BOARD MEETING AGENDA
Monday, July 27, 2015
Regular Meeting - 7:00 P.M.

Boardroom
5072 Benson Road
Union City, CA 94587

Directors
Manny Fernandez
Tom Handley
Pat Kite
Anjali Lathi
Jennifer Toy

Officers
Paul R. Eldredge
General Manager/ District Engineer

David M. O'Hara
Attorney

THIS MEETING WILL BE TELECONFERENCED WITH VICE PRESIDENT HANDLEY FROM VIA PRIVATA TORRIANI 3, CERNOBBIO, ITALY. THE TELECONFERENCE LOCATION SHALL BE ACCESSIBLE TO THE PUBLIC.

1. Call to Order.

2. Pledge of Allegiance.

3. Roll Call.

Motion 4. Approve Minutes of the Meeting of July 13, 2015.

5. Monthly Operations Report for June 2015 *(to be reviewed by the Budget & Finance Committee).*

6. Written Communications.

7. Oral Communications.

The public may provide oral comments at regular and special Board meetings; however, whenever possible, written statements are preferred ***(to be received at the Union Sanitary District office at least one working day prior to the meeting)****. This portion of the agenda is where a member of the public may address and ask questions of the Board relating to any matter within the Board's jurisdiction that is not on the agenda. If the subject relates to an agenda item, the speaker should address the Board at the time the item is considered. Oral comments are limited to three minutes per individuals, with a maximum of 30 minutes per subject. Speaker's cards will be available in the Boardroom and are to be completed prior to discussion.*

Motion 8. Resolution No. 2765, Honoring District General Counsel David M. O'Hara Upon his Retirement.

Motion 9. Approve the Salary for the Position of Buyer I *(to be reviewed by the Personnel Committee)*.

Motion 10. Accept the Final Report for the Hayward Marsh Rehabilitation Options Study from RMC Water and Environment *(to be reviewed by the Legal/Community Affairs Committee).*

Motion	11.	Accept the Final Report for the Alvarado Wastewater Treatment Plant Site Study from RMC Water and Environment *(to be reviewed by the Legal/Community Affairs Committee).*
Motion	12.	Approve Modification of Job Title from Communications Coordinator to Communications and Intergovernmental Relations Coordinator, and Revisions to Job Description and Salary Schedule *(to be reviewed by the Personnel Committee).*
Information	13.	Information Items: a. Check Register. b. Cal-Card Quarterly Activity Report *(to be reviewed by the Budget & Finance Committee)*. c. Status Report on Computer and Student Loan Program *(to be reviewed by the Budget & Finance Committee)*. d. Board of Directors Internal Committee Assignments for FY16. e. Discuss and Provide Direction to Staff Regarding Additional Communications on District Hearings and Website Information on Email Addresses *(to be reviewed by the Legal/Community Affairs Committee)*.
Information	14.	Committee Meeting Reports. *(No Board action is taken at Committee meetings):* a. Budget & Finance Committee – Thursday, July 23, 2015, at 4:30 p.m. b. Legal/Community Affairs Committee – Friday, July 24, 2015, at 8:30 a.m. c. Personnel Committee – Friday, July 24, 2015, at 9:30 a.m. d. Construction Committee – will not meet.
Information	15.	General Manager's Report. *(Information on recent issues of interest to the Board).*
Information	16.	Other Business: a. Comments and questions. *Directors can share information relating to District business and are welcome to request information from staff.* b. Scheduling matters for future consideration.
	17.	Adjournment – The Board will adjourn to the next Regular Meeting in the Boardroom on Monday, August 10, 2015, at 7:00 p.m.

The Public may provide oral comments at regular and special Board meetings; however, whenever possible, written statements are preferred (to be received at the Union Sanitary District at least one working day prior to the meeting).

If the subject relates to an agenda item, the speaker should address the Board at the time the item is considered. If the subject is within the Board's jurisdiction but not on the agenda, the speaker will be heard at the time "Oral Communications" is calendared. Oral comments are limited to three minutes per individual, with a maximum of 30 minutes per subject. Speaker's cards will be available in the Boardroom and are to be completed prior to discussion of the agenda item.

The facilities at the District Offices are wheelchair accessible. Any attendee requiring special accommodations at the meeting should contact the General Manager's office at (510) 477-7503 at least 24 hours in advance of the meeting.

THE PUBLIC IS INVITED TO ATTEND

NOTICE OF
COMMITTEE MEETING

All meetings will be held in
the General Manager's Office
5072 Benson Road, Union City, CA 94587

UNION SANITARY DISTRICT

REVISED

BOARD MEETING OF JULY 27, 2015

Committee Membership:

Budget and Finance	Directors Anjali Lathi and Tom Handley (Alt. – Pat Kite)
Construction Committee	Directors Pat Kite and Jennifer Toy (Alt. – Manny Fernandez)
Legal/Community Affairs	Directors Pat Kite and Tom Handley (Alt. –Anjali Lathi)
Legislative Committee	Directors Manny Fernandez and Jennifer Toy (Alt–Tom Handley)
Personnel Committee	Directors Manny Fernandez and Anjali Lathi (Alt. – Jennifer Toy)
Audit Committee	Directors Manny Fernandez and Tom Handley (Alt. Jennifer Toy)

Legal/Community Affairs Committee, ~~Wednesday, July 22, 2015, at 4:30 p.m.~~
Friday, July 24, 2015, at 8:30 a.m.

