

Important Notice Regarding COVID-19

This meeting is compliant with Governor Newsom's Executive Order N-29-20 which allows local legislative bodies to hold public meetings electronically only, without a physical location for public participation, accessible only telephonically or otherwise electronically (video conferencing) to all members of the public seeking to observe and address the local legislative body, in order to avoid public gatherings, and until further notice.

Based on guidance from the California Department of Public Health and the California Governor's Office, in order to minimize the spread of the COVID 19 virus, please do the following:

1. If you choose not to attend the Board of Directors meeting but wish to make a comment on a specific agenda item, please submit your comment via email by 5:00 p.m. on the Friday before the meeting. Please submit your comment to the Secretary of the Board at WRApubliccomment@co.monterey.ca.us mailto:WRApubliccomment@co.monterey.ca.us In an effort to assist the Secretary in identifying the agenda item relating to your public comment please indicate in the Subject Line, the meeting body (i.e. Board of Directors Agenda) and item number (i.e. Item No. 10). Your comment will be placed into the record at the Board meeting.

2. If you are watching the live stream of the Board meeting and wish to make either a general public comment for items not on the day's agenda or to comment on a specific agenda item as it is being heard, please submit your comment, limited to 250 words or less, to the Secretary of the Board at WRApubliccomment@co.monterey.ca.us mailto:WRApubliccomment@co.monterey.ca.us In an effort to assist the Secretary in identifying the agenda item relating to your public comment please indicate in the Subject Line, the meeting body (i.e. Board of Directors Agenda) and item number (i.e. Item No. 10). Every effort will be made to read your comment into the record, but some comments may not be read due to time limitations. Comments received after an agenda item will be made part of the record if received prior to the end of the meeting.

3. For ZOOM participation please join by computer audio at:

https://montereycty.zoom.us/j/97582967969

OR to participate by phone call any of these numbers below:

+1 669 900 6833 US (San Jose)

+1 346 248 7799 US (Houston)

+1 312 626 6799 US (Chicago)

+1 929 205 6099 US (New York)

+1 253 215 8782 US

+1 301 715 8592 US

Enter this Meeting ID number: 975 8296 7969, PASSWORD: 464867 when prompted. Please note there is no Participant Code, you will just hit # again after the recording prompts you. You will be placed in the meeting as an attendee; when you are ready to make a public comment if joined by computer audio please Raise your Hand; and by phone please push *9 on your keypad.

Aviso Importante Sobre COVID-19

Esta reunión cumple con la Orden Ejecutiva N-29-20 del Gobernador Newsom que permite que los cuerpos legislativos locales tengan reuniones públicas electrónicas solamente, sin un lugar físico para la participación pública, accesibles solo por teléfono o electrónicamente (videoconferencia) para todos los miembros del público que busquen observar y dirigirse al cuerpo legislativo local, a fin de evitar reuniones públicas, y hasta nuevo aviso.

Basado en la guía del Departamento de Salud del Estado de Califonia (California Department of Public Health) y de la Oficina del Governador, para minimizar la propagación del virus COVID 19, por favor haga lo siguiente:

1. Si prefiere no asistir a la reunión de la Junta Directiva pero desea hacer un comentario sobre algún tema específico de la agenda, por favor envie su comentario por correo electrónico antes de las 5:00 p.m. el Viernes antes de la reunion. Envie su comentario al Secretario de la junta al correo electronico WRApubliccomment@co.monterey.ca.us

mailto:WRApubliccomment@co.monterey.ca.us Para ayudar al Secretario a idenficar el artículo de la agenda relacionado con su comentario, por favor indique en la linea de asunto del correo electronico el cuerpo de la reunion (es decir, la Agenda de la Junta Directiva) y el número de artículo (es decir, el Artículo No. 10). Su comentario se colocará en el registro de la reunion de esta Junta.

2. Si usted esta observando la transmisión de la reunion de la Junta en vivo y desea hacer un comentario público general para articulos que no son parte de la agenda del día o para comentar en un artículo específico de la agenda mientras se esta escuchando, envie su comentario, con un límite de 250 palabras o menos, al Secretario de la Junta al correo electronico WRApubliccomment@co.monterey.ca.us mailto:WRApubliccomment@co.monterey.ca.us Para ayudar al Secretario a idenfificar el artículo de la agenda del dia relacionado con su comentario, por favor indique en la linea de asunto del correo electronico el cuerpo de la reunión (es decir, la Agenda de la Junta Directiva) y el número de artículo (es decir, al Artículo No. 10). Se hará todo lo posible para leer su comentario y hacerlo parte del registro de la Junta, pero algunos comentarios pueden no leerse debido a limitaciones de tiempo. Cualquier comentario recibido despues del artículo de la agenda se hará parte del registro de la reunión si es recibido antes de que termine la reunión.

3. Para participar for ZOOM, por favor únase for audio de computadora por: https://montereycty.zoom.us/j/97582967969
O para participar for teléfono, llame a culquiera de los números a continuación: +1 669 900 6833 US (San Jose)
+1 346 248 7799 US (Houston)
+1 312 626 6799 US (Chicago) +1 929 205 6099 US (New York) +1 253 215 8782 US

+1 301 715 8592 US Cuando se le solicite, ingrese este número de reunión: 975 8296 7969, PASSWORD: 464867. Por

favor tenga en cuenta que no hay código de participante, simplemente presione # nuevamente después de que la grabación se lo indique.

4. Se le colocará en la reunion como asistente; cuando deseé hacer un comentario público si esta unido por la computadora utilize la opción de levantar la mano en el chat de la pantalla; o por teléfono presione *9 en su teclado.

Call to Order at 10:00 a.m.

<u>Roll Call</u>

Public Comment on Items not on the Agenda

Introductions

Review of Agenda and Objectives

Presentation

Receive a presentation on the Draft Engineer's Report for the Monterey County Water Resources Agency Assessment District Formation Zone 2D - Nacimiento and San Antonio Maintenance Project

Presented by: Brent Buche, General Manager Kari Wagner, Wallace Group

<u>Attachments:</u> Draft Engineers Report Zone 2D Comparison of Pay as You Go to Bonding Memo

Roundtable Discussion

Public Comment

Board of Directors Direction to Staff

Adjournment

Monterey County

Board Report

Legistar File Number: WRAG 21-030

Salinas, CA 93901 February 16, 2021

Board of Supervisors Chambers

168 W. Alisal St., 1st Floor

Current Status: Draft Matter Type: WR General Agenda

Receive a presentation on the Draft Engineer's Report for the Monterey County Water Resources Agency Assessment District Formation Zone 2D - Nacimiento and San Antonio Maintenance Project

Presented by: Brent Buche, General Manager Kari Wagner, Wallace Group



Introduced: 2/4/2021

Version: 1



UNADOPTED

DRAFT Engineer's Report

For the

Monterey County Water Resources Agency

Assessment District Formation Zone 2D – Nacimiento and San Antonio Maintenance Project

State of California



January 25, 2021

Prepared by:

Wallace Group a California Corporation 612 Clarion Court San Luis Obispo, California 93401



Certification

In accordance with the provisions of Section 6735 of the Business and Professions Code of the State of California, this report was prepared by or under the direction of the following Civil Engineer, licensed in the State of California.

The undersigned respectively submits the enclosed report as directed by the Board of Supervisors of the Monterey County Water Resources Agency.

Dated this _____day of _____, 2021 and finally approved on _____ day of _____, 2021.

Kari E. Wagner, P.E. RCE No. 66026 Wallace Group, a California Corporation

Table of Contents

List of Tables	ii
List of Figures	ii
List of Abbreviations	iii
Recognitions	iv
Executive Summary	ES-1
Part I: Project Description	ES-1
Part II: Estimate of Costs	ES-2
Part III: Assessment Zone Boundary	ES-3
Part IV: Assessment Methodology	ES-6
Part V: Assessment Roll	ES-7
Part VI: Maximum Annual Administration Assessment	ES-7
Introduction	1 -
Part I: Project Description	3 -
1.1 Background	3 -
1.2 Project Description	7 -
1.3 Operation and Maintenance of Nacimiento and San Antonio Dams	- 23 -
1.4 Reserve Account for Nacimiento and San Antonio Dams	- 24 -
Part II: Estimate of Costs	- 25 -
2.1 Maintenance Project	- 25 -
2.2 Operation and Maintenance of Nacimiento and San Antonio Dams	- 28 -
2.3 Reserve Account for Nacimiento and San Antonio Dams	- 28 -
Part III: Assessment Zone Boundary	- 29 -
3.1 Zone 2D Assessment Boundary	- 30 -
Part IV: Assessment Methodology	- 32 -
4.1 Assessment Law	- 32 -
4.2 Definition of Benefit	- 32 -
4.3 Assessment Rate Calculation Methodology	- 42 -
Part V: Assessment Roll	- 44 -
Part VI: Maximum Annual Administration Assessment	- 45 -

List of Tables

26
27
25
28
28
34
35
35
38
38
39
39
42
42
41
41
42
42
43

List of Figures

Figure 1. Nacimiento Dam Spillway	4
Figure 2. San Antonio Dam Spillway	5
Figure 3. Boundary of Zone 2	6
Figure 4. Boundary of Zone 2A	8
Figure 5. Boundary of Zone 2C	8
Figure 6. Proposed Assessment District Boundary Zone 2D	29
Figure 7. Economic Study Units from 1998 Historical Benefits Analysis Report	37

List of Abbreviations

AF	Acre-Feet
AFY	Acre-Feet per Year
Agency	Monterey County Water Resources Agency (See also MCWRA)
CAMP	Capital Asset Management Plan
COLA	Cost of Living Adjustment
cfs	Cubic feet per second
DSOD	California Department of Water Resources Division of Safety of Dams
ESU	Economic Study Units
FERC	Federal Energy Regulatory Commission
GEI	GEI Consultants
HLOW	High-level outlet works
HBA	Historical Benefits Analysis
lbs	Pounds
LLOW	Low-level outlet works
msl	Mean sea level
District	Monterey County Flood Control and Water Conservation District
MCWRA	Monterey County Water Resources Agency (See also Agency)
O&M	Operation and maintenance
PMF	Probable Maximum Flood
SB	Senate Bill
SVWP	Salinas Valley Water Project

iii

Recognitions

Board of Supervisors

District 1: Luis Alejo District 2: John M. Phillips District 3: Christopher Lopez District 4: Wendy Root-Askew District 5: Mary Adams

Board of Directors

John Baillie, Chair Marvin Borzini Ken Ekelund Mark Gonzalez Mike LeBarre Mike Scattini Matthew Simis Jason Smith Deidre Sullivan

Staff Members

Brent Buche, General Manager Elizabeth Krafft, Deputy General Manager Chris Moss, Senior Water Resources Engineer Shaunna Murray, Senior Water Resources Engineer

Professional Services

Assessment Engineer Kari Wagner, PE Wallace Group, a California Corporation

Financial Advisor

Nathan Perez, Esq. DTA

iv

Executive Summary

This Engineer's Report has been prepared to describe the technical basis for a new assessment that would, if passed, fund the Maintenance Project, which is made up of separate and distinct Subprojects for the Nacimiento and San Antonio Reservoir and Dam facilities and operations. The proposed Subprojects are the highest priority tasks that have been identified by Monterey County Water Resources Agency ("MCWRA") in their nine-year operations and maintenance list, but have not been performed because MCWRA has not had the financial resources to complete the Subprojects. The Maintenance Project will allow MCWRA to fully maintain both Nacimiento and San Antonio dam operations, meet federal and state regulatory compliance, and ensure the safety of Monterey County residents and MCWRA staff.

The purpose of this Engineer's Report is to document an assessment methodology developed by MCWRA for a special assessment that could fund the proposed Maintenance Project. This report includes a general description of the Subprojects, documentation of the assessment methodology, delineation of the zones of benefit, and the proposed assessments. Proposition 218 requires an assessment to be supported by a detailed engineer's report prepared by a registered professional engineer certified by the State of California. This Engineer's Report includes the following Parts:

- Part I: Project Description
- Part II: Estimate of Costs
- Part III: Assessment Zone Boundary
- Part IV: Assessment Methodology
- Part V: Assessment Roll (Under Separate Cover)
- Part VI: Maximum Annual Administration Assessment

Part I: Project Description

The Mission of MCWRA is to manage, protect, store and conserve water resources in Monterey County for beneficial and environmental use, while minimizing damage from flooding to create a safe and sustainable water supply for present and future generations. MCWRA owns Nacimiento and San Antonio Reservoirs and Dams, which are integral parts of MCWRA's mission to provide flood control services and maintain water resources for the County of Monterey. Nacimiento and San Antonio Reservoirs ("Reservoirs") are managed for the combined goals of flood protection, water conservation, and recreation, with safety always being the primary consideration. The operation of the Reservoirs is controlled by applicable federal and state legal requirements, which include the Agency's water rights associated with the Reservoirs.

The Nacimiento Dam was completed in 1957 and San Antonio Dam was completed in 1967. The dams are 63 and 53 years old, respectively. The appurtenant structures are reaching their useful life spans and thus need replacement or repairs to continue their service. In addition, MCWRA received a letter from Division of Safety of Dams ("DSOD") on May 12, 2017, mandating a detailed evaluation and assessment of the concrete spillway features be completed at Nacimiento and San Antonio Dams. A similar letter and mandate was received from Federal Energy Regulation Commission Division of Dam Safety and Inspection ("FERC") in May 2017 regarding the Nacimiento Dam Spillway.

MCWRA has identified a series of highest priority subprojects necessary to comply with FERC and DSOD regulations. These proposed highest priority subprojects were identified based on three goals: (1) public and employee safety; (2) restoring full operational functionality; and (3) compliance with federal and state regulatory requirements. The Subprojects are as follows:

Nacimiento Reservoir and Dam

- Subproject 1: Replacement of Three Low Level Outlet Valves and Discharge Piping
- Subproject 2: Spillway Evaluation, Investigation, and Maintenance Repairs
 Subproject 2A: Spillway Rehabilitation
- Subproject 3: Spillway Plunge Pool Erosion Control
- Subproject 4: Low Flow Channel Sand Boil Prevention
- Subproject 5: Modify One Low Level Outlet Valve to Provide Flow Control and Energy Dissipation
- Subproject 6: Low Level Intake Valve Actuator Replacement
- Subproject 7: Dam Embankment Seismic Stability Evaluation and Implementation
- Subproject 8: Spillway Bridge Maintenance
- Subproject 9: Nacimiento Lake Drive Road Repair
- Subproject 10: Protection of Powerplant Penstock from Adjacent Slope Failure
- Subproject 11: Security Upgrades

San Antonio Reservoir and Dam

- Subproject 1: Spillway Rehabilitation/Replacement
- Subproject 2: Butterfly Valve Hydraulic Operator Upgrade
- Subproject 3: Replace Intake Structure Bulkhead Gate
- Subproject 4: Low Level Discharge Valve Maintenance
- Subproject 5: Replace Combination Air Release Vacuum Valves
- Subproject 6: Install Access Hatch in Low Level Outlet Works Conduit
- Subproject 7: Replace Intake Structure Trash Racks
- Subproject 8: Interior and Exterior Paint of Low Level Outlet Works Conduit
- Subproject 9: Horizontal Drain Repair
- Subproject 10: Toe Drain Repair
- Subproject 11: Abutment Drain Repair
- Subproject 12: New Piezometers
- Subproject 13: Road Pavement Repair
- Subproject 14: New Access Road
- Subproject 15: Install Boat Barrier Buoy Line and replace Spillway Log Boom

In addition, the proposed assessment is to include an Operation and Maintenance ("O&M") Account, which will provide for continued operations and maintenance of the Nacimiento and San Antonio Reservoirs and Dams, and a Reserve Account to be used for unanticipated projects only, as determined by the MCWRA Board of Directors and Board of Supervisors.

Part II: Estimate of Costs

MCWRA's Maintenance Project has identified eleven Subprojects for Nacimiento Reservoir and Dam. The Subprojects include valve replacements, studies, road repairs, and security upgrades.

Subproject 2 includes a field investigation of the spillway that may reveal the need for further construction work. The extent of the construction work is not known at this time; however, an additional Subproject 2A is included if that field investigation shows that additional work is necessary. The estimated cost for the Nacimiento Subprojects is \$50,565,600. The estimated cost for the additional Nacimiento Subproject 2A is \$25,800,000. As such, the total estimated cost for Nacimiento Subprojects is \$76,365,600. Table ES-1 summarizes the estimated cost for each Subproject for Nacimiento.

MCWRA's Maintenance Project includes fifteen Subprojects for San Antonio Reservoir and Dam. These proposed Subprojects include a fully functional spillway, valve replacements, studies, road repairs, maintenance to various facilities, drainage repairs, and seismic upgrades. The total estimated cost for the San Antonio Subprojects is \$72,356,750. This includes \$60,000,000 for the Spillway Repair/Replacement Subproject. Table ES-1 summarizes the estimated cost for each Subproject for San Antonio.

MCWRA has identified a total of \$2.7 million annually that is necessary to properly operate and maintain both Reservoirs. Currently, the Zone 2C Assessment District funds \$1.2 million of the O&M expenses needed to maintain both Reservoirs. It is projected an additional \$1.5 million is needed to continue to operate the dams under today's regulatory standards. MCWRA has also identified a need to maintain a \$1.5 million balance in the Reserve Account, that will be built up over a three-year period or \$500,000 per year for three years for emergency projects only. An annual COLA based on the San Francisco, Oakland, San Jose Urban Consumer's Price Index for the month ending February will be applied to both the O&M Account and the Reserve Account.

Part III: Assessment Zone Boundary

The proposed Assessment Zone Boundary for Zone 2D is defined based on geological conditions and hydrologic factors, which define and limit the benefits derived from Nacimiento and San Antonio Reservoirs. The proposed Zone 2D is identical to Zone 2C because these parcels have been identified to receive a similar special benefit from the operations of Nacimiento and San Antonio Reservoirs. Figure ES-1 shows limits of the proposed Zone 2D.

