "desirable" and that AVEK will attempt to maintain such "uniformity" between such contracts; and

WHEREAS, AVEK does not provide SWP Water directly to any person or entity for domestic or municipal purposes; and

WHEREAS, AVEK does not own or operate any facilities that can produce reclaimed water or native groundwater from any area in AVEK's Jurisdictional Boundaries, and neither does AVEK possess any contractual right or matured water right to produce such waters; and

WHEREAS, the Urban Water Management Planning Act, California Water Code Section 10610 *et seq.* ("UWMP Act") provides that urban water management plans shall include a resolution or ordinance by the supplier that sets forth a water shortage contingency plan; and

WHEREAS, Section 61.1 of t he AVEK Enabling Act sets forth guiding principles for AVEK's distribution of SWP Water, which principles can be drawn upon in allocating such water in times of shortage (the provisions of Section 61.1 of the AVEK Enabling Act are set forth in Exhibit A to this Ordinance); and

WHEREAS, real property related taxes have been paid to AVEK since 1959 by entities in AVEK's Jurisdictional Boundaries.

WHEREAS, AVEK has circulated drafts of its proposed 2005 UWMP and the water shortage contingency plan set forth in this Ordinance ("WSC Plan") to the public for review and comment; and

WHEREAS, AVEK's Board of Directors ("AVEK Board") held duly noticed public hearings on its proposed 2005 UWMP on November 15, 2005 and December 20, 2005, and a public meeting on the WSC Plan on December 20. 2005; and

WHEREAS, the AVEK Board received written and verbal testimony and evidence from the public and others concerning its proposed 2005 UWMP and WSC Plan.

II.
FINDINGS

THEREFORE, AVEK finds as follows:

1. AVEK finds that there is a need to adopt a water shortage contingency plan given, among other things, the requirements of the UWMP Act and the potential that the amount of SWP Water made available to AVEK by DWR may not satisfy the demands for SWP Water by AVEK's customers (even though such demand for SWP water has only exceeded the available supply of SWP Water once since AVEK was formed).

2. The WSC Plan complies with all applicable laws and regulations, including but not limited to the UWMP Act, the AVEK Enabling Act, and the Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan issued by

DWR and dated as of January 18, 2005.

3. AVEK finds that the WSC Plan is fair and equitable.

4. The WSC Plan is consistent with the intent and terms of the AVEK's Water Supply Agreement and the AVEK Enabling Act.

5. Each of the recitals contained in the Ordinance is approved as a finding of fact.

III.
ADOPTION OF WATER SHORTAGE CONTINGENCY PLAN

Therefore, be it resolved and ordained by the AVEK Board as follows:

1. AVEK adopts a WSC Plan that would be implemented when the aggregate
amount of SWP Water reasonably ordered by AVEK's customers in any water year exceeds the amount of SWP Water that DWR makes available to AVEK on that same water year (a "SWP Water Shortage Year"). When that contingency occurs (which contingency will be deemed to occur under both stages listed in Appendix 1 hereto), AVEK plans to allocate that amount of available SWP Water as follows:

(a) The available SWP Water shall first be allocated per each county (the
"County Allocation of SWP Water") in AVEK's Jurisdictional Boundaries based on a running historical average of the amount of taxes paid to AVEK by entities in each particular county since the formation of AVEK in 1959. (Attached as Exhibit B to this Ordinance is the historical amount of such taxes paid by county through June 30, 2005.) AVEK shall annually update and publish that running historical average of taxes paid to AVEK by county.

(b) Each County's Allocation of SWP Water shall be further allocated to each AVEK customer within that particular county based on its average annual percentage of SWP Water received in the two water years prior to the SWP Water Shortage Year relative to the amount of SWP Water received by all other AVEK customers in that particular county in those two prior water years. (For illustrative purposes, attached as Exhibit C to this Ordinance is a list of such relative percentages by AVEK customers by county for 2004.)

(c) In determining the amount of SWP Water that should be delivered by
AVEK to any customer in any SWP Water Shortage Year, AVEK will fill orders for SWP Water that will be used by the AVEK customer(s) for consumptive or agricultural uses in

that same water year prior to filling any order for SWP Water that would be used by an AVEK customer for banking or storage purposes.

(d) AVEK reserves the right to allocate SWP Water that it receives from DWR in a SWP Water Shortage Year in a manner that differs from the provisions of this WSC Plan based on a finding by the AVEK Board of unique or unusual circumstances or needs.

This Ordinance shall be in full force and effect upon the date of adoption, and shall be published in full in a newspaper of general circulation within ten (10) days from the date of adoption.

Passed and adopted this 19th day of June, 2007, by the following vote:

AYES: 6 **NOES:** 0 **ABSENT:** 1 **ABSTAIN:** 0

Andy D. Rutledge, President
Board of Directors
Antelope Valley-East Kern Water Agency

ATTEST: ______________ **Agency Secretary**

Page 4 of 4

EXHIBIT A

§ 61.1 Distribution and apportionment of water purchased from State, etc.

The agency shall whenever practicable, distribute and apportion the water purchased from the State of California or water obtained from any other source as equitably as possible on the basis of total payment by a district or geographical area within the agency regardless of its present status, of taxes, in relation that such payment bears to the total taxes and assessments collected from all other areas.

It is the intent of this section to assure each area or district its fair share of water based upon the amounts paid into the agency, as they bear relation to the total amount collected by the agency.

EXHIBIT B

AVEK Water Agency
Taxes Collected from inception through 06/30/07

	Los Angeles County		Kern County		Ventura County		
Description	Taxes Collected by Fiscal Year	% of Total	Taxes Collected by Fiscal Year	% of Total	Taxes Collected by Fiscal Year	% of Total (above 0.1%)	TOTALS
FYE 06/30/1961	58,306.69	74%	20,846.13	26%			79,152.82
FYE 06/30/1962	55,138.24	74%	19,372.90	26%			74,511.14
FYE 06/30/1963	156,220.27	74%	53,906.15	26%			210,126.42
FYE 06/30/1964	221,396.82	73%	81,444.27	27%			302,841.09
FYE 06/30/1965	174,560.93	71%	69,835.70	29%			244,396.63
FYE 06/30/1966	195,498.90	67%	97,105.93	33%			292,604.83
FYE 06/30/1967	417,054.54	64%	234,620.40	36%	201.75	0.0%	651,876.69
FYE 06/30/1968	787,195.00	68%	371,132.00	32%	3,066.00	0.3%	1,161,393.00
FYE 06/30/1969	969,673.00	71%	396,253.00	29%	3,319.00	0.2%	1,369,245.00
FYE 06/30/1970	1,227,682.00	69%	547,964.00	31%	4,642.00	0.3%	1,780,288.00
FYE 06/30/1971	1,233,111.00	67%	600,115.00	33%	3,555.00	0.2%	1,836,781.00
FYE 06/30/1972	1,825,460.00	68%	854,406.00	32%	4,560.00	0.2%	2,684,426.00
FYE 06/30/1973	1,948,561.00	69%	862,025.00	31%	2,512.00	0.1%	2,813,098.00
FYE 06/30/1974	2,047,586.00	72%	806,490.00	28%	2,309.00	0.1%	2,856,385.00
FYE 06/30/1975	2,586,924.00	74%	890,533.00	26%	9,396.00	0.3%	3,486,853.00
FYE 06/30/1976	2,029,787.00	70%	862,576.00	30%	3,921.00	0.1%	2,896,284.00
FYE 06/30/1977	1,720,809.00	70%	721,466.00	29%	3,770.00	0.2%	2,446,045.00
FYE 06/30/1978	1,607,785.00	67%	774,212.00	32%	5,121.00	0.2%	2,387,118.00
FYE 06/30/1979	1,784,643.00	64%	997,363.00	36%	3,663.00	0.1%	2,785,669.00
FYE 06/30/1980	4,171,081.00	82%	892,189.00	18%	3,511.00	0.1%	5,066,781.00
FYE 06/30/1981	4,995,491.00	79%	1,351,056.00	21%	4,834.00	0.1%	6,351,381.00
FYE 06/30/1982	3,115,496.00	72%	1,222,927.00	28%	6,544.00	0.2%	4,344,967.00
FYE 06/30/1983	4,311,370.00	71%	1,722,635.00	29%	8,196.00	0.1%	6,042,201.00
FYE 06/30/1984	5,689,690.00	79%	1,501,127.00	21%	4,279.00	0.1%	7,195,096.00
FYE 06/30/1985	9,769,574.00	73%	3,575,437.00	27%	18,208.00	0.1%	13,363,219.00
FYE 06/30/1986	12,776,020.00	78%	3,633,507.00	22%	13,154.00	0.1%	16,422,681.00
FYE 06/30/1987	12,730,936.00	80%	3,073,228.00	19%	10,767.00	0.1%	15,814,931.00
FYE 06/30/1988	12,076,802.00	81%	2,805,666.00	19%	5,427.00	0.0%	14,887,895.00
FYE 06/30/1989	13,700,634.00	82%	2,928,709.00	18%	48,066.00	0.3%	16,677,409.00
FYE 06/30/1990	16,387,060.00	85%	2,924,143.00	15%	3,950.00	0.0%	19,315,153.00
FYE 06/30/1991	14,757,446.00	82%	3,236,690.00	18%	0	0.0%	17,994,136.00
FYE 06/30/1992	14,730,588.00	83%	2,987,854.00	17%	722.00	0.0%	17,719,164.00
FYE 06/30/1993	14,795,789.00	84%	2,895,327.00	16%	722.00	0.0%	17,691,838.00
FYE 06/30/1994	10,374,526.00	81%	2,408,372.00	19%	732.00	0.0%	12,783,630.00
FYE 06/30/1995	11,757,593.00	84%	2,215,878.00	16%	747.00	0.0%	13,974,218.00
FYE 06/30/1996	11,705,148.00	89%	1,445,898.00	11%	730.00	0.0%	13,151,776.00
FYE 06/30/1997	9,078,884.00	83%	1,843,601.00	17%	721.00	0.0%	10,923,206.00
FYE 06/30/1998	10,297,808.00	84%	1,890,125.00	16%	734.00	0.0%	12,188,667.00
FYE 06/30/1999	8,893,825.00	77%	2,623,064.00	23%	674.00	0.0%	11,517,563.00
FYE 06/30/2000	15,687,806.00	88%	2,094,870.00	12%	676.00	0.0%	17,783,352.00
FYE 06/30/2001	10,233,359.00	82%	2,184,558.00	18%	685.00	0.0%	12,418,602.00
FYE 06/30/2002	10,098,249.00	83%	2,069,703.00	17%	353.00	0.0%	12,168,305.00
FYE 06/30/2003	10,853,001.00	76%	3,394,512.00	24%	269.00	0.0%	14,247,782.00
FYE 06/30/2004	12,011,832.00	86%	1,987,130.00	14%	280.00	0.0%	13,999,242.00
FYE 06/30/2005	12,275,847.00	84%	2,290,255.00	16%	0.00	0.0%	14,566,102.00
FYE 06/30/2006	12,375,800.89	83%	2,467,682.61	17%	0.00	0.0%	14,843,483.50
FYE 06/30/2007	12,548,965.69	82%	2,783,514.23	18%	260.29	0.0%	15,332,740.21
	323,248,013.97	**81%**	**75,711,324.32**	**19%**	**185,277.04**	**0.0%**	**399,144,615.33**

EXHIBIT C

Kern County	%
Billiton Exploration U.S.A.	0.24
Boron CSD	4.66
City of California City	9.88
Desert Lake CSD	1.47
Desert Sage Apartments	0.09
Edgemont Acres MWC	0.31
Edwards AFB	37.79
Mojave Public Utility District	1.01
Rosamond CSD	17.88
US Borax	26.67

Los Angeles County	%
Antelope Valley Country Club	0.35
California Water Service Co	0.58
Landale MWC	0.13
Los Angeles County Waterworks Districts	84.98
Palm Ranch Irrigation District	0.71
Quartz Hill Water District	8.42
Shadow Acres MWC	0.61
Sunnyside Farms MWC	0.59
White Fence Farms MWC	1.71
Lake Elizabeth MWC	1.91

Appendix 1 to the Water Shortage Contingency Plan

Water Supply Shortage Stages and Conditions

Stage No.	Water Supply Conditions	% Shortage
1	Reduction in SWP Allocation Below Current Demand	1 %
2	Reduction in SWP Allocation Below Current Demand	50%

APPENDIX C

- **RATE STABILIZATION FUND DISCUSSION**

The Agency uses as its rate stabilization fund the Agency's reserve fund to stabilize rates during periods of water shortages or disasters affecting water supply.

Appendix D

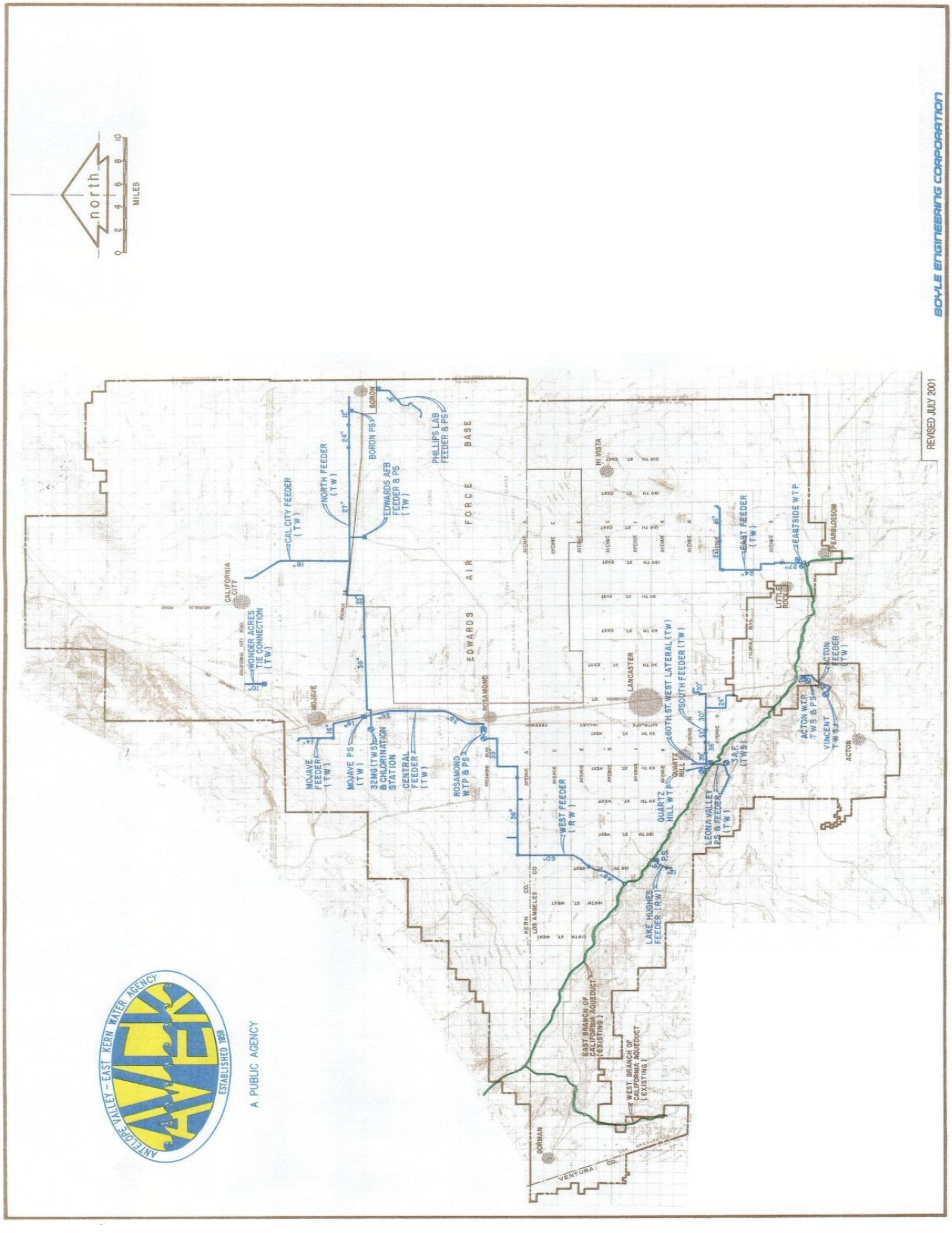
- **WATER SUPPLY CAPACITY CHARGE IMPROVEMENTS**

Proposed Expansions
Eastside WTP (10 mgd to 25 mgd)
QHWTP (Phase I – 9 MG reservoirs)
QHWTP (Phase II – second 9 MG reservoirs)
Acton WTP (4 mgd to 8 mgd)
Rosamond WTP (4 mgd to 8 mgd)
Westside Water Treatment Plant #1 (15 mgd)
Westside Water Treatment Plant #2 (3 mgd)
East Feeder/South Feeder – Interconnect Pipeline
East Feeder/South Feeder – Interconnect Pump Station
Mojave Pump Station Addition
South Feeder Parallel Pipeline (Phase II)
QHWTP/Westside WTP #I – Interconnect Pipeline
QHWTP/Westside WTP #2 – Interconnect Pump Station
Westside WTP I Feeder Pipeline
West WTP I Feeder Pump Station
East Feeder Parallel Pipeline
Lake Hughes Feeder Parallel Pipeline
Lake Hughes Feeder Pump Station
Leona Valley Feeder Parallel Pipeline
Leona Valley Feeder Pump Station
QHWTP/RWTP Intercon. Pipeline
QHWTP/RWTP Intercon. Pump Station
Area Raw Water Turnouts, Pipelines and Basin Inlets
North Feeder Pump Station
QHWTP (65 mgd to 90 mgd and ozone)