10. Accept the Final Report for the Hayward Marsh Rehabilitation Options Study from RMC Water and Environment.

11. Accept the Final Report for the Alvarado Wastewater Treatment Plant Site Study from RMC Water and Environment.

13e. Discuss and Provide Direction to Staff Regarding Additional Communications on District Hearings and Website Information on Email Addresses.

Budget & Finance Committee, Thursday, July 23, 2015, at 4:30 p.m.

5. Monthly Operations Report for June 2015.

13b. Cal-Card Quarterly Activity Report.

13c. Status Report on Computer and Student Loan Program.

Personnel Committee, Friday, July 24, 2015, at 9:30 a.m.

9. Approve the Salary for the Position of Buyer I.

12. Approve Modification of Job Title from Communications Coordinator to Communications and Intergovernmental Coordinator, and Revisions to Job Description and Salary Schedule.

Committee meetings may include teleconference participation by one or more Directors.
(Gov. Code Section 11123)
Committee Meetings are open to the public. Only written comments will be considered. No action will be taken.

MINUTES OF THE MEETING OF THE
BOARD OF DIRECTORS OF
UNION SANITARY DISTRICT
July 13, 2015

CALL TO ORDER

President Fernandez called the meeting to order at 7:00 p.m.

PLEDGE OF ALLEGIANCE

ROLL CALL

PRESENT: Manny Fernandez, President
Jennifer Toy, Vice President
Tom Handley, Secretary
Pat Kite, Director

ABSENT: Anjali Lathi, Director
General Manager Eldredge stated Director Lathi very much wanted to be present, but was unfortunately unable to attend due to being severely under the weather.

STAFF: Paul Eldredge, General Manager
Dave O'Hara, District Counsel
Karen Murphy, Special District Counsel
Rich Cortés, Business Services Manager
Sami Ghossain, Technical Services Manager
James Schofield, Collection Services Manager
Michelle Powell, Communications Coordinator
Maria Scott, Principal Financial Analyst
Regina McEvoy, Assistant to the GM/Board Secretary
Victor Vasut, Lead Collection Service Worker
Jamie Rojo, Accounting Tech Specialist
Jose Rodrigues, Collection Services Planner/Scheduler
Lilly DeMelo, Customer Service Fee Analyst
Ariel Teixeira, Administrative Specialist I
Nancy Walker, Engineering Technician III
Tom Herlihy, Collection Services Worker II
Maurice Fortner, Plant Operator III
Mariela Espinosa, Customer Service Fee Analyst

GUESTS: Alice Johnson, League of Women Voters
ACWD Director Sethy
Eight other members of the public were also present, but were not known to staff, did not submit a speaker card, and did not address the Board.

APPROVAL OF THE MINUTES OF THE SPECIAL MEETING OF JUNE 15, 2015

It was moved by Secretary Handley, seconded by Director Kite, to Approve the Minutes of the Special Meeting held June 15, 2015. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

APPROVAL OF THE MINUTES OF THE SPECIAL MEETING OF JUNE 17, 2015

It was moved by Director Kite, seconded by Vice President Toy, to Approve the Minutes of the Special Meeting held June 17, 2015. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

APPROVAL OF THE MINUTES OF THE MEETING OF JUNE 22, 2015

It was moved by Director Kite, seconded by President Fernandez, to Approve the Minutes of the Regular Meeting held June 22, 2015. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

WRITTEN COMMUNICATIONS

There were no written communications.

ORAL COMMUNICATIONS

There were no oral communications.

PUBLIC HEARING: 1) CONFIRMING SEWER SERVICE CHARGE ORDINANCE NO. 31.38, 2) ADOPTING SEWER SERVICE CHARGE FOR FISCAL YEAR 2016, AND 3) SETTING AND COLLECTING SEWER SERVICE CHARGES FOR FISCAL YEAR 2016 ON THE TAX ROLL

This item was reviewed by the Budget & Finance Committee. General Manager Eldredge provided a PowerPoint presentation that included an overview of District finances and services funded by sewer service charges. The PowerPoint presentation was attached to the meeting packet.

Secretary Handley requested General Manager Eldredge explain a regional sanitary sewer overflow (SSO) map not included in the presentation. General Manager Eldredge stated there is a map of the San Francisco Bay Area which uses a symbol for each SSO occurrence. The map shows far fewer SSO's in the Tri-City area served by USD than in many other portions of the Bay Area.

Business Services Manager Cortes stated the notice of public hearing to set Sewer Service Charges for Fiscal Year 2016 had been published in the Argus newspaper and

the Tri-City Voice newspaper on June 30 and July 7, 2015, and had also been posted on the District website. In 2013, a 218 notice covering the next three years (2014, 2015, and 2016) was sent to all USD customers. While the current public hearing is not required as part of the 218 process, State Codes require the District conduct a public hearing annually as a requirement prior to placing sewer service charges on the property tax roll. The District opts to place sewer service charges on the property tax roll as a cost saving measure. Business Services Manager Cortes stated the District received 15 emails, which were included in the record and attached to the packet, regarding the public hearing on the proposed rates. Business Services Manager Cortes reviewed the responses to the emails as included in the staff report.

President Fernandez opened the public hearing. There were no speakers on the matter. President Fernandez closed the public hearing.