Historic work has shown there to be five distinct sub-areas within the Salinas Valley Groundwater Basin. Those sub-areas were first identified in 1949 Department of Water Resources ("DWR") Bulletin 52 and include:

- Upper Valley
- Forebay
- Pressure
- East Side
- Arroyo Seco

Historic work has further shown that each of the sub-areas within the Salinas Valley Groundwater Basin is hydraulically connected, but due to their varying geology and geography they receive varying levels of benefits from the operation of the two Reservoirs. However, there is one area that is hydraulically connected but does not receive appreciable recharge from the Salinas River. A portion of the upper Arroyo Seco Cone area is not being recharged in any appreciable manner by the Salinas River due to the predominance of recharge resulting from the Arroyo Seco River. Because of these differences, MCWRA has concluded that a portion of the upper Arroyo Seco Cone does not benefit from the operation of the existing Reservoirs and is therefore not included in the proposed Zone 2D.

Nacimiento			San Antonio			
1	Replacement of Three Low Level Outlet Valves and Discharge Piping	\$703,750	1	Spillway Rehabilitation/Replacement	\$60,000,000	
2	Spillway Evaluation, Investigation, and Maintenance Repairs	\$2,850,000	2	Butterfly Valve Hydraulic Operator Upgrade	\$570,000	
2A	Spillway Rehabilitation	\$25,800,000	3	Replace Intake Structure Bulkhead Gate	\$224,250	
3	Spillway Plunge Pool Erosion Control	\$20,120,000	4	Low Level Discharge Valve Maintenance	\$202,000	
4	Low Flow Channel Sand Boil Prevention	\$12,575,000	5	Replace Combination Air Release Vacuum Valves	\$172,000	
5	Modify One Low-Level Outlet Valve to Provide Flow Control and Energy Dissipation	\$4,941,000	6	Install Access Hatch in Low Level Outlet Works Conduit	\$1,059,000	
6	Low Level Intake Valve Actuator Replacement	\$1,221,250	7	Replace Intake Structure Trash Racks	\$1,117,500	
7	Dam Embankment Seismic Stability Evaluation and Implementation	\$1,352,000	8	Interior and Exterior Paint of Low-Level Outlet Works Conduit	\$2,785,000	
8	Spillway Bridge Maintenance	\$487,500	9	Horizontal Drain Repair	\$416,000	
9	Nacimiento Lake Drive Road Repair	\$3,425,500	10	Toe Drain Repair	\$208,000	
10	Protection of Powerplant Penstock from Adjacent Slope Failure	\$1,600,000	11	Abutment Drain Repair	\$520,000	
11	Security Upgrades	\$1,289,600	12	New Piezometers	\$1,456,000	
			13	Road Pavement Repair	\$520,000	
		14	New Access Road	\$2,730,000		
				Install Boat Barrier Buoy Line and Replace Spillway Log Boom	\$377,000	
Total \$76,365.600			Total \$72.356.75			

Table ES-1. Summary of Estimated Costs for Nacimiento and San Antonio Subprojects

EXECUTIVE SUMMARY



Figure ES-1. Proposed Assessment District Boundary Zone 2D

Part IV: Assessment Methodology

The proposed Zone 2D assessment is based upon the concept that the benefits received from the Maintenance Project, Operations and Maintenance fund, and Reserve fund will allow MCWRA to operate both Nacimiento and San Antonio Reservoirs so that they will continue to provide flood protection and a sustainable water supply.

A benefit assessment is an involuntary charge that property owners pay for a public improvement or service, which provides a special benefit to their property. The assessment amount is directly related to the amount of the special benefit their property receives. Here, in establishing the special benefit analysis, it was necessary to first identify the special benefits that the proposed Maintenance Project renders to the properties within the Assessment District. The special benefits of operating and maintaining both Reservoirs for the Zone 2D boundary include:

- 1. Flood protection if the dams were not present;
- 2. Flood protection if the dams were to breach; and
- 3. Sustainable water supply that is established because of the dams being maintained.

For Zone 2D, the three special benefits noted above will be evaluated specifically in the five subbasins and additionally two sub-areas adjacent to San Antonio Dam. The seven sub-areas are as follows:

- Upper Valley
- Forebay
- Arroyo Seco
- Pressure
- Eastside
- Extended Upper Valley Above the San Antonio Dam
- Extended Upper Valley Below the San Antonio Dam

The special benefits are further evaluated or dependent upon whether the land is actively or passively utilized. Monterey County has agricultural, residential, commercial, industrial, open space, and other land use designations. These land use areas do not all receive the same benefits from the continued operations of the Nacimiento and San Antonio Reservoirs. Table ES-2 provides a summary of the Proposed Active/Passive Land Use and Weighted Factor.

In 1998, MCWRA commissioned a Historical Benefits Analysis ("HBA") prepared by Montgomery Watson, which identified and quantified the benefits of the construction and operation of the Nacimiento and San Antonio Reservoirs. Although this report was completed in 1998, the benefits of the two reservoirs are still applicable today. In addition, the land uses and benefits that were evaluated in the HBA continue to be relevant.

The HBA looked at three major categories with and without the two Reservoirs in operation:

- Flood control benefits
- Hydrologic benefits, i.e. water supply benefits
- Economic benefits

	Land Use	Active (A) or Passive (P)	Weighted Factor		
Factor A	Irrigated Agriculture	А	1.0		
	Residential (Single Family, Multi-Family)				
Factor B	Commercial	1.0			
	Industrial	A	1.0		
	Institutional				
	Dry Farming				
Factor C	Grazing	0.1			
	Vacant Lot	ot			
Factor D	River Channels	P	0.01		
	Lands with Frequent Flooding		0.01		
Factor I	Open Space	P	0.0		

 Table ES-2.
 Proposed Active/Passive Land Use and Weighted Factor

Table ES-3 provides a summary of the Special Benefits from flood protection and water supply based on the HBA and supplemental MCWRA investigations.

Table ES-3. Summary o	f Sj	pecial Benefits f	from Flood Prote	ection and Wat	ter Supply
		///////	Viccol en l'en l'en l'en l'en les		

Sub-areas	Flood Protection without Dams	Flood Protection from Dam Breach	Water Supply Benefits	Average
Upper Valley Above the Dam	0.0	1.0	2.7	1.2
Upper Valley Below the Dam	3.0	5.0	2.0	3.3
Upper Valley	3.7	4.0	2.3	3.3
Forebay	3.3	3.0	1.3	2.5
Arroyo Seco	1.3	3.0	1.0	1.8
Pressure	4.7	2.0	3.3	3.3
Eastside	1.0	1.0	2.0	1.3

In evaluating the results of Table ES-3, the results illustrate that all sub-areas receive a Special Benefit from the construction of the dams. However, the level of benefit is different. Specifically, the Upper Valley Below the Dam, Upper Valley, and Pressure Zone receive similar substantial benefit. Forebay and Arroyo Seco receive a slightly reduced benefit, while Upper Valley Above the Dam and the Eastside receive the lowest level of benefit.

**ASSESSMENT RATE CALCULATION METHODOLOGY WRITE UP TO BE COMPLETED ONCE A METHOD OF PAYMENT, PAY AS YOU GO OR BONDING, IS DETERMINED.

Part V: Assessment Roll

The assessment roll for this Engineer's Report is provided under separate cover.

Part VI: Maximum Annual Administration Assessment

The Agency also proposes including an administration assessment to pay for various costs and expenses incurred from time to time by the Agency and not otherwise reimbursed to the Agency.

These administrative costs result from the administration and collection of assessment installments, or from the administration or registration of the improvement bonds and the various funds and accounts pertaining thereto, in an amount per year not to exceed four dollars (\$4.00) per parcel. An annual COLA based on the San Francisco, Oakland, San Jose Urban Consumer's Price Index for the month ending February will be applied.

MONTEREY COUNTY WATER RESOURCES AGENCY COUNTY OF MONTERY, CALIFORNIA

ENGINEER'S REPORT

Introduction

Pursuant to the provisions of the Monterey County Water Resources Agency Act, California Water Code, Appendix 52, ("Agency Act"); Article XIIID of the California Constitution ("Article XIIID"); the Proposition 218 Omnibus Implementation Act, Article 4.6 of Chapter 4 of Part 1 of Division 2 of the Government Code of the State of California (the "Implementation Act"); and in accordance with the Resolution of Intention passed and adopted on ______ by the Board of Supervisors of Monterey County Water Resources Agency (the "Resolution of Intention") in connection with the financing, acquisition and construction of certain public improvements; together with appurtenances and appurtenant work, and operations and maintenance and reserves of such facilities in connection therewith; Kari E. Wagner, P.E. duly-authorized representative of Wallace Group, a California Corporation, submits herewith the report for the special assessment district known and designated as Monterey County Water Resources Agency: Zone 2D (the "Assessment District"), consisting of six parts as follows:

Part I: Background and Project Description

A background of the Nacimiento and San Antonio Reservoirs and Dams, and a general description of the Maintenance Project and its Subprojects are detailed. In addition, a description of the necessary operations and maintenance, and reserve need are described.

Part II: Estimate of Costs

An estimate of the costs of the Maintenance Project including a breakdown of all subproject costs, and a summary of the operations and maintenance costs and reserve account needs.

Part III: Assessment Zone Boundary

A description of the proposed assessment zone boundary.

Part IV: Assessment Methodology

A description of the method of assessing costs to the parcels in the Assessment District along with a list of parcels in the Assessment District (under separate cover) and the assessments apportioned to those parcels (see Part V).

Part V: Assessment Roll

The proposed assessment of a portion of the costs and expenses of the proposed improvements in proportion to the estimated special benefits to be received by properties within the Assessment District from said improvements.

The Assessment Roll also includes the "Assessor APN" for each parcel which is the Assessor's Parcel Number corresponding to each property within the Assessment District as recorded in the Monterey County Assessor's Office.

Pursuant to the provisions of law and the Resolution of Intention, the costs and expenses of the Zone 2D Assessment District have been assessed upon each of the parcels of land benefitted in

direct proportion and relation to the estimated special benefits to be received by each of the parcels.

Part VI: Maximum Annual Administration Assessment

A proposed maximum annual administration assessment upon each parcel to pay costs incurred by the Monterey County Water Resources Agency resulting from the administration and collection of assessments and/or administration and registration of bonds and other funds.

- 2 -

Part I: Project Description

This section of the Engineer's Report provides the background of the Monterey County Water Resources Agency ("MCWRA" or "Agency"), and more specifically the Nacimiento and San Antonio Reservoir and Dam facilities and operations. This section also fully describes the proposed Maintenance Project, which is made up of separate distinct Subprojects. The proposed Subprojects are the highest priority tasks that have been identified by MCWRA in their nine-year operations and maintenance list but have not been performed because MCWRA has not had the financial resources to complete the subprojects. The Maintenance Project will allow MCWRA to fully maintain both Nacimiento and San Antonio dam operations, meet federal and state regulatory compliance, and ensure the safety of Monterey County residents and MCWRA staff.

1.1 Background

The Mission of MCWRA is to manage, protect, store and conserve water resources in Monterey County for beneficial and environmental use, while minimizing damage from flooding to create a safe and sustainable water supply for present and future generations.

MCWRA was formed in 1947 by state law, which established the Monterey County Flood Control and Water Conservation District ("District"). In January 1991, new legislation (SB 2580) changed the name of the District to the Monterey County Water Resources Agency to reflect its powers and functions more accurately. In addition to MCWRA's responsibility for floodplain management and emergency flood-related preparedness, MCWRA also has jurisdiction over most matters pertaining to water within the entire area of the County of Monterey. This jurisdiction includes both incorporated and unincorporated areas of the County; however, exceptions are detailed in agreements MCWRA has with Monterey Peninsula Water Management District, Pajaro Valley Water Management Agency, and the County of Monterey. MCWRA is empowered to conserve water in any manner; to buy, sell and purvey water; and to prevent the waste or diminution of the water extractions which are determined to be harmful to the Salinas Valley Groundwater Basin.

MCWRA owns Nacimiento and San Antonio Reservoirs and Dams, which are integral parts of MCWRA's mission to provide flood control services and maintain water resources for the County of Monterey. Nacimiento and San Antonio Reservoirs ("Reservoirs") are managed for the combined goals of flood protection, water conservation, and recreation, with safety always being the primary consideration. The operation of the Reservoirs is controlled by applicable federal and state legal requirements, which include the Agency's water rights associated with the Reservoirs.

1.1.1 Nacimiento Dam

Nacimiento Reservoir and Dam are in northern San Luis Obispo County, about 20 miles from the coast in central California. Nacimiento Dam was completed in 1957. This earthfill dam has a height of 215 feet above the streambed and a crest length of 1,650 feet. The crest elevation is 825 feet above mean sea level ("msl") with a spillway elevation of 787.75 feet, which can be raised to an elevation of 800 feet using an inflatable Obermeyer spillway gate. The dam has two outlets. The high-level outlet works ("HLOW") is composed of twin 8-foot x 8-foot square slide gates at an elevation of 755 feet. The HLOW has a maximum capacity of 5,500 cubic feet per second ("cfs"), when the reservoir elevation is 800 feet. The low-level outlet works ("LLOW") is a 53-inch diameter pipe located near the southern side of the dam. The inlet to the LLOW is at an elevation of 670 feet. Releases from the LLOW can be made from either valve, or the Nacimiento Hydroelectric Power Plant ("Hydroelectric Plant"). The LLOW has a maximum capacity of 460 cfs when the reservoir elevation is 800 feet.

When the reservoir is full (elevation 800 feet), it has a maximum storage capacity of 377,900 acrefeet, is 18 miles long, and has about 165 miles of shoreline. The maximum elevation during flood stage is 825 feet, with a maximum temporary capacity of 538,000 acre-feet and a temporary surface area of 7,149 acres.



Figure 1. Nacimiento Dam Spillway

Operational pools have been created to aid in the management of water being stored in the reservoir. The physical dead pool is at an elevation of 670 feet, 10,300 acre-feet of storage, at the invert of the intake structure of the LLOW. Water cannot flow by gravity out of the reservoir below an elevation of 670 feet. The operational minimum pool is at elevation 687.8 feet, 22.300 acre-feet of storage. Water below an elevation of 687.8 feet is reserved for fish and wildlife habitat, as well as a contractual water entitlement belonging to the County of San Luis Obispo. The conservation pool which extends from the minimum pool to the concrete spillway elevation of 787.75 feet is the operational pool used to store water for later release to the Salinas River for groundwater recharge, fish passage, and the operation of the Salinas Valley Water Project. The flood pool extends from the concrete spillway to an

elevation of 801 feet or 1 foot above the top of the inflated Obermeyer spillway gate. The flood pool is intended to provide winter flood protection by retaining inflows for controlled releases based on downstream conditions. The spillway is able to pass the Probable Maximum Flood ("PMF") without overtopping of the dam.

The Hydroelectric Plant resides at the Nacimiento Dam abutment. This facility is a 4-megawatt power plant that contains both large and small turbines, and operates in the range of 25 cfs to 460 cfs.

Nacimiento Dam is under the jurisdiction of both the Federal Energy Regulatory Commission Division of Dam Safety and Inspection ("FERC"), and the California Department of Water Resources, Division of Safety of Dams ("DSOD"). FERC has jurisdiction due to the existence of the Hydroelectric Plant. Regarding hazard to downstream population and infrastructure in the event of catastrophic failure, Nacimiento Dam has been classified by FERC as "High" and DSOD as "Extremely High". Both ratings are based on probable loss of human life if the structure was to fail.

1.1.2 San Antonio Dam

San Antonio Reservoir and Dam is in southern Monterey County, about 16 miles northwest from Paso Robles in central California. San Antonio Dam was completed in 1967. This earthfill dam has a height of 201 feet above the streambed and a crest length of 1,433 feet. The crest of the dam elevation is 802 feet above msl with a spillway crest elevation of 780 feet and a spillway capacity of 35,400 cfs. San Antonio Dam has an outlet works consisting of an 84-inch diameter, steel conduit located underground near the center of the dam. The outlet works has a maximum

capacity of 2,200 cfs when the reservoir elevation is 780 feet. When the reservoir is full (elevation 780 feet), which is the crest of the spillway, it has a maximum storage capacity of 335,000 acrefeet, is 16 miles long, and has about 100 miles of shoreline. The maximum elevation during flood stage is 802 feet, with a maximum temporary capacity of about 477,000 acrefeet and a temporary surface area of about 7,500 acres.

Operational pools have been created to aid in the management of water being stored in the San Antonio The physical Reservoir. dead pool is at an elevation of 645 feet, 10,000 acre-feet of storage, at the invert of the intake structure of the outlet works. Water cannot flow by gravity out of the reservoir below an elevation of 645 feet. The operational minimum pool is at elevation 666 feet, 23,000 acre-feet of storage. Water below an elevation of 666 feet is reserved for fish and wildlife



Figure 2. San Antonio Dam Spillway

habitat. The conservation pool which extends from minimum pool to elevation of 774.5 feet, 305,000 acre-feet of storage, is the operational pool used to store water for later release to the Salinas River for groundwater recharge, fish passage, and the operation of the Salinas Valley Water Project. The flood pool extends from the conservation pool to the spillway elevation of 780 feet, 335,000 acre-feet of storage. The flood pool is intended to provide winter flood protection by retaining inflows for controlled releases based on downstream conditions. Due to the Spillway Evaluation rating of "poor" (explained in detail below) the Agency has implemented a self-imposed rule curve, with DSOD approval, as repairs and modifications are implemented. Flood control releases would not be allowed to enter the spillway under normal conditions.

San Antonio Dam is under the jurisdiction of the DSOD. Regarding hazard to downstream population and infrastructure in the event of catastrophic failure, San Antonio Dam has been classified by DSOD as "Extremely High". Again, this represents a rating based on probable loss of human life if the structure were to fail.

1.1.3 Funding History

Nacimiento Reservoir was constructed by the District beginning in 1955. Funding for this project came from the formation of Zone 2 (See Figure 3). Stakeholders within Zone 2 were assessed a water standby and availability charge. This paid for the capital costs and the operations and maintenance of the dam and activities along the Salinas River downstream to the Pacific Ocean. However, as the dam facilities aged, the rate of increase for the assessments did not keep up with the costs.