Abbreviation Legend"
QH = Quartz Hill, R = Rosamond, WTP = Water Treatment Plant

Appendix E

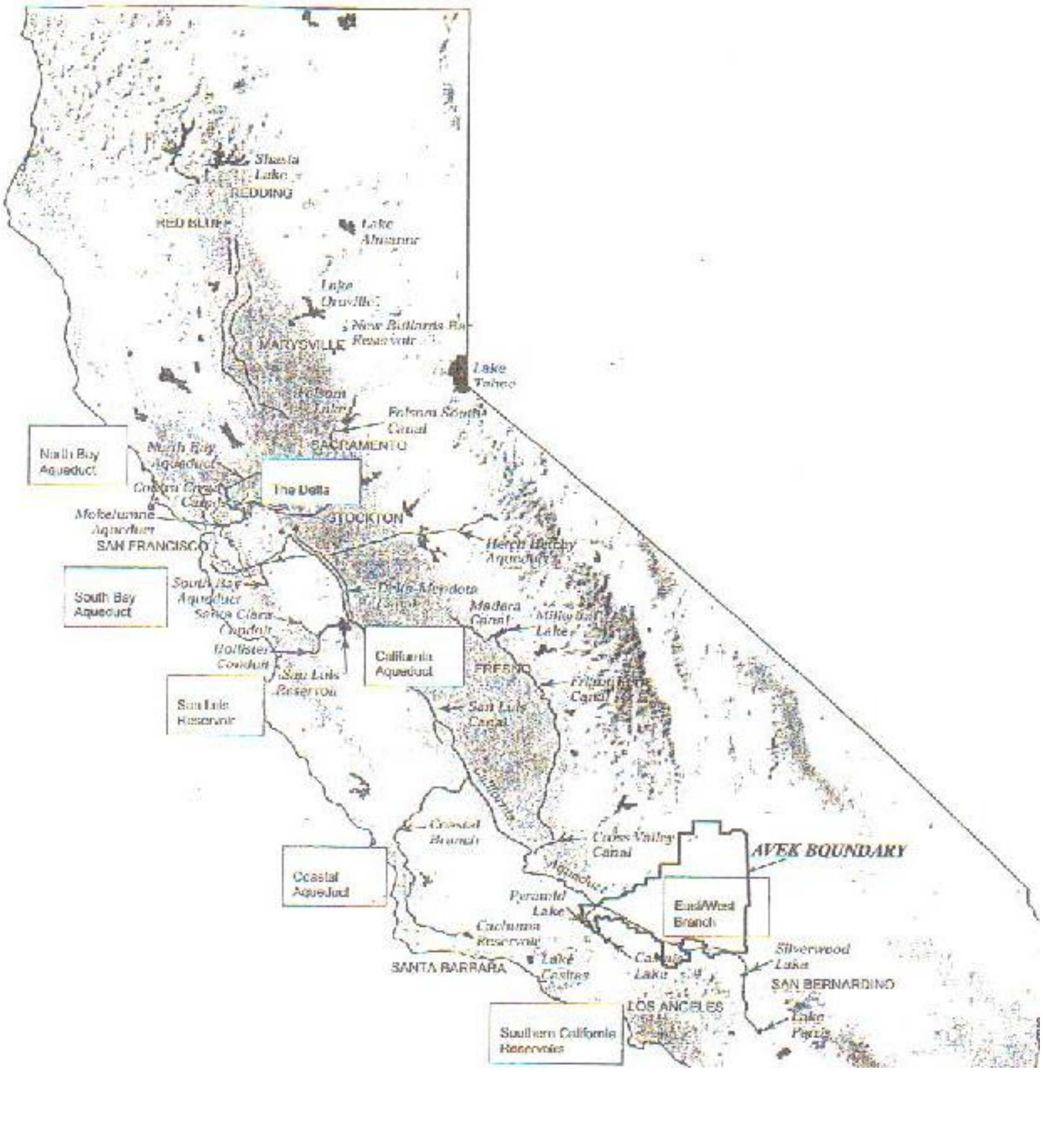
- **AVEK BOUNDARY LOCATION MAP**


north
MILES
BOYLE ENGINEERING CORPORATION
REVISED JULY 2001
ANTELOPE VALLEY - EAST KERN WATER AGENCY
AVEK
ESTABLISHED 1959
A PUBLIC AGENCY
EDWARDS AIR FORCE BASE
LANCASTER
MOJAVE
ROSAMOND
CALIFORNIA CITY
BORON
GORMAN
ACTON
PEARBLOSSOM
HI VISTA

Appendix F

- **MAP OF SWP**
- **WATER DELIVERIES TO AVEK**
- **TABLES B.8 AND B.9 SWP RELIABILITY DATA**

STATE WATER PROJECT FEATURES



AVEK's Historical SWP Deliveries

Year	Ac-Ft
1962	0
1963	0
1964	0
1965	0
1966	0
1967	0
1968	0
1969	0
1970	0
1971	0
1972	53
1973	20
1974	1,259
1975	8,068
1976	27,782
1977	11,202
1978	33,137
1979	60,493
1980	72,407
1981	79,375
1982	50,291
1983	32961
1984	32,662
1985	37,064
1986	32,449
1987	33,875
1988	34,079
1989	45,191
1990	47,206
1991	7,568
1992	28,041
1993	41,452
1994	47,663
1995	47,286
1996	56,356
1997	61,752
1998	52,926
1999	69,073
2000	84,016
2001	63,508
2002	59,888
2003	61162
2004	61252
2005	58000*
2006	79531
2007	77193

*estimated

Tables B.8 and B.9 / SWP Reliability Data

Table B.8 SWP Table A deliveries from the Delta under Future (2027) Conditions
PCM Model with A2 Emissions and less restrictive Old River and Middle River flow targets

		No Climate Change Lower flow target scenario[1]		PCM with A2 Emissions Lower flow target scenario[1]		Estimated Delivery Interpolated to 2027[2]	
Year	SWP Table A demands (taf)	SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]
1922	4,133	4,057	98%	4,062	98%	4,060	98%
1923	4,133	3,114	75%	2,377	58%	2,771	67%
1924	4,133	438	11%	568	14%	498	12%
1925	4,133	1,628	39%	1,473	36%	1,556	38%
1926	4,133	2,414	58%	1,907	46%	2,178	53%
1927	4,133	4,133	100%	4,107	99%	4,133	100%
1928	4,133	2,109	51%	1,909	46%	2,016	49%
1929	4,133	847	20%	970	23%	904	22%
1930	4,133	2,357	57%	1,974	48%	2,179	53%
1931	4,133	1,098	27%	1,164	28%	1,128	27%
1932	4,133	1,512	37%	1,353	33%	1,438	35%
1933	4,133	2,274	55%	1,378	33%	1,857	45%
1934	4,133	1,327	32%	1,381	33%	1,352	33%
1935	4,133	3,734	90%	3,527	85%	3,638	88%
1936	4,133	3,569	86%	3,562	86%	3,566	86%
1937	4,133	3,510	85%	2,518	61%	3,049	74%
1938	4,133	4,133	100%	4,133	100%	4,133	100%
1939	4,133	3,527	85%	2,997	73%	3,280	79%
1940	4,133	3,642	88%	3,834	93%	3,731	90%
1941	3,898	3,908	95%	3,906	95%	3,907	95%
1942	4,133	4,133	100%	3,805	92%	3,981	96%
1943	4,133	3,849	93%	3,587	87%	3,727	90%
1944	4,133	2,924	71%	2,058	50%	2,521	61%
1945	4,133	3,394	82%	3,896	94%	3,627	88%
1946	4,133	3,795	92%	3,080	75%	3,463	84%
1947	4,133	1,697	41%	1,704	41%	1,700	41%
1948	4,133	3,256	79%	2,786	67%	3,037	73%
1949	4,133	1,387	34%	1,370	33%	1,379	33%
1950	4,133	2,738	66%	2,810	68%	2,771	67%
1951	4,133	4,133	100%	4,133	100%	4,133	100%
1952	3,898	3,907	95%	3,907	95%	3,907	95%
1953	4,133	4,091	99%	3,373	82%	3,757	91%
1954	4,133	3,079	74%	2,962	72%	3,025	73%
1955	4,133	980	24%	929	22%	956	23%
1956	4,133	4,133	100%	4,133	100%	4,133	100%
1957	4,133	2,460	60%	1,945	47%	2,221	54%
1958	4,133	4,133	100%	4,133	100%	4,133	100%
1959	4,133	3,219	78%	2,489	60%	2,880	70%
1960	4,133	1,557	38%	1,874	45%	1,705	41%
1961	4,133	2,746	66%	2,627	64%	2,691	65%
1962	4,133	3,016	73%	2,902	70%	2,963	72%
1963	4,133	3,923	95%	3,687	89%	3,813	92%
1964	4,133	1,605	39%	1,535	37%	1,572	38%
1965	4,133	3,368	81%	3,225	78%	3,301	80%

Table B.8 cont. SWP Table A deliveries from the Delta under Future (2027) Conditions
PCM Model with A2 Emissions and less restrictive Old River and Middle River flow targets

Year	SWP Table A demands (taf)	No Climate Change Lower flow target scenario[1]		PCM with A2 Emissions Lower flow target scenario[1]		Estimated Delivery Interpolated to 2027[2]	
		SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]
1966	4,133	3,476	84%	3,208	78%	3,352	81%
1967	4,133	4,133	100%	4,133	100%	4,133	100%
1968	4,133	2,988	72%	2,743	66%	2,874	70%
1969	3,898	3,903	94%	3,903	94%	3,903	94%
1970	4,133	4,133	100%	4,133	100%	4,133	100%
1971	4,133	3,665	89%	3,452	84%	3,566	86%
1972	4,133	1,458	35%	1,422	34%	1,441	35%
1973	4,133	4,133	100%	3,758	91%	3,959	96%
1974	4,133	4,133	100%	4,133	100%	4,133	100%
1975	4,133	3,624	88%	3,404	82%	3,521	85%
1976	4,133	2,167	52%	2,000	48%	2,089	51%
1977	4,133	287	7%	274	7%	281	7%
1978	3,898	3,905	94%	3,903	94%	3,904	94%
1979	4,133	3,292	80%	3,056	74%	3,182	77%
1980	3,898	3,766	91%	3,491	84%	3,638	88%
1981	4,133	2,737	66%	2,570	62%	2,659	64%
1982	4,133	4,133	100%	4,133	100%	4,133	100%
1983	3,898	3,903	94%	3,903	94%	3,903	94%
1984	4,133	4,133	100%	4,133	100%	4,133	100%
1985	4,133	3,226	78%	2,581	62%	2,926	71%
1986	3,898	2,863	69%	3,004	73%	2,928	71%
1987	4,133	2,679	65%	2,567	62%	2,627	64%
1988	4,133	450	11%	446	11%	448	11%
1989	4,133	3,486	84%	3,424	83%	3,457	84%
1990	4,133	281	7%	377	9%	325	8%
1991	4,133	889	22%	875	21%	883	21%
1992	4,133	1,124	27%	1,090	26%	1,108	27%
1993	4,133	4,036	98%	4,057	98%	4,046	98%
1994	4,133	1,866	45%	1,494	36%	1,693	41%
1995	3,898	3,903	94%	3,903	94%	3,903	94%
1996	4,133	4,133	100%	3,813	92%	3,984	96%
1997	4,133	3,301	80%	3,199	77%	3,254	79%
1998	3,898	3,908	95%	3,908	95%	3,908	95%
1999	4,133	4,133	100%	3,960	96%	4,052	98%
2000	4,133	3,960	96%	3,602	87%	3,794	92%
2001	4,133	769	19%	824	20%	795	19%
2002	4,133	2,586	63%	1,996	48%	2,312	56%
2003	4,133	3,213	78%	3,241	78%	3,226	78%
Avg	**4,106**	**2,947**	**71%**	**2,782**	**67%**	**2,870**	**69%**
Min	**3,898**	**281**	**7%**	**274**	**7%**	**281**	**7%**
Max	**4,133**	**4,133**	**100%**	**4,133**	**100%**	**4,133**	**100%**

[1]/ See Table 6.3 [2]/ Values used to describe Future Conditions in Chapter 6 [3]/ 4,133 taf/year

Table B.9 SWP Table A deliveries from the Delta under Future (2027) Conditions
PCM Model with A2 Emissions and more restrictive Old River and Middle River flow targets

		No Climate Change Higher flow target scenario[1]		PCM with A2 Emissions Higher flow target scenario[1]		Estimated Delivery Interpolated to 2027[2]	
Year	SWP Table A demands (taf)	SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]
1922	4,133	3,664	89%	3,545	86%	3,609	87%
1923	4,133	2,991	72%	2,850	69%	2,925	71%
1924	4,133	125	3%	150	4%	137	3%
1925	4,133	1,565	38%	1,394	34%	1,485	36%
1926	4,133	1,968	48%	1,463	35%	1,733	42%
1927	4,133	3,706	90%	3,736	90%	3,720	90%
1928	4,133	1,895	46%	1,701	41%	1,805	44%
1929	4,133	646	16%	712	17%	677	16%
1930	4,133	2,114	51%	1,849	45%	1,991	48%
1931	4,133	1,046	25%	1,051	25%	1,049	25%
1932	4,133	1,165	28%	1,286	31%	1,222	30%
1933	4,133	1,915	46%	1,172	28%	1,569	38%
1934	4,133	1,427	35%	1,264	31%	1,351	33%
1935	4,133	3,087	75%	3,437	83%	3,250	79%
1936	4,133	2,959	72%	3,265	79%	3,101	75%
1937	4,133	3,774	91%	2,662	64%	3,257	79%
1938	4,133	4,133	100%	4,133	100%	4,133	100%
1939	4,133	3,158	76%	2,727	66%	2,958	72%
1940	4,133	3,136	76%	3,226	78%	3,178	77%
1941	3,898	3,798	92%	3,826	93%	3,811	92%
1942	4,133	3,626	88%	3,421	83%	3,531	85%
1943	4,133	3,466	84%	3,754	91%	3,600	87%
1944	4,133	2,550	62%	1,272	31%	1,955	47%
1945	4,133	3,315	80%	4,000	97%	3,634	88%
1946	4,133	3,430	83%	2,729	66%	3,104	75%
1947	4,133	1,819	44%	1,441	35%	1,643	40%
1948	4,133	2,891	70%	2,535	61%	2,726	66%
1949	4,133	1,096	27%	1,068	26%	1,083	26%
1950	4,133	2,232	54%	1,992	48%	2,120	51%
1951	4,133	4,133	100%	4,133	100%	4,133	100%
1952	3,898	3,907	95%	3,906	95%	3,906	95%
1953	4,133	3,163	77%	2,660	64%	2,929	71%
1954	4,133	3,034	73%	2,938	71%	2,989	72%
1955	4,133	998	24%	676	16%	848	21%
1956	4,133	4,133	100%	4,133	100%	4,133	100%
1957	4,133	1,991	48%	1,760	43%	1,883	46%
1958	4,133	4,133	100%	4,133	100%	4,133	100%
1959	4,133	2,933	71%	2,481	60%	2,722	66%
1960	4,133	1,237	30%	1,522	37%	1,370	33%
1961	4,133	2,492	60%	2,162	52%	2,339	57%
1962	4,133	3,124	76%	3,127	76%	3,126	76%
1963	4,133	3,119	75%	3,065	74%	3,094	75%
1964	4,133	2,189	53%	1,582	38%	1,907	46%
1965	4,133	2,979	72%	2,955	72%	2,968	72%

Table B.9 cont. SWP Table A deliveries from the Delta under Future (2027) Conditions
PCM Model with A2 Emissions and more restrictive Old River and Middle River flow targets

		No Climate Change Higher flow target scenario[1]		PCM with A2 Emissions Higher flow target scenario[1]		Estimated Delivery Interpolated to 2027[2]	
Year	SWP Table A demands (taf)	SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]	SWP Table A Delivery (taf)	percent of max SWP Table A[3]
1966	4,133	3,376	82%	2,891	70%	3,150	76%
1967	4,133	4,047	98%	4,110	99%	4,077	99%
1968	4,133	2,368	57%	2,085	50%	2,236	54%
1969	3,898	3,903	94%	3,903	94%	3,903	94%
1970	4,133	4,133	100%	4,133	100%	4,133	100%
1971	4,133	3,124	76%	3,090	75%	3,108	75%
1972	4,133	1,487	36%	1,408	34%	1,450	35%
1973	4,133	3,455	84%	3,275	79%	3,371	82%
1974	4,133	3,748	91%	3,684	89%	3,718	90%
1975	4,133	3,232	78%	3,000	73%	3,124	76%
1976	4,133	1,632	39%	1,558	38%	1,598	39%
1977	4,133	278	7%	248	6%	264	6%
1978	3,898	3,905	94%	3,904	94%	3,904	94%
1979	4,133	3,044	74%	2,768	67%	2,915	71%
1980	3,898	3,905	94%	3,893	94%	3,899	94%
1981	4,133	2,545	62%	2,169	52%	2,370	57%
1982	4,133	4,133	100%	4,133	100%	4,133	100%
1983	3,898	3,903	94%	3,903	94%	3,903	94%
1984	4,133	4,133	100%	4,133	100%	4,133	100%
1985	4,133	3,030	73%	2,420	59%	2,746	66%
1986	3,898	2,841	69%	3,253	79%	3,032	73%
1987	4,133	2,280	55%	1,709	41%	2,014	49%
1988	4,133	427	10%	636	15%	524	13%
1989	4,133	3,197	77%	3,184	77%	3,191	77%
1990	4,133	191	5%	177	4%	184	4%
1991	4,133	733	18%	626	15%	683	17%
1992	4,133	1,100	27%	1,047	25%	1,075	26%
1993	4,133	3,504	85%	3,554	86%	3,527	85%
1994	4,133	2,283	55%	1,372	33%	1,859	45%
1995	3,898	3,902	94%	3,903	94%	3,903	94%
1996	4,133	3,604	87%	3,661	89%	3,631	88%
1997	4,133	3,211	78%	3,287	80%	3,246	79%
1998	3,898	3,908	95%	3,908	95%	3,908	95%
1999	4,133	4,133	100%	4,112	99%	4,123	100%
2000	4,133	3,316	80%	3,237	78%	3,279	79%
2001	4,133	982	24%	617	15%	812	20%
2002	4,133	2,063	50%	1,845	45%	1,961	47%
2003	4,133	2,836	69%	2,831	69%	2,834	69%
Avg	**4,106**	**2,734**	**66%**	**2,592**	**63%**	**2,668**	**65%**
Min	**3,898**	**125**	**3%**	**150**	**4%**	**137**	**3%**
Max	**4,133**	**4,133**	**100%**	**4,133**	**100%**	4,133	100%