RESOLUTION NO. 2763, CONSIDERING PROTESTS AND ESTABLISHING SEWER SERVICE CHARGE RATES FOR FISCAL YEAR 2016

This item was reviewed by the Budget & Finance Committee. Business Services Manager Cortes stated staff recommended Board approval of the proposed resolution Considering Protests and Establishing Sewer Service Charge Rates for Fiscal Year 2016.

Secretary Handley requested the sewer service charge rate notification process be brought back to the Board at a later date for discussion, and the Board agreed by consensus of the members present.

It was moved by Director Kite, seconded by Secretary Handley, to Adopt Resolution No. 2763, Considering Protests and Establishing Sewer Service Charge Rates for Fiscal Year 2016. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

ADOPT ORDINANCE NO. 31.38, AMENDING ORDINANCE NO. 31.37, SETTING THE SEWER SERVICE CHARGES SPECIFIED THEREIN FOR FISCAL YEAR 2016

This item was reviewed by the Budget & Finance Committee. Business Services Manager Cortes stated staff recommended Board adoption of Ordinance No. 31.38, amending Ordinance No. 31.37, setting the Sewer Service Charges specified therein for Fiscal Year 2016.

It was moved by Director Kite, seconded by Secretary Handley, to Adopt Ordinance No. 31.38, Amending Ordinance No. 31.37, Setting the Sewer Service Charges Specified Therein for Fiscal Year 2016. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

ADOPTING FINAL OPERATING AND CAPACITY FUND BUDGETS FOR FISCAL YEAR 2016

This item was reviewed by the Budget & Finance Committee. Principle Financial Analyst Scott stated the final Operating and Capacity Fund budgets for Fiscal Year 2016 reflect Board input and information presented at the Board meeting held June 8, 2015. The budget reflects increasing the sewer service charge by an average of 5.7%, maintaining the current capacity fee at $5,595.66 per EDU, and increasing the net operating budget 2.9%.

It was moved by Director Kite, seconded by Secretary Handley, to Adopt the Final Operating and Capacity Fund Budgets for Fiscal Year 2016. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

AUTHORIZE THE GENERAL MANAGER TO EXECUTE A LEASE AGREEMENT WITH THE CALIFORNIA STATE LANDS COMMISSION FOR A SEWER CROSSING AT SCOTT CREEK IN THE CITY OF FREMONT

This item was reviewed by the Legal/Community Affairs Committee. Technical Services Manager Ghossain stated "The Crossings" development is located at the southernmost portion of the District's service area, and includes construction of three large industrial buildings and extension of Fremont Boulevard to Dixon Landing Road. Sewer lines constructed to serve the new development include a portion that runs across Scott Creek, which is managed by the State Lands Commission (SLC). District staff negotiated a lease agreement with the SLC which granted permission for the sewer line to be located under Scott Creek as the SLC does not grant permanent easements for encroachments across State Lands. District staff have reviewed the lease agreement and exhibits, and recommend authorizing the General Manager to execute the lease agreement. General Manager Eldredge stated the State Lands Commission had proposed a 20 year lease, and District staff requested and received a 30 year lease.

It was moved by Vice President Toy, seconded by Secretary Handley, to Authorize the General Manager to Execute a Lease Agreement with the California State Lands Commission for a Sewer Crossing at Scott Creek in the City of Fremont. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

RESOLUTION NO. 2764, ACCEPT A SANITARY SEWER EASEMENT FROM THE ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT LOCATED NEAR FREMONT BOULEVARD AND LAKEVIEW BOULEVARD IN THE CITY OF FREMONT

This item was reviewed by the Legal/Community Affairs Committee. Technical Services Manager Ghossain stated new sewer lines were constructed to serve "The Crossings" development. The new sewer line runs south along Fremont Boulevard and under and across an Alameda County Flood Control and Water Conservation District (ACFC) channel. The new sewer lines were constructed per District standard specifications and the ACFC provided the grant of easement for Board review. District staff have reviewed and recommend approval of the grant deed, legal description, and plat.

It was moved by Secretary Handley, seconded by Vice President Toy, to Adopt Resolution No. 2764, Accepting a Sanitary Sewer Easement from the Alameda County Flood Control and Water Conservation District Located Near Fremont Boulevard and Lakeview Boulevard in the City of Fremont. Motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

ELECTION OF OFFICERS FOR THE BOARD OF DIRECTORS FOR FY 2016

General Manager Eldredge stated Board Policy 3070.2, approved by the Board in October 2013, provides for the offices of President, Vice President, and Secretary. The policy states that annually, nominations will be made for each office with the vote of the majority of Directors of the Board required for election. Historically, the Board has followed a rotation of officers, where Vice President becomes President, Secretary becomes Vice President, and the 4th member in rotation becomes Secretary. General Manager Eldredge recommended the new Board officers assume their duties immediately following the meeting.

On a motion made by Director Kite, seconded by Secretary Handley, Jennifer Toy was nominated for the office of President, Tom Handley was nominated for the office of Vice President, and Pat Kite was nominated for the office of Secretary. There were no further nominations, and the motion carried with the following vote:

AYES: Fernandez, Handley, Kite, Toy
NOES: None
ABSENT: Lathi
ABSTAIN: None

The Board agreed, by consensus of the members present, to have the new Board officers assume their duties immediately following the meeting.