- 5 -

ENGINEER'S REPORT PART I PROJECT DESCRIPTION



Figure 3. Boundary of Zone 2

- 6 -

San Antonio Reservoir was constructed by the District beginning in 1965. Funding for this project came from the formation of Zone 2A (see Figure 4). Stakeholders within Zone 2A were assessed a water standby and availability charge. This paid for the capital costs and the operations and maintenance of the dam and activities along the Salinas River downstream to the Pacific Ocean. However, again, as the dam facilities aged, the rate of increase for the assessments did not keep up with the costs.

The Salinas Valley Water Project ("SVWP") was constructed by MCWRA in 2009 and 2010. The SVWP included modifications to the Nacimiento Dam Spillway, installation of the Salinas River Diversion Facility, and funding for operations and maintenance for both Reservoirs. Funding for the SVWP came from the formation of Zone 2C (See Figure 5). The formation of Zone 2C eliminated the water standby and availability charges from Zones 2 and 2A. However, over time it has become clear that the SVWP is underfunded, due in part to unknown costs, including stakeholder negotiations over the assessment amount, more costly regulatory requirements, and underfunding of the capital asset management program. MCWRA currently only has sufficient funding for a reactive maintenance program. Meaning instead of following a proactive maintenance program that takes into consideration equipment lifecycle and wear and tear, MCWRA is only able to repair and replace limited equipment upon failure or near-failure.

In 2015, MCWRA staff developed a nine-year operations and maintenance list which details the annual regulatory requirements, repairs, and replacement projects for both Nacimiento and San Antonio Reservoirs and Dams. The list has been updated annually with more projects being added to the list than are completed each year. It is apparent that to recover from years of inadequate funding and a maintenance list that continues to increase with projects, additional funding is necessary to properly maintain the Reservoirs and Dams.

1.2 Project Description

The Nacimiento Dam was completed in 1957 and San Antonio Dam was completed in 1967. The dams are 63 and 53 years old, respectively. The appurtenant structures are reaching their useful life spans and thus need replacement or repairs to continue their service. In addition, MCWRA received a letter from DSOD on May 12, 2017, mandating a detailed evaluation and assessment of the concrete spillway features be completed at Nacimiento and San Antonio Dams. A similar letter and mandate was received from FERC in May 2017 regarding the Nacimiento Dam Spillway. In MCWRA's opinion, these mandates from FERC and DSOD were in response to the incident that occurred at the Oroville Dam spillway in Butte County in 2017, to prevent an incident of this magnitude to other regulated dams.

In response to the FERC and DSOD mandates, MCWRA engaged GEI Consultants ("GEI") to assess both dams. Regarding San Antonio, GEI submitted a report titled *Spillway Condition Assessment Report*, May 2018, that concluded that the spillway "is generally in poor to fair operable condition" unsafe for use under high flow conditions. DSOD reviewed the report, conducted an independent evaluation, and concurred with GEI's conclusions. In response, DSOD sent MCWRA a letter dated April 12, 2019 that requested a work plan and schedule to resolve the spillway deficiencies identified in the GEI report. DSOD required that MCWRA submit the work plan and schedule no later than July 1, 2019, and that every effort be made to restore the spillway no later than November 1, 2024. MCWRA submitted a letter to DSOD on June 28, 2019, that included a work plan and project schedule, which has been approved by DSOD. There are no regulatory limitations for operation of the spillway. MCWRA has committed to a self-imposed restriction on water surface elevation that allows for the safe operation of the facility.

- 7 -

ENGINEER'S REPORT PART I PROJECT DESCRIPTION



- 8 -

Figure 4. Boundary of Zone 2A



-9-

Figure 5. Boundary of Zone 2C

The June 2018 Spillway Condition Assessment Report for Nacimiento Dam stated it was "in good operable order". There are no regulatory limitations for operation of the spillway. The main potential failure modes thought to be of highest concern are spillway chute defects such as concrete spalls, delamination, and offsets. Also, of concern is the potential of clogged or ineffective underdrains and erosion in the plunge pool.

In conjunction with GEI's assessments and FERC/DSOD's requirements, MCWRA has identified a series of highest priority subprojects necessary to comply with FERC and DSOD regulations. These proposed highest priority subprojects were identified based on three goals: (1) public and employee safety; (2) restoring full operational functionality; and (3) compliance with federal and state regulatory requirements. Each subproject identified below achieves one or a combination of the three project goals. In addition, the subprojects have been prioritized below by their respective completion dates. Regardless, each subproject is proposed to be completed within the next five to eight years.

1.2.1 Nacimiento Reservoir and Dam

MCWRA has identified 11 Subprojects for Nacimiento Reservoir and Dam. Descriptions of each of the Subprojects are provided below. One initial Subproject includes a field investigation that may reveal the need for further construction work. The extent of the construction work is not known at this time; however, this potential work is included within the list of Subprojects, designated with an "A" following the investigation Subproject number. Since the construction Subproject is not known at this time, the cost estimate for this Subproject is based on an assumed Subproject. If this Subproject is not needed, the property owners in the proposed Zone 2D Assessment District will not be charged assessments for that work.

The following provides a description of each proposed Subproject.

Subproject 1: Replacement of Three Low Level Outlet Valves and Discharge Piping

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

The low-level outlet works at Nacimiento Dam consists of a conduit under the dam which discharges through six outlet valves used to control releases from the reservoir. This conduit also serves as the penstock to supply flow to the Hydroelectric Plant.

Facility Constraint

Presently, four of the six outlet valves are operational. Two of the outlets have new valves and discharge piping as of June 2020. Two outlets have 37-year old valves and discharge piping, which have reached their useful life and need to be replaced. The remaining two are currently inoperable.

Subproject Description

This Subproject includes design, regulatory approvals, and construction to restore operational three of the low-level outlet valves and discharge piping function. The fourth valve is proposed to be replaced with Subproject 5.

Subproject 2: Spillway Evaluation, Investigation, and Maintenance Repairs

The Subproject Goal: Public and Employee Safety, Restore Full Operational Functionality, and Compliance with Federal and State Regulatory Requirements (FERC Part 12D Requirements)

Facility Description

The Nacimiento Dam spillway was originally constructed 330 feet long and discharged onto the hillside below the left side of the dam. After considerable erosion below the spillway due to high flow in 1969, the spillway was extended to its present length of 524 feet and a plunge pool was constructed below the spillway in 1970.

Facility Constraint

A Spillway Condition Assessment Report for Nacimiento Dam Spillway was completed in 2018 By GEI. Spillway repairs were recommended and include: removal and replacement of delaminated concrete; concrete crack and spall repair; retrofit existing spillway subdrains to create access to the drains for inspection and flushing; and investigation of conditions under the concrete spillway slabs. Replacement of the delaminated concrete, and crack and spall repair began in 2017 and is ongoing.

Investigation of conditions under the spillway concrete slabs were completed in late 2019 by GEI. That investigation revealed that voids exist under one slab needs design, design approval by FERC and DSOD, and construction. Retrofitting existing spillway subdrains to create access to the drains for inspection and flushing also needs to be completed, requiring design, design approval by FERC and DSOD, and construction. Concrete spillway maintenance consisting of removal and replacement of delaminated concrete, crack and spall repair, and concrete joint sealing will occur periodically through the life of the spillway.

Subproject Description

The proposed assessment will cover costs of the Subproject moving forward. This Subproject includes the preliminary implementation for continued operations identified in the Spillway Condition Assessment Report and subsequent evaluations and investigations to confirm adequacy.

Subproject 2A: Spillway Rehabilitation

The Subproject Goal: Public and Employee Safety, Restore Full Operational Functionality, and Compliance with Federal and State Regulatory Requirements (FERC Part 12D Requirements)

Facility Description

See Subproject 2 Facility Description.

Facility Constraint

Based on the results of the investigation described in Subproject 2 above, significant repairs may be required for the spillway. At least one area of concrete delamination has already been identified and other areas are still being evaluated. Another area of major concern to the regulators is the subsurface drainage directly below the concrete chute since inadequate subsurface drainage was a major contributor in the Oroville incident. Further investigation will identify the significance of this issue for the Nacimiento spillway. The chute floor is also a main concern. The Nacimiento Spillway Modifications Project satisfied flow requirements for the PMF by increasing the chute wall height and the approach to the structure was fortified. Additional modifications may be required for the chute floor and subfloor.

Subproject Description

Potential repairs to Nacimiento spillway pending full investigation.

Subproject 3: Spillway Plunge Pool Erosion Control

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements (FERC Part 12D Requirements)

Facility Description

The spillway plunge pool is a low elevation, bowl-like area immediately downstream of the Nacimiento Dam spillway where spillway discharge impacts the ground to reduce its energy as water moves downstream. The Nacimiento Dam spillway was originally constructed 330 feet long and discharged onto the hillside below the left side of the dam. After considerable erosion below the spillway due to high flow in 1969, the spillway was extended to its present length of 524 feet and a plunge pool was constructed below the spillway in 1970.

Facility Constraint

The spillway extension and plunge pool modifications were designed by the U.S. Army Corps of Engineers in 1969, and the plunge pool banks were expected to erode. However, the erosion was not expected to endanger the dam. Since 1970, relatively small spillway flows have eroded the plunge pool banks. Significant erosion occurred in 2011 and 2017, and erosion is presently considered severe and could endanger the spillway toe, and possibly the dam embankment if allowed to continue.

Subproject Description

Erosion control measures are needed to prevent endangerment of the spillway toe and dam embankment. This Subproject includes design and implementation of erosion control measures for the spillway plunge pool. The erosion control measures range from gabion basket or concrete flow diverters to large rip rap or roller compacted concrete. Also, under evaluation is the removal of the large rock outcropping within the plunge pool. This Subproject includes design, permitting, and construction of the erosion control measures.

Subproject 4: Low Flow Channel Sand Boil Prevention

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

The low flow channel discharges water from the low-level outlets and the Hydroelectric Plant to the Nacimiento River downstream of the dam.

Facility Constraint

During 2017 spillway releases, sand boils were discovered in the low flow channel which occurred from subsurface water flow from the spillway plunge pool to the low flow channel. Subsurface water moving fast enough can carry soil particles and create voids under the soil surface that results in greater subsurface water flow and subsurface erosion over time. Because the subsurface flow from the spillway plunge pool to low flow channel occurs near the toe of the dam embankment, movement of soil particles in that vicinity risks creation of subsurface soil erosion at the dam toe, and should be prevented to protect the integrity and performance of the dam embankment. DSOD has directed MCWRA to stop the boils in the low flow channel from occurring.

Subproject Description

This Subproject includes investigation into the flow pathways, design of a solution, FERC and DSOD approval, and permitting and construction of a solution.

Subproject 5: Modify One Low Level Outlet Valve to Provide Flow Control and Energy Dissipation

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

The low-level outlet works at Nacimiento Dam consists of a conduit under the dam which discharges through six outlet valves used to control releases from the reservoir. This conduit also serves as the penstock to supply flow to the Hydroelectric Plant.

Facility Constraint

Presently, four of the six outlet valves are operational. The low-level outlet works were designed for releasing water from the reservoir without restriction or regulation. Water release requirements from Nacimiento Reservoir have changed over the years. For example, the minimum required reservoir release for downstream fishery habitat changed from 25 cfs to 60 cfs. The outlet valves presently in place are best used in 100% open position and are not designed to regulate flow at all reservoir water elevations without incurring damage from cavitation.

MCWRA can release 25 cfs through Unit #2, the small turbine in the Hydroelectric Plant down to elevation 728 feet, and the remaining 35 cfs is released through one of the four operational valves. The valve must be throttled to regulate this flow. Modifications to the discharge pipe have been made to limit cavitation impacts, but a flow regulating energy dissipating valve that is designed to operate in that manner is needed. An outlet valve designed to regulate flow from zero to approximately 120 cfs and dissipate the energy to prevent downstream erosion is needed to prevent damage to existing valves for flow regulation.

Subproject Description

MCWRA has analyzed release requirements and outlet conduit constraints to prepare a list of alternatives to correct the issue. The design and construction would include the installation of a flow regulating energy dissipating valve, and piping to discharge downstream of the Hydroelectric Plant into a stilling basin before reentering the Nacimiento River. This Subproject includes the design, permitting, and construction of the regulating and flow dissipating valve.

Subproject 6: Low Level Intake Valve Actuator Replacement

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

The low-level conduit reservoir intake structure includes three hydraulically actuated intake valves operating under continuously submerged conditions. Original 1957 valve actuators were replaced in 1989 and rebuilt in 2013. These valves are within a submerged structure requiring a specialized construction dive team to perform replacement work unless the reservoir is at dead pool.

Facility Constraint

The actuators, that open and close the valves, are aged and at the end of their useful life. New actuators will ensure decades of continued safe and reliable operation.

Subproject Description

This Subproject includes the design, fabrication, and installation of new valve actuators.

Subproject 7: Dam Embankment Seismic Stability Evaluation and Implementation

The Subproject Goal: Public and Employee Safety and Compliance with Federal and State Regulatory Requirements (FERC Part 12D Requirements)

Facility Description

Nacimiento Dam is classified as high hazard by FERC and extremely high hazard by DSOD. These classifications are based on hazard to the population downstream of the dam in the event of a dam failure. FERC classifies a dam as high hazard if loss of one life could occur if the dam were to fail (reservoir level unspecified). DSOD classifies a dam as extremely high hazard if considerable loss of life could occur if the dam were to fail with a full reservoir. The hazard classification does not refer in any way to the condition of the dam or its appurtenant structures. FERC and DSOD require high hazard dams to be evaluated for seismic stability.

Facility Constraint

The last seismic stability evaluation of Nacimiento Dam embankment was performed in 2005. The best estimate of seismically induced vertical deformation (settlement) is about 10 feet (GEI, 2005), considerably less than the 25 feet of normal operating freeboard at full reservoir elevation of 800 feet. The 2005 seismic stability analysis relied on certain assumed embankment and foundation soil properties. It also assumed water surface location within the dam embankment because complete information was not available from original construction records (mid-1950s).

A Geotechnical Drilling and Piezometer Installation Plan ("Plan") to collect the needed soil samples and water surface location information for use in an updated seismic stability evaluation has been prepared and submitted to FERC and DSOD for their approval. Data collected from the piezometers will also be monitored long term, providing previously unavailable information regarding dam behavior and general health.

Subproject Description

This Subproject includes the implementation of the Plan and an updated seismic stability evaluation. The work to collect the subsurface samples and install the piezometers will occur in early 2021. Samples will be analyzed and a geotechnical report prepared. In order to comply with the regulatory requirements, MCWRA has already entered into a contract with a consultant but has spread the costs out over multiple fiscal years due to insufficient revenue. The proposed assessment would go towards the unfunded portions of this Subproject.

Subproject 8: Spillway Bridge Maintenance

The Subproject Goal: Public and Employee Safety

Facility Description

Nacimiento Lake Drive is a County of San Luis Obispo public road. The road is located along the crest of Nacimiento Dam. MCWRA is responsible for this roadway one mile on either side of centerline of Nacimiento Dam, including maintenance and replacement. A bridge over the spillway is located within this area of responsibility.

Facility Constraint

The bridge over the spillway is permitted for loads by the California Department of Transportation (Caltrans), who regularly inspects and provides a condition assessment and repair recommendations. The bridge is currently rated for all legal loads (80,000 lbs). Loads heavier than 80,000 lbs are no longer permitted, which is a downgrade that occurred in early 2020 based on a recent Caltrans inspection.

Subproject Description

This Subproject includes design, regulatory approvals, and construction necessary to restore the bridge to an "all legal loads" rating to allow unrestricted vehicle passage for staff performing operations and maintenance on the dam.

Subproject 9: Nacimiento Lake Drive Road Repair

The Subproject Goal: Public and Employee Safety

Facility Description

Nacimiento Lake Drive is a County of San Luis Obispo public road. The road is located along the crest of Nacimiento Dam. MCWRA is responsible for this roadway one mile on either side of centerline of Nacimiento Dam, including maintenance and replacement. This road is the only access to the dam and the Hydroelectric Plant used by MCWRA staff.

Facility Constraint

This two-mile portion of roadway needs repair, with sections possibly needing pavement removal and replacement.

Subproject Description

This Subproject includes the design, permitting, and construction to restore the roadway condition and provide long-term use. This Subproject includes additional guardrail and signage upgrades along the two-mile stretch of road that do not currently meet Caltrans standards.

Subproject 10: Protection of Powerplant Penstock from Adjacent Slope Failure

The Subproject Goal: Public and Employee Safety and Compliance with Federal and State Regulatory Requirements

Facility Description

The outlet conduit travels from the inlet structure (Subproject 6) in the reservoir, through the dam, to the downstream discharge point (Subprojects 1 and 5). This is the only outlet from elevation 755' to 670'.

Facility Constraint

The hillside to the east of the Hydroelectric Plant suffered a slope failure in 1995 that impacted the side of the power plant and covered a portion of exposed penstock adjacent to the power plant. Additional but smaller slope failures have occurred since 1995. A 2019 evaluation by consultant AECOM of the slope above the power plant determined that it is unlikely to fail in a similar nature to the one that occurred in 1995. However, AECOM found that smaller slope failures are certain to continue. Recommendations from the 2019 evaluation included extension of an existing concrete wall to protect the penstock from slide debris impact. The power plant is the Low-Level Outlet for the reservoir, which is within the dam. Any damage to this facility could have a direct negative impact to safe operation of the facility.

Subproject Description

This Subproject includes the design, permitting, and construction of the slope protection recommendations.

Subproject 11: Security Upgrades

The Subproject Goal: Public and Employee Safety and Compliance with Federal and State Regulatory Requirements

Facility Description

Nacimiento is classified as a high downstream hazard dam, meaning loss of life is probable in the event of a dam failure. A public road crosses the dam, and multiple non-MCWRA parties possess unrestricted access to the dam entrance road under easement rights. Therefore, safety of the dam also includes protection from significant security threats.