[1]/ See Table 6.3 [2]/ Values used to describe Future Conditions in Chapter 6 [3]/ 4,133 taf/year

Appendix G

- **AVEK TREATED M&I CUSTOMER LIST**
- **UWMP CONTACTED AGENCIES LIST**

UWMP Notification Fax/Mailing List

City of California City
Mike Bevins, Public Works
21000 Hacienda Blvd.
California City, CA 93505
Fax: 760-373-7511

Edwards Air Force Base
Mike Keeling, Directorate of Contracting
Fax: 661-275-9656

City of Lancaster
Randy Williams, Public Works
44933 Fern Avenue
Lancaster, CA 93534
Fax: 723-6182

Los Angeles County
Department of Public Works
Dean Efstathiou, Chief Deputy Director
P. O. Box 7508
900 S. Fremont Avenue
Alhambra, CA 91802
Fax:

City of Palmdale
Attn: Steve Williams
38250 N. Sierra Highway
Palmdale, CA 93550
Fax: 661-267-5292

Building Industry Association
Gretchen Gutierrez
43423 Division Street, Suite 401
Lancaster, CA 93535
Fax: 848-6090

Kern County Planning Department
Lorelei Oviatt, Division Chief
1115Truxtun Avenue
Bakersfield, CA
Fax: 661-868-3485

Shell Mining Co./Billiton Exploration U.S.A.
PO Box 576
Room 4156
Houston, TX 77001-0576

Billing

Contact:	H. James Sewell
Phone:	(281) 544-2807
Fax:	(281) 544-2238
E-mail:	Jim.Sewell@shell.com

Emergency

Contact 1:	H. James Sewell
Day Phone:	(281) 544-2807
Night Phone:	(281) 731-3287
Contact 2:	Ken Tweedt
Day Phone:	(661) 824-9404
Night Phone:	(661) 824-9232

Boron CSD (Treated/M&I)
PO Box 1060
Boron, CA 93596

Billing

Contact:	Janna Riddle
Phone:	(760) 762-6127
Cell:	(760) 559-1224
Fax:	(760) 762-6508
E-mail:	bcsd@ccis.com

Emergency

Contact 1:	Russell Terrill
Day Phone:	(760) 250-3270
Night Phone:	(760) 762-6795
Contact 2:	Pete Lopez
Day Phone:	(760) 250-3271
Night Phone:	(760) 250-3271

Department of Health Services

System #:	1510002
Contact Person:	James Stites
Phone:	(661) 335-7315

City of California City (Treated/M&I)
21000 Hacienda Blvd
California City, CA 93505
Billing
Contact:
Phone: (760) 373-8696
Fax:
E-mail:
Emergency
Contact 1:
Day Phone:
Night Phone:
Contact 2:
Day Phone:
Night Phone:
Department of Health Services
System #:
Contact Person:
Phone:

Desert Lake CSD (Treated/M&I)
PO Box 567
Boron, CA 93596
Billing
Contact: Dollie Kostopoulos
Phone: (760) 762-5349
Fax: (760) 762-3161
E-mail: dimples@ccis.com
Emergency
Contact 1: Dollie Kostopoulos
Day Phone: (760) 403-0012
Night Phone: (760) 762-5786
Contact 2: Deanna Lone
Day Phone: (760) 762-5349
Night Phone: (760) 762-5365
Department of Health Services
System #: 1510027
Contact Person: James Stites
Phone: (661) 335-7315

Desert Sage Apartments (Treated/M&I)
Rick Nishimura
1101 Salisbury
La Canada, Ca. 91011

Billing

Contact:	Rick Nishimura
Phone:	(818) 720-6042
Fax:	(818) 790-9973
E-mail:	

Emergency

Contact 1:	Rick Nishimura
Day Phone:	(818) 720-6042
Night Phone:	(818) 720-6042
Contact 2:	
Day Phone:	
Night Phone:	

Edgemont Acres MWC (Treated/M&I)
PO Box 966
North Edwards, CA 93523-0966

Billing

Contact:	Renee Richey
Phone:	(760) 769-4764
Fax:	(760) 769-4764
E-mail:	eamwc@ccis.com

Emergency

Contact 1:	Ray Young
Day Phone:	(760) 769-4166
Night Phone:	
E-mail:	ryoung@ccis.com
Contact 2:	Bruce White
Day Phone:	(760) 769-4754
Night Phone:	

Department of Health Services

System #:	1500290
Contact Person:	
Phone:	

Edwards AFB (Main Base) (Treated/M&I)
95 CEG/CERF – Main Base Water Delivery
225 N. Rosamond Blvd
Building 3500
Edwards AFB, CA 93524-8540
Billing
Contact:
Phone: (661) 277-4927
Fax:
E-mail:
Emergency
Contact 1:
Day Phone:
Night Phone:
E-mail:
Contact 2:
Day Phone:
Night Phone:
Department of Health Services
System #:
Contact Person:
Phone:

Edwards AFB (Phillips Lab) (Treated/M&I)
95 CEG/CERF – Propulsion Lab Water
225 N. Rosamond Blvd
Building 3500
Edwards AFB, CA 93524-8540
Billing
Contact:
Phone: (661) 277-4927
Fax:
E-mail:
Emergency
Contact 1:
Day Phone:
Night Phone:
E-mail:
Contact 2:
Day Phone:
Night Phone:
Department of Health Services
System #:
Contact Person:
Phone:

FPL Energy (Treated/M&I)
41100 Highway 395
Boron, CA 93516

Billing

Contact:	Janis Hill
Phone:	(760) 762-5562 x300
Fax:	(760) 762-5546
E-mail:	rfimbres@kjcsolar.com

Emergency

Contact 1:	Robert Fimbres
Day Phone:	(760) 762-5562 x300
Night Phone:	(760) 964-9854
Contact 2:	Mike Roberson
Day Phone:	(760) 762-5562 x375
Night Phone:	(760) 964-4334

Mojave Public Utility District (Treated/M&I)
15844 K Street
Mojave, CA 93501

Billing

Contact:	Carol Pridgen
Phone:	(661) 824-4161
Fax:	(661) 824-2361
E-mail:	

Emergency

Contact 1:	Bruce Gaines
Day Phone:	(661) 824-4161
Night Phone:	(661) 824-0529
Contact 2:	Bee Coy
Day Phone:	(661) 824-4262
Night Phone:	(661) 824-2435

Department of Health Services

System #:	1510014
Contact Person:	James Stites
Phone:	(661) 335-7315

Rosamond CSD (Treated/M&I)
2700 20th Street West
Rosamond, CA 93560

Billing

Contact:	Toni Welsh
Phone:	(661) 256-3411
Fax:	(661) 256-2557
E-mail:	twelsh@qnet.com

Emergency

Contact 1:	Juan DeLaRosa
Day Phone:	(661) 256-3411
Night Phone:	
Contact 2:	Jack Stewart
Day Phone:	(661) 256-3411
Night Phone:	

Department of Health Services

System #:	1510018
Contact Person:	Jesse DHaLiwal
Phone:	(661) 335-7318

US Borax/Rio Tinto Minerals (Treated/M&I)
14486 Borax Rd
Boron, CA 93516

Billing

Contact:	Mel Lawson
Phone:	(661) 256-5807
Fax:	(760) 762-7344
E-mail:	mel.lawson@riotinto.com

Emergency

Contact 1:	Chuck Amento
Day Phone:	(760) 762-7353
Night Phone:	(760) 559-4327
Contact 2:	Suresh Rajapakse
Day Phone:	(760) 762-7053
Night Phone:	(760) 447-9766

SOUTH FEEDER

Antelope Valley Country Club (Treated/M&I)
39800 Country Club Dr
Palmdale, CA 93551

Billing

Contact:	Martha Whitfield
Phone:	(661) 947-3142 x13
Fax:	(661) 947-5026
E-mail:	

Emergency

Contact 1:	Buzz Barker
Day Phone:	(661) 810-0313
Night Phone:	(760) 373-8234
Contact 2:	Steve Applegate
Day Phone:	(661) 947-3142 x15
Night Phone:	(661) 949-0657

California Water Service Co (Treated/M&I)
Antelope Valley District
5015 West Avenue L-14
Quartz Hill, CA 93536

Billing

Contact:	
Phone:	(661) 943-9001
Fax:	(661) 722-5720
E-mail:	

Emergency

Contact 1:	Chris Whitley
Day Phone:	(661) 943-9001
Night Phone:	(661) 400-9403
Contact 2:	Jose Ojeda
Day Phone:	(661) 943-9001
Night Phone:	(661) 400-9404

Department of Health Services

System #:	1910243
Contact Person:	Steve Sung
Phone:	(213) 580-5723

El Dorado MWC (Treated/M&I)
PO Box 900519
Palmdale, CA 93590

Billing

- Contact: Jeanne Miller
- Phone: (661) 947-3255
- Fax: (661) 947-9701
- E-mail: sprung@antele.net

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Appendix H

ASSUMPTIONS FOR POPULATION GROWTH PROJECTIONS

The population growth projections encompass water purveyors located in areas currently served by AVEK primarily around the Antelope Valley and portions of eastern Kern County. This includes the City of Lancaster, portions of the City of Palmdale, various communities in Kern County, and two unincorporated areas in Los Angeles County. Communities in Kern County include the cities of Mojave, Boron, Edwards, and Rosamond, and the Edwards Air Force Base. Unincorporated communities in Los Angeles County include Acton and Lake LA area.

The base population shown in this report is taken from years 1990 and 2000 census data provided by California Department of Finance (DoF). Documentation can be retrieved at the following website: www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS.

Lancaster:
Population growth projections were based on the average growth rate of Palmdale from 2000 to 2020 as reported by Southern California Association of Government (SCAG) Documentation can be retrieved at their website: www.scag.ca.gov/forecast/downloads/2004GF.xls and from the Economic Roundtable Report produced by the Greater Antelope Valley Economic Alliance at: www.aveconomy.org.

Palmdale:
Population growth projection provided by SCAG. Documentation can be retrieved at their website - http://www.scag.ca.gov/forecast/downloads/2004GF.xls and from the Economic Roundtable Report produced by the Greater Antelope Valley Economic Alliance at: www.aveconomy.org. Since AVEK boundaries encompass approximately 50% of the City of Palmdale, only 50% of the projected population has been included in the tables and figures of this report.

Kern County:
Data for population growth projections are also provided by the DoF. Documentation for the projections can be retrieved at their website at:
www.dof.ca.gov/HTML/DEMOGRAP/DRU_Publications/Projections/P3/KERN.XLS. The DoF projections did not separate the cities mentioned above with the remaining cities in Kern County. Therefore, population growth data was extrapolated using year 2000 census data of the areas served by AVEK and the projected kern county growth rates from this DoF document. The population from this area accounts for approximately 11%-15% of the total population served by AVEK.

Los Angeles County:
Data for population growth projections are provided by the Economic Roundtable Report produced by the Greater Antelope Valley Economic Alliance at: www.aveconomy.org. The projections did not separate the areas served by AVEK with the remaining unincorporated cities in Los Angeles County. Therefore, population growth data was extrapolated using year 2000 census data and the projected growth rate of 'Unincorporated LA County' as provided in the Economic Roundtable Report. The population from this area accounts for approximately 6%-7% of the total population base served by AVEK.

Appendix I

- **EXCERPT FROM LOS ANGELES COUNTY WATERWORKS DISTRICT RECYCLED WATER SUPPLY ASSESSMENT**
- **SANITARY SURVEY UPDATE REPORT 2001**
- **WATER QUALITY WEBSITE INFORMATION**

THE FOLLOWING IS AN EXCERPT FROM THE LOS ANGELES COUNTY WATERWORKS DISTRICT'S DRAFT UWMP

2.3 Recycled Water Supplies

Another source of water that is available to the Antelope Valley but is not yet being utilized by the Study Area is recycled water. District No. 40 is currently leading an effort to develop a Recycled Water Facilities Plan for the Antelope Valley. This Facilities Plan recommends a backbone recycled water system to serve the Study Area.

2.3.1 Source Characteristics

Lancaster Water Reclamation Plant (LWRP), Palmdale Water Reclamation Plant (PWRP) and Rosamond Wastewater Treatment Plant (RWWTP) are three wastewater treatment plants in the Study Area. These three plants primarily provide secondary treated effluent. Currently, the only recycled water in the Study Area that is treated to a tertiary level is a small percentage of the wastewater at the LWRP through additional onsite facilities known as the Antelope Valley Tertiary Treatment Plant (AVTTP). Effluent management is challenging in Antelope Valley because the area is a closed basin with no river or other outlet to the Pacific Ocean. Effluent management options are restricted to methods such as reuse, evaporation, and percolation. LWRP, PWRP and RWWRP will all provide tertiary treated effluent with future upgrades. A description of each of the three treatment plants that may provide recycled water to the Study Area is provided below.

2.3.1.1 Lancaster Water Reclamation Plant (LWRP)

The LWRP, built in 1959 and located north of the City of Lancaster, is owned, operated, and maintained by the Los Angeles County Sanitation District No. 14 (District No. 14). LWRP, which has a permitted capacity of 16.0 mgd, treated an average flow of 13.3 mgd in 2004 to secondary

standards for use agricultural irrigation, wildlife habitat, and recreation. Additionally, 0.6 mgd is currently treated to tertiary standards and used for landscape irrigation at the Apollo Lakes Regional County Park.

District No. 14 plans to upgrade the existing LWRP for a total capacity of 21 mgd by 2008 with a proposed future upgrade to 26 mgd by 2014. Tertiary treated effluent from the upgraded LWRP will be available for municipal reuse in addition to the existing uses.

2.3.1.2 Palmdale Water Reclamation Plant (PWRP)

PWRP, built in 1953 and located on two sites adjacent to the City of Palmdale, is owed, operated, and maintained by the Los Angeles County Sanitation District No. 20 (District No. 20). PWRP, which has a permitted capacity of 15.0 mgd, treated an average flow of 9.4 mgd in 2004 to secondary standards for land application or agricultural irrigation.

A recent revision to the Waste Discharge Requirements due to concerns of nitrate in the groundwater, requires District No. 20 to eliminate their existing practice of land application and agricultural irrigation above agronomic rates of treated effluent by October 15, 2008. By November 15, 2009, District No. 20 is required to prevent the discharge of nitrogenous compounds to the groundwater at levels that create a condition of pollution or violate the water quality objectives identified in the 1994 Water Quality Control Plan for the Lahontan Region (1994 Basin Plan). In response, the treatment capacity of the PWRP will be increased to 22.4 mgd and tertiary treatment added. Tertiary treated water is anticipated to be fully used for municipal purposes.

2.3.1.3 Rosamond Wastewater Treatment Plant (RWWTP)

RWWTP, located in the City of Rosamond, is owned, operated, and maintained by the RCSD. RWWTP, which has a permitted capacity of 1.3 mgd, treated an average flow of 1.1 mgd to undisinfected secondary standards for landscape irrigation on-site.

RCSD plans to increase the capacity to 1.8 mgd in 2010 through the addition of 0.5 mgd tertiary treatment facility. The tertiary treatment facility will then be upgraded to 1.0 mgd in 2018.

Design for the proposed treatment plant improvements is complete and has been approved by the State of California. Construction is currently delayed due to lack of funding. Once constructed, the plant would provide tertiary treated recycled water for landscape irrigation at median strips, parks, schools, senior complexes and new home developments.

2.3.2 Availability of Supply

For the purpose of this study, wastewater flow projections are being used to define the amount of recycled water available to the Study Area. These projections were determined from the Draft Facilities Plan and are for tertiary treated water only. They also consider recycled water that has already been contracted out to users outside of the Study Area. Table 2-7 provides a summary of the recycled water flow projections for the Study Area through 2030. The flow projections for LWRP and PWRP in 2005 include secondary treated effluent because the tertiary treatment plant upgrades are not yet constructed.

TABLE 2-7
RECYCLED WATER AVAILABILITY TO STUDY AREA 2005 – 2030

	2005	2010	2015	2020	2025	2030
LWRP[a] (mgd)	12	14.8	19	23	27.1	31.2
PWRP[b] (mgd)	10.0	13.2	16.4	19.5	22.4	25.5
RWWTP[c] (mgd)	0	0.5	1.0	1.0	1.0	1.0
Study Area (mgd)	**22.0**	**28.5**	**36.4**	**43.5**	**50.5**	**57.7**
Study Area (AFY)	**24,700**	**32,000**	**40,800**	**48,800**	**56,700**	**64,800**

Notes:
(a) Obtained from the *Lancaster Water Reclamation Plant 2020 Facilities Plan*, prepared by the Sanitation Districts of Los Angeles County, May 2004, less the 3.03 mgd already committed to contract.
(b) Obtained from the *Draft Palmdale Water Reclamation Plant 2025 Facilities Plan and Environmental Impact Report*, prepared by the Sanitation Districts of Los Angeles County, April 2005.
(c) Obtained from documentation and phone calls provided by RCSD in May 2005 and a RCSD fax received in August 2005.

Although Table 2-7 provides the volumes of recycled water available, actual use of recycled water is limited to demand. Table 2-8 provides the projections of recycled water demand for the Study Area assuming 100 percent delivery of Table A and existing groundwater pumping rates. The projections are based on a recycled water market assessment and are generally for agricultural irrigation, landscape irrigation, and wildlife habitat. Due to delays in funding, RCSD has yet to determine their recycled water demand or identify any recycled water users. Thus, for purposes of this report, a conservative estimate of zero demand was assumed. District No. 40 recycled water demands were determined from the addition of the City of Lancaster and City of Palmdale demands from the Facilities Plan. Use of recycled water would be encouraged through the use of financial incentives (i.e., recycled water would be available at a lower cost than the existing potable water supply).