INFORMATION ITEMS:

Check Register
All questions were answered to the Board's satisfaction.

Agreement with RMC Water and Environment for Flow Model and Capacity Analysis Professional Services
Technical Services Manager Ghossain stated the District executed an agreement with RMC Water and Environment (RMC) on February 3, 2009. The agreement provided for staff the ability to obtain engineering services in a timely fashion for small tasks associated

with gravity sewer flow modeling and capacity analyses. Said services are needed as part of District Capital Improvement Project planning and design, or when unanticipated large developments or high volume dischargers apply for connection to the District's sewer system. The two-year agreement with RMC had a total cost ceiling of $40,000, with total compensation not to exceed $20,000 per year. The agreement was first amended in 2011 to extend the term from two years to four years, and again amended in 2013 to extend the agreement for another two years to April 15, 2015. On July 7, 2015, District staff entered into a new two-year agreement with RMC with a cost ceiling of $50,000, and total compensation not to exceed $25,000 per year. RMC was again selected to provide service to the District due to the knowledge, experience, and track record of their Project Manager, Gisa Ju. Ms. Ju was the project manager of the previous seven Collection System master plan studies, and has a detailed understanding of the District's dynamic flow model and sewer collection system.

Agreement with Carollo Engineers for General Engineering Services

Technical Services Manager Ghossain stated District staff have executed three general engineering agreements with Carollo Engineers since 2004. The agreements with Carollo have provided for staff the ability to obtain engineering services in a timely fashion for tasks such as design of small projects and engineering evaluations. The last such agreement was executed on April 20, 2011, for a total cost ceiling of $50,000 for a two-year period. The agreement was amended in 2013 for an additional two years without changing the total cost ceiling. The agreement was again amended in 2013 to increase the total cost ceiling by an additional $15,000, and expired on April 20, 2015. Staff executed a new $50,000 cost ceiling two-year agreement with Carollo on July 6, 2015.

Solar and Cogeneration Facilities Operational Update

Technical Services Manager Ghossain reported the following:

- Alvarado Wastewater Treatment Plant Solar Carport – Construction was completed at a cost of $884,000 and operation began in September 2011. The District applied for the California Solar Initiative (CSI) incentive that would rebate $0.2568 per kilowatt-hour (kWh) of power generated by the system for a period of five years. Through May 31, 2015, the Solar Carport generated a total of 958,333 kWh of power, which equated to $154,881 in energy savings at the Plant. The District has received $202,681, or approximately 80%, of the CSI incentive rebate from PG&E. The current total benefit of the Solar Carport is $357,562, which represents 40.4% of simple payback for the initial construction cost of the facility.
- Irvington Pump Station Solar Facility – Construction was completed at a cost of $2.85 million and operation began in April 2012. The system consists of 1,680 solar panels and is rated at 408 kW. The District applied for the CSI incentive rebate of $0.15 per kWh of power generated by the system for a period of five years. Through June 4, 2015, the solar facility has generated a total of 2,997,859 kWh of power, which equated to $867,457 in energy savings at the Irvington Pump Station. The District has received $413,320, or 66%, of the CSI incentive rebate from PG&E. The current total benefit of the solar facility is $1,280,777, which represents 44.9% of simple payback for the initial construction cost of the facility.
- Cogeneration Facility – Construction was completed at a cost of $11.8 million and the facility entered full operation in late November 2014. The facility consists of two 850-kW biogas-fueled engine generators and a packaged biogas conditioning system. The District applied for a grant from the Self-Generation Incentive Program (SGIP) that provides financial incentives for the installation of new, qualifying self-generation equipment installed to meet all or a portion of the electric energy needs of a facility. PG&E, as administrator of the SGIP, approved the

District's application for a maximum rebate of $3.38 million. The District has received half of the total rebate from PG&E, and the other half will be paid to the District annually over the next five years depending upon actual electric energy generated by the facility. The facility generated a total of 6,776,843 kWh of power through May 21, 2015, which equated to approximately $615,000 in energy savings at the plant. The current total benefit of the facility is $2,305,000, which represents 19.5% of simple payback for the initial construction cost of the facility.

Report on the EBDA Commission Meeting of June 18, 2015

Secretary Handley stated an evaluation of proposals received for upcoming testing of the EBDA Outfall was presented to the Commission. New technology will be used to test and evaluate the useful life of the Outfall. Vice President Handley stated the State Lands Commission lease for the Outfall will need to be renewed and may require more frequent inspection of the Outfall.

Certificate of Achievement for Excellence in Financial Reporting

Business Services Manager Cortes stated the Government Finance Officers Association of the United States and Canada (GFOA) is the professional association of state/provincial and local finance officers in North America, and has served the public finance profession since 1906. GFOA has awarded its Certificate of Achievement for Excellence in Financial Reporting to Union Sanitary District for its fiscal year 2014 Comprehensive Annual Financial Report (CAFR). This award is the highest form of recognition in the area of government accounting and financial reporting, and is designed to recognize and encourage excellence in financial reporting by state and local governments. This is the twelfth year running that Principal Financial Analyst Scott has developed a CAFR report that has been recognized at the national (GFOA) level.

COMMITTEE MEETING REPORTS:

The Budget & Finance, Construction, and Legal/Community Affairs Committees met.