Facility Constraint

Significant vandalism or terrorism damage to the dam or its components could result in loss of operational control of reservoir releases, possible downstream flooding, or harm to dam maintenance staff. Upgraded security measures are desirable to deter, detect, and delay security breaches.

Subproject Description

This Subproject includes security upgrades to the dam and appurtenant structures.

1.2.2 San Antonio Reservoir and Dam

MCWRA has identified 15 priority Subprojects for San Antonio Reservoir and Dam. These proposed priority Subprojects include a fully functional spillway, valve replacements, studies, road repairs, drainage repairs, seismic upgrades, and maintenance to various other facilities. The following provides a description of each proposed Subproject.

Subproject 1: Spillway Rehabilitation/Replacement

The Subproject Goal: Public and Employee Safety, Restore Full Operational Functionality, and Compliance with Federal and State Regulatory Requirements

Facility Description

The San Antonio Spillway is a concrete chute that allows the uncontrolled release of water from the reservoir at water surface elevations above 780 feet. There is a concrete ogee weir at the entrance, concrete chute walls, and an energy-dissipating flip bucket on the downstream outlet. The original spillway was designed and constructed at a capacity less than the PMF discharge. Below the spillway chute are subsurface drains to remove water and reduce impacts of hydrostatic pressure.

Facility Constraint

A Condition Assessment Report was completed by GEI for San Antonio Dam spillway in 2018. GEI's report identified significant foundation and structural deficiencies that could greatly compromise spillway performance during high flow events. DSOD's independent evaluation agreed with the deficiencies identified in the GEI Report, and the conclusion that the spillway is in poor condition and unsafe for use under high flow conditions. DSOD therefore requires a major rehabilitation or full replacement of the spillway to ensure the safe performance of the spillway under significant flows up to the maximum design outflow. DSOD also requires that every effort be made by MCWRA to restore the full function of the spillway by November 1, 2024.

Subproject Description

MCRWA is performing its due diligence to determine if a full replacement is the only solution to this directive. Agency staff and their consultants are determining the amount of work required to repair the existing facility to ensure complete compliance of the regulatory demand. The final Subproject must be sufficient to provide decades of successful operation, and not be a temporary solution. This Subproject includes the design, permitting and construction of an approved spillway rehabilitation or replacement.

Subproject 2: Butterfly Valve Hydraulic Operator Upgrade

The Subproject Goal: Public and Employee Safety and Restore Full Operational Functionality

Facility Description

The outlet conduit at San Antonio Dam includes the original 96-inch butterfly valve that resides in the tunnel at the halfway point under the dam operated by a hydraulic system. This valve allows the flow of water from the reservoir into the outlet conduit. This valve also isolates the downstream section of the conduit to allow maintenance of its appurtenances.
Facility Constraint

This valve has continued to operate with regular maintenance for 52 years, but is showing signs of non-repairable age. Due to its size, replacing the valve would be an expensive endeavor and is not recommended at this time. The hydraulic operator is also original equipment and has not worked reliably in recent years.

Subproject Description

Upgrades to hydraulic and mechanical components will allow improved valve operation and longevity. The uniqueness of the facility requires a new, custom-built system be designed and fabricated. This Subproject includes design and installation of a new hydraulic operator system.

Subproject 3: Replace Intake Structure Bulkhead Gate

The Subproject Goal: Public and Employee Safety and Compliance with Federal and State Regulatory Requirements

Facility Description

The trash rack intake structure has a bulkhead suspended above the conduit opening that when lowered closes the conduit inlet. This is critical to allow personnel to safely enter the conduit for inspection and maintenance.

Facility Constraint

The existing bulkhead gate is the original equipment and was inspected during the low water surface elevation event of 2015. The evaluation of the facility confirmed that the gate has fulfilled its life expectancy and needs replacement.

Subproject Description

This Subproject includes the fabrication and installation of a new bulkhead gate.

Subproject 4: Low Level Discharge Valve Maintenance

The Subproject Goal: Restore Full Operational Functionality

Facility Description

An 84-inch diameter Howell-Bunger ring-cone valve regulates water discharge from the San Antonio Dam low level outlet. San Antonio Dam has no other low-level outlet, making this valve critical to releasing water from San Antonio.

Facility Constraint

This is the original valve and has been operated and maintained for 52 years. The valve needs a full evaluation to identify whether it is best to perform a complete overhaul of the valve, or if the valve should be replaced. The valve's energy dissipation features located immediately downstream of the valve are severely corroded and worn from use and need rehabilitation.

Subproject Description

This Subproject includes the evaluation and rehabilitation of the existing valve and repair of the valve's dissipation features. If installation of a new valve is required, additional funding will be needed.

Subproject 5: Replace Combination Air Release Vacuum Valves

The Subproject Goal: Public and Employee Safety and Restore Full Operational Functionality

Facility Description

Directly downstream of the 96-inch butterfly valve on the San Antonio Dam low level outlet conduit is a series of combination air release/vacuum relief valves. These valves allow air to escape when the conduit is being filled with water and allows air to enter the conduit when it is being drained, which is critical to maintain structural integrity of the conduit.

Facility Constraint

These valves have outperformed their life cycle and need to be replaced.

Subproject Description

This Subproject includes design and replacement of eight new combination air release vacuum valves.

Subproject 6: Install Access Hatch in Low Level Outlet Works Conduit

The Subproject Goal: Public and Employee Safety, Restore Full Operational Functionality, and Compliance with Federal and State Regulatory Requirements

Facility Description

The San Antonio Dam low level outlet works includes an 84-inch diameter steel conduit running approximately 625 linear feet through the dam. Access to the inside of the conduit is needed for periodic condition inspection and relining of the steel conduit. An access point large enough for personnel and gear is needed at each end of the conduit for safe personnel access and rescue, if needed.

Facility Constraint

Currently, sufficient access only exists at one end of the conduit, near the 96-inch butterfly valve in the middle of the dam. Recoating the interior of the conduit by 2026 is a requirement of the DSOD approved maintenance schedule. MCWRA was able to recoat the interior of the upstream half of the conduit from the reservoir intake to the 96-inch butterfly valve. This was possible due to the low reservoir elevations during the fall of 2015, which provided a second point of access and escape. In order to recoat the downstream half of the conduit an additional access port must be installed at the downstream end of the conduit near the fixed-cone discharge valve, providing access from both ends of the work area during higher reservoir conditions.

Subproject Description

This Subproject includes the design and construction of a new access hatch.

Subproject 7: Replace Intake Structure Trash Racks

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

The San Antonio Dam low level outlet works intake structure includes a large concrete structure with three metal trash racks to limit debris and other large materials from entering the conduit. These are the original trash racks and were inspected during historic low water surface elevations in 2015.

Facility Constraint

MCWRA staff was able to evaluate the trash racks and noted significant corrosion and issues with anchoring into the concrete. To prevent the entrance of foreign material to the outlet conduit a full replacement of all three trash racks is required. Replacement is on the DSOD approved maintenance schedule for completion by December 31, 2020. A time extension request to DSOD will be required.

Subproject Description

This Subproject includes design, regulatory approval, fabrication, and installation of new trash racks.

Subproject 8: Interior and Exterior Paint of Low Level Outlet Works Conduit

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

To maintain the integrity of the outlet conduit, the interior and exterior conduit is coated or lined. The upstream internal section of the outlet conduit was recoated in 2015.

Facility Constraint

The lining for the low-level outlet works from the butterfly valve downstream, is the original lining and has deteriorated and shows signs of failure.

Subproject Description

When Subproject 5, the access hatch into the 84-inch pipeline hatch is installed, the downstream half of the outlet conduit can be safely entered by personnel and recoated. This will also be the opportunity to recoat the exterior exposed steel portion of the outlet conduit from the 96-inch butterfly valve to the ring-cone discharge valve. This work is on the approved DSOD schedule for completion by 2026. This Subproject includes the design, permitting, and construction of coating the interior and exterior low-level outlet works conduit.

Subproject 9: Horizontal Drain Repair

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

A critical component of earthen dams is to have adequate subsurface drainage of embankment seepage water. Subsurface drainage occurs through horizontal subsurface corrugated metal drains that run parallel with the outlet tunnel.

Facility Constraint

The coated corrugated metal perforated drainpipe that extends 125 feet into the dam embankment has succumbed to years of corrosion and has collapsed in one location. The drainpipe needs to be repaired.

Subproject Description

This Subproject includes design, regulatory approval, and construction of repairs to this drainpipe.

Subproject 10: Toe Drain Repair

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

At the downstream toe of the San Antonio Dam embankment are a series of vertical drains that were installed to reduce hydrostatic pressure within the earthen embankment.

Facility Constraint

Currently, the ground level bases of the drains are deteriorated, and the drains do not perform as originally designed. Downhole camera inspection of the drains is also needed to evaluate drain performance and any need for repair or replacement.

Subproject Description

This Subproject includes evaluation, design, and construction of toe drains to reestablish the structural integrity of the exposed portion of the well. This will allow for proper drainage of subsurface flow at the toe of the dam.

Subproject 11: Abutment Drain Repair

The Subproject Goal: Restore Full Operational Functionality and Compliance with Federal and State Regulatory Requirements

Facility Description

The downstream left abutment of the San Antonio Dam has a series of horizontal drains at various elevations that relieve hydrostatic pressure within the earthen abutment adjacent to the dam embankment. Depending on reservoir elevation, these drains discharge subsurface water at varying flow rates into steep drainpipes located on the ground surface along the left dam abutment.

Facility Constraint

The existing drainpipe system has reached its useful life and needs replacement with appropriate anchoring, inlet connections, and integrated flow measurement at key points.

Subproject Description

This Subproject includes the design and installation of a new abutment drain system.

Subproject 12: New Piezometers

The Project Goal: Public and Employee Safety and Compliance with Federal and State Regulatory Requirements

Facility Description

When San Antonio Dam was constructed, over 80 piezometers were installed. These devices identify the water surface elevation within the earthen dam embankment. This is critical in the dam operation to ensure the internal drainage systems are functioning properly, and is one of the methods used for monitoring dam stability and safety.

Facility Constraint

Most of the piezometers have reached their useful life, including some that are nonoperational. A new strategically placed piezometer system is needed to allow effective monitoring into the future for DSOD requirements.

Subproject Description

This Subproject includes the evaluation of the existing piezometer system, design, regulatory approval, and construction of a new system.

Subproject 13: Road Pavement Repair

The Subproject Goal: Public and Employee Safety

Facility Description

The San Antonio Dam has a roadway system around and along the dam, which was constructed in the mid-1960s. These roads are used for the operations and maintenance of the facility, as well as for safe observation and monitoring of the facility. This roadway system includes access to the spillway, the abutment drains, the weather station, the piezometers, and the river area below the dam.

Facility Constraint

The paved roads in and around the dam have survived beyond their intended life and are in need of rehabilitation to ensure safe travel of staff vehicles and heavy equipment necessary for continued dam operations and maintenance.

Subproject Description

This Subproject includes engineering design, regulatory compliance, and construction of the removal and replacement of asphalt concrete throughout the road network facility.

Subproject 14: New Access Road

The Subproject Goal: Public and Employee Safety

Facility Description

The downstream toe of the dam currently does not have an access road, which is required for operations and maintenance of the dam.

Facility Constraint

There is limited vehicle and equipment access to the downstream toe of the dam. Therefore, maintenance vehicles, construction equipment, specialty contractor equipment, and the like cannot easily access this area to perform required maintenance.

Subproject Description

This Subproject includes engineering design, regulatory compliance, and construction of an access road to provide ready access for all types of equipment to perform maintenance, repairs, and respond to a dam emergency.

Subproject 15: Install Boat Barrier Buoy Line and Replace Spillway Log Boom

The Subproject Goal: Public and Employee Safety

Facility Description

San Antonio Dam currently does not have a large highly visible buoyant type log boom system, similar to the one in-use at Nacimiento Dam, that spans the reservoir surface directly in front of the dam to keep the public safely away from the face of the dam.

Facility Constraint

A boat barrier buoy line and spillway log boom preventing access to San Antonio Dam does not exist. Unauthorized public access to the dam has occurred by reservoir boaters, and should be restricted to promote overall security and safety of the dam facilities.

Subproject Description

This Subproject would include installation of a boat barrier buoy line and spillway log boom on the reservoir surface in front of these dam facilities. The barrier line and boom will help prevent unauthorized public access to the dam facilities and help prevent large debris from entering the spillway chute or intake structure. The boat barrier line would be anchored to both sides of the reservoir, and only allow Agency staff through an access gate to reach the dam face. Proper signage will be included to allow citations for trespassing. The Subproject includes the design, permitting, and construction of a boat barrier buoy line and spillway log boom.

1.3 Operation and Maintenance of Nacimiento and San Antonio Dams

The proposed assessment includes an Operation and Maintenance ("O&M") Account, which will provide for continued operations and maintenance of the Nacimiento and San Antonio Reservoirs and Dams. Currently, Zone 2C provides an O&M budget of approximately \$3 million for the Reservoirs. Of the \$3 million, just less than 40% (~\$1.2 mil) is dedicated to routine O&M of the two Reservoirs which includes staff time, materials, and projects. The remaining \$1.8 million is used for compliance and monitoring items such as data collection and management, hydrology and water quality studies, stream management program, lagoon management, and administration as required by the approved SVWP. Funding for the Capital Asset Management Plan ("CAMP") was previously a component in Zones 2 and 2A charges but was eliminated with the formation of Zone 2C.

MCWRA staff has ascertained that the existing \$1.2 million is inadequate to meet the current routine O&M needs of both Reservoirs because of additional requirements for safety, monitoring,

and regulatory compliance. For example, due to FERC and DSOD requirements, MCWRA needs additional dedicated staff to focus solely on dam safety and capital project implementation. In addition, the nine-year operations and maintenance list should have been covered by the O&M budget from the Zone 2C assessments, but the current funding is insufficient to complete these projects. The proposed O&M Account includes an annual cost of living adjustment ("COLA"). An annual COLA based on the San Francisco, Oakland, San Jose Urban Consumer's Price Index for the month ending February will be applied.

1.4 Reserve Account for Nacimiento and San Antonio Dams

When operating a utility such as a reservoir emergency arise that cannot be scheduled or budgeted in advance. Therefore, the proposed assessment includes a Reserve Account that will be used for unanticipated projects only, as determined by the MCWRA Board of Directors and Board of Supervisors. The proposed Reserve Account includes an annual COLA. An annual COLA based on the San Francisco, Oakland, San Jose Urban Consumer's Price Index for the month ending February will be applied.

Part II: Estimate of Costs

The following section provides an estimate of the costs for the Maintenance Project identified in Part I, and the annual O&M and reserve needs.

2.1 Maintenance Project

MCWRA's Maintenance Project has identified eleven Subprojects for Nacimiento Reservoir and Dam. The Subprojects include valve replacements, studies, road repairs, and security upgrades. Subproject 2 includes a field investigation of the spillway that may reveal the need for further construction work. The extent of the construction work is not known at this time; however, an additional Subproject 2A is included if that field investigation shows that additional work is necessary. The estimated cost for the Nacimiento Subprojects is \$50,565,600. The estimated cost for the additional Nacimiento Subproject 2A is \$25,800,000. As such, the total estimated cost for Nacimiento Subprojects is \$76,365,600.

MCWRA's Maintenance Project includes fifteen Subprojects for San Antonio Reservoir and Dam. These proposed Subprojects include a fully functional spillway, valve replacements, studies, road repairs, maintenance to various facilities, drainage repairs, and seismic upgrades. The total estimated cost for the San Antonio Subprojects is \$72,356,750. This includes \$60,000,000 for the Spillway Repair/Replacement Subproject.

Tables 1 and 2 on the following pages provide a cost breakdown for each of the identified subprojects. The cost breakdown includes:

- Planning/Administration Includes MCWRA staff time, environmental review, preliminary engineering, and permitting (up to 30% of construction costs).
- Design Includes consultant engineering, inspection, construction administration, and engineering services during construction (up to 35% of construction costs).
- Construction Includes construction costs, including parts purchasing.
- Project Contingency All costs are preliminary and there many unknowns (up to 30%) contingency for project unforeseen conditions).
- Environmental Monitoring Contingency Provides a contingency for environmental monitoring during construction depending on the reservoir level (up to 75% of construction costs).
- Pumping Contingency Provides a contingency for bypass pumping during construction depending on reservoir level (\$30,000/day).

Table 3 provides a summary of the Project costs.

Table 3. Total Project Cos	st
Description	Amount (\$)
Nacimiento	76,365,600
San Antonio	72,356,750
Total	148,722,350

Table 1. Estimate of Costs for Nacimiento Subprojects

		Dianning/						Droiget	Environmental	Dumping	
Priority	Project Name	Administration ¹	Inspection ²		onstruction ³		Subtotal	Project	Contingency ⁵	Pumping	Total
1	Replacement of Three Low Level Outlet Valves and Discharge Piping	\$ 25,000	\$ 87,500	\$	250,000	\$	362,500	\$ 36,250	\$ 125,000	\$ 180,000	\$ 703,750
2	Spillway Evaluation, Investigation, and Maintenance Repairs	\$ 75,000	\$ 525,000	\$	1,500,000	\$	2,100,000		\$ 750,000		\$ 2,850,000
2A	Spillway Rehabilitation	\$ 2,500,000	\$ 3,500,000	\$	10,000,000	\$	16,000,000	\$ 4,800,000	\$ 5,000,000		\$ 25,800,000
3	Spillway Plunge Pool Erosion Control	\$ 2,000,000	\$ 2,400,000	\$	8,000,000	\$	12,400,000	\$ 3,720,000	\$ 4,000,000		\$ 20,120,000
4	Low Flow Channel Sand Boil Prevention	\$ 1,250,000	\$ 1,500,000	\$	5,000,000	\$	7,750,000	\$ 2,325,000	\$ 2,500,000		\$ 12,575,000
5	Modify One Low-Level Outlet Valve to Provide Flow Control and Energy Dissipation	\$ 630,000	\$ 540,000	\$	1,800,000	\$	2,970,000	\$ 891,000	\$ 900,000	\$ 180,000	\$ 4,941,000
6	Low Level Intake Valve Actuator Replacement	\$ 63,750	\$ 148,750	\$	425,000	\$	637,500	\$ 191,250	\$ 212,500	\$ 180,000	\$ 1,221,250
7	Dam Embankment Seismic Stability Evaluation and Implementation	\$ 162,500	\$ 227,500	\$	650,000	\$	1,040,000	\$ 312,000			\$ 1,352,000
8	Spillway Bridge Maintenance	\$ 37,500	\$ 87,500	\$	250,000	\$	375,000	\$ 112,500			\$ 487,500
9	Nacimiento Lake Drive Road Repair	\$ 425,000	\$ 510,000	\$	1,700,000	\$	2,635,000	\$ 790,500			\$ 3,425,500
10	Protection of Powerplant Penstock from Adjacent Slope Failure	\$ 250,000	\$ 350,000	\$	1,000,000	\$	1,600,000				\$ 1,600,000
11	Security Upgrades	\$ 155,000	\$ 217,000	\$	620,000	\$	992,000	\$ 297,600			\$ 1,289,600
	Grand Tota						48,862,000	\$ 13,476,100	\$ 13,487,500	\$ 540,000	\$ 76,365,600

1 Planning/Administration: Includes MCWRA staff time, environmental, preliminary engineering, permitting. Up to 35% of construction.