TABLE 2-8
PROJECTED FUTURE USE OF RECYCLED WATER IN THE STUDY AREA (AFY)

	2010	2015	2020	2025	2030
District No. 40	2,720	5,440	8,160	10,880	13,600
Percent of Total Supply	2	4	6	8	10
Rosamond CSD	0	0	0	0	0
Percent of Total Supply	0	0	0	0	0
Quartz Hill WD	0	0	0	0	0
Percent of Total Supply	0	0	0	0	0
Study Area	**2,720**	**5,440**	**8,160**	**10,880**	**13,600**
Percent of Total Supply	**2**	**4**	**5**	**7**	**8**

2.3.3 Water Quality

The current and projected water quality of the treated wastewater at LWRP, PWRP and RWWTP that will be used for recycled water purposes is expected to meet tertiary treated standards as defined in California Water Code Title 22 regulations. Furthermore, the use of recycled water would allow for more potable water to available with the same water quality as

CALIFORNIA STATE WATER PROJECT WATERSHED

Sanitary Survey Update Report 2001

PREPARED BY:
California Department of Water Resources
Division of Planning and Local Assistance
Municipal Water Quality Investigations Program

UNDER THE DIRECTION OF:
The State Water Contractors

December 2001

Gray Davis Governor State of California	Mary D. Nichols Secretary for Resources The Resources Agency	Thomas M. Hannigan Director Department of Water Resources

Contents

More detailed Contents information along with lists of Figures and Tables are provided at the beginning of each chapter. At the beginning of chapters 3 through 10, which address the State Water Project watersheds and water supply systems, the reader will find significance matrices ranking potential contaminant sources.

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Acknowledgments

The Sanitary Survey Action Committee (SSAC) provided project oversight, logistical support, and manuscript review for the *2001 Sanitary Survey Update*. A work team consisting of members of the SSAC and California Department of Health Services worked with Department of Water Resources staff to refine the original work plan for the update, and to address issues that arose during its writing and production. While the majority of the draft report was reviewed by the SSAC, this report is a DWR product and does not necessarily reflect the viewpoint of individual committee members or the member's organization.

The Department of Water Resources appreciates the SSAC's input and support in the development of the *2001 Sanitary Survey Update*:

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2001 SANITARY SURVEY UPDATE

DWR gratefully acknowledges the following individuals for their contribution in providing data, analyses, review, and insight:

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San Gabriel Valley Municipal Water District

San Gorgonio Pass Water Agency

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Santa Clara Valley Water District

Solano County Water Agency

Tulare Lake Basin Water Storage District

Contents

Figure

1

Introduction and Background

1.1 PURPOSE OF THE WATERSHED SANITARY SURVEY UPDATE

The California Department of Health Services (DHS), under California Surface Water Treatment regulations, requires that all water purveyors perform a sanitary survey of their water source watersheds and update it every 5 years. These regulations implement the federal Surface Water Treatment Rule (SWTR), which became effective on 31 December 1990.

The purpose of a watershed sanitary survey is to:

- Describe control and management practices,
- Describe potential contaminant sources or activities (PCSs) and their effect on drinking water source quality,
- Determine if appropriate treatment is provided, and
- Identify actions and recommendations to improve or control contaminant sources.

1.2 HISTORY OF THE SWP SANITARY SURVEY UPDATE 2001

After completion of the initial State Water Project (SWP) *Sanitary Survey* in 1990, a SWP Sanitary Survey Action Committee (SSAC) was formed. It consisted of staff from the California Department of Water Resources (DWR) and DHS's Drinking Water Program, representatives of the State Water Contractors and consultants. The SSAC's role was to follow up on the report's recommendations. The SSAC's work resulted in the State Water Project Action Plan. This action committee has continued to meet over the years, and although individual membership has changed, the SSAC makeup has remained the same.

The SSAC has taken on the task of providing guidance for the 5-year updates of the *Sanitary Survey*. The *Sanitary Survey Update Report 1996* focused on changes in SWP watersheds and water quality since 1990. The update also provided information from site visits to watersheds—Del Valle, San Luis, Pyramid, Castaic, Silverwood, Perris, Barker Slough/North Bay Aqueduct watershed, and the open channel section of Coastal Aqueduct. An emphasis was placed on the occurrence of coliforms and the pathogens *Giardia* and *cryptosporidium*. The *Update 1996*, completed in May 1996, included the results of an extensive database search on toxic sites within SWP watersheds.

1.3 COORDINATION WITH STAKEHOLDERS

Preparation for the *Sanitary Survey Update Report 2001* began July 1999 with SSAC meetings to discuss and develop a work plan and scope of work. The SSAC approved a draft work plan and schedule in September 1999 and adopted the final work plan in December 1999.

In May 2000, SSAC members with specific expertise and/or access volunteered to work as a subgroup to expedite the information retrieval, evaluation, and feedback process for the 2001 update. Those seven members represented DHS, SWP contractors, Metropolitan Water District of Southern California (MWDSC), Santa Clara Valley Water District (SCVWD), DWR's Operations and Maintenance Division (O&M), and the California Urban Water Agencies (CUWA).

Following work plan development, DWR's Municipal Water Quality Investigations (MWQI) management and staff, DHS staff, and the SSAC established agreements to help assure adequate progress, the obtainment of necessary information, and feedback on document content quality.

In conjunction with the agreements, this group—SSAC subgroup, MWQI and DHS staff—held frequent and focused meetings and conference calls to track progress, discuss schedule and resource issues, and prioritize tasks.

DHS granted a schedule extension, which was requested because of staffing resource issues and difficulty in obtaining available information. The original delivery date of January 2001 for the final review draft was eventually changed to 4 May 2001. Because of time constraints, not all chapters were reviewed by the SSAC prior to the release of the final review draft. The SSAC, DHS, and DWR staff conducted a thorough review of the final review draft chapters and after a review of the comments, the document was edited to achieve technical accuracy and consistent formatting.

1.4 2001 Sanitary Survey Assessment Approach

Sanitary Survey Update Report 2001 offers detailed evaluations of study areas and issues that were selected based on actions and recommendations from previous reports and concerns stemming from new data and information. Findings and recommendations in *Update 1996* led to extensive studies of the Barker Slough watershed and pathogens in source waters. Each of these follow-up activities is covered in detail in its own chapter.

The SSAC work plan specified that *Sanitary Survey Update 2001* would rely on existing data and information from DWR, MWDSC, and other agencies and would require extensive coordination and cooperation to obtain relevant information from several federal, State, and local sources.

During work plan development, it was agreed to provide information in *Sanitary Survey Update 2001* to make it useful for SWP utilities in complying with the California Drinking Water Source Assessment and Protection (DWSAP) Program. The relationship of the *Sanitary Survey Update 2001* to the DWSAP Program is discussed in section 1.8. *Sanitary Survey Update 2001* is not required by the DWSAP Program but much of its PCS information is readily available for incorporation into a source water assessment as required by the DWSAP Program.

A key task in the work plan was the preparation of a sanitary survey questionnaire and its distribution to SWP contractors. This approach was also used for the *Sanitary Survey Update 1996*. The questionnaire was used to obtain information in the most efficient and direct way possible on contaminant sources, available data, and major water quality issues. Of the 29 contractors, 12 responded to the questionnaire (several contractors were not using SWP water at the time).

1.5 Scope of Work for Each SWP Watershed

During the development process for *Sanitary Survey Update 2001*, DWR stated that new field reconnaissance surveys and additional monitoring studies would not be performed specifically for the update. The exception was a 4-year study of the Barker Slough watershed because *Sanitary Survey Update 1996* recommended an investigation.

The major *Sanitary Survey Update 2001* tasks performed for each watershed study include:

- Review and evaluation of the results from the questionnaire sent to SWP contractors,
- Personal communication with staff of various agencies and review of pertinent reports and data about major water quality issues,
- Delineation and mapping of each source watershed area,
- Evaluation of areas and contaminants of known or suspected concern, as directed by DHS and the SSAC,
  - Development of inventories of PCSs and activities in each area.
  - Determination of the susceptibility of the water supplies of each area to those contaminant sources and activities.
- Reports and summaries of the results; identification and rating of significant PCSs and development of recommended actions to reduce the susceptibility of water supplies to existing and future water quality problems.

1.6 Selection and Evaluation of Potential Contaminant Sources

The general types of PCSs used in the *Sanitary Survey Update 2001* were developed with SSAC input and the *American Water Works Association Guidance Manual*. They are presented below.

- Recreation
- Wastewater treatment/facilities (includes treatment plant effluent discharges, storage, transport, treatment, disposal to land, and septic systems)
- Urban runoff
- Animal populations (includes grazing, dairies, and wild animal populations)
- Algal blooms
- Agricultural activities (includes agricultural cropland use, pesticide/herbicide use, and agricultural drainage)
- Mining
- Solid or hazardous waste disposal facilities
- Logging

- Unauthorized activity (includes illegal dumping, leaking underground tank)
- Traffic accidents/spills
- Groundwater discharges
- Seawater intrusion
- Geologic hazards (landslides, earthquakes, floods)
- Fires
- Land use changes

Different PCSs can require different approaches and types of data for evaluation. In general, susceptibility to PCSs in a given watershed was determined through the questionnaire and information and data obtained in response to the following criteria:

- Frequency of drinking water regulations (maximum contaminant levels) being actually or nearly exceeded at the water treatment plant intakes, reservoirs, and in the treated water, including complaints about taste and odor.
- Constituents of concern (COC) causing additional water treatment costs or affecting treatment operations (for example, TOC removal requirement).
- Proximity of PCS to source waters (for example, reservoirs, streams) and/or treatment plant intakes.
- Beach closures due to high bacteria counts or wastes or spills associated with certain PCSs (for example, water recreation, sewage spills, septic tank leaks).
- Available water quality data on receiving water downstream of PCS areas and upstream of the nearest water supply diversions. Comparison between these locations, including at the water supply intake.
- The lack of data or the need to do a more thorough assessment of the susceptibility of the watershed to 1 or more PCSs.

1.7 REPORT ORGANIZATION

1.7.1 CHAPTER PRESENTATION

The *Sanitary Survey Update 2001* watershed chapters are organized by geographical areas, such as the 4 Southern California reservoirs, or by spatial connection, such as the 5 sections of the California Aqueduct. Figure 1-1 shows the approximate geographical location of the watersheds covered in the chapters and their corresponding sections of the SWP. The following SWP structures and their corresponding watersheds are covered in *Sanitary Survey Update 2001*:

- SWP reservoirs
  - Pyramid Lake
  - Castaic Lake
  - Silverwood Lake
  - Lake Perris
  - San Luis Reservoir
  - Lake Del Valle
- SWP aqueducts
  - North Bay Aqueduct (Barker Slough watershed)
  - South Bay Aqueduct
  - California Aqueduct sections:
    - H. O. Banks Pumping Plant to O'Neill Forebay/ Check 13
    - O'Neill Forebay
    - O'Neill Forebay to Avenal
    - Avenal to Kern River Intertie (Check 28)
    - Kern River Intertie to East/West Bifurcation (Check 41)
  - Coastal Branch
  - East Branch and West Branch
- Harvey O. Banks Delta Pumping Plant
  - The Sacramento San Joaquin Delta and watersheds of the Sacramento and San Joaquin rivers

Figure 1-1 Sanitary Survey Chapters and Corresponding Watersheds

At the beginning of each watershed section, a summary matrix shows the assessed threat a PCS poses for that particular watershed and water supply system. The matrix also shows the chapter section where the PCS is presented in detail. The chapter then presents the following information:

- Descriptions of land use, geology and soils, vegetation, and hydrology of each watershed area or descriptions of the SWP aqueduct branches for the water supply system site.
- Identification of PCSs for each area.
- Summary of water quality data.
- Discussion of the significance of the PCS(s) to each area.
- Watershed management practices.

Including this introductory chapter, 5 chapters do not focus on a particular watershed. Chapter 2 summarizes current laws and regulations for drinking water. Chapter 11 describes the SWP Emergency Action Plan and related information. Chapter 12 presents and discusses pathogen data, which DHS and the SSAC considered necessary to include in this report. Chapter 13 contains conclusions and recommendations for the PCSs and water quality issues presented in chapters 3 through 10.

1.7.2 Significance Matrices

Significance matrices provide a new approach for the SWP *Sanitary Survey* to give the reader a visual summary of the relative importance of PCSs in a watershed. Each watershed chapter begins with a matrix, which operates as a "road map" by providing a quick assessment of the most important PCSs and directing the reader to corresponding chapter sections. The matrices are not absolute ratings of importance. A chapter should be read completely to gain a full understanding of the potential threats to drinking water quality. Each PCS that threatens drinking water contamination of a water supply system was rated as follows:

● PCS is a highly significant threat to drinking water quality

◒ PCS is a medium threat to drinking water quality

⊙ PCS is a potential threat, but available information is inadequate to rate the threat.

○ PCS is a minor threat to drinking water quality

In each matrix, symbols represent ratings, and numbers stand for the chapter section in which the PCS is discussed. The ratings were based on data and information collected during research for *Sanitary Survey Update 2001*. Some data provided a clear connection between the PCS and its potential to contaminate drinking water. Some information was anecdotal and based on the collective knowledge and experience of the author investigating a source, as well as other SS Update authors and staff of the DWR Water Quality Assessment Branch.. In some cases, where a PCS was a clear source of the contaminant but the linkage as a threat was unclear, the PCS was given a medium rating. Sometimes a PCS was a clear source of the contaminant, but evidence and data indicated the source was not a threat to drinking water. In these cases, the PCS received a minor threat rating, for example, pesticides in the Delta watersheds.

Chapter headings for PCSs initially were drawn from a master list approved by the SSAC work team in fall 1999. The list had to be varied and expanded because of the extreme variation in geographical areas and settings for each chapter.

1.7.3 Development of Conclusions and Recommendations

Conclusions and recommendations in chapter 13 were developed at 5 workshops where SSAC and other staff reviewed and discussed authors' drafts and provided extensive input and revision. Detail of the process and content is provided in the introduction to chapter 13. It must be emphasized that chapter 13 is not a "stand-alone" chapter and that each chapter must be reviewed to obtain a complete picture of the status of a particular watershed. Only significant PCSs were included in chapter 13's conclusions and recommendations.

1.8 Relationship with DHS's Drinking Water Source Assessment and Protection (DWSAP) Program

Under the 1996 reauthorization of the Safe Drinking Water Act (SDWA), all states must complete a source water assessment (SWA) for public water systems by 2003. A SWA document is prepared to determine the existence of PCSs, to determine the appropriate monitoring needed, to inform the public, and to assist in the development of watershed protection programs. The DWSAP Program presents a set of standardized procedures for conducting a SWA. The DHS allows watershed sanitary surveys, like the *Sanitary Survey Update Report 2001*, as alternative methods of determining a water source's vulnerability.

While its requirements are similar, *Sanitary Survey Update Report 2001* contains more information than a SWA. Because of the vast size of the SWP, many subwatersheds interconnect with it. The major tasks of developing this sanitary survey consisted of separate assessments for each of the subwatersheds selected for inclusion. The DWSAP Program assessment and vulnerability summary of sources that are part of the SWP may be based on the information contained in this *Sanitary Survey Update.*

DHS will use the *Sanitary Survey Update Report 2001* as the basis of the DWSAP Program's source water assessment for SWP facilities and for the preparation of vulnerability summaries for those facilities. DHS will work with contractors and water utilities to complete the SWAs. Water utilities then will be required to include information about the assessments and vulnerability summary language in their Consumer Confidence Reports (Walker pers. comm).

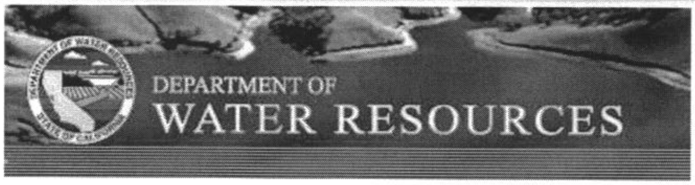
There are 6 information requirements that SWP contractors will be required to supply for their DWSAP Program assessments. Contractors will prepare their own DWSAP Program assessments for DHS, based on *Sanitary Survey Update 2001* information, to include the following:

1) Location of Supply Source.
2) Delineation of Source Areas and/or Protection Zones—Watershed will be designated as the source area/protection zone. This sanitary survey will provide the detailed information on the watershed, so each contractor's SWA can refer to the *2001 Sanitary Survey Update Report.*
3) Evaluation of Physical Barrier Effectiveness—DHS will provide standard language on this.
4) Inventory of Possible Contaminating Activities—This is identified in the *2001 Sanitary Survey Update Report.* Water contractors can refer to the update and provide limited description in DWSAP Program document.
5) Vulnerability Ranking—After review of raw water quality data provided by DWR and the water contractors, a consistent approach for each contractor to use in assessing vulnerability will be developed.
6) Assessment Map—*2001 Sanitary Survey Update Report* contains maps of watershed showing major land uses pipelines, any intakes, etc.

Reference

PERSONAL COMMUNICATION

Walker, Leah, Senior Engineer, Department of Health Services, Drinking Water Program. 1999. E-mail to Mike Zanoli, DWR. Nov 23.