GENERAL MANAGER'S REPORT:

General Manager Eldredge reported the following:

- The new District receptionist, Rica Agbuya, started work July 13, 2015.
- FMC Mechanical Team Coach Dave Port's last day at the District will be July 17, 2015, due to his retirement.
- The Co-digestion pilot project, commonly known as the cheese waste project, may be ready for testing the week of July 20, 2015
- The Reclaimed Water Study kickoff meeting was held, and work on the study is ongoing with anticipated completion in February 2016.
- Analysis of the Capacity Fee Study is underway, and draft results are expected in the next few weeks. Once the study is completed, a Board workshop will be scheduled to review the findings.
- A section of temporary pipe, used as part of the Thickener project, failed due to an accumulation of solids in the pipe caused by a valve being inadvertently closed. Precautions have been taken to prevent this from happening again. Operational staff are preparing standard operating procedures to ensure all employees are made aware of the correct processes for operating the temporary piping.

OTHER BUSINESS:

Dave O'Hara stated former attorney for the District Marvin Haun passed away recently.

Secretary Kite stated she recently attended the Alameda County Chapter CSDA meeting which included a presentation on the future of BART.

ADJOURNMENT:

The meeting was adjourned at 8:14 p.m. to the next Regular Board Meeting in the Boardroom on Monday, July 27, 2015, at 7:00 p.m.

SUBMITTED:

_____
REGINA McEVOY
SECRETARY TO THE BOARD

ATTEST:

_____
TOM HANDLEY
SECRETARY

APPROVED:

_____
MANNY FERNANDEZ
PRESIDENT

Adopted this 27th day of July, 2015

Directors
Manny Fernandez
Tom Handley
Pat Kite
Anjali Lathi
Jennifer Toy

Officers
Paul R. Eldredge
General Manager/ District Engineer

David M. O'Hara
Attorney

DATE: July 20, 2015

TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer

SUBJECT: Agenda Item No. 5 - Meeting of July 27, 2015
Information Item: **Monthly Operations Report for June, 2015**

Background

Attached is the June 2015 Operations Report. Staff is available to answer questions regarding information contained in the report.

Work Group Managers

General Manager/Administration	Paul Eldredge	GM
Business Services	Rich Cortés	BS
Collection Services	James Schofield	CS
Technical Support	Sami Ghossain	TS
Treatment and Disposal Services	Armando Lopez	T&D
Fabrication, Maintenance, and Construction	Robert Simonich	FMC

General Manager's Summary
Below is a summary of major activities that occurred at the District during June 2015.

ODOR COMPLAINTS:
There were no odors reported during the month of June 2015.

SAFETY:

- We had one first aid incident where an employee had a cut on his hand received while working with a razor blade. The employee was sent to Urgent Care to prevent any infection.
- We also had an incident where a forklift drove onto the floor grating in the Co-Gen building. The grating started to collapse. It was identified that the floor grating is not rated for any type of vehicle traffic. The area is being marked to warn vehicles entering the area.

- A near miss incident occurred when we had a caustic chemical delivered and put into use before the Safety Data Sheet was reviewed or training was provided for the employees. Once identified, training was provided and the product was used without incident.
- The employee that had the work related injury reported in February is still off work. He had surgery in early May and hopes to be back to work in July.
- We had a hazardous materials audit at the Newark Pump Station completed by the Alameda County Environmental Health Department. We were cited for a number of violations, most were errors in the Spill Prevention Control & Countermeasures Plan (SPCC). The SPCC is being corrected by the contractor that developed it.
- We completed annual training for employees on the Injury and Illness Prevention Program and the ergonomics refresher.
- There was an Ice Cream Social to Celebrate the X-mod reduction and recognize the safe work of our employees.

STAFFING & PERSONNEL:

Completed Recruitments Resulting in Promotions:

- 6/1 Scott Martin – Electrical and Instrumentation Coach
- 6/29 Mike Hovey – FMC Planner/Scheduler I

Recruitments Opened:

- 6/1 – Business Services Manager
- 6/22 – Environmental Compliance Inspector II/III
- 6/29 – Mechanic II

G.M. ACTIVITIES: For the month of June, the GM was involved in the following:

- Met with City of Fremont staff to discuss The Crossings development.
- Attended the Safety Committee Meeting.
- Conducted the District Update and Safety Recognition Event for all District staff.
- Attended an ACWD Board Meeting.
- Attended the Audit Committee meeting.
- Participated in hiring interviews for Human Resources Manager.
- Attended the MAC and EBDA meetings.
- Participated in two half day strategic planning sessions with the Executive Team.
- Attended the Treatment Plant Site Study Board Workshop.
- Attended the Hayward Marsh Options Study Board Workshop.

Attachments: Odor Report and Map
Hours Worked and Leave Time by Work Group
Business Services
Technical Services
Collection Services
Fabrication, Maintenance, and Construction
Treatment and Disposal Services

ODOR REPORT
June 2015

During the recording period from June 01, 2015 through June 30, 2015, there were no odor related service requests received by the District.