2 Design: Includes consultant engineering, inspection, construction administration, and engineering services during construction. Up to 35% of construction.

3 Construction: Includes construction costs, including parts purchasing

4 Project Contingency: All project costs are preliminary. Up to 30% contingency has been provided for planning, administration, design, and construction for unknowns.

5 Environmental Monitoring Contingency: Provides a contingency for environmental monitoring during construction depending on lake level. Up to 75% of construction costs.

6 Pumping Contingency: Provides a contingency for bypass pumping during construction depending on lake level. \$30,000/day

ENGINEER'S REPORT -PART II ESTIMATE OF COSTS

Table 1. Estimate of Costs for San Antonio Subprojects

		Planning/	Design/CM/			Project	Environmental Monitoring	Pumping	
Priority	Project Name	Administration ¹	Inspection ²	Construction ³	Subtotal	Contingency ⁴	Contingency ⁵	Contingency ⁶	Total
1	Spillway Rehabilitation/Replacement	\$	9,000,000	\$ 36,000,000	\$ 45,000,000	\$ 15,000,000			\$ 60,000,000
2	Butterfly Valve Hydraulic Operator Upgrade	\$ 62,500	\$ 87,500	\$ 250,000	\$ 400,000	\$ 120,000	\$ 50,000.0		\$ 570,000
3	Replace Intake Structure Bulkhead Gate	\$ 22,500	\$-	\$ 150,000	\$ 172,500	\$ 51,750			\$ 224,250
4	Low Level Discharge Valve Maintenance	\$ 15,000	\$ 25,000	\$ 100,000	\$ 140,000	\$ 42,000	\$ 20,000.0		\$ 202,000
5	Replace Combination Air Release Vacuum Valves	\$ 12,000	\$ 28,000	\$ 80,000	\$ 120,000	\$ 36,000	\$ 16,000.0		\$ 172,000
6	Install Access Hatch in Low Level Outlet Works Conduit	\$ 67,500	\$ 112,500	\$ 450,000	\$ 630,000	\$ 189,000	\$ 90,000.0	\$ 150,000	\$ 1,059,000
7	Replace Intake Structure Trash Racks	\$ 67,500	\$ 157,500	\$ 450,000	\$ 675,000	\$ 202,500	\$ 90,000.0	\$ 150,000	\$ 1,117,500
8	Interior and Exterior Paint of Low-Level Outlet Works Conduit	\$ 150,000	\$ 300,000	\$ 1,500,000	\$ 1,950,000	\$ 585,000	\$ 150,000.0	\$ 100,000	\$ 2,785,000
9	Horizontal Drain Repair	\$ 50,000	\$ 70,000	\$ 200,000	\$ 320,000	\$ 96,000			\$ 416,000
10	Toe Drain Repair	\$ 25,000	\$ 35,000	\$ 100,000	\$ 160,000	\$ 48,000			\$ 208,000
11	Abutment Drain Repair	\$ 62,500	\$ 87,500	\$ 250,000	\$ 400,000	\$ 120,000			\$ 520,000
12	New Piezometers	\$ 175,000	\$ 245,000	\$ 700,000	\$ 1,120,000	\$ 336,000			\$ 1,456,000
13	Road Pavement Repair	\$ 62,500	\$ 87,500	\$ 250,000	\$ 400,000	\$ 120,000			\$ 520,000
14	New Access Road	\$ 225,000	\$ 375,000	\$ 1,500,000	\$ 2,100,000	\$ 630,000			\$ 2,730,000
15	Install Boat Barrier Buoy Line and Replace Spillway Log Boom	\$ 30,000	\$ 60,000	\$ 200,000	\$ 290,000	\$ 87,000			\$ 377,000
		\$ 53,877,500	\$ 17,663,250	\$ 416,000	\$ 400,000	\$ 72,356,750			

1 Planning/Administration: Includes MCWRA staff time, environmental, preliminary engineering, permitting. Up to 30% of construction.

2 Design: Includes consultant engineering, inspection, construction administration, and engineering services during construction. Up to 35% of construction.

3 Construction: Includes construction costs, including parts purchasing

4 Project Contingency: All project costs are preliminary. Up to 30% contingency has been provided for planning, administration, design, and construction for unknowns.

5 Environmental Monitoring Contingency: Provides a contingency for environmental monitoring during construction depending on lake level. Up to 75% of construction costs.
6 Pumping Contingency: Provides a contingency for bypass pumping during construction depending on lake level. \$30,000/day

ENGINEER'S REPORT -PART II ESTIMATE OF COSTS

2.2 Operation and Maintenance of Nacimiento and San Antonio Dams

MCWRA has identified a total of \$2.7 million annually that is necessary to properly operate and maintain both Reservoirs. Table 4 provides the current \$1.2 million O&M expenses for both Reservoirs, which is currently funded and will remain funded under the Zone 2C Assessment District. Table 5 provides the projected expenses needed to continue to operate the dams under today's regulatory standards, which totals \$1.5 million. This portion will be funded under the proposed Zone 2D Assessment District. An annual COLA based on the San Francisco, Oakland, San Jose Urban Consumer's Price Index for the month ending February will be applied.

Table 4. Current Operations and Maintenance Expenses					
Description	Amount (\$)				
Staff		575,675			
Services Supplies & Consultants		636,715			
Total		1,212,390			

Table 4 Current Operations and Maintenance Expenses

Table 5. Projected Operations and Maintenance Needs					
Description	Amount (\$)				
Staff					
Water Maintenance Worker II	105,000				
Water Maintenance Worker II	105,000				
Senior Water Maintenance Worker	125,000				
Water Resources Engineer	165,000				
Services, Supplies & Consultants	1,000,000				
Total	1,500,000				

2.3 Reserve Account for Nacimiento and San Antonio Dams

The Reserve Account will maintain a \$1.5 million balance that is built up over a three-year period or \$500.000 per year for three years. An annual COLA based on the San Francisco. Oakland. San Jose Urban Consumer's Price Index for the month ending February will be applied. If funds are used from this Reserve Account, the funds will be replenished the subsequent year with no more than one-third of the total Reserve Account being funded in one year.

Part III: Assessment Zone Boundary

The following section provides a description of the assessment zone boundary and the sub-areas for the proposed Zone 2D (See Figure 6).



Figure 6. Proposed Assessment District Boundary Zone 2D

3.1 Zone 2D Assessment Boundary

The proposed Assessment Zone Boundary for Zone 2D is defined based on geological conditions and hydrologic factors, which define and limit the benefits derived from Nacimiento and San Antonio Reservoirs per the *Salinas Valley Water Project Engineer's Report*, prepared by Raines, Melton & Carella, Inc. ("RMC"), dated 2003 ("Zone 2C Engineer's Report"). The proposed Zone 2D is identical to Zone 2C because these parcels have been identified to receive a similar special benefit from the operations of Nacimiento and San Antonio Reservoirs. The basis for the inclusion of lands within Zone 2C and the proposed Zone 2D, include the following:

- 1. There must be a hydrogeologic or flood protection basis for establishing benefit;
- 2. The zone of hydrologic benefits is defined as land overlying water bearing alluvium that has hydraulic continuity with the Salinas River;
- 3. The zone of benefits exclude narrow, likely shallow channels off the main basin where pumping cannot induce an up-gradient recharge;
- 4. Existing annexations, such as the Chalone Valley that are non-hydraulically connected have been included since they are receiving benefits through physically installed pumping and piping equipment;
- 5. The southern boundary of the zone of benefit is defined by the Monterey/San Luis Obispo County line;
- Lands immediately adjacent to San Antonio Reservoir receive hydrologic benefits due to recharge of the underlying aquifer, and receive recreational benefits afforded by their proximity to San Antonio Reservoir;
- 7. The boundary in the former Fort Ord area is defined by the then existing 2A boundary. Work completed for the Army by Harding Lawson Associates clearly demonstrates the boundary of the hydraulically connected alluvium is approximated by the then existing Zone 2A delineation; and
- 8. Any contiguous parcel that overlies a portion of the alluvial material that is in hydrologic continuity with the Salinas River has been included since the overlying portion of the parcel provides access to all hydrologic benefits.

Historic work has shown there to be five distinct sub-areas within the Salinas Valley Groundwater Basin. Those sub-areas were first identified in 1949 Department of Water Resources ("DWR") Bulletin 52 and include:

- Upper Valley
- Forebay
- Pressure
- East Side
- Arroyo Seco

Historic work has further shown that each of the sub-areas within the Salinas Valley Groundwater Basin is hydraulically connected, but due to their varying geology and geography they receive varying levels of benefits from the operation of the two Reservoirs. Since the formation of Zone 2C, the identification of the sub-areas and the geologic research identified still holds true and is not disputed.

However, there is one area that is hydraulically connected but does not receive appreciable recharge from the Salinas River. A portion of the upper Arroyo Seco Cone area is not being recharged in any appreciable manner by the Salinas River due to the predominance of recharge resulting from the Arroyo Seco River. Average annual flow in the Arroyo Seco River is approximately 40 percent of average annual flow in the Salinas River. This predominance of flow from the Arroyo Seco River precludes flow in the Salinas River from recharging the upper portion of the Arroyo Seco Cone, even though the area is in hydraulic continuity with the alluvium of the Salinas Valley. Water quality testing as noted in the Zone 2C Engineer's Report, confirms this observation and shows a chemical characteristic of the groundwater of the upper Arroyo Seco Cone area in both drought and non-drought conditions that is quite distinct from the chemical "signature" of Salinas River water. Because of these differences, MCWRA has concluded that a portion of the upper Arroyo Seco Cone does not benefit from the operation of the existing Reservoirs and is therefore not included in the proposed Zone 2D.

Part IV: Assessment Methodology

The following section provides a discussion on the assessment methodology for the proposed Zone 2D.

4.1 Assessment Law

The law requires that assessments imposed be based on the special benefit properties received from the works of improvement. However, the law does not specify the method or formula that should be used to apportion the assessments in assessment district proceedings. In addition, Article XIIID of the California Constitution requires that only special benefits are assessable; that no assessment may exceed the proportional special benefit conferred on the parcel assessed; and that publicly owned parcels shall not be exempt from the assessment unless clear and convincing evidence demonstrates that such publicly-owned parcels receive no special benefits from the improvements for which the improvements are imposed. Special benefit is a particular and distinct benefit over and above general benefits conferred on real property located in an assessment district or to the public at-large. General enhancement of property does not constitute special benefit.

It is necessary to identify the special benefits that the works of improvement will render to the properties within an assessment district. It is also necessary that the properties receive a special and direct benefit as distinguished from benefit to the general public.

The Assessment Engineer is appointed for the purpose of analyzing the facts and determining the method or formula for apportionment of the assessment obligation to the benefited properties. For these proceedings, MCWRA retained Wallace Group as the Assessment Engineer.

The Assessment Engineer makes his or her recommendation for the method of apportionment of the improvement at a public hearing. The final authority and action rests with the MCWRA Board of Supervisors after hearing all testimony and evidence presented at the public hearing, and the tabulation of the assessment ballots. Upon conclusion of the public hearing, the MCWRA Board of Supervisors must make the final action in determining that the assessment has been made in direct proportion to the special benefit received. Ballot tabulation will then be completed and if a majority protest weighted by assessment amount does not protest the assessment, then the MCWRA Board of Supervisors may establish the Zone 2D Assessment District.

As noted previously, MCWRA's mission is to manage, protect, store and conserve water resources in Monterey County for beneficial and environmental use, while minimizing damage from flooding to create a safe and sustainable water supply for present and future generations. This occurs if and only if MCWRA can safely and effectively operate and manage the Nacimiento and San Antonio Reservoirs and Dams. The proposed Maintenance Project will directly allow MCWRA to continue to operate the Reservoirs safely and at full reservoir capacity, without restrictions, for the primary purpose of providing flood protection and a sustainable water supply to all parcels within the Zone 2D Assessment District.

4.2 Definition of Benefit

The proposed Zone 2D assessment is based upon the concept that the benefits received from the Maintenance Project, Operations and Maintenance fund, and Reserve fund will allow MCWRA to operate both Nacimiento and San Antonio Reservoirs so that they will continue to provide flood protection and a sustainable water supply.

4.2.1 General Benefit

Nacimiento and San Antonio Reservoirs are multi-use facilities and in addition to the primary purposes described previously, recreational opportunities are created as an indirect benefit. Both the Nacimiento and San Antonio Reservoirs have provided recreational opportunities including boating, fishing, and general recreation since the Reservoirs began operation. The Reservoirs also provide a variety of environmental benefits by enhancing the habitat for fish, wildlife, and vegetative species. These indirect benefits are not specific to any sub-area but can be spread equally throughout the Salinas Valley.

4.2.2 Special Benefit

A benefit assessment is an involuntary charge that property owners pay for a public improvement or service, which provides a special benefit to their property. The assessment amount is directly related to the amount of the special benefit their property receives. Here, in establishing the special benefit analysis, it was necessary to first identify the special benefits that the proposed Maintenance Project renders to the properties within the Assessment District. The special benefits of operating and maintaining both Reservoirs for the Zone 2D boundary include:

- 4. Flood protection if the dams were not present;
- 5. Flood protection if the dams were to breach; and
- 6. Sustainable water supply that is established because of the dams being maintained.

For Zone 2D, the three special benefits noted above will be evaluated specifically in the five subbasins and additionally two sub-areas adjacent to San Antonio Dam. The seven sub-areas are as follows:

- Upper Valley
- Forebay
- Arroyo Seco
- Pressure
- Eastside
- Extended Upper Valley Above the San Antonio Dam
- Extended Upper Valley Below the San Antonio Dam

The Nacimiento Dam is not included as a sub-area because it is located in San Luis Obispo County, which is outside of MCWRA's jurisdiction. Additionally, San Luis Obispo County and MCWRA entered into a contract in 1959 for San Luis Obispo County to contribute to the construction and ongoing maintenance of San Antonio Dam, and in exchange receive 17,500 acre feet of water each year.

The special benefits are further evaluated or dependent upon whether the land is actively or passively utilized. Monterey County is the jurisdictional agency responsible for designating land use areas within the County. Monterey County has agricultural, residential, commercial, industrial, open space, and other land use designations. These land use areas do not all receive the same benefits from the continued operations of the Nacimiento and San Antonio Reservoirs. For instance, an acre of irrigated agricultural land is expected to have a higher benefit from the continued operations of the Nacimiento and San Antonio Reservoirs than an acre of open space. This is because the irrigated agricultural land uses the water supply that is recharged by the Salinas River, and has infrastructure or crops that could be impacted if flood protection was not

provided. Each land use area has a distinct benefit from the proposed Project and requires a unique assessment according to the benefits that would be received from the Project.

Land use factors have been assigned based on whether the land is actively or passively used. Active use of the land means the landowner has put the land to its potential use, with the highest potential uses being irrigated agricultural, residential single family, residential multi-family, commercial, industrial, and institutional uses. These active land uses are assigned a weighted factor of 1.0. Dry farming, grazing, vacant lot, lands subject to frequent flooding, and native lands or open space are lower levels of use of land, or more passive uses. Thus, dry farming, grazing, and vacant lots are assigned a weighted factor of 0.1, and river channels and lands with frequent flooding are assigned a weighted factor of 0.01. Open Space is not developable and therefore carries no assessment. This methodology is consistent with the existing Zone 2C, as well as the methodology used for the previous Zones 2 and 2A. The passive/active use land factors are summarized in Table 6.

	Land Use	Active (A) or Passive (P)	Weighted Factor
Factor A	Irrigated Agriculture	A	1.0
	Residential (Single Family, Multi-Family)		
Easter P	Commercial		1.0
Factor D	Industrial	A	1.0
	Institutional		
	Dry Farming		
Factor C	Grazing	P	0.1
	Vacant Lot		
Factor D	River Channels	р	0.01
	Lands with Frequent Flooding	F	0.01
Factor I	Open Space	P	0.0

Table 6. Proposed Active/Passive Land Use and Weighted Factor

In addition to the weighted factors in Table 6, the assessment guidelines in Table 7 were used to assess parcels with special land uses or unique land conditions. These unique conditions include parcels with multiple land uses and other unique land use considerations. Appendix ____ provides an overall list of Monterey County's Land Use Codes and the Factors assigned to the corresponding land use. The guidelines also classify special land uses into appropriate assessment categories.