DWR

Water Quality

- Water Quality
  - State Water Project Water Quality - *Division of Operations and Maintenance*
    The State Water Project water quality program collects detailed information on concentrations and distribution of chemical, physical, and biological parameters at more than thirty sites in the California Aqueduct and associated reservoirs.
  - Municipal Water Quality - *Division of Environmental Services*
    Site includes publications, program resources, projects and data related to drinking water quality.
  - Office of Water Quality - *Division of Environmental Services*
    Meet the overall water quality needs of DWR and to provide a central focal point for the collection and dissemination of water quality information.
  - Bay-Delta Hearing and Program Development - *State Water Project Analysis Office*
    Includes water rights hearings information, workshops, and Environmental Impact Reports.
  - South Delta Improvement Project (SDIP) - *Bay-Delta Office*
    The SDIP works to incrementally maximize diversion capability into Clifton Court Forebay, while providing an adequate water supply for diverters within the SDWA, and reducing the effects of State Water Project exports on both aquatic resources and direct fish losses in the South Delta.
  - North Delta Improvement Project (NDIP) - *Bay-Delta Office*
    The NDIP works to implement flood control improvements in a manner that benefits aquatic and terrestrial habitats, to the extent practicable.
  - Northern District Water Quality - *Division of Planning and Local Assistance*
    Water bodies are assessed for water quality characteristics, risks to beneficial uses, and effects of watershed management.
  - Central District Water Quality - *Division of Planning and Local Assistance*
    Assists local agencies and watershed groups with the collection, analysis, and storage of water quality data from rivers, streams, lakes, and reservoirs throughout its district boundaries.
  - San Joaquin District Water Quality - *Division of Planning and Local Assistance*
    Provide assistance and technical advice to local water agencies and to the general public on water quality conditions and on water well standards.
  - Southern District Water Quality - *Division of Planning and Local Assistance*
    Technical assessments are conducted that provide unique and consistent information on the status, trends, and causes of groundwater and surface water quality conditions.
  - Southern Field Division Water Quality Programs - *Division of Operations and Maintenance*

Department of Water Resources

Contact Us

Mission:

To manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

1416 9th Street,
Sacramento, CA 95814

Mailing Address:
P. O. Box 942836,
Sacramento, CA 94236

Monitors the water quality of its four Southern California reservoirs to provide its State Water Project contractors with the most current reservoir conditions.

- Water Data Library - *Division of Planning and Local Assistance*
  Grab sample water quality data collected by DWR.
- California Data Exchange Center (CDEC) - *Division of Flood Management*
  Real-time decision support system to DWR Flood Management and other flood emergency response organizations, providing operational and historical hydrologic and meteorlogic data, forecasts, and reports.
- San Joaquin River Real-time Program - *Division of Planning and Local Assistance*
  The Real-time Water Quality Management Program uses telemetered stream stage, salinity data and computer models to simulate and forecast water quality conditions along the lower San Joaquin River.

- Land & Water Use
- Ecosystem/Watershed Restoration
- Sacramento-San Joaquin Delta
- Drainage
- Environmental Analysis & Review
- Ecological Studies
- Environmental Compliance & Evaluation
- Environmental Documentation
- Invasive Species

Back to Top of Page

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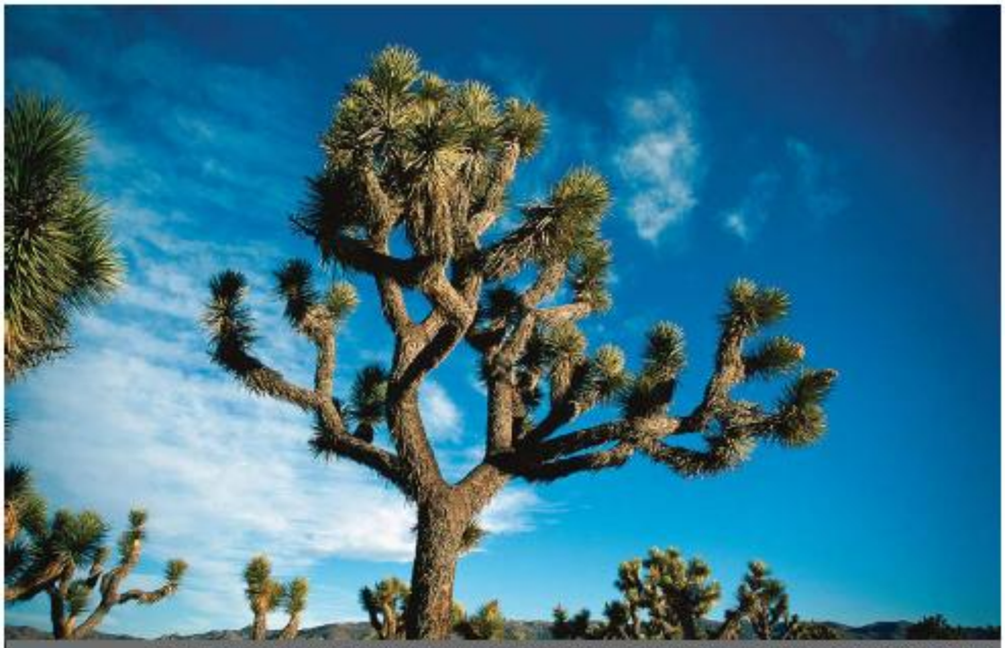
Appendix J

- **ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN (IRWMP) EXECUTIVE SUMMARY**



This plan defines a clear vision and direction for the sustainable management of groundwater reserves in the Antelope Valley Region.

Executive Summary

ANTELOPE VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN OVERVIEW

The California Water Plan 2005 update is the basis for all Integrated Regional Water Management (IRWM) planning efforts underway throughout the State, including this IRWM Plan for the Antelope Valley Region. It represents a fundamental transition in how the State looks at water resource management, and how the State government needs to be more involved at a local and regional level with governing agencies and interest groups to better identify and address State-wide water concerns.

The State recognizes that there is a need to consider a broader range of resource management issues, competing water demands, new approaches to ensuring water supply reliability, and new ways of financing.

IRWM planning was derived from Proposition 50 which was passed by California voters in November 2002, authorizing $3.4 billion in general obligation bonds to fund a variety of specified water and wetlands projects. It set aside $380 million for grants related to the implementation of IRWM Plans and is jointly administered by the California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB).

Proposition 50 states that IRWM Plans should include a description of the region and participants, regional objectives and priorities, water management strategies, implementation, impacts and benefits, data management, financing, stakeholder involvement, relationship to local planning, and state and federal coordination. This Antelope Valley Integrated Regional Water Management (IRWM) Plan includes a discussion of the specified elements, as summarized below.

INTRODUCTION (SECTION 1)

Several years ago, leaders and agencies in the Antelope Valley Region recognized the need for regional cooperation and planning. In an effort to represent the broad interests within the Antelope Valley Region, a number of organizations joined to form a Regional Water Management Group (RWMG) to work together and create this IRWM Plan. Members of the RWMG include the Antelope Valley-East Kern Water Agency (AVEK), Antelope Valley State Water Contractors Association (AVSWCA), City of Lancaster, City of Palmdale, Littlerock Creek Irrigation District, Los Angeles County Sanitation District (LACSD) Nos. 14 and 20, Los Angeles County Waterworks District No. 40 (LACWWD 40), Palmdale Water District (PWD), Quartz Hill Water District (QHWD), and Rosamond Community Services District (RCSD). These agencies agreed to contribute funds to help develop the AV IRWM Plan, provide and share information, review and comment on drafts, adopt the final AV IRWM Plan, and assist in future grant applications for the priority projects identified in this IRWM Plan.

> *"We have a responsibility for future generations, and we have a responsibility just as responsible citizens, to protect this groundwater resource and make sure that we use it in the best way possible."*
>
> – Adam Ariki,
> Los Angeles County Waterworks District No. 40

In January 2007, the RWMG and other community participants (the Stakeholders) set about developing a broadly supported water resource management plan that defines a meaningful course of action to meet the expected demands for water within the entire Antelope Valley Region through 2035. They chose to create the water resource management plan consistent with the State sponsored Integrated Regional Water Management Program that makes grant funds available to support sound regional water management. The goals of the AV IRWM Plan are to address:

- How municipal and industrial (M&I) purveyors can reliably provide the quantity and quality of water that will be demanded by a growing population;
- Options to satisfy agricultural users' demand for reliable supplies of reasonable cost irrigation water; and
- Opportunities to protect and enhance the current water resources (including groundwater) and the environmental resources within the Antelope Valley Region.

The RWMG acknowledged that a separate process (called adjudication) related to groundwater management was also underway. Members of the RWMG and other stakeholders discussed at length whether it was possible (and if possible, how) to develop a Regional Water Management Plan before the adjudication was settled. The members of the RWMG agreed that since the IRWM Plan and the adjudication were focused on different aspects of water management, they could proceed in parallel. This IRWM Plan contains information to help take action to meet shared objectives for long-term water management for the entire region. The results of the adjudication will help provide important clarity and certainty between groundwater users about how the groundwater resources will be managed, but other important water management actions can and should be taken without waiting for a final adjudicated solution. Members of the RWMG agreed that no information developed for the purposes of the IRWM Plan should be interpreted to interfere in any way with the adjudication process. The data provided in this report were not prepared in a manner suitable to answer the questions being addressed in the adjudication.

REGION DESCRIPTION (SECTION 2)

The Antelope Valley Region of California is home to over 444,000 people living in many different communities. Residents within this Region have experienced tremendous changes over the past generation due to a rapid increase in population coming from nearby large cities. Current forecasts of population growth suggest even larger changes


Surface water for the Antelope Valley Region comes from the state aqueduct and Littlerock Reservoir

will occur before 2035. Water plays a central role in the health and well being of all residents within the Antelope Valley Region. People use water for drinking, bathing, household and outdoor activities, agriculture, business endeavors, recreation, and to sustain and enhance natural habitats. This common need for water links communities together in many ways. When anyone uses water, the ability of other people to use water within the Antelope Valley Region can be affected.

The Antelope Valley Region encompasses approximately 2,400 square miles in northern Los Angeles County, southern Kern County, and western San Bernardino County. Major communities within the Antelope Valley Region include Boron, California City, Edwards Air Force Base, Lancaster, Mojave, Palmdale and Rosamond. All of the water currently used in the Antelope Valley Region comes from two sources: (1) naturally occurring water within the Antelope Valley Region (surface water and groundwater accumulated from rain and snow that falls in the Antelope Valley and surrounding mountains), and (2) State Water Project water (surface water that is collected in northern California and imported into the Antelope Valley and other areas around the state).

"This plan is going to provide a long-range benefit to the Antelope Valley and will be able to continue to provide for economic development, particularly with residential development throughout the Antelope Valley Region."

– Gretchen Gutierrez,
Antelope Valley Building Industry Association

The number of residents within the Antelope Valley Region expanded more than 330 percent between 1970 and 2005, growing from 103,000 people in 1970 to 444,000 people in 2005. Forecasters expect the population to continue to swell, potentially reaching 1,174,000 residents by the year 2035. As the number of people living and working in the

Antelope Valley Region increases, the competition for water supply increases, and the challenge of maintaining good water quality and managing the interconnected water cycle becomes more challenging.

Creation of a proactive, "smart" design for the fast-developing Antelope Valley Region makes this IRWM Plan essential to efficient and effective water management.

ISSUES AND NEEDS (SECTION 3)

Water managers and local planners face many daunting challenges related to supporting the well being of the Antelope Valley Region. Past activities have created problems that need to be addressed and expected increases in population growth make resolving these problems even more difficult. In order to help address the broad challenges, the AV IRWM Plan was organized to address issues and needs in the following categories. Section 3 of the Plan describes these issues and needs in detail.

Supplies are Variable and Uncertain

Determining the amount of water available for use at any given time (now or in the future) is more challenging than one might imagine. The amount of water supply available varies considerably due to changes in weather, rain and snow, and other conditions. All water supplies within the Antelope Valley Region come from two sources: (1) local rain and snow, or (2) imports of water from outside the Antelope Valley Region. The local water supplies come from rainfall and snowmelt that percolate into the groundwater aquifers or are captured in Littlerock Reservoir. Current estimates of water supplies made available from local rainfall and snowmelt vary widely (30,300 to 81,400 acre-feet per year (AFY).[1,2] Imported water comes from the State Water Project, which has historically varied. The currently available supplies from imported water can also vary widely from year to year (6,400 to 74,300 AFY).

Demand is Greater than Supply

One fundamental challenge in the Antelope Valley Region is that demand for water exceeds available supplies. The

The expected rapid growth in the Antelope Valley Region will affect water demand and increase the threat of water contamination from additional wastewater and urban runoff without proper management.

demand for water clearly exceeds even the higher estimates of currently available supplies. By 2010 the demand for water in an average year by 2010 will be 274,000 AFY and by 2035 could be 447,000 AFY. Even using the higher estimates of available supply, this means demand could exceed supply by 73,600 AFY in 2010 and by 236,800 AFY in 2035. The expected imbalance between supply and demand in 2035 is about the same as currently available supplies. If communities do not begin conserving water more effectively, the Region will need twice the water as it currently has in order to meet demand in 2035.

Historically, water supplies within the Antelope Valley Region have been used primarily for agriculture; however, due to population growth, water demands from residential and business uses have increased significantly and this trend is expected to continue. The expected continuation of rapid growth in the Antelope Valley Region will affect water demand and increase the threat of water contamination from additional wastewater and urban runoff. More residents will also lead to higher demand for water-based recreation.

Much of the water used within the Antelope Valley Region is extracted from groundwater aquifers. The amount of water pumped within the Antelope Valley Region has varied tremendously since the early 1900s. The United States Geological Survey estimated that groundwater pumping in 1919 was about 29,000 AFY and reached as high as 400,000 AFY in the 1950's. For many of those years, the amount of water being pumped was greater than the amount of water being replenished, creating an imbalance within the groundwater aquifers. Because the amounts pumped were greater than the amounts being replenished, groundwater levels have declined significantly throughout the Antelope Valley Region. The long-term depletion of aquifers cannot be continued indefinitely without serious

1 An acre-foot per year is enough water to cover an acre of land one foot deep and meet the water needs of a family of four for one year.

2 The analyses provided in the IRWM Plan are strictly for long-term planning purposes and have not been conducted to answer the questions being addressed within the adjudication. Once the detailed analysis of available local water supply are completed within the adjudication, the supply numbers for the IRWM Plan will need to be updated.

consequences. The historical declines in groundwater levels within the Antelope Valley Region have caused permanent damage to aquifers in some areas through land subsidence, or sinking.

In order to prevent further damage from declining groundwater levels, many water providers and managers within the Antelope Valley Region recognize the need to balance the water being pumped from the aquifers with the water being put back. In response to this need, a legal process called adjudication is currently underway. If the adjudication process is successful, groundwater users within the Antelope Valley Region will create and abide by a plan to stabilize groundwater levels and prevent further damage that can result from declining groundwater levels. While determining a method to balance groundwater use with the amount of water being replenished is a necessary piece to creating a viable water management strategy within the Antelope Valley Region, the adjudication likely will not provide any additional water supplies needed to meet the growing demands within the Antelope Valley Region.

Recognizing the need to identify meaningful actions beyond the adjudication, members of the Group and other community participants agreed to focus on actions beyond the adjudication in the Plan. Participants in developing the AV IRWM Plan encourage a quick and collaborative settlement of the adjudication process, but the contents of the AV IRWM Plan identify and recommend actions that go well beyond the adjudication. The actions identified in the AV IRWM Plan can help meet the larger needs of the Antelope Valley Region but will require a solution from the adjudication to stabilize groundwater levels. Nothing in the IRWM Plan shall be interpreted to interfere in any way with the adjudication process.

Water Quality and Flood Management

The groundwater basin within the Antelope Valley Region is an undrained, closed basin, meaning there is no outlet for water to flow to the ocean. When water enters a closed basin, any minerals or chemicals in the water typically accumulate in the basin. Currently, groundwater quality is excellent within the principal aquifer but is not as good toward the northern portion of the dry lake areas. Some portions of the basin contain groundwater with high fluoride, boron, total dissolved solids, and nitrate concentrations. Arsenic is another emerging contaminant of concern in the Antelope Valley Region and has been observed in LACWWD 40, PWD, Boron, and QHWD wells. Research conducted by the LACWWD and the United States Geological Survey has shown the problem to reside primarily in the deep aquifer,

The need for regional coordination of flood control efforts is readily apparent with the increase of paved surfaces, along with the increase of local flood events.

The preservation of the Antelope Valley Region's unique environmental features can be achieved through integrated surface and groundwater management actions.

and it is not anticipated that the existing arsenic problem will lead to future loss of groundwater as a water supply resource for the Antelope Valley.

Portions of the Antelope Valley Region are also subject to flooding from uncontrolled runoff in the nearby foothills, which can be aggravated by lack of proper drainage facilities and defined flood channels. This runoff can negatively affect the water quality of the underlying groundwater basin, and can create stagnant ponds in places where clay soils beneath the surface do not allow for percolation to occur. The need for regional coordination of flood control efforts becomes more readily apparent as urban development and paved surfaces increase throughout the Antelope Valley Region, along with the frequency of local flood events.

Environmental Resources

The Antelope Valley Region has many unique environmental features, and several plant and animal species are only found in this area. As the pressure for growth expands out into undeveloped or agricultural lands, the need to balance industry and growth against protection of endangered species and sensitive ecosystems requires difficult decisions and trade-offs, each resulting in a variety of unique impacts on water demands and supplies in the Region. The actions identified in the AV IRWM Plan can help to preserve open space and natural habitats in the greater the Antelope Valley Region while maximizing surface water and groundwater management efforts.

Water Management and Land Use

What people do on the land of the Antelope Valley and how they do it directly impacts many aspects of life, including the water cycle, within the Antelope Valley Region. Historically throughout California, land use planning and water use planning have been done almost independently of one another. The challenges identified within the Plan clearly show a need for much closer collaboration between

The expected rapid growth in the Antelope Valley Region will affect water demand and increase the threat of water contamination from additional wastewater and urban runoff without proper management.

land use planning efforts and water management planning efforts. Continued development within the Antelope Valley Region depends heavily on the successful completion of the objectives presented in the Plan to meet the growing demand for recreational opportunities while minimizing or avoiding the loss of local culture and values.

OBJECTIVES (SECTION 4)

The Stakeholders worked together to identify clear objectives and planning targets they want to accomplish by implementing the AV IRWM Plan (see Table ES-1). Although the AV IRWM Plan is intended to address the Antelope Valley Region's water resource management needs, this document also identifies several open space, recreation, and habitat targets as well. Refer to Section 4 of the AV IRWM Plan for details on how the objectives and targets were determined.