Legend

Odor Complaints: June 2015

- ★ Odor found, USD resolved (0)
- ● Odor found, not related to USD (0)
- ▲ No odor found (0)

Odor Complaints: July 2014 to May 2015

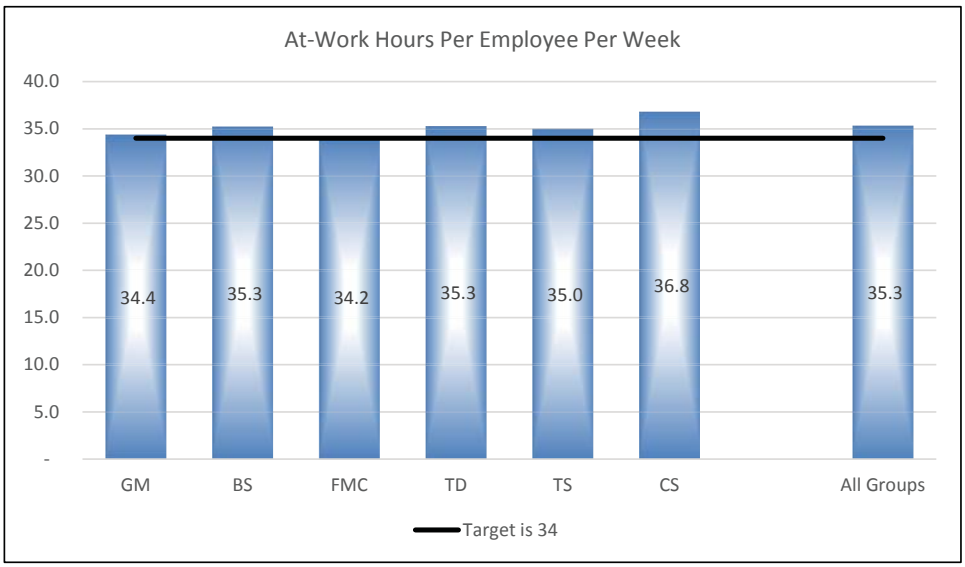
- ★ Odor found, USD resolved (5)
- ● Odor found, not related to USD (5)
- ▲ No odor found (18)

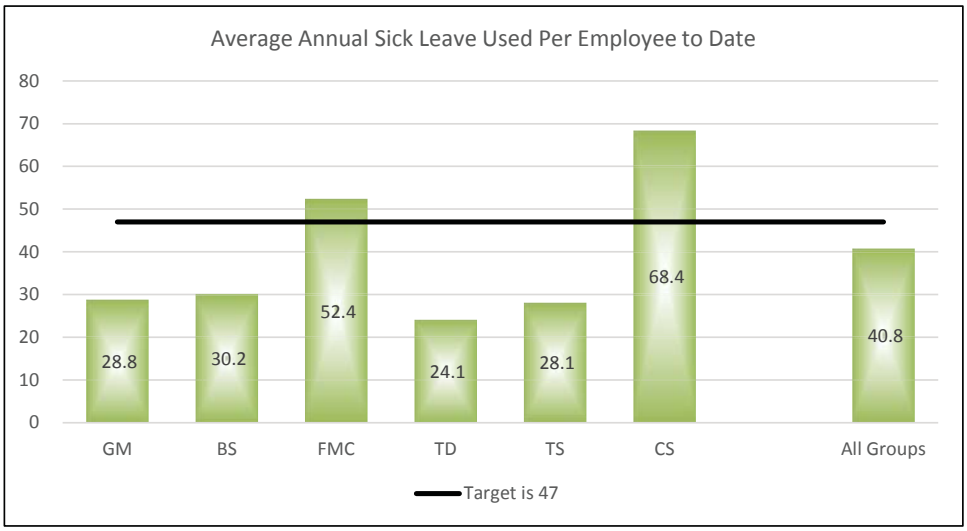
Location of Odor Reports
July 2014 to June 2015

0 0.5 1 2 3 4 5 Miles

N W E S

HOURS WORKED AND LEAVE TIME BY WORK GROUP
July 1, 2014 through July 1, 2015
Weeks to Date: 52 out of 52 (100.0%)





NOTES

(1) Regular hours does not include hours worked by part-time or temporary employees.

(2) Overtime hours includes call outs.

(3) Discretionary Leave includes Vacation, HEC, Holiday, MAL, FLEX, Funeral, Jury Duty, Military, OT Banked Use, Paid Admin., SLIP, VRIP, Holiday Banked Use leaves.