No.	Condition	Guideline
1	All residential type parcels: single family, multi-family, suburban residential, mobile home park, condominiums	All residential parcels to be assessed equally as Factor B by acreage
2	Parcel with an area less than 1 acre	Assessed at actual acreage to a minimum of 1/8 (0.125) acre
3	Parcel with multiple land uses	Assessed at actual acreage of each of the distinct land use designated by County Land Use Codes
4	Mobile Home Park	Assessed as one parcel as Factor B by acreage
5	Parcel with partial undevelopable land such as wetlands, riparian habitat, or other protected habitat	Parcel to be assessed by subtracting out undevelopable area and assessing according to Factor D, lands with frequent flooding, and assessing developable area based on assigned land use
6	Open Space	Open Space is not developable and therefore carries no assessment and will be Assessed according to Factor I
7	Wetlands, riparian habitat, or other protected habitat	Assess according Factor D, lands with frequent flooding
8	Other developed parcels (e.g., Schools, fire stations, public facilities, parks, community centers, churches, golf courses)	Parcels to be assessed equally as Factor B by acreage

Table 7. Assessment Guidelines

There is a total of 405,506 acres within Zone 2D. Table 8 provides a summary of the acreage by Factor for each sub-area using the County of Monterey Tax Assessor's parcel information.

r								
	Above Dam	Below Dam	Upper Valley	Forebay	Arroyo Seco	Pressure	Eastside	Total
Factor A								
& B	-	382.59	59,693.96	38,129.32	19,468.51	64,641.78	58,738.57	241,054.73
Factor C	299.79	6,035.91	26,953.79	7,115.36	3,406.93	21,365.70	19,640.73	84,818.21
Factor D	-	537.33	8,176.18	9,909.49	2,418.00	6,991.09	2,302.00	30,334.09
					10.1-			
Factor I	5,253.93	10,178.43	866.51	1,494.21	43.15	23,672.79	7,789.47	49,298.49
Total	5,553.72	17,134.26	95,690.44	56,648.38	25,336.59	116,671.36	88,470.77	405,505.52
Factor I Total	5,253.93 5,553.72	10,178.43 17,134.26	866.51 95,690.44	1,494.21 56,648.38	43.15 25,336.59	23,672.79 116,671.36	7,789.47 88,470.77	49,298 405,50

Table 8. Land Use Acreages by Factor and Sub-area**

** Acreage based on County Tax Roll dated January 2020.

4.2.3 Special Benefit Evaluation

In 1998, MCWRA commissioned a Historical Benefits Analysis ("HBA") prepared by Montgomery Watson, which identified and quantified the benefits of the construction and operation of the Nacimiento and San Antonio Reservoirs. Although this report was completed in 1998, the benefits of the two reservoirs are still applicable today. In addition, the land uses and benefits that were evaluated in the HBA continue to be relevant.

The HBA looked at three major categories with and without the two Reservoirs in operation:

- Flood control benefits
- Hydrologic benefits, i.e. water supply benefits
- Economic benefits

The HBA recognized that flooding would occur in each of the subareas, but that the impact on the flooding, both physically and economically was not consistent throughout the Salinas Valley. The HBA broke up the Salinas Valley into Economic Study Units ("ESU") (See Figure 7). The correlation of ESUs used in the HBA to the subareas used for this Engineer's Report are as follows:

- Pressure: ESU 1, 3 and 5
- Eastside: ESU 2 and 6
- Forebay: ESU 7 and 8B
- Arroyo Seco: 8A
- Upper Valley: ESU 9 and 10
- Upper Valley Below the Dam: ESU 10

Note, the Upper Valley Above the Dam was not identified in the HBA and therefore was not assigned an ESU. Justifications for special benefit rating are provided for each section based on engineering judgment.

In addition, in 2018, MCWRA completed an inundation study for both Nacimiento and San Antonio Reservoirs and Dams. The inundation study evaluated maximum flood depth, the flood arrival time, and the flood recession time if either dam were to breach.

The properties included in the proposed Zone 2D Assessment District are located over water bearing alluvium of the Salinas River, and will receive a special benefit from the operation of the Reservoirs. The proposed Maintenance Project maintains the two Reservoirs and Dams and thus benefits the properties within the Zone 2D Assessment District, and will not serve or directly benefit the general public or those parcels not subject to the assessment. The following describes the Special Benefit for each of these three categories (flood control benefits, hydrologic benefits, and economic benefits) as it relates to the seven sub-areas and their specific special benefit.

4.2.3.a Flood Protection Without the Dams

Flood protection was one of the primary reasons why the Reservoirs were constructed. The HBA provides information concerning physical impacts to properties, flood control hydrology, and flood control hydraulics. The HBA also completed an economic analysis of the flood control benefits. The HBA includes the annual probability of exceedances of discharges along the Salinas River given either of the two flood control situations "with" and "without" Reservoirs, the depth of flooding for a given discharge, and the potential for damage from erosion during flooding. The HBA analysis was based on historical floods and actual river gage information located at Bradley and Spreckels. The conclusions of the HBA study showed that there was benefit of the construction of the Reservoirs on flood control as follows:

- Reduces the frequency of large floods;
- Reduces the impacts from a 100-year flood;

- Allows the reduction in discharge during a flood which translates into an average reduction in depth of flooding of 3 feet; and
- Reduces the potential overbank velocities reducing potential damages from erosion.



Figure 7. Economic Study Units from 1998 Historical Benefits Analysis Report

The following provides a summary of the impacts of flood protection without the dams on each of the sub-areas.

4.2.3.a.1 Erosivity

Table 3-13 of the HBA quantifies the erosivity that would occur if the Reservoirs were not in place and the value of the land that would be impacted. Table 9 provides a summary of the sub-areas and their average impact as it relates to erosivity per the HBA. Each sub-area is rated on a scale of 0 to 5, with 0 having no impact to 5 having significant impact. Note, the costs identified in the following evaluation are based on 1998 dollars. The analysis assumes that there is a relative scale of inflation across the Salinas Valley, and the relative scale of the numbers identified below would remain constant and were not inflated to current day values.

Sub-areas	Scale of Impact 0 to 5	Justification (Based on Table 3-13 of the HBA)
Upper Valley Above the Dam	0	Land above the dam is not impacted by downstream flooding
Upper Valley Below the Dam	4	Average cost per acre is \$254
Upper Valley	4	Average cost per acre is \$277
Forebay	5	Average cost per acre is \$313
Arroyo Seco	3	Average cost per acre is \$143
Pressure	4	Average cost per acre is \$264
Eastside	2	Average cost per acre is \$83

Table 9. Erosivity Impacts

4.2.3.a.2 Agriculture Land Damage

Table 3-15 of the HBA quantifies the value of the Agriculture Land damage value that would occur if the Reservoirs were not in place. Table 10 provides a summary of the sub-areas and their average impact as it relates to Agriculture Land. Each sub-area is rated on a scale of 0 to 5, with 0 having no impact to 5 having significant impact. Note, the costs identified in the following evaluation are based on 1998 dollars. The analysis assumes that there is a relative scale of inflation across the Salinas Valley, and the relative scale of the numbers identified below would remain constant and were not inflated to current day values.

Sub-areas	Scale of Impact 0 to 5	Justification (Based on Table 3-15 of the HBA)
Upper Valley Above the Dam	0	Land above the dam is not impacted by downstream flooding
Upper Valley Below the Dam	3	Average cost per acre is \$299
Upper Valley	5	Average cost per acre is \$760
Forebay	4	Average cost per acre is \$618
Arroyo Seco	1	Average cost per acre is \$39
Pressure	5	Average cost per acre is \$889
Eastside	1	Average cost per acre is \$43

4.2.3.a.3 Buildings and Structures Damage

Table 3-17 of the HBA quantifies the value of the Buildings and Structures damage value that would occur if the Reservoirs were not in place. Table 11 provides a summary of the sub-areas and their average impact as it relates to Buildings and Structures for this Engineer's Report. Each sub-area is rated on a scale of 0 to 5, with 0 having no impact to 5 having significant impact. The analysis assumes that there is a relative scale of inflation across the Salinas Valley, and the

relative scale of the numbers identified below would remain constant and were not inflated to current day values.

Sub-areas	Scale of Impact 0 to 5	Justification (Based on Table 3-17 of the HBA)
Upper Valley Above the Dam	0	Land above the dam is not impacted by downstream flooding
Upper Valley Below the Dam	2	Average cost per acre is \$21,076
Upper Valley	2	Average cost per acre is \$13,620
Forebay	1	Average cost per acre is \$3,739
Arroyo Seco	0	Average cost per acre is \$0
Pressure	5	Average cost per acre is \$1,892,275
Eastside	0	Average cost per acre is \$0

Table 11. Buildings and Structures Impacts

4.2.3.a.4 Flood Protection Without Dams Summary

Table 12 provides a summary of the impacts to each sub-area for Flood Protection without the Dams and a total score assuming that each subcategory is equally weighted.

Sub-areas	Erosivity	Agriculture Lands	Buildings and Structures	Average
Upper Valley Above the Dam	0	0	0	0.0
Upper Valley Below the Dam	4	3	2	3.0
Upper Valley	4	5	2	3.7
Forebay	5	4	1	3.3
Arroyo Seco	3	1	0	1.3
Pressure	4	5	5	4.7
Eastside	2	1	0	1.0

Table 12. Summary of Flood Control Without Dams Impact

4.2.3.b Flood Protection from Dam Breach

As owner of Nacimiento and San Antonio Dams, MCWRA has the responsibility of maintaining the dams. If a failure were to occur, property would be damaged and lives would be in danger. MCWRA prepared inundation maps in 2018 for failures at Nacimiento and San Antonio Dams. The maps identify the maximum flood depth, the peak flow, the flood arrival time, and the flood recession time. This study does not evaluate the economic impact that the flooding would have on each sub-area. It can be assumed that the economic impact would be the same as the flooding without the dams presented in the previous section, therefore, that element will not be further considered. Table 13 provides an evaluation of the impacts to each of the sub-areas based on the 2018 inundation maps.

Sub-areas	Scale of	Justification					
	Impact 0 to 5						
Upper Valley Above the Dam	1	Limited access to/from property during					
		emergency event					
Upper Valley Below the Dam	5	Peak flows, quickest arrival of flood waters					
Upper Valley	4	Peak flows, delayed arrival of flood waters					
Forebay	3	Lower peak flows, delated arrival of flood water					
Arroyo Seco	3	Lower peak flows, delated arrival of flood water					
Pressure	2	Lowest peak flows, longest delay for flood water					
		arrival					
Eastside	1	Minimal risk/impact to Eastside. Reduces					
		access to/from property during emergency event					

Table 13. Summary of Impacts from Dam Breach

4.2.3.c Water Supply Benefits

One of the goals of the HBA was to analyze and quantify the historical water supply benefits, as well as the distribution of the benefits, resulting from the construction and operation of Nacimiento and San Antonio Reservoirs. The water supply benefits analysis includes:

- Groundwater levels
- Impacts on well performance
- Seawater intrusion

It should be noted that groundwater quality was also analyzed in the HBA. However, the information and tools available at the time of the study could not provide conclusive information on the benefits of the construction of the dams as it relates to water quality in the sub-areas. Therefore, this benefit will not be included in this Engineer's Report.

4.2.3.c.1 Avoidance of Groundwater Pumping

The HBA demonstrates that construction of the dams provides increased groundwater levels in each of the sub-areas. As a result, there is an economic benefit of reduced costs in groundwater pumping. Table 3-1 of the HBA quantifies the avoided pumping costs in each of the sub-areas with the Reservoirs in place. Table 14 provides a summary of the sub-areas and their its average impact as it relates to avoided pumping costs. Each sub-area is rated on a scale of 0 to 5, with 0 having no impact to 5 having significant impact. The analysis assumes that there is a relative scale of inflation across the Salinas Valley, and the relative scale of the numbers identified below would remain constant and were not inflated to current day values.

Table 14. Avolueu Groundwater Puniping Costs						
Sub-areas	Scale of Impact	Justification				
	0 to 5	(Based on Table 3-1 of the HBA)				
Upper Valley Above the Dam	3	The dams provide increased groundwater				
		levels above the dam				
Upper Valley Below the Dam	2	Avoided pumping cost per acre, \$1.45				
Upper Valley	3	Avoided pumping cost per acre, \$4.87				
Forebay	4	Avoided pumping cost per acre, \$7.66				
Arroyo Seco	3	Avoided pumping cost per acre, \$3.59				
Pressure	4	Avoided pumping cost per acre, \$8.14				
Eastside	5	Avoided pumping cost per acre, \$9.46				

Table 14. Avoided Groundwater Pumping Costs

4.2.3.c.2 Avoidance of New Well Construction

The HBA demonstrates that construction of the dams provides increased groundwater levels in each of the sub-areas. The HBA evaluated the impact that groundwater levels would have on existing wells, and the need to drill new wells or lower existing wells as groundwater levels lowered. Table 3-2 in the HBA provides an analysis that shows the number of wells in each subarea that would be impacted and quantified the avoidance costs of drilling new wells. Table 15 provides a summary of the sub-area and their average impact as it relates to avoided well costs. Each sub-area is rated on a scale of 0 to 5, with 0 having no impact to 5 having significant impact. The analysis assumes that there is a relative scale of inflation across the Salinas Valley, and the relative scale of the numbers identified below would remain constant and were not inflated to current day values.

Sub-areas	Scale of Impact	Justification (Based on Table 3-2 of the HBA)
Upper Valley Above the Dam	5	The dams provide increased groundwater
Upper Valley Below the Dam	4	Avoided well cost per acre, \$1.80
Upper Valley	4	Avoided well cost per acre, \$1.95
Forebay	0	Avoided well cost per acre, \$0.00
Arroyo Seco	0	Avoided well cost per acre, \$0.00
Pressure	1	Avoided well cost per acre, \$0.06
Eastside	1	Avoided well cost per acre, \$0.06

Table 15, Avoided Well Costs

4.2.3.c.3 Avoidance of Seawater Intrusion

Table 3-6 in the HBA provides an analysis that shows the impact that the construction of the dams has on seawater intrusion specifically in the Pressure Sub-area. Table 16 provides a summary of the sub-areas and their average impact as it relates to seawater intrusion. Each sub-area is rated on a scale of 0 to 5, with 0 having no impact to 5 having significant impact.

Table 16. Avoided Well Costs due to Seawater Intrusion						
Sub-areas	Scale of Impact 0 to 5	Justification (Based on Table 3-6 of the HBA)				
Upper Valley Above the Dam	0	No seawater intrusion concerns				
Upper Valley Below the Dam	0	No seawater intrusion concerns				
Upper Valley	0	No seawater intrusion concerns				
Forebay	0	No seawater intrusion concerns				
Arroyo Seco	0	No seawater intrusion concerns				
Pressure	5	Significant seawater intrusion concerns				
Eastside	0	No seawater intrusion concerns				

4.2.3.c.4 Water Supply Benefits without Dams Summary

Table 17 provides a summary of the impacts to each sub-area for water supply without the dams and a total score.

Table 17. Summary of Water Supply Benefits Without Dams Impact

Sub-areas	Avoided Groundwater Pumping	Avoided New Well Construction	Avoided Seawater Intrusion	Average
Upper Valley Above the Dam	3	5	0	2.7
Upper Valley Below the Dam	2	4	0	2.0
Upper Valley	3	4	0	2.3
Forebay	4	0	0	1.3
Arroyo Seco	3	0	0	1.0
Pressure	4	1	5	3.3
Eastside	5	1	0	2.0

4.2.3.d Special Benefits Summary

Table 18 provides a summary of Tables 5, 6 and 10 for Flood Protection and Water Supply Benefits each sub-area receives from the construction of Nacimiento and San Antonio Dams.

Sub-areas	Flood Protection without Dams	Flood Protection from Dam Breach	Water Supply Benefits	Average
Upper Valley Above the Dam	0.0	1.0	2.7	1.2
Upper Valley Below the Dam	3.0	5.0	2.0	3.3
Upper Valley	3.7	4.0	2.3	3.3
Forebay	3.3	3.0	1.3	2.5
Arroyo Seco	1.3	3.0	1.0	1.8
Pressure	4.7	2.0	3.3	3.3
Eastside	1.0	1.0	2.0	1.3

Table 18. Summary of Special Benefits from Flood Protection and Water Supply

In evaluating the results of Table 18, the results illustrate that all sub-areas receive a Special Benefit from the construction of the dams. However, the level of benefit is different. Specifically, the Upper Valley Below the Dam, Upper Valley, and Pressure Zone receive similar substantial benefit. Forebay and Arroyo Seco receive a slightly reduced benefit, while Upper Valley Above the Dam and the Eastside receive the lowest level of benefit.

4.3 Assessment Rate Calculation Methodology

The overall costs of the Maintenance Project were allocated to the sub-areas according to land use designation and the special benefit. The first step in this allocation process is to calculate the equivalent acreage for each sub-area based on the land use factors. Table 19 provides a summary of the equivalent acreage by land use factor for each sub-area based on the land use factors identified in Table 6 multiplied by the actual land use acreage totals from Table 8.

	Land Use Factor	Above Dam	Below Dam	Upper Vallev	Forebay	Arroyo Seco	Pressure	Eastside	Total	
Factor A	1.00		000 50	50,000,00	00,400,00	40,400,54	04.044.70	50 700 57	044.054.70	
&В	1.00	-	382.59	59,693.96	38,129.32	19,468.51	64,641.78	58,738.57	241,054.73	
Factor C	0.10	29.98	603.59	2,695.38	711.54	340.69	2,136.57	1,964.07	8,481.82	
Factor D	0.01	-	5.37	81.76	99.09	24.18	69.91	23.02	303.34	
Factor I	0.00	-	-	-	-	-	-	-	-	
Ec	uivalent									
Acrea	ige Total	30	29.98	991.55	62,471.10	38,939.95	19,833.38	66,848.26	60,725.66	
* Lond Lloo	Land Lies Assaure (see Table 0) VI and Lies Faster									

Table 19. Equivalent Acreage by Land Use Factor*

Land Use Acreage (see Table 8) X Land Use Factor

**Please see supporting memo discussing pay as you go versus bonding option. Once a method of payment is selected, the assessment rate calculation methodology write up will be incorporated into this Engineer's Report.