These objectives and planning targets represent the most important things the Stakeholders have chosen to work together to accomplish over the next several years. Everything done within the context of this IRWM Plan should contribute in some way to achieving these objectives. Also, because the planning targets are measurable, residents within the Antelope Valley Region can monitor how well the Plan is being implemented.

Stephen Sorenson County Park, a community recreation facility within the Antelope Valley, is home to "Lovejoy Springs" as it is known by the community.

Apollo Park Lake

Table ES-1 Antelope Valley Region Objectives and Planning Targets

Objectives	Planning Targets
Water Supply Management	
Provide reliable water supply to meet the Antelope Valley Region's expected demand between now and 2035.	Reduce (73,600 to 236,800 AFY) mismatch of expected supply and demand in average years by providing new water supply and reducing demand, starting 2009.
	Provide adequate reserves (50,600 to 57,400 AFY) to supplement average condition supply to meet demands during single-dry year conditions, starting 2009.[3]
	Provide adequate reserves (0 to 62,000 AF/4 year period) to supplement average condition supply to meet demands during multi-dry year conditions, starting 2009.[4]
Establish a contingency plan to meet water supply needs of the Antelope Valley Region during a plausible disruption of SWP water deliveries.	Demonstrate ability to meet regional water demands without receiving SWP water for 6 months over the summer, by June 2010.
Stabilize groundwater levels at current conditions.	Manage groundwater levels throughout the basin such that a 10-year moving average of change in observed groundwater levels is greater than or equal to 0, starting January 2010.
Water Quality Management	
Provide drinking water that meets customer expectations.	Continue to meet Federal and State water quality standards as well as customer standards for taste and aesthetics throughout the planning period.
Protect aquifer from contamination.	Prevent unacceptable degradation of aquifer according to the Basin Plan throughout the planning period.
	Map contaminated sites and monitor contaminant movement, by December 2008.
	Identify contaminated portions of aquifer and prevent migration of contaminants, by June 2009.
Protect natural streams and recharge areas from contamination.	Prevent unacceptable degradation of natural streams and recharge areas according to the Basin Plan throughout the planning period.
Maximize beneficial use of recycled water.	Increase infrastructure and establish policies to use 33% of recycled water to help meet expected demand by 2015, 66% by 2025, and 100% by 2035.
Flood Management	
Reduce negative impacts of stormwater, urban runoff, and nuisance water.	Coordinate a regional flood management plan and policy mechanism by the year 2010.
Environmental Resource Management	
Preserve open space and natural habitats that protect and enhance water resources and species in the Antelope Valley Region.	Contribute to the preservation of an additional 2,000 acres of open space and natural habitat, to integrate and maximize surface water and groundwater management by 2015.
Land Use Planning/Management	
Maintain agricultural land use within the Antelope Valley Region.	Preserve 100,000 acres of farmland in rotation[5] through 2035.
Meet growing demand for recreational space.	Contribute to local and regional General Planning documents to provide 5,000 acres[6] of recreational space by 2035.
Improve integrated land use planning to support water management.	Coordinate a regional land use management plan by the year 2010.

3 Dry year reserves determined by taking the dry year mismatch and adding the average year supplement. Assumes that the average year supplement equals the average year mismatch for any given year. Range determined from the maximum and minimum reserves.

4 As with single-dry year, multi-dry year reserves determined by summing the 4-year dry year mismatch and adding the 4-year average year supplement. Assumes that the average year supplement equals the average year mismatch for any given year. Range determined from the maximum and minimum reserves.

5 The phrase "in-rotation" means that not all 100,000 acres will be in agricultural production at one time rather the land will be rotated in cycles to make most efficient use of the land.

6 The City of Palmdale and City of Lancaster's General Plans provide a standard of 5 acres of parkland per 1,000 City residents. The Kern County General Plan provides a standard of 2.5 acres per 1,000 residents. The other local and regional General Plans do not provide a standard for "recreation or parkland" preservation. This planning target assumes a 2035 population of 1.17 million residents in the Antelope Valley Region.

WATER MANAGEMENT STRATEGIES (SECTION 5)

An overview and description of each of the Proposition 50 Water Management Strategies required to be considered in the AV IRWM Plan is provided in Section 5. These water management strategies include those that are currently utilized by the agencies and organizations in the Antelope Valley Region on an ongoing basis, the strategies now being implemented, and those that are planned for the future.

Additionally, in the AV IRWM Plan, the 20 different water management strategies identified in the IRWM Plan Guidelines (CWC §§ 79562.5 and 79564) were compared with those identified in the California Water Plan and then grouped into the AV IRWM Plan's five regional and broad-based water management strategy areas: water supply management; water quality management; flood management; environmental resource management; and land use management.

To help identify the many potential projects in the Antelope Valley Region and to assess the contribution of these projects towards meeting the AV IRWM Plan objectives and planning targets (as identified in Table ES-1, above), a "Call for Projects" form was sent out to all the Stakeholders to give them the opportunity to submit their project concepts for consideration. The Call for Projects provided an avenue to engage the Stakeholders in the information-sharing aspect of Plan development, and resulted in identification of many projects that provide multiple benefits that span more than one water management strategy.

IRWM PLAN AND PROJECTS INTEGRATION, EVALUATION AND PRIORITIZATION (SECTIONS 6 AND 7)

Many local agencies and other community participants have worked well together to create a Plan that identifies challenging issues and needs being faced by all Antelope Valley residents. Fortunately, this IRWM Plan also identifies actions that can help meet the objectives for the Antelope Valley Region and identifies methods for cooperative implementation of those actions.

Table ES-2 lists the projects and actions that the Stakeholders believe will help meet the Regional objectives. Implementing the high priority actions will require focused effort, broad community support, political resolve, and money. The Stakeholders are actively pursuing financial assistance through several grant programs to help leverage local investments. The RWMG is also working to establish a secure and long-lasting way to coordinate resources to meet the growing needs of the entire Antelope Valley Region.

Table ES-2 Stakeholder Prioritized Projects

Priority	Project	Project Sponsor
Water Supply Groundwater Recharge/Banking Infrastructure Projects		
High	Antelope Valley Water Bank	Western Development and Storage
	Aquifer Storage and Recovery Project - Injection Well Development	LACWWD 40
	Upper Amargosa Creek Recharge, Flood Control & Riparian Habitat Restoration Project	City of Palmdale, AVEK
	Water Supply Stabilization Project – Westside	AVEK/AVSWCA/ LACWWD 40
Medium	Aquifer Storage and Recovery Project: Additional Storage Capacity	LACWWD 40
	Lower Amargosa Creek Recharge & Flood Control Project	J. Goit/City of Palmdale
	Water Supply Stabilization Project – Eastside Project	AVEK
Water Infrastructure Projects		
High	Avenue K Transmission Main, Phases I-IV	LACWWD 40
	Littlerock Dam Sediment Removal Project	PWD
	Wastewater Pipeline	RCSD
Low	Avenue M and 60th Street West Tanks	LACWWD 40
	Place Valves and Turnouts on Reclaimed Water Pipeline	RCSD

Table ES-2 Stakeholder Prioritized Projects (continued)

Priority	Project	Project Sponsor
Recycled Water Projects		
High	Antelope Valley Recycled Water Project Phase 2	LACWWD 40/Palmdale/ LACSD
	Groundwater Recharge Using Recycled Water Project	City of Lancaster
Medium	Groundwater Recharge – Recycled Water Project	PWD
	Kern County and Los Angeles County Interconnection Pipeline	RCSD
	Regional Recycled Water Project Phase 3	LACWWD 40/Palmdale/LACSD
	Tertiary Treated Water Conveyance and Incidental Groundwater Recharge of Amargosa Creek Avenue M to Avenue H	City of Lancaster
Low	Regional Recycled Water Project Phase 4	LACWWD 40/Palmdale/ LACSD
Water Conservation/Water Use Efficiency		
High	Comprehensive Water Conservation/Efficient Water Use Program	Antelope Valley Water Conservation Coalition/ LACWWD/PWD
Water Quality Projects		
High	Lancaster Water Reclamation Plan Stage V	LACSD
	Palmdale Water Reclamation Plan Existing Effluent Management Sites	LACSD
	Palmdale Water Reclamation Plan Stage V	LACSD
	Partial Well Abandonment of Groundwater Wells for Arsenic Mitigation	LACWWD 40
Medium	Lancaster Water Reclamation Plan Stage VI	LACSD
	Lancaster Water Reclamation Plan Proposed Effluent Management Sites	LACSD
	Palmdale Water Reclamation Plan Stage VI	LACSD
	Palmdale Water Reclamation Plan Proposed Effluent Management Sites	LACSD
	Palmdale Water District New Treatment Plant	PWD
Low	42nd Street East, Sewer Installation	City of Palmdale
Flood Management Projects		
High	Development of Coordinated Antelope Valley Flood Control Plan	Cities of Lancaster, Palmdale, Los Angeles Department of Public Works (LADPW), Kern County
Medium	Quartz Hill Storm Drain	LADPW
	Anaverde Detention Basin, Dam & Spillway at Pelona Vista Park	City of Palmdale
	Barrel Springs Detention Basin and Wetlands	City of Palmdale
	Hunt Canyon Groundwater Recharge and Flood Control Basin	City of Palmdale
Low	45th Street East Flood Control Basin (Q East Basin)	City of Palmdale
	Avenue Q and 20th Street East Basin (Q West Basin)	City of Palmdale
	Storm water Harvesting	Leona Valley Town Council
Environmental Resource Management Projects		
High	Ecosystem and Riparian Habitat Restoration of Amargosa Creek; Avenue J to Avenue H	City of Lancaster
Medium	Tropico Park Pipeline Project	RCSD
Land Use Management Projects		
High	Development of a Coordinated Land Use Management Plan	Cities of Lancaster, Palmdale, LADPW, Kern County /Antelope Valley Conservancy
	Amargosa Creek Pathways Project	City of Lancaster

FRAMEWORK FOR IMPLEMENTATION (SECTION 8)

The AV IRWM Plan is a dynamic document that identifies monitoring guidelines and sets forth procedures for measuring the success, benefits, and impacts of the AV IRWM Plan. An ongoing management process is proposed for evaluating, updating and maintaining the Plan, and a comprehensive implementation framework has been developed to establish and identify a capital improvement program and financial plan for both construction and operation and maintenance of the projects and management actions selected as "high priority" (see Table ES-2, for a list of the high priority projects).

The 11 public agencies that have joined together to create the RWMG have recognized the value of working collectively towards meeting the regional goals identified in this Plan. In order to do this, they have signed a Memorandum of Understanding (MOU) to define what their roles and responsibilities are in developing and moving forward with implementation of the AV IRWM Plan. The decision-making structure of the MOU provides the RWMG with the responsibility to make formal decisions regarding the scope and content of the AV IRWM Plan. While the structure and approach has been successful to create the plan, the RWMG discussed whether the MOU and facilitated broad agreement approach would work well to implement and update the Plan after it is adopted. Several potential options were discussed including selection of one willing existing agency within the RWMG, (the City of Palmdale for example), that would serve on behalf of the entire stakeholder group, or creation of a new legal entity, such as a new Joint Powers Authority (JPA) to lead the collaboration with the stakeholder group and help implement the IRWM Plan.

The stakeholders decided that they would like to continue using the current approach of facilitated broad agreement to implement and update the AV IRWM Plan. However, several of the RWMG Members expressed a desire to form a more formal governance structure to implement the Plan over the next several years. The stakeholders understand that creating a new, more formal governance structure that will maintain the positive momentum the group has demonstrated during the past year until the year 2035 will likely require a few years.

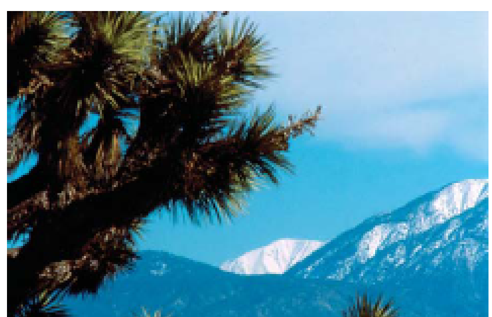
Implementation of the high priority projects in the IRWM Plan is currently the responsibility of the individual lead agency with the jurisdictional authority to approve the project. The Stakeholders and RWMG have chosen these projects because they want to take action on them within the next two to three years, and they directly address the objectives and targets of better management of resources within the Antelope Valley Region. Furthermore, implementing the projects together yield greater benefits to the Region then if each agency implemented on their own.

The collection, management, distribution and use of data collected as part of this IRWM Planning effort, and through implementation, are essential to making this a sustainable effort that will benefit the Antelope Valley Region for years to come. Data regarding water quantity and quality are currently collected and distributed by a number of different agencies. The Stakeholders have identified strategies in this IRWM Plan to ensure quick identification of data gaps, avoiding duplicative (and costly) studies that result in the same information, and integrating with other important regional, statewide programs, and federal needs.

This IRWM Plan identifies performance measures that will be used to evaluate strategy performance, monitoring systems that will be used to gather actual performance data, and mechanisms to change these strategies if the data collected shows the Antelope Valley Region's IRWM planning targets are not being met. The Stakeholders also recognized that additional technical detail is needed for several of the IRWM Plan's performance measures to be properly implemented and measurable. The Stakeholder group has agreed to continue to refine these performance measures as the AV IRWM Plan is implemented.

This IRWM Plan is necessarily a Stakeholder-driven Plan. The RWMG invites the public and interested Stakeholders to become active participants in the Region's ongoing efforts to:

- Identify, evaluate, prioritize, and implement solutions to the Region's complex water management issues, challenges, and conflicts; and
- Continue the development and evolution of this Plan.



The San Gabriel Mountains provide a beautiful, natural backdrop to many Antelope Valley households.

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14

ATTACHMENT 14. CONSENT FORM

ATTACHMENT 14

Consent Form

IRWM Plan Update

Applicant: Antelope Valley East Kern Water Agency (AVEK)
IRWM Region: Antelope Valley
RWMG: Lahontan

RWMG Members include:

Antelope Valley-East Kern Water Agency, Palmdale Water District, Quartz Hill Water District, Littlerock Creek Irrigation District, Antelope Valley State Water Contractors Association, City of Palmdale, City of Lancaster, County Sanitation District No. 14 of Los Angeles County, County Sanitation District No. 20 of Los Angeles County, Rosamond Community Services District, and Los Angeles County Waterworks District No. 40, Antelope Valley.

Date of Adoption: January 2008

As the authorized representative of the above-reference RWMG, I acknowledge and affirm that the RWMG is utilizing an IRWM Plan that was adopted on or before September 30, 2008, to meet part of the grant Eligibility Criteria for the Round 1, Proposition 84 IRWM Grant Program, Implementation Grant solicitation

I also acknowledge that the RWMG understands that it must enter into a binding agreement with DWR to update, within two years of the execution date of the agreement, the IRWM Plan to meet the IRWM Plan standards contained in the Guidelines, and to undertake all reasonable and feasible efforts to take into account water-related needs of disadvantaged communities in the area within the IRWM Region.

I further acknowledge that the RWMG understands that failure to meet the condition listed above may result in termination of the grant agreement by DWR and that DWR may demand the immediate repayment to the State of an amount equal to the amount of grant funds disbursed to Grantee prior to such termination.

Daniel Flory, P.E.	
Name of Authorized Representative	Signature
AVEK, General Manager	12/13/2010
Title of Authorized Representative	Date

SWP water is delivered wholesale to the Antelope Valley as both an agricultural and urban supply. Table 15-2 shows the history of actual wholesale SWP deliveries to the Antelope Valley. SWP deliveries are used by the Region's retail water purveyors along with local groundwater resources. The IRWMP provides a complete discussion of each water purveyor's supplies in Section 2 and 3.

TABLE 15-2
State Water Project Historical Table A. Amounts vs. Actual Deliveries in Antelope Valley Region in Acre Feet by Year (IRWMP 2007)

Year	Table A Amount (AFY)	Actual Delivery Amount (AFY)
1975	41,100	8,588
1980	81,530	72,598
1985	55,910	38,622
1990	151,700	57,561
1995	158,000	54,727
2000	162,000	92,637
2004	165,000	110,379

SUMMARY

Conjunctive use, water efficiency and water recycling all play a prominent role in regional water planning and the increased emphasis on regional self-sufficiency. These sections are included in the IRWM Plan (Sections 4.2 and 5.1.1). The implementation of these types of projects demonstrates the Region's commitment to reducing dependence on water supplied from the Delta.

Much of the water used within the Antelope Valley Region is extracted from groundwater aquifers. The amount of water pumped within the Antelope Valley Region has varied tremendously since the early 1900s. With the need to balance the water being pumped from the groundwater aquifers with the water being naturally recharged, a legal process called adjudication has begun in the Antelope Valley. If the adjudication process is successful, groundwater users within the Region will create and abide by a plan to stabilize groundwater levels and prevent further damage that can result from declining groundwater levels.

The members of the RWMG agreed that since the IRWM Plan and the adjudication were focused on different aspects of water management, the two could proceed in parallel. The IRWM Plan encourages a quick and collaborative settlement of the adjudication process, but the contents of the Plan identify and recommend actions that go well beyond the adjudication. Members of the RWMG and other community participants agreed to focus on these actions in the Plan by presenting high-priority projects for implementation beyond the adjudication itself.

Currently, all water agencies in the Antelope Valley Region utilize water conservation methods as a means to reduce demand during drought conditions. Additionally, the Antelope Valley - East Kern Water Agency's (AVEK) largest retail customer, Los Angeles County Waterworks District 40 (LACWWD40) is a member of the California Urban Water Conservation Council (CUWCC) and a signatory of the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU).