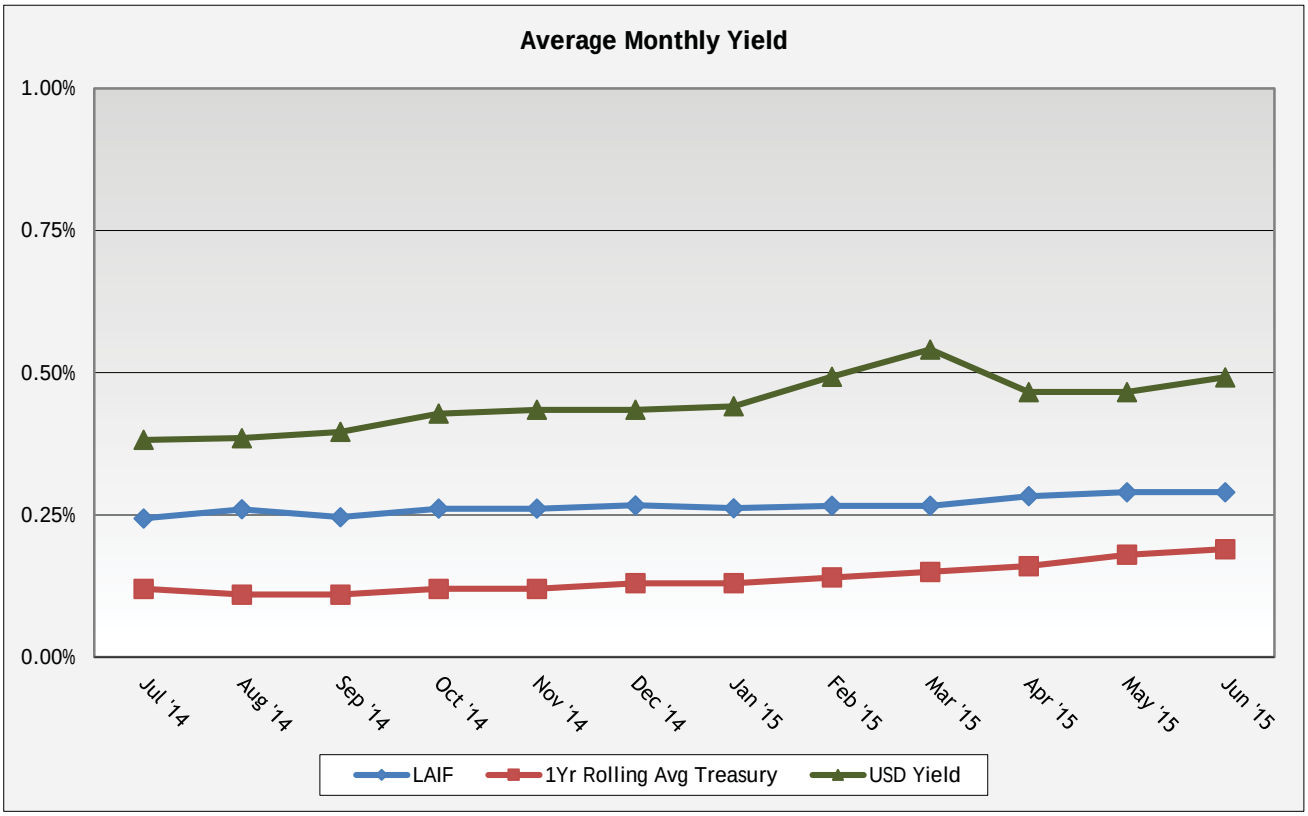
(4) Sick Leave includes sick and catastrophic sick leaves as well as protected time off, which the District has no discretion.

An employee using 15 vacation, 11 holiday, 2 HEC, and 5 sick days will work an average of **34.9** hours per week over the course of a year; with 20 vacation days, **34.2** hours per week.

Business Services Group
Activities Report
June 2015

- The recruitment for Maintenance Mechanical Coach was completed; Scott Martin was promoted on 6/1/2015.
- The recruitment for Planner/Scheduler I was completed; Mike Hovey was promoted on 6/29/2015.
- HR developed the "Extended Purposes" policy on the new California Healthy Workplaces, Healthy Families law that went into effect on July 1, 2015. HR also informed all staff of the new law and the District's policy relating to the law.
- The Organizational Performance Program Manager (OPPM) facilitated meeting with CS group to develop new SLA's for teams and Planner/Scheduler.
- The OPPM planned and facilitated 2 Strategic Planning 1/2 day sessions with the ET; completed agenda and updates to documents.
- The OPPM attended WEF Water Leadership Institute sessions in VA.
- The OPPM hosted Team Orientation for New HR Analyst, Leticia Najera.

AVERAGE MONTHLY YIELD



BUDGET AND FINANCE REPORT

FY 2015
Preliminary

Year-to-date as of 6/30/15 | **100% of year elapsed**

Revenues

	Budget	Actual	% of Budget Rec'd		Audited Last Year Actuals 6/30/14
Capacity Fees	$2,700,000	$4,820,637	179%		$3,315,007
Sewer Service Charges	47,448,461	46,014,344	97%	final pymt Aug.	45,139,420
Operating	848,500	1,016,859	120%		1,072,242
Interest	299,000	309,600	104%		385,844
Misc. (incl. LAVWMA pymnt, solar, Cogen rebates)	1,994,200	2,127,593	107%		297,776
Subtotal Revenues	$53,290,161	$54,289,033	102%		$50,210,289
SRF Loan Proceeds (Thickener)	3,390,000	4,501,122	133%		2,424,739
Total Revenues + SRF Proceeds	**$56,680,161**	**$58,790,155**	**104%**		**$52,635,028**

Expenses

	Budget	Actual	% of Budget Used		Last Year Actuals
Capital Improvement Prog.					
Capacity Projects	$3,240,000	$3,210,128	99%		$5,592,023
Renewal & Repl. Projects	11,632,500	11,434,506	98%		14,195,068
Operating	32,659,214	30,705,033	94%		30,751,966
Special Projects	1,708,478	864,281	51%		775,361
Retiree Medical (Annual Required Contribution)	543,540	543,540	100%		462,852
Vehicle & Equipment	1,057,700	786,059	74%		784,695
Information Systems	1,216,000	611,242	50%		848,449
Plant & Pump Station R&R	250,000	168,089	67%		197,237
Pretreatment Fund	7,000	52,060	744%	incl carbon analy	5,124
County Fee for Sewer Service Charge Admin.	106,000	105,559	100%	& legal	105,559
Misc. (A/R write-off)	0	0	0%		1,343
Debt Servicing:					
SRF Loans (Irv.,Wilw,LHH,Cdr,NPS, Sub1,Boyc,Prim Cl)	3,127,389	3,127,110	100%		4,675,361
Total Expenses	**$55,547,821**	**$51,607,607**	**93%**		**$58,395,038**
Total Revenue & Proceeds less Expenses	***$1,132,340***	***$7,182,548***			***($5,760,010)***