Part V: Assessment Roll

(UNDER SEPARATE COVER)

Part VI: Maximum Annual Administration Assessment

The Agency also proposes including an administration assessment to pay for various costs and expenses incurred from time to time by the Agency and not otherwise reimbursed to the Agency. These administrative costs result from the administration and collection of assessment installments, or from the administration or registration of the improvement bonds and the various funds and accounts pertaining thereto, in an amount per year not to exceed four dollars (\$4.00) per parcel. An annual COLA based on the San Francisco, Oakland, San Jose Urban Consumer's Price Index for the month ending February will be applied.

Zone 2D – Nacimiento and San Antonio Maintenance Project Comparison of Pay As You Go to Bonding February 5, 2021

Introduction

The following is a supplemental report to the Draft Engineer's Report dated, January 25, 2021 for the Assessment District Formation for Zone 2D – Nacimiento and San Antonio Maintenance Project. This document provides a comparison of a Pay as You Go ("PAYG") funding option to a Bonding funding option to raise the funds required to pay for the Maintenance Project. The backup information on the development of the Maintenance Project and its associated Subprojects, the special benefit analysis, and the benefits unit methodology can be found in detail in the Engineer's Report. The purpose of this supplemental report is to provide an analysis between these two funding methodologies and allow input from constituents within Zone 2D on which funding methodology is preferred or a combination of the two. Once a funding methodology is chosen, the chosen methodology write up will be incorporated in the Final Engineer's Report.

Background

Monterey County Water Resources Agency ("Agency" or "MCWRA") owns and operates the Nacimiento and San Antonio dams. MCWRA receives approximately \$3 mil from Zone 2C for operations of the two dams. Of this \$3 mil, \$1.2 mil is allocated for operations and maintenance ("O&M") of the dams on an annual basis.¹ With the increased regulations on the two dams that were not anticipated in 2003 when Zone 2C was formed and aging infrastructure, many needed subprojects have been identified, but have been deferred due to lack of funding. The need to complete these subprojects is becoming more dire, and certain projects are required to be completed by the Federal Energy Regulatory Commission Division of Dam Safety and Inspection ("FERC"), and the California Department of Water Resources, Division of Safety of Dams ("DSOD").

MCWRA has identified 11 Subprojects for Nacimiento Dam and 15 Subprojects for San Antonio Dam. The total estimated costs are \$76 mil and \$72 mil respectively, with a total of \$148 mil for both dams. These costs fluctuate slightly as subproject descriptions and cost estimates are being finalized, but these approximate budgets will be used for the purposes of this analysis.

In addition, MCWRA is proposing an additional \$1,500,000 annually for operations and maintenance needs for the dams, and \$1,500,000 for a Reserve Account. The Reserve Account will be built up over a three-year period or \$500,000 per year for three years.

Funding Methodology

To finance the maintenance project, MCWRA is proposing a special assessment and the creation of Zone 2D. The proposed Zone 2D has the same boundary as the existing Zone 2C, which funded the Salinas Valley Water Project. The methodology of the benefit units has been modified for Zone 2D. See Section 4 of the Draft Engineer's Report for a detailed explanation.



¹ The remaining amount is allocated to maintenance of the Salinas River channel, maintenance of the Salinas River mouth, debris clearing, data collection and management, and other administrative tasks.

MCWRA Zone 2D Assessment District Comparison of PAYG to Bonding February 5, 2021

Zone 2D special benefits were evaluated within seven sub-areas, as follows:

- Extended Upper Valley Above the Dam
- Extended Upper Valley Below the Dam
- Upper Valley
- Forebay
- Arroyo Seco
- Pressure
- Eastside

In addition, the special benefit is further dependent upon whether the land is actively or passively utilizing the land. The following provides the breakdown of benefit units per acre for the various land uses.

- Factors A&B, Active: Assessed 1.0 Benefit Unit per acre: Irrigated Ag, Residential (all), Commercial, Institutional, Industrial
- Factor C, Passive: Assessed 0.1 Benefit Unit per acre: Dry Farming, Grazing, Vacant Lot
- Factor D, Passive: Assessed 0.01 Benefit Unit per acre: River Channels, Lands with Frequent Flooding
- Factor I, Passive: Land Receiving No Charge

There is a total of 405,506 acres within Zone 2D. Table 1 provides a summary of the acreage in each sub-area by Factor as described above using the County of Monterey Tax Assessor's parcel information from January 2020. Note, the Final Engineer's Report will update the parcel information based on the latest data available.

	Above Dam	Below Dam	Upper Valley	Forebay	Arroyo Seco	Pressure	Eastside	Total
Factor A/B	0	382.59	59,693.96	38,129.32	19,468.51	64,641.78	58,738.57	241,054.73
Factor C	299.79	6,035.91	26,953.79	7,115.36	3,406.93	21,365.70	19,640.73	84,818.21
Factor D	0	537.33	8,176.18	9,909.49	2,418.00	6,991.09	2,302.00	30,334.09
Factor I	5,253.93	10,178.43	866.51	1,494.21	43.15	23,672.79	7,789.47	49,298.49
Total	5,553.72	17,134.26	95,690.44	56,648.38	25,336.59	116,671.36	88,470.77	405,505.52

Table 1. Land Use Acreages by Factor and Sub-Area**

** Acreage based on County Tax Roll dated January 2020.

Each of the sub-areas were analyzed to determine the Special Benefit conferred based on three categories: flood control benefits, hydrologic benefits, and economic benefits. Based on the analysis presented in the Draft Engineer's Report, the Special Benefit received by each of the seven sub-areas varies. Table 2 provides a summary of the averages of the three categories analyzed.

Sub-areas	Average
Upper Valley Above the Dam	1.2
Upper Valley Below the Dam	3.3
Upper Valley	3.3
Forebay	2.5
Arroyo Seco	1.8
Pressure	3.3
Eastside	1.3

Table 2. Summary of Special Benefits from Flood Protection and Water Supply

The overall costs of the projects were allocated to the sub-areas according to land use and the Special Benefit. The first step in this allocation process is to calculate the equivalent acreage for each sub-area based on the land use factors. Table 3 provides a summary of the equivalent acreage by land use factor for each sub-area based on the land use factors multiplied by the actual land use acreage totals from Table 1.

	Land Use Factor	Above Dam	Below Dam	Upper Valley	Forebay	Arroyo Seco	Pressure	Eastside	Total
Factor A & B	1.00	-	382.59	59,693.96	38,129.32	19,468.51	64,641.78	58,738.57	241,054.73
Factor C	0.10	29.98	603.59	2,695.38	711.54	340.69	2,136.57	1,964.07	8,481.82
Factor D	0.01	-	5.37	81.76	99.09	24.18	69.91	23.02	303.34
Factor I	0.00	-	-	-	-	-	-	-	-
Equivalent A	Acreage								
Total		29.98	991.55	62,471.10	38,939.95	19,833.38	66,848.26	60,725.66	249,839.89

Table 3. Equivalent Acreage by Land Use Factor*

* Land Use Acreage (see Table 1) X Land Use Factor

Next, using the Special Benefit average identified in Table 2 and the Total Equivalent Acreage by Land Use Factor in Table 3, a Cost Share and a Cost Share Ratio can be calculated. Table 4 provides a summary by sub-area of the cost share and the cost share ratio that will be used to determine the cost per acre for the various financing methods.

**NOTE, WALLACE GROUP USED AN EXCEL FILE TO CALCULATE THE COST SHARES IN THE FOLLOWING TABLES. WALLACE GROUP DID NOT ROUND THE CALCULATION RESULTS THROUGHOUT THE PROCESS TO ENSURE THE MOST ACCURATE NUMBERS WERE BEING GENERATED. FOR THIS MEMORANDUM, THE FOLLOWING TABLES USE ROUNDED NUBMERS IN EACH OF THE CELLS. AS A RESULT, IF THE NUMBERS ARE USED IN THE TABLES BELOW TO CALCULATE THE FINAL COST SHARES, THE RESULTING VALUES MAY NOT MATCH EXACTLY TO WHAT IS PROVIDED. FOR EXAMPLE, TABLE 5, SECOND ROW: 0.510%X\$9,660,000 = \$49,266.00, BUT THE TABLE SHOWS \$49,230.60. THIS IS BECAUSE THE 0.510% IS ROUNDED FROM 0.50963131%.

	Benefit Ratio	Equivalent Acreage ¹	Cost Share ²	Cost Share Ratio ³
Above Dam	1.2	29.98	35.97	0.006%
Below Dam	3.3	991.55	3,272.13	0.510%
Upper Valley	3.3	62,471.10	206,154.63	32.109%
Forebay	2.5	38,939.95	97,349.88	15.162%
Arroyo Seco	1.8	19,833.38	35,700.09	5.560%
Pressure	3.3	66,848.26	220,599.26	34.358%
Eastside	1.3	60,725.66	78,943.36	12.295%
	Total	249,840.89	642,055.33	100.000%

Table 4. Cost Share Factors and Ratios

¹Equivalent Acreage = Land Use Acreage (See Table 1) X Land Use Factor ²Cost Share = Benefit Ratio X Equivalent Acreage (3.3 x 991.55 acres = 3,272.13) ³Cost Share Ratio = Cost Share/Cost Share Total (3,272.13/642,055.33 = 0.510%)

Funding Options for Maintenance Project

As noted previously, the total project cost is \$148 mil. To ensure there are adequate funds, the project costs were escalated to the mid-point of construction for each project. Therefore, the total costs MCWRA must raise to complete the 26 projects is \$160 mil.

MCWRA is pursuing two funding options. Option 1 is for MCWRA to obtain a bond for the \$160 mil. Option 2 is to utilize a "pay-as-you-go" method.

Option 1: Bond

MCWRA evaluated a 30-year bond debt service. There are upfront costs associated with bonding, which include legal and bond counsel, cost of issuance, required reserve account, and capitalized interest which will add approximately 15% to the project costs. A bond issuance will have a lower annual payment for the special assessment but will be incurred over a potential 30-year period. The annual debt service for a 30-year bond is approximately \$9,660,000. The cost per acre is provided in Table 5, based on a debt service of \$9,660,000 and the cost share ratio provided in Table 4.

This results in an annual cost per acre of \$18.05 to \$49.65 per year per 1-acre irrigated parcel depending on the sub-area. The cost for Factor C would be \$1.81 to \$4.96 per year per acre. The cost for Factor D would be \$0.18 to \$0.50 per year per acre. The total project cost will be \$289.8 mil after 30 years.

MCWRA Zone 2D Assessment District Comparison of PAYG to Bonding February 5, 2021

	Cost Share Ratio ¹	Annual Equivalent Cost Share ²	Cost per Equivalent Acre ³	Factor A/B Cost per Acre per Year	Factor C Cost per Acre per Year	Factor D Cost per Acre per Year
Above Dam	0.006%	\$541.26	\$18.05	\$18.05	\$1.81	\$0.18
Below Dam	0.510%	\$49,230.60	\$49.65	\$49.65	\$4.96	\$0.50
Upper Valley	32.109%	\$3,101,685.59	\$49.65	\$49.65	\$4.96	\$0.50
Forebay	15.162%	\$1,464,671.00	\$37.61	\$37.61	\$3.76	\$0.38
Arroyo Seco	5.560%	\$537,123.28	\$27.08	\$27.08	\$2.71	\$0.27
Pressure	34.358%	\$3,319,011.27	\$49.65	\$49.65	\$4.96	\$0.50
Eastside	12.295%	\$1,187,737.01	\$19.56	\$19.56	\$1.96	\$0.20
Total	100.000%	\$9,660,000.00				

Table 5. Bonding Cost Share Factors and Ratios

¹Cost Share Ratio = See Table 4

²Equivalent Cost Share = Cost Share Ratio X Debt Service (0.510% x \$9,660,000 = \$49,230.60)

³Cost per Acre = Equivalent Cost Share/Equivalent Acreage (See Table 3) (\$49,230.60/991.55 = \$49.65)

Option 2: Pay-as-You-Go

MCWRA also evaluated paying for the maintenance project on a PAYG basis. Property owners would make the special assessment payments for a term that is approved by the property owners. This methodology would result in higher annual payments than the bond option, but a shorter payment period. The overall total project costs will be \$160 mil, which is significantly less than the bonding option. Table 6 provides the total revenue cost share for each sub-area by Land Use Factor.

	Cost Share Ratio ¹	Total Revenue Required by Sub-Area ²	Total Factor A/B Cost per Acre	Total Factor C Cost per Acre	Total Factor D Cost per Acre
Above Dam	0.006%	\$8,964.91	\$299.04	\$29.90	\$2.99
Below Dam	0.510%	\$815,413.64	\$822.36	\$82.24	\$8.22
Upper Valley	32.109%	\$51,373,674.32	\$822.36	\$82.24	\$8.22
Forebay	15.162%	\$24,259,561.02	\$623.00	\$62.30	\$6.23
Arroyo Seco	rroyo Seco 5.560% \$8,896,451.8		\$448.56	\$44.86	\$4.49
Pressure	34.358%	\$54,973,271.49	\$822.36	\$82.20	\$8.22
Eastside	12.295%	\$19,672,662.76	\$323.96	\$32.40	\$3.24
Total	100.000%	\$160,000,000.00			

Table 6. PAYG Total Revenue Required by Sub-Area and by Land Use Factor

¹Cost Share Ratio = See Table 4

²Total Revenue Required = Cost share Ratio X Total Debt (0.510% x \$160,000,000 = \$815,413.64)

MCWRA Zone 2D Assessment District Comparison of PAYG to Bonding February 5, 2021

The annual payment for the PAYG option is highly dependent on how quickly the projects need to be completed and the timing at which the funds need to be generated. Several of the projects have deadlines set by FERC or DSOD. Table 7 provides the proposed schedule for each of the Subprojects used to determine the PAYG alternatives.

The PAYG option was evaluated under two different scenarios. The first was equal payments spread over 6 years. The second was equal payments spread over 8 years. Table 8 provides the costs for each sub-area by land use factor for spreading the costs over 6 years. Table 9 provides the costs for each sub-area by land use factor for spreading the costs over 8 years. Both scenarios result in a deficit at some time during the term, meaning the income generated does not meet the expenses required for the project. Spreading the costs over 8 years has a significantly larger impact on MCWRA's ability to complete the projects in the proposed timeline. If the revenue generated does not provide adequate funds to pay for the projects, MCWRA would either need to borrow from the general fund or defer project schedules beyond what is shown in Table 7.

MCWRA Zone 2D Assessment District Comparison of PAYG to Bonding January 29, 2021

		T	otal Project	Project	Project						[
		Costs + 5%		Duration	Start						
Project So	hedule		Inflation	(Years)	(Year)	Year 1	Year 2	Year 3	Year 4	Year 5	
Nacimien	to Projects										
1	Replacement of Three Low Level Outlet Valves and Discharge Piping	\$	738,938	2	1	\$ 369,469	\$ 369,469	\$ -	\$ -	\$ -	ç
2	Spillway Evaluation, Investigation, and Maintenance Repairs	\$	2,992,500	8	1	\$ 598,500	\$ 448,875	\$ 448,875	\$ 299,250	\$ 299,250	Ş
2A	Spillway Rehabilitation	\$	27,090,000	4	3	\$ -	\$ -	\$ 5,418,000	\$ 9,481,500	\$ 9,481,500	ç
3	Spillway Plunge Pool Erosion Control	\$	21,126,000	5	1	\$ 2,112,600	\$ 2,112,600	\$ 5,281,500	\$ 6,337,800	\$ 5,281,500	Ş
4	Low Flow Channel Sand Boil Prevention	\$	13,203,750	3	3	\$ -	\$ -	\$ -	\$ -	\$ 3,961,125	Ş
	Modify One Low-Level Outlet Valve to Provide Flow Control and										
5	Energy Dissipation	\$	5,188,050	2	2	\$ -	\$ 1,037,610	\$ 4,150,440	\$ -	\$ -	Ş
6	Low Level Intake Valve Actuator Replacement	\$	1,282,313	2	2	\$ -	\$ 320,578	\$ 961,734	\$ -	\$ -	Ş
7	Dam Embankment Seismic Stability Evaluation and Implementation	\$	1,419,600	2	2	\$ -	\$ 851,760	\$ 567,840	\$ -	\$ -	Ş
8	Spillway Bridge Maintenance	\$	511,875	2	2	\$ -	\$ 255,938	\$ 255,938	\$ -	\$ -	\$
9	Nacimiento Lake Drive Road Repair	\$	3,596,775	2	4	\$ -	\$ -	\$ -	\$ 1,798,388	\$ 1,798,388	Ş
10	Protection of Powerplant Penstock from Adjacent Slope Failure	\$	1,680,000	2	4	\$ -	\$ -	\$ -	\$ -	\$ -	Ş
11	Security Upgrades	\$	1,354,080	4	1	\$ 338,520	\$ 338,520	\$ 338,520	\$ 338,520	\$ -	Ş
Nacimien	to Total	\$	80,183,880			\$ 3,419,089	\$ 5,735,349	\$ 17,422,847	\$ 18,255,458	\$ 20,821,763	\$
San Antor	nio Projects										
1	Spillway Rehabilitation/Replacement	\$	63,000,000	5	1	\$ 3,150,000	\$ 6,300,000	\$ 18,900,000	\$ 18,900,000	\$ 15,750,000	\$
2	Butterfly Valve Hydraulic Operator Upgrade	\$	598,500	2	1	\$ 299,250	\$ 299,250	\$ -	\$ -	\$ -	Ş
3	Replace Intake Structure Bulkhead Gate	\$	235,463	1	1	\$ 235,463	\$ -	\$ -	\$ -	\$ -	Ş
4	Low Level Discharge Valve Maintenance	\$	212,100	1	1	\$ 212,100	\$ -	\$ -	\$ -	\$ -	Ş
5	Replace Combination Air Release Vacuum Valves	\$	180,600	2	1	\$ 72,240	\$ 108,360	\$ -	\$ -	\$ -	\$
6	Install Access Hatch in Low Level Outlet Works Conduit	\$	1,111,950	2	2	\$ -	\$ 444,780	\$ 667,170	\$ -	\$ -	\$
7	Replace Intake Structure Trash Racks	\$	1,173,375	2	1	\$ 293,344	\$ 880,031	\$ -	\$ -	\$ -	Ş
8	Interior and Exterior Paint of Low-Level Outlet Works Conduit	\$	2,924,250	2	4	\$ -	\$ -	\$ -	\$ 1,900,763	\$ 1,023,488	Ş
9	Horizontal Drain Repair	\$	436,800	2	3	\$ -	\$ -	\$ 218,400	\$ 218,400	\$ -	\$
10	Toe Drain Repair	\$	218,400	3	3	\$ -	\$ -	\$ 76,440	\$ 76,440	\$ 65,520	Ş
11	Abutment Drain Repair	\$	546,000	2	3	\$ -	\$ -	\$ 273,000	\$ 273,000	\$ -	Ş
12	New Piezometers	\$	1,528,800	3	3	\$ -	\$ -	\$ 305,760	\$ 611,520	\$ 611,520	Ş
13	Road Pavement Repair	\$	546,000	2	3	\$ -	\$ -	\$ -	\$ 136,500	\$ 409,500	Ş
14	New Access Road	\$	2,866,500	2	4	\$ -	\$ -	\$ -	\$ 1,433,250	\$ 1,433,250	Ş
15	Install Boat Barrier Buoy Line and Replace Spillway Log Boom	\$	395,850	2	4	\$ -	\$ -	\$ -	\$ 98,963	\$ 296,888	Ş
San Antor	nio Total	\$	75,974,588			\$ 4,262,396	\$ 8,032,421	\$ 20,440,770	\$ 23,648,835	\$ 19,590,165	\$