15

ATTACHMENT 15. IRWM PLAN REDUCE DELTA WATER DEPENDENCE

INTRODUCTION

The Antelope Valley Integrated Regional Water Management (IRWM) Plan was originally adopted in 2007. Cost and other factors continue to lead local interests to develop and implement programs that emphasize efficient water use and full utilization of local supplies, including water reuse. The 2007 Plan emphasizes water management strategies that will maximize reliance on local supplies and reduce dependence on imported water. The Region currently relies on State Water Project (SWP) supplies to meet a significant portion of the demand; therefore, the Region is eligible for augmented funding in this grant process.

Commitment to Reduce Dependence

The RWMG has committed to full utilization and development of local supplies, efficient water use, and environmental protection. Part of the IRWM Plan recognized the need to reduce reliance on water exported from the San Joaquin-Sacramento River Delta (Delta) system. The commitment to reducing dependence is reflected in the IRWM Plan, and the submitted "Application for Proposition 84 Planning Grant Round 1" funding provides assurances that the updates to the IRWM Plan will continue to help reduce dependence on the Delta.

Relevant excerpts from the IRWM Plan that refer to reduced dependence on the Delta are included in this attachment.

Use of Delta Water in IRWM Region

Water currently used in the Antelope Valley Region comes from two sources: (1) naturally occurring water within the Antelope Valley Region (surface water and groundwater accumulated from rain and snow that falls in the Antelope Valley and surrounding mountains), and (2) SWP water (surface water that is collected in northern California and imported into the Antelope Valley and other areas around the state). Current State Water Contractor (SWC) allotments are shown in Table 15-1.

TABLE 15-1
State Water Project Current Table A. Amounts in Antelope Valley Region in Acre Feet per Year (IRWMP 2007)

State Water Project Participant	Table A Amount (AFY)
Antelope Valley - East Kern Water Agency (AVEK)	141,400
Palmdale Water District (PWD)	21,300
Littlerock Creek Irrigation District (LCID)	2,300
Total Regional Table A	**165,000**

All agencies are members of the RWMG

IRWM PLAN

2007 IRWM Objectives

The IRWM Plan identified several objectives within each of five issue areas. Those relating to increasing water supply reliability and management of SWP supplies (IRWM Plan, Table 4-1) include:

- Water Supply Management
    - Provide reliable water supply to meet the Antelope Valley Region's expected demand between now and 2035.
    - Establish a contingency plan to meet water supply needs of the Antelope Valley Region during a plausible disruption of SWP water deliveries.
    - Stabilize groundwater levels at current conditions.
- Water Quality Management
    - Provide drinking water that meets customer expectations.
    - Protect aquifer from contamination
    - Protect natural streams and recharge areas from contamination.
    - Maximize beneficial use of recycled water
- Land Use Planning/Management
    - Improve integrated land use planning to support water management.

In the 2007 IRWMP, Planning Targets were developed for each Objective. Relevant examples (IRWMP, Table 4-1) include:

- Establish a contingency plan to meet water supply needs of the Antelope Valley Region during a plausible disruption of SWP water deliveries.
    - **Target**: Demonstrate ability to meet regional water demands without receiving SWP water for 6 months over the summer, by June 2010.
- Maximize beneficial use of recycled water
    - **Target**: Increase infrastructure and establish policies to use 33 percent of recycled water to help meet expected demand by 2015, 66 percent by 2025, and 100 percent by 2035.

Implementation of these portions of the IRWMP are helping the Region move toward reducing dependence on the Delta for water supply by increasing reliability of local water sources, using local supplies in periods of decreased SWP availability, and planning for additional local supplies such as recycled water and implementation of water banks. In order to meet these objectives, the Plan identified several strategies (Plan Section 5.1) including:

- Conjunctive use
- Land use planning
- Non-point source pollution control
- Surface storage
- Watershed planning
- Water and wastewater treatment
- Water transfers

Selection of Project for this Implementation Grant Application

The RWMG reviewed objectives of the 2007 IRWM Plan and identified the AVEK Water Supply Stabilization Project (WSSP- 2) Water banking project as the one with highest priority with the greatest potential for immediate implementation.

Assurances Regarding the IRWM Plan Update

The Antelope Valley IRWM Region has demonstrated a commitment to improved water use efficiency and effective management of local supplies which is an essential step to reducing SWP water from the Bay-Delta. The Antelope Valley RWMG has been recommended for a Planning Grant to revise the 2007 IRWM Plan to include program preferences such as:

- Effectively integrate water management programs and projects;
- Use and reuse water more efficiently, climate change response;
- Practice integrated flood management; and
- Protect surface water and groundwater quality, ensure equitable distribution of benefits) were adequately addressed.

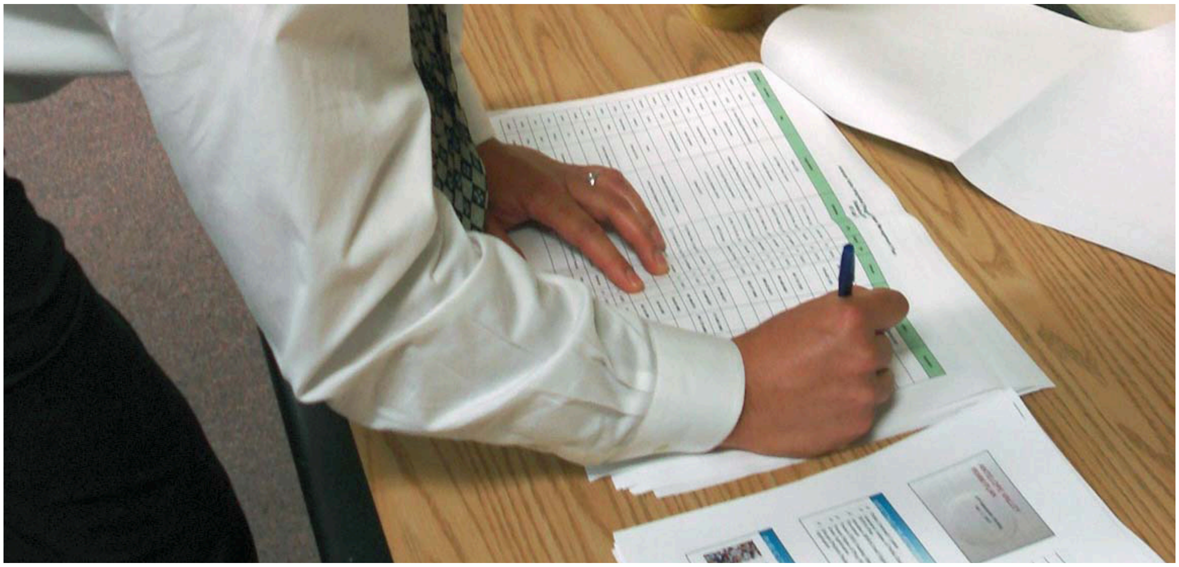
The Antelope Valley RWMG will begin revising the 2007 IRWM Plan as soon as final approval of its grant occurs. This approval is expected in June of 2011.

ATTACHMENT EXHIBITS

File 2 of 3 – IRWMP Excerpt Section 4.2 Water Supply Management Objectives and Targets

File 3 of 3 – IRWMP Excerpt Section 5.1.1 Water Management Strategy Descriptions

Attachment 15 Exhibit
IRWMP Excerpt:
Section 4.2 Water Supply Management Objectives and Targets



draft list of objectives was discussed amongst the entire group and new stakeholder comments were reviewed and incorporated into the objectives, as appropriate. The list was then finalized and incorporated into the IRWM Plan. By accomplishing these objectives, significant benefits to the Antelope Valley Region can be achieved.

"The time for action has arrived, and I believe that the Integrated Regional Water Management Plan provides us the tool."

– Randy Williams,
City of Lancaster

To establish quantified benchmarks for implementation of the IRWM Plan, planning targets have been identified to amplify the objectives and provide more definition to the Antelope Valley Region's major water resource needs over the planning horizon. Although the IRWM Plan is intended to address the Antelope Valley Region's water resource management needs, this document also identifies several open space, recreation, and habitat targets, as the implementation of water supply, flood management, and water quality projects have the potential to contribute towards these other Regional needs. In addition, habitat and open space projects have the potential to generate additional water supply and water quality benefits.

The objectives and planning targets are presented below (and summarized in Table 4-1) and are presented under this IRWM Plan element to which they most closely correspond.

4.2 WATER SUPPLY MANAGEMENT OBJECTIVES AND TARGETS

Water supply management objectives and targets are directly related to addressing the key issues and needs identified in the water supply assessment in Section 3, including water supply and groundwater management issues.

Objective: Provide reliable water supply to meet the Antelope Valley Region's expected demand between now and 2035.

Reliability is defined herein as "how much one can count on a certain amount of water being delivered to a specific place at a specific time," and depends on the availability of water from the source, availability of the means of conveyance, and the level and pattern of water demand at the place of delivery.

Reliability criteria identify the maximum acceptable level of supply shortage an agency is willing to sustain during a drought. For this study, a reliability criterion has been used to evaluate water supply plans. This criterion requires water supply to be sufficient to meet projected demands 95 percent of the time. In the remaining 5 percent of the time, it is assumed that the maximum allowable supply shortage will be 5 percent of the demand. This level is chosen because a 5 percent water demand reduction is anticipated

Table 4-1 Antelope Valley Region Objectives and Planning Targets	
Objectives	**Planning Targets**
Water Supply Management	
Provide reliable water supply to meet the Antelope Valley Region's expected demand between now and 2035.	Reduce (73,600 to 236,800 AFY) mismatch of expected supply and demand in average years by providing new water supply and reducing demand, starting 2009. Provide adequate reserves (50,600 to 57,400 AFY) to supplement average condition supply to meet demands during single-dry year conditions, starting 2009.[1] Provide adequate reserves (0 to 62,000 AF/ 4 year period) to supplement average condition supply to meet demands during multi-dry year conditions, starting 2009.[2]
Establish a contingency plan to meet water supply needs of the Antelope Valley Region during a plausible disruption of SWP water deliveries.	Demonstrate ability to meet regional water demands without receiving SWP water for 6 months over the summer, by June 2010.
Stabilize groundwater levels at current conditions.	Manage groundwater levels throughout the basin such that a 10-year moving average of change in observed groundwater levels is greater than or equal to 0, starting January 2010.
Water Quality Management	
Provide drinking water that meets customer expectations.	Continue to meet Federal and State water quality standards as well as customer standards for taste and aesthetics throughout the planning period.
Protect aquifer from contamination.	Prevent unacceptable degradation of aquifer according to the Basin Plan throughout the planning period. Map contaminated sites and monitor contaminant movement, by December 2008. Identify contaminated portions of aquifer and prevent migration of contaminants, by June 2009.
Protect natural streams and recharge areas from contamination.	Prevent unacceptable degradation of natural streams and recharge areas according to the Basin Plan throughout the planning period.
Maximize beneficial use of recycled water.	Increase infrastructure and establish policies to use 33% of recycled water to help meet expected demand by 2015, 66% by 2025, and 100% by 2035.
Flood Management	
Reduce negative impacts of stormwater, urban runoff, and nuisance water.	Coordinate a regional flood management plan and policy mechanism by the year 2010.
Environmental Resource Management	
Preserve open space and natural habitats that protect and enhance water resources and species in the Antelope Valley Region.	Contribute to the preservation of an additional 2,000 acres of open space and natural habitat, to integrate and maximize surface water and groundwater management by 2015.
Land Use Planning/Management	
Maintain agricultural land use within the Antelope Valley Region.	Preserve 100,000 acres of farmland in rotation[3] through 2035.
Meet growing demand for recreational space.	Contribute to local and regional General Planning documents to provide 5,000[4] acres of recreational space by 2035.
Improve integrated land use planning to support water management.	Coordinate a regional land use management plan by the year 2010.

to be readily attainable by voluntary conservation. Typically when a shortage occurs, water customers increase their awareness of water usage and voluntarily reduce water demands, avoiding water rationing.

As discussed in Section 3, the Antelope Valley Region's expected demand between 2010 and 2035 is approximately 274,000 and 447,000 acre-feet per year (AFY) for an average water year. However, the planned water supply for an average water year is approximately 200,400 to 210,200 AFY, resulting in a mismatch of approximately 73,600 to 236,800 AFY. Assuming average year supplemental water is equivalent to the average year mismatch, there is an additional mismatch of 50,600 to 57,400 AF for a single dry water year and 0 to 62,000 AF/4-yrs for a 4-year multi-dry year condition. This additional mismatch (or reserve) was determined by taking the drought year mismatch and adding the average year supplement. The range of the reserve is the maximum and minimum reserves. In order to assure a reliable water supply, the following three planning targets have been identified. The targets are based on the assumption of a regional population estimates shown in Table 2-3. However, if actual growth is less than projected or if average annual water use per capita decreases due to conservation efforts, then the overall demand for the Antelope Valley Region would decrease as well. Any reduction in demand would reduce the mismatch. Similarly, this target assumes the supply from only currently planned sources presented in Section 3 and that groundwater extractions are limited to groundwater recharge. Thus, any changes or limitations to the groundwater supply resulting from the pending adjudication could significantly alter the mismatch as well.

Target: Reduce (73,600 to 236,800 AFY) mismatch of expected supply and demand in average years by providing new water supply and reducing demand, starting 2009.

Target: Provide adequate reserves (50,600 to 57,400 AFY) to supplement average condition supply to meet demands during single-dry year conditions, starting 2009.

Target: Provide adequate reserves (0 to 62,000 AFY) to supplement average condition supply to meet demands during multi-dry year conditions, starting 2009.

1 Dry year reserves determined by taking the dry year mismatch and adding the average year supplement. Assumes that the average year supplement equals the average year mismatch for any given year. Range determined from the maximum and minimum reserves.

2 As with single-dry year, multi-dry year reserves determined by summing the 4-year dry year mismatch and adding the 4-year average year supplement. Assumes that the average year supplement equals the average year mismatch for any given year. Range determined from the maximum and minimum reserves.

3 The phrase "in-rotation" means that not all 100,000 acres will be in agricultural production at one time rather the land will be rotated in cycles to make most efficient use of the land.

4 The City of Palmdale and City of Lancaster's General Plans provide a standard of 5 acres of parkland per 1,000 City residents. The Kern County General Plan provides a standard of 2.5 acres per 1,000 residents. The other local and regional General Plans do not provide a standard for "recreation or parkland" preservation. This planning target assumes a 2035 population of 1.17 million residents in the Antelope Valley Region.

Objective: Establish a contingency plan to meet water supply needs of the Antelope Valley Region during a plausible disruption of SWP water deliveries.

Given the Antelope Valley Region's dependence on State Water Project (SWP) water, as discussed in Section 3, all elements of its reliability should be considered. Fluctuations in SWP deliveries due to climatic changes have already been incorporated in the supply and demand comparisons for average, single-dry, and multi-dry year conditions, as provided in Section 3.However, impacts to the Antelope Valley Region in the event of an outage or disruption of SWP water due to emergency situations (e.g., a flood, earthquake, power outage, or other disaster) also need to be considered and a response planned. In the event of a temporary loss of SWP for 6 months over the summer, the Antelope Valley Region would be short approximately 37,150 AFY from the normal supply (assumes lost of half of average year 2035 expected SWP supply.) The Antelope Valley Region needs to address and identify necessary actions to accommodate for such a loss and to ensure imported water supply; therefore, the following target has been identified.

Target: Demonstrate ability to meet regional water demands without receiving SWP water for 6 months over the summer, by June 2010.

Objective: Stabilize groundwater levels at current conditions.

As previously mentioned, a decrease in groundwater levels has led to incidences of land subsidence within the Antelope Valley Region, which may result in the loss of groundwater storage as well as a possible degradation of groundwater quality. Accordingly, maintaining groundwater levels is a key component to managing the groundwater basin and ensuring its reliability by preventing future land subsidence.

Addressing the following AB 3030 elements for stabilizing groundwater would also assist the Region in achieving this objective and planning target: (a) mitigation of conditions of overdraft; (b) replenishment of groundwater extracted by water producers; and (c) monitoring of groundwater levels and storage. To track and prevent future land subsidence and ensure the reliability of the Region's groundwater supply, the planning target below would monitor and identify changes in groundwater levels to demonstrate that management actions are having a positive impact to the groundwater basin.

It is recognized and acknowledged that the on-going adjudication of the Antelope Valley Ground Water Basin and the

Physical Solution that may be adopted by the Court may require the target set forth below to be modified.

Target: Manage groundwater levels throughout the basin such that a 10 year moving average of change in observed groundwater levels is greater than or equal to 0, starting in January 2010.

4.3 WATER QUALITY MANAGEMENT OBJECTIVES AND TARGETS

Addressing the following AB 3030 elements for improving and maintaining water quality would assist the Antelope Valley Region in achieving the water quality objectives and planning targets discussed below: identification and management of wellhead protection areas and recharge areas; regulation of the migration of contaminated groundwater; construction and operation by local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects; development of relationships with State and Federal regulatory agencies; and review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

Objective: Provide drinking water that meets customer expectations.

As discussed in Section 3.2, water quality is generally good Valley-wide except for the northeast part of the Antelope Valley Region, the borders of the Lancaster subunit, and some shallow wells in north Edwards Air Force Base (AFB) and Boron. Poorer water quality appears to be associated with areas containing hard-rock outcrops and areas underlain by the shallow playa deposits where evaporation has concentrated solutes. In general, the water quality over time has remained relatively unchanged across the entire Antelope Valley Region and generally meets Maximum Contaminant Levels (MCLs). The exceptions to the good groundwater quality are some high concentrations of boron associated with naturally-occurring boron deposits, high nitrates associated with fertilizer use and poultry farming near the areas of Little Rock and Quartz Hill, and high arsenic levels due to recent changes (lowering) of the MCL.

However, in addition to meeting the Federal and State standards for water quality, other secondary standards (such as taste, color, and odor) may also affect a customer's overall satisfaction with the water. Although these constituents do not result in any health effects to the customer, they do impact the customer's desire to drink and use the water. Thus the following planning target has been identified.

Target: Continue to meet Federal and State water quality standards as well as customer standards for taste and aesthetic throughout the planning period.

Objective: Protect aquifer from contamination.

Groundwater is a main component of the Antelope Valley Region's water supply. Any loss of supply due to water quality degradation[5] would significantly hinder the Antelope Valley Region's ability to meet anticipated demands. As the Antelope Valley Region begins to reduce its dependence on imported water, utilize more recycled water, and implement recharge and storage projects, protecting the aquifer will become increasingly more important. All of these non-groundwater sources can potentially cause degradation to the existing groundwater supply during recharge. Thus the following planning target has been identified, which will involve monitoring these recharge sources to ensure they have negligible impacts to the groundwater supply.

Target: Prevent unacceptable degradation of aquifer according to the Basin Plan throughout the planning period.

Identifying sources of contaminants and taking appropriate measures to reduce or eliminate the potential for contamination is crucial to ensuring a reliable water supply. Where contamination has occurred, programs and projects must be implemented to prevent its migration to other areas of the Basin. In some cases, treatment or remediation may be required to prevent migration. An area of the Basin that has been identified as contaminated is the portion of the aquifer near the Los Angeles World Airport where the spreading of wastewater effluent has contributed to a decline in water quality within to top 50 feet of the aquifer. Other sources of potential contamination are from wells no longer in service that that have not been properly abandoned. These wells are suspected of drawing on water of a lesser quality from the deep aquifer to intermix with the water of the upper aquifer, degrading its quality. These areas and others not yet identified should be identified, mapped, and monitored to prevent any future migration. The mapped information should include constituent concentrations in areas of concern that exceed 50 percent of drinking water quality standards. Mapping contami-

5 For the purposes of this IRWM Plan, any increase in constituent levels over naturally occurring levels is considered degradation; any increase in constituent levels over the State or Federal standards is considered contamination.

<u>Attachment 15 Exhibit</u>
IRWMP Excerpt:
Section 5.1.1 Water Management Strategy Descriptions

Additionally, the Regional Water Management Group (RWMG) evaluated the 9 additional management strategies identified in the State IRWM Plan Guidelines (CWC §§ 79562.5 and 79564) within the IRWM Plan, and not just those that are required to be considered. Therefore, the following strategies were also addressed:

- Conjunctive use
- Desalination
- Imported water
- Land use planning
- NPS pollution control
- Surface storage
- Watershed planning
- Water and wastewater treatment
- Water transfers

Additionally, Proposition 84 has suggested that IRWM Plans also consider those resource management strategies identified in the California Water Plan. In this report, we have aggregated the 20 different management strategies identified in the IRWM Plan Guidelines with those identified in the California Water Plan, into five water management strategy areas, as shown in Table 5-1. Descriptions of these water management strategies are provided below in Section 5.1.1. The five water management strategies are: Water Supply Management, Water Quality Management, Flood Management, Environmental Resource Management, and Land Use Management. For each management strategy, the actions and activities that are either underway or proposed for implementation in order to meet the objectives identified in Section 4 are described.

Many of the water management strategies described in the IRWM Plan Guidelines are currently being utilized in the management of water resources in the Antelope Valley Region. Strategies already practiced include: imported water, water and wastewater treatment, water quality protection and improvement, wetlands enhancement and creation, environmental and habitat protection and improvement, and stormwater capture and management.

The following water management strategies are being implemented in the Antelope Valley Region, but their application may not be widespread, and opportunities exist to expand and better integrate these strategies: flood management, groundwater management, conjunctive use, non-point source (NPS) pollution control, surface storage, water conservation, water recycling, watershed planning, and water supply reliability.

The following water management strategies are not currently utilized in the Antelope Valley Region because they are either infeasible (i.e., desalination), or under-funded: ecosystem restoration, recreation and public access, land use planning, and water transfers. Expanded utilization of these strategies could be implemented to enhance water supplies and improve water supply reliability.

5.1.1 Water Management Strategy Descriptions

Water Supply Management

Water supply reliability: Reliability is defined in this IRWM Plan as "how much one can count on a certain amount of water being delivered to a specific place at a specific time," and depends on the availability of water from the source, availability of the means of conveyance, and the level and pattern of water demand at the place of delivery. Opportunities for increased supply reliability in the Antelope Valley Region include the establishment of groundwater recharge basins, the implementation of conjunctive use projects utilizing recycled water and storm runoff, and the development of natural treatment systems, such as constructed habitat or open space area, to improve both water quality and storage capability.

Groundwater management: Groundwater has historically provided the majority of the total water supply in the Antelope Valley Region. Projected urban growth coupled with limits on the available local and imported water supply is likely to continue to increase the reliance on groundwater. Issues concerning water quality are also likely to influence how groundwater is managed in the Antelope Valley Region. Opportunities for management of the basin include reductions in impervious surfaces to increase infiltration, creation of recharge areas and spreading basins, management of stormwater flows and appurtenant water capture and conveyance systems. Future groundwater Basin management will depend on the pending adjudication.

Water conservation: Water conservation is a demand management measure which stresses the efficient utilization of water resources. Minimizing the use of water where possible through water efficiency measures helps to combat the inherent variability in the heavily relied upon imported and local supplies. Opportunities to expand water conservation in the Antelope Valley Region include, but are not limited to, implementation of Best Management Practices (BMPs), establishment of water efficiency ordinances, and development of evapotranspiration (ET) controllers for more efficient irrigation.

Table 5-1 Water Management Strategy Matrix

Proposition 50 IRWMP Strategies Note: (a) Those strategies that must be considered to meet the minimum IRWM Plan Standards.	California Water Plan Strategies																							
	Agricultural lands stewardship	Agricultural water use efficiency	Conjunctive management and groundwater storage	Conveyance	Desalination	Drinking Water Treatment and Distribution	Economic incentives	Ecosystem restoration	Floodplain management	GW/aquifer remediation	Matching water quality to water use	Pollution prevention	Precipitation enhancement	Recharge areas protection	Recycled municipal water	Surface storage – CALFED	Surface storage – regional/local	System reoperation	Urban land use management	Urban runoff management	Urban water use efficiency	Water transfers	Water-dependent recreation	Watershed management
Water Supply Management																								
Water supply reliability(a)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Groundwater management**			■						■	■		■		■	■				■	■		■		■
Water conservation(a)		■					■								■				■		■			■
Water recycling(a)			■							■	■				■				■		■			■
Conjunctive use			■							■				■								■		■
Surface storage				■												■	■	■						■
Water transfers			■	■						■				■								■		■
Desalination					■																			
Imported water						■										■	■	■				■		■
Water Quality Management																								
Water quality protection and improvement(a)						■			■	■	■	■		■	■				■	■				■
Water and wastewater treatment					■	■				■	■				■									■
Non-point source pollution control								■	■		■	■		■					■	■				■
Flood Management																								
Flood management(a)									■					■					■	■				■
Environmental Resource Management																								
Storm water capture and management(a)								■	■			■		■					■	■				■
Ecosystem restoration(a)								■				■												■
Env. and habitat protection and improvement(a)								■						■										■
Recreation and public access(a)																	■						■	■
Wetlands enhancement and creation(a)								■	■	■				■					■					■
Land Use Management																								
Land use planning	■	■	■	■			■	■	■	■	■	■		■	■		■		■	■	■		■	■
Watershed planning	■	■	■	■		■	■	■	■	■	■	■	■	■	■		■	■	■	■	■		■	■

Water recycling: Recycled water is defined in the California Water Code to mean "water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur." Water recycling is a term which encompasses the process of treating wastewater, storing, distributing, and using the recycled water. The uses to which recycled water can be applied (e.g., landscape and agricultural irrigation, cooling, etc.) depend upon the quality of the treated water and the quality required for subsequent uses. Currently the only recycled water in the Antelope Valley Region that is treated to a tertiary level is a small percentage of the wastewater at the Lancaster Water Reclamation Plant (WRP). This IRWM Plan includes a number of current and planned management actions to increase recycled water use in the Antelope Valley Region.

Conjunctive use: Conjunctive use refers to the coordination of surface water and groundwater resources to maximize the utility of an area's collective water resources. Conjunctive use involves using surplus surface water when available (e.g., storm runoff, surplus surface water flows, or recycled water) to recharge the groundwater basin containing adequate storage capacity. Groundwater banking is a form of conjunctive use wherein surplus surface water or other available waters are injected or recharged for storage in the aquifer, and then extracted at a later time when surface water supplies are limited.

Surface storage: Surface storage is the use of reservoirs, whether on-stream or off-stream, or storage tanks, to collect water for later release and use. Surface water in the Antelope Valley Region is stored mainly in Littlerock Creek Reservoir and Lake Palmdale. Opportunities to enhance surface storage in the Antelope Valley Region include modification of these local reservoirs to increase storage capacity and operational flexibility, as well as the creation of new surface impoundments for recycled water and/or treated stormwater runoff.

Water transfers: A water transfer is defined in the California Water Code as "a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer or exchange of water or water rights." Transferring water supplies, or water rights, from one area to another is an important tool for water management in California, particularly agricultural to urban transfers. There is an opportunity in the Antelope Valley Region to integrate conjunctive use programs with water transfer projects.

Desalination: Desalination is a water treatment process for the removal of dissolved salts from water for beneficial use. Desalination is used on brackish (high-salinity) water as well as seawater. Due to the fact that groundwater within the Antelope Valley Region is not high in total dissolved solids (TDS), and that the basin is geographically distant from the ocean, desalination as a water management strategy is of low priority in the Antelope Valley Region. However, it could become a source of future imported water supply through inter-jurisdictional agreements.

Imported water: Imported water as a management strategy generally refers to bringing in, or importing, water from other areas. The largest source of imported water in California is the State Water Project (SWP). This strategy can be applied in three ways; by reducing dependence on imported water, by increasing use of imported water from new or existing sources, or by using imported water more efficiently. Imported water to the Antelope Valley Region is contracted through the Antelope Valley-East Kern Water Agency (AVEK), Littlerock Creek Irrigation District (LCID), and Palmdale Water District (PWD). Currently AVEK does not have enough storage available for its imported water, and therefore is unable to utilize its full Table A amount.

Water Quality Management

Water quality protection and improvement: This strategy regards the quality of potable water, the quality of the groundwater, and the quality of stormwater and urban runoff. The focus of water quality management in the Antelope Valley Region is on maintaining and improving the existing water quality and preventing future contamination. Opportunities for water quality protection and improvement include creation of water capture, conveyance, and recharge basins, which act as natural treatment systems, identification and mapping of potential contaminant areas, and upgrading treatment processes at existing WRPs and water treatment plants.

Water and wastewater treatment: As previously stated, the principle sources of water supply in the Antelope Valley Region are imported water and groundwater. Water treatment facilities in the Antelope Valley Region that treat this water are designed to treat raw water and produce drinking water that is safe for human consumption, which meets all regulatory State and Federal standards. Wastewater treatment facilities are designed to treat water that is discarded by a community to a point that it becomes safe to return back to the environment or for reuse. Opportunities exist for recycled water through tertiary treatment of existing supplies.

Non-point source (NPS) pollution control: NPS pollution may come from a variety of sources; one specific point cannot usually be identified. NPS pollution primarily occurs when rainfall, snowmelt, or irrigation runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes, and coastal waters or introduces them into groundwater. The runoff can pick up both naturally-occurring and human-deposited pollutants and transport them to waterbodies. NPS control in the Antelope Valley Region is needed to address dry weather and nuisance water runoff.

Flood Management

Flood management: Flood management includes minimizing impacts of floods on buildings and farmland, removing obstacles in the floodplain, voluntarily or with compensation, preventing interference with the safe operation of flood management systems, preserving or restoring natural floodplain processes, educating the public about avoiding flood risks and about planning for emergencies, and reducing flooding risks to humans. Opportunities exist in the Antelope Valley Region for regional coordination of flood management activities.

Environmental Resource Management

Stormwater and urban runoff capture and management: Stormwater capture and management is linked to flood management. Stormwater capture involves inlets and conveyances that will deliver flows to detention and/or retention (recharge) basins. Any attempts to recharge flows should not worsen existing drainage conditions. There is an opportunity to address urban runoff and improve water quality utilizing the same stormwater infrastructure. Challenges include short duration/high intensity storm events, sedimentation, contaminants in the stormwater, and urban runnoff. Opportunities exist for regional coordination of stormwater, urban runoff and flood management activities.

Ecosystem restoration: The California Water Plan defines ecosystem restoration as "improving the condition of modified natural landscapes and biotic communities to provide for the sustainability and for the use and enjoyment of those ecosystems by current and future generations." The benefits of ecosystem restoration in the Antelope Valley Region are numerous, and depending on the type of ecosystem restored, they can include: capturing and storing stormwater, groundwater recharge, flood protection, increasing water supply reliability, wildlife habitat creation, restoration and enhancement, water quality enhancement, flood management, and recreation.

Environmental and habitat protection and improvement: Risks to the environment and habitat in the Antelope Valley Region include pressures from growth and development, the loss of open space, invasive species, channelization, incompatible land uses, and other common problems associated with urbanization and pollution. Restoration, improvement, and protection of the Antelope Valley Region's environmental resources have the potential to provide benefits related to water supply and water quality of the local surface and groundwater.

Recreation and public access: Open space used for recreation and public access has the potential to enhance water supply by preserving or enhancing groundwater recharge and thereby improving water supply reliability. Opportunities exist in the Antelope Valley Region for protecting and/or creating new recreational areas or open space that can provide multiple benefits to other strategies including groundwater management, improvements in stormwater or urban runoff management, and to enhance flood management.

Wetlands enhancement and creation: The Antelope Valley Region does not have a significant amount of wetlands, and for this reason this scarce resource should be protected. Wetland and riparian projects can provide water quality, groundwater recharge, flood management and recreational opportunities. Thus, there may be opportunities in the future for the creation of wetland areas in the Antelope Valley Region to provide these additional benefits.

Land Use Management

Land use planning: Land use planning as a strategy generally refers to actions that can be taken by agencies with land use decision-making authority (i.e., cities, counties) to further the objectives set out in this IRWM Plan to better manage and protect local water and related environmental resources. Land use strategies can include long-range planning goals, objectives, general plan policies, ordinances, regulations, education and outreach programs, etc. Opportunities exist in the Antelope Valley Region for increased land use planning efforts such as the addition of water resource elements in the Antelope Valley Areawide General Plan, and the enactment of natural resource protection and efficiency ordinances. Other mechanisms for increased land use planning efforts can include the cities and counties providing incentives for private development that promotes features to improve water quality, enhance groundwater recharge, and reduce water demand.

Watershed planning: The California Water Plan defines watershed management as "the process of evaluating, planning, managing, restoring and organizing land and other resource use within an area of land that has a single common drainage point." The Antelope Valley Region is a good example of a geographical watershed. Managing the water and environmental resources within the Antelope Valley Region, as is being investigated through this IRWM Plan, is a means of watershed management.

5.1.2 Call for Projects

To identify the many potential projects in the Antelope Valley Region and to assess the collective contribution of these projects towards meeting the IRWM Plan objectives and planning targets, development of this IRWM Plan included a "Call for Projects" which gave stakeholders the opportunity to directly submit their projects and project concepts for consideration. Stakeholders could submit projects at any stage of development, including ideas about projects or project concepts. Avenues available for participating in the Call for Projects included the submission of projects via a project identification form, either submitted via electronic mail, by facsimile, or directly on-line via this IRWM Plan website (www.avwaterplan.org). Additionally, to increase participation and awareness in this IRWM Plan, a Call for Projects "Road Show" was conducted, in which the IRWM Plan consultant team visited one-on-one with many members of the Antelope Valley Regional Water Management Group (RWMG) to discuss project ideas. As of June 2007, approximately 50 projects were submitted for inclusion in this IRWM Plan.

While many of the projects lack detailed supporting information, the Call for Projects provided a mechanism to engage stakeholders in the process of sharing project information and discussing the issues related to the integration of projects. Many of the projects discussed in this section provide multiple benefits, spanning more than one strategy. Therefore, some assumptions were made with regard to what water management strategy a particular project would benefit the most, to begin the initial organization of the projects. For example, a groundwater recharge project generally was assumed to provide water supply benefits, with a secondary benefit of addressing water quality needs. Section 6, Water Management Strategy Integration, will delve into this issue further, by examining in more detail how these projects can be integrated to provide multiple benefits.

The information provided herein represents the outcome of the initial step in a process of bringing individual projects into the collaborative process implied by this IRWM Plan. Additional projects are likely to be added to the database, and it is expected that stakeholders will revise and update information on projects submitted.

5.2 WATER MANAGEMENT STRATEGIES

In the following sections, each of the five water management strategies are described generally; their objectives and planning targets are presented in Table 5-2; and current and planned activities and actions to meet those objectives are listed along with new project ideas and concepts submitted during the Call for Projects.

Table 5-2 Water Supply Objectives

Objective	Planning Target
Provide reliable water supply to meet the Antelope Valley Region's expected demand between now and 2035.	Reduce (73,600 to 236,800 acre-feet per year [AFY]) mismatch of expected supply and demand in average years by providing new water supply and reducing demand, starting 2009. Provide adequate reserves (50,600 to 57,400 AFY) to supplement average condition supply to meet demands during single dry year conditions, starting 2009. Provide adequate reserves (0 to 62,000 acre-feet [AF]/4-yr period) to supplement average condition supply to meet demands during multi-dry year conditions, starting 2009.
Establish contingency plan to meet water supply needs of Antelope Valley Region during a plausible disruption of SWP water deliveries.	Demonstrate ability to meet regional water demands without receiving SWP water for 6 months over the summer, by June 2010.
Stabilize groundwater levels at current conditions.	Manage groundwater levels throughout the basin such that a 10 year moving average of change in observed groundwater levels is greater than or equal to 0, starting January 2010.

WATER STABILIZATION PROJECT NO. 2 IMPLEMENTATION GRANT PROPOSAL

Submitted by

Antelope Valley-East Kern Water Agency

January 7, 2011