Table 7. Nacimiento and San Antonio Estimated Project Schedule

 Total Nacimiento and San Antonio
 \$ 156,158,468
 \$ 7,681,485
 \$ 13,767,771
 \$ 37,863,617
 \$ 41,904,293
 \$ 40,411,928
 \$

	Year 6			Year 7	Year 8	Total		
	\$	-	\$	-	\$ -	\$	738,938	
)	\$	299,250	\$	299,250	\$ 299,250	\$	2,992,500	
)	\$	2,709,000	\$	-	\$ -	\$	27,090,000	
)	\$	-	\$	-	\$ -	\$	21,126,000	
5	\$	4,621,313	\$	4,621,313	\$ -	\$	13,203,750	
	\$	-	\$	-	\$ -	\$	5,188,050	
	\$	-	\$	-	\$ -	\$	1,282,313	
	\$	-	\$	-	\$ -	\$	1,419,600	
	\$	-	\$	-	\$ -	\$	511,875	
3	\$	-	\$	-	\$ -	\$	3,596,775	
	\$	504,000	\$	1,176,000	\$ -	\$	1,680,000	
	\$	-	\$	-	\$ -	\$	1,354,080	
3	\$	8,133,563	\$	6,096,563	\$ 299,250	\$	80,183,880	
)	\$	-	\$	-	\$ -	\$	63,000,000	
	\$	-	\$	-	\$ -	\$	598,500	
	\$	-	\$	-	\$ -	\$	235,463	
	\$	-	\$	-	\$ -	\$	212,100	
	\$	-	\$	-	\$ -	\$	180,600	
	\$	-	\$	-	\$ -	\$	1,111,950	
	\$	-	\$	-	\$ -	\$	1,173,375	
3	\$	-	\$	-	\$ -	\$	2,924,250	
	\$	-	\$	-	\$ -	\$	436,800	
)	\$	-	\$	-	\$ -	\$	218,400	
	\$	-	\$	-	\$ -	\$	546,000	
)	\$	-	\$	-	\$ -	\$	1,528,800	
)	\$	-	\$	-	\$ -	\$	546,000	
)	\$	-	\$	-	\$ -	\$	2,866,500	
3	\$	-	\$	-	\$ -	\$	395,850	
5	\$	-	\$	-	\$ -	\$	75,974,588	
3	\$	8,133,563	\$	6,096,563	\$ 299,250	\$1	156,158,468	

MCWRA Zone 2D Assessment District Comparison of PAYG to Bonding February 5, 2021

Table 7. PAYG Cost per Acre Spread Over 6 Years	
---	--

	Above						
	Dam	Below Dam	Upper Valley	Forebay	Arroyo Seco	Pressure	Eastside
Factor A & B	\$49.84	\$137.06	\$137.06	\$103.83	\$74.76	\$137.06	\$53.99
Factor C	\$4.98	\$13.71	\$13.71	\$10.38	\$7.48	\$13.71	\$5.40
Factor D	\$0.50	\$1.37	\$1.37	\$1.04	\$0.75	\$1.37	\$0.54

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Income	\$26,666,666.67	\$45,651,848.33	\$58,550,744.38	\$47,353,794.17	\$32,116,168.33	\$18,370,907.50
Expenses	\$7,681,485.00	\$13,767,770.60	\$37,863,616.88	\$41,904,292.50	\$40,411,927.50	\$8,133,562.50
Balance	\$18,985,181.67	\$31,884,077.71	\$20,687,127.50	\$5,449,501.67	\$(8,295,759.17)	\$10,237,345.00

Year 7	Year 8
\$10,237,345.00	\$4,140,782.50
\$6,096,562.50	\$299,250.00
\$4,140,782.50	\$3,841,532.50

Table 8. PAYG Cost per Acre Spread Over 8 Years

	Above Dam	Below Dam	Upper Valley	Forebay	Arroyo Seco	Pressure	Eastside
Factor A & B	\$37.38	\$102.79	\$102.79	\$77.87	\$56.07	\$102.79	\$40.49
Factor C	\$3.74	\$10.28	\$10.28	\$7.79	\$5.61	\$10.28	\$4.05
Factor D	\$0.37	\$1.03	\$1.03	\$0.78	\$0.56	\$1.03	\$0.40

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Income	\$20,000,000.00	\$32,318,515.00	\$38,550,744.38	\$20,687,127.50	\$(1,217,165.00)	\$(21,629,092.50)
Expenses	\$7,681,485.00	\$13,767,770.60	\$37,863,616.88	\$41,904,292.50	\$40,411,927.50	\$8,133,562.50
Balance	\$12,318,515.00	\$18,550,744.38	\$687,127.50	\$(21,217,165.00)	\$(41,629,092.50)	\$(29,762,655.00)

Year 7	Year 8
\$(9,762,655.00)	\$4,140,782.50
\$6,096,562.50	\$299,250.00
\$(15,859,217.50)	\$3,841,532.50

Option 3: Pay-as-You-Go and Bond Hybrid

MCWRA also evaluated a hybrid, 30-year debt service bond for the San Antonio Spillway and the remaining \$100,000,000 as PAYG. Table 9 provides a summary of the costs for the Bond portion of the payment. Table 10 provides a summary of the costs for the PAYG. Table 11 provides a summary of the annual costs for the PAYG spread out over 6 years.
	Cost Share Ratio ¹	Annual Equivalent Cost Share ²	Cost per Equivalent Acre ³	Factor A/B Cost per Acre per Year	Factor C Cost per Acre per Year	Factor D Cost per Acre per Year
Above Dam	0.006%	\$246.54	\$8.22	\$8.22	\$0.82	\$0.08
Below Dam	0.510%	\$22,423.88	\$22.61	\$22.61	\$2.26	\$0.23
Upper Valley	32.109%	\$1,412,776.04	\$22.61	\$22.61	\$2.26	\$0.23
Forebay	15.162%	\$667,137.93	\$17.13	\$17.13	\$1.71	\$0.17
Arroyo Seco	5.560%	\$244,652.43	\$12.34	\$12.34	\$1.23	\$0.12
Pressure	34.358%	\$1,511,764.97	\$22.61	\$22.61	\$2.26	\$0.23
Eastside	12.295%	\$540,998.23	\$8.91	\$8.91	\$0.89	\$0.09
Total	100.000%	\$4,400,000.00				

Table 9. Bonding Cost Share Factors and Ratios

¹Cost Share Ratio = See Table 4

²Equivalent Cost Share = Cost Share Ratio X Debt Service (0.510% x \$4,400,000 = \$22,423.88)

³Cost per Acre = Equivalent Cost Share/Equivalent Acreage (See Table 3) (\$22,423.88/991.55 = \$22.61)

Table 10. PAYG Total Revenue Required by Sub-Area and by Land Use Factor

	Cost Share Ratio ¹	Total Revenue Required by Sub-Area ²	Total Factor A/B Cost per Acre	Total Factor C Cost per Acre	Total Factor D Cost per Acre
Above Dam	0.006%	\$5,603.07	\$186.90	\$18.69	\$1.87
Below Dam	0.510%	\$509,633.52	\$513.97	\$51.40	\$5.14
Upper Valley	32.109%	\$32,108,546.45	\$513.97	\$51.40	\$5.14
Forebay	15.162%	\$15,162,225.63	\$389.37	\$38.94	\$3.89
Arroyo Seco	5.560%	\$5,560,282.42	\$280.35	\$28.03	\$2.80
Pressure	34.358%	\$34,358,294.68	\$513.97	\$51.40	\$5.14
Eastside	12.295%	\$12,295,414.22	\$202.47	\$20.25	\$2.02
Total	100.000%	\$100,000,000.00			

¹Cost Share Ratio = See Table 4

²Total Revenue Required = Cost share Ratio X Total Debt (0.510% x \$100,000,000 = \$509,633.52)

	Above Dam	Below Dam	Upper Valley	Forebay	Arroyo Seco	Pressure	Eastside
Factor A & B	\$31.15	\$85.66	\$85.66	\$64.90	\$46.72	\$85.66	\$33.75
Factor C	\$3.11	\$8.57	\$8.57	\$6.49	\$4.67	\$8.57	\$3.37
Factor D	\$0.31	\$0.86	\$0.86	\$0.65	\$0.47	\$0.86	\$0.34

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Income	\$16,666,666.67	\$28,801,848.33	\$38,000,744.38	\$35,703,794.17	\$29,366,168.33	\$21,370,907.50
Expenses	\$4,531,485.00	\$7,467,770.63	\$18,963,616.88	\$23,004,292.50	\$24,661,927.50	\$8,133,562.50
Balance	\$12,135,181.67	\$21,334,077.71	\$19,037,127.50	\$12,699,501.67	\$4,704,240.83	\$13,237,345.00

Year 7	Year 8
\$13,237,345.00	\$7,140,782.50
\$6,096,562.50	\$299,250.00
\$7,140,782.50	\$6,841,532.50

Table 12. Bond and PAYG (6 Year)

Year 1-6

	Above	Below	Upper		Arroyo		
	Dam	Dam	Valley	Forebay	Seco	Pressure	Eastside
Factor A & B	\$39.37	\$108.28	\$108.28	\$82.03	\$59.06	\$108.28	\$42.65
Factor C	\$3.94	\$10.83	\$10.83	\$8.20	\$5.91	\$10.83	\$4.27
Factor D	\$0.39	\$1.08	\$1.08	\$0.82	\$0.59	\$1.08	\$0.43

Years 7-30

	Above	Below	Upper		Arroyo		
	Dam	Dam	Valley	Forebay	Seco	Pressure	Eastside
Factor A & B	\$8.22	\$22.61	\$22.61	\$17.13	\$12.34	\$22.61	\$8.91
Factor C	\$0.82	\$2.26	\$2.26	\$1.71	\$1.23	\$2.26	\$0.89
Factor D	\$0.08	\$0.23	\$0.23	\$0.17	\$0.12	\$0.23	\$0.09

Operation and Maintenance

As noted previously, the existing O&M fund from Zone 2C is inadequate to properly maintain the two dams. MCWRA proposes to increase the O&M by \$1.5 mil annually for future maintenance of the two

dams. Table 13 provides a summary of the O&M annual costs for each sub-area by land use factor. Note, there is a proposed cost of living ("COLA") adjustment for the O&M fund. In addition, the costs presented in Table 13 will remain as shown regardless if it is chosen to go with bonding or PAYG.

	Above	Below	Upper		Arroyo		
	Dam	Dam	Valley	Forebay	Seco	Pressure	Eastside
Factor A & B	\$2.80	\$7.71	\$7.71	\$5.84	\$4.21	\$7.71	\$3.04
Factor C	\$0.28	\$0.77	\$0.77	\$0.58	\$0.42	\$0.77	\$0.30
Factor D	\$0.03	\$0.08	\$0.08	\$0.06	\$0.04	\$0.08	\$0.03

Table 13. O&M Cost per Acre

Reserves Account

Emergencies occur when operating a utility. It is essential to have a fund that is dedicated to meeting the financial needs of these emergencies. A reserve account is recommended with an allocated \$1.5 mil to be built up over 3 years or \$500,000 per year. Table 14 provides a summary of the Reserve annual costs for the first three years for each sub-area by land use factor. Once the Reserve is met, this charge would no longer be applied unless MCWRA uses the funds and the funds will be required to be replenished. At no time will the charge exceed the annual costs presented in Table 14. There is a COLA proposed for the reserve fund. Note, the costs presented in Table 14 will remain as shown regardless if it is chosen to go with bonding or PAYG.

Table 14. Reserve Cost per Acre	Table	14.	Reserve	Cost	per	Acre
---------------------------------	-------	-----	---------	------	-----	------

	Above Dam	Below Dam	Upper Valley	Forebay	Arroyo Seco	Pressure	Eastside
Factor A & B	\$0.93	\$2.57	\$2.57	\$1.95	\$1.40	\$2.57	\$1.01
Factor C	\$0.09	\$0.26	\$0.26	\$0.19	\$0.14	\$0.26	\$0.10
Factor D	\$0.01	\$0.03	\$0.03	\$0.02	\$0.01	\$0.03	\$0.01

Financial Obligation Summary

Table 15 provides a comparison summary of the costs for each sub-area by land use factor, for funding the maintenance projects (bonding and PAYG options), operations and maintenance, and reserves account.

			Above	Below	Upper		Arroyo		
			Dam	Dam	Valley	Forebay	Seco	Pressure	Eastside
	Bonding	30 yrs	\$18.05	\$49.65	\$49.65	\$37.61	\$27.08	\$49.65	\$19.56
Feeter	PAYG	6 yrs	\$49.84	\$137.06	\$137.06	\$103.83	\$74.76	\$137.06	\$53.99
Factor	PAYG	8 yrs	\$37.38	\$102.79	\$102.79	\$77.87	\$56.07	\$102.79	\$40.49
AQD	DAVC / Pond	Yrs 1-6	\$39.37	\$108.28	\$108.28	\$82.03	\$59.06	\$108.28	\$42.65
	PATG/BOIlu	Yrs 7-30	\$8.22	\$22.61	\$22.61	\$17.13	\$12.34	\$22.61	\$8.91
	Bonding	30 yrs	\$1.81	\$4.96	\$4.96	\$3.76	\$2.71	\$4.96	\$1.96
	PAYG	6 yrs	\$4.98	\$13.71	\$13.71	\$10.38	\$7.48	\$13.71	\$5.40
Factor C	PAYG	8 yrs	\$0.50	\$1.37	\$1.37	\$1.04	\$0.75	\$1.37	\$0.54
	PAYG/Bond	Yrs 1-6	\$3.94	\$10.83	\$10.83	\$8.20	\$5.91	\$10.83	\$4.27
		Yrs 7-30	\$0.08	\$0.23	\$0.23	\$0.17	\$0.12	\$0.23	\$0.09
	Bonding	30 yrs	\$0.18	0.50	\$0.50	\$0.38	\$0.27	\$0.50	\$0.20
	PAYG	6 yrs	\$0.50	\$1.37	\$1.37	\$1.04	\$0.75	\$1.37	\$0.54
Factor D	PAYG	8 yrs	\$0.37	\$1.03	\$1.03	\$0.78	\$0.56	\$1.03	\$0.40
	DAVC / Pond	Yrs 1-6	\$0.39	\$1.08	\$1.08	\$0.82	\$0.59	\$1.08	\$0.43
	PATG/BOIlu	Yrs 7-30	\$0.08	\$0.23	\$0.23	\$0.17	\$0.12	\$0.23	\$0.09
Factor	0&M		\$2.80	\$7.71	\$7.71	\$5.84	\$4.21	\$7.71	\$3.04
A&B	Reserves		\$0.93	\$2.57	\$2.57	\$1.95	\$1.40	\$2.57	\$1.01
Easter C	0&M		\$0.28	\$0.77	\$0.77	\$0.58	\$0.42	\$0.77	\$0.30
Factor C	Reserves		\$0.09	\$0.26	\$0.26	\$0.19	\$0.14	\$0.26	\$ 0.10
Eactor D	0&M		\$0.03	\$0.08	\$0.08	\$0.06	\$0.04	\$0.08	\$0.03
	Reserves		\$0.01	\$0.03	\$0.03	\$0.02	\$0.01	\$0.03	\$0.01

Table 15. Comparison Summary of Costs per Acre

Proposition 218 Process

If the Board of Supervisors approves the Draft Engineer's Report, all property owners in Zone 2D will receive a ballot for each parcel they own with the total annual payment being assessed on their property. The property owner must return their ballot on or before the close of the Majority Protest Hearing, which is tentatively scheduled for June 22, 2021. A ballot is not counted unless it is returned. The ballots must be tabulated according to the proportional financial obligation of the affected properties. For example, the vote of a property owner assessed \$100 will have 20 times the weight of the vote of a property owner assessed \$5.

A majority protest exists if the assessment ballots submitted, and not withdrawn, in opposition to the proposed assessment exceed the assessment ballots submitted, and not withdrawn, in its favor, weighting those assessment ballots as described above. If there is a majority protest, the assessment cannot be imposed. If there is no majority protest, the MCWRA Board of Supervisors may impose the assessment.

If the assessment passes, property owners will see the assessment on their 2021/22 property tax bill. MCWRA will then be able to fund the 26 projects proposed. If the assessment fails, MCWRA will not be able to fund the 26 proposed projects including the DSOD mandated spillway repair. This action will most likely jeopardize the operational level of San Antonio Dam, and the operation of the hydroelectric plant at Nacimiento Reservoir.