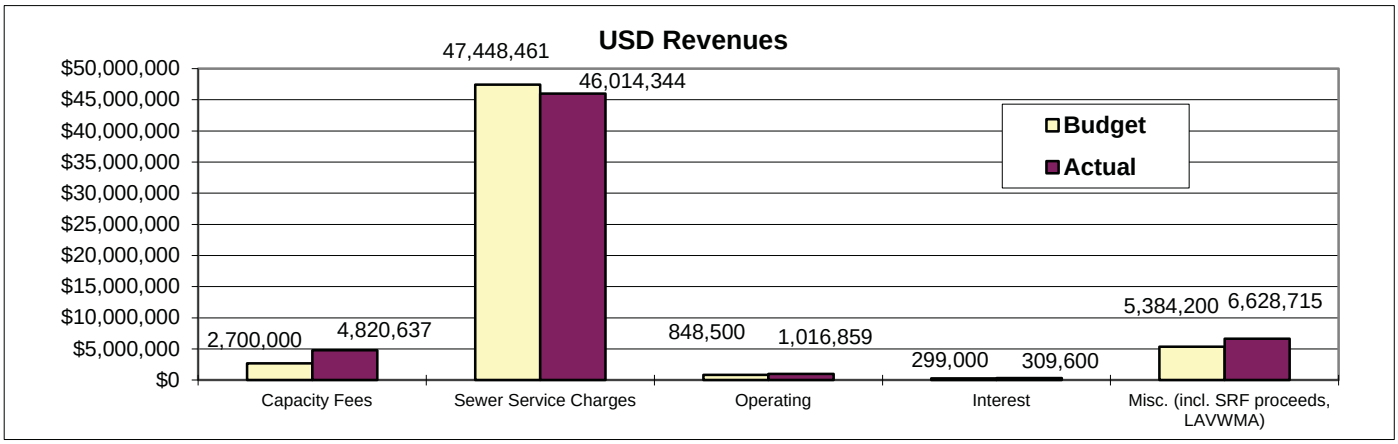
Gross Operating Expenses by Work Group

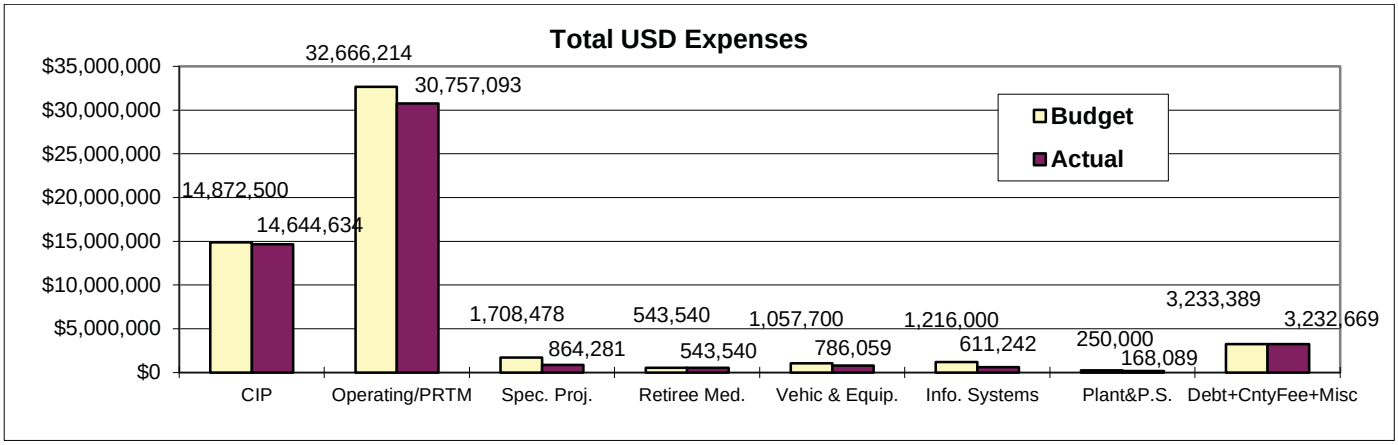
	Budget	Actual	% of Budget Used	Last Year Actuals
Board of Directors	$170,900	$129,598	76%	$166,233
General Manager/Admin.	1,036,505	1,007,661	97%	1,153,217
Business Services	4,666,100	4,621,632	99%	4,416,832
Collection Services	5,954,753	5,545,556	93%	5,460,336
Technical Services	5,247,562	4,956,792	94%	4,850,139
Treatment & Disposal Services	9,980,700	9,162,286	92%	9,739,655
Fabrication, Maint. & Construction	5,602,694	5,281,508	94%	4,965,555
Total	$32,659,214	$30,705,033	94%	**$30,751,966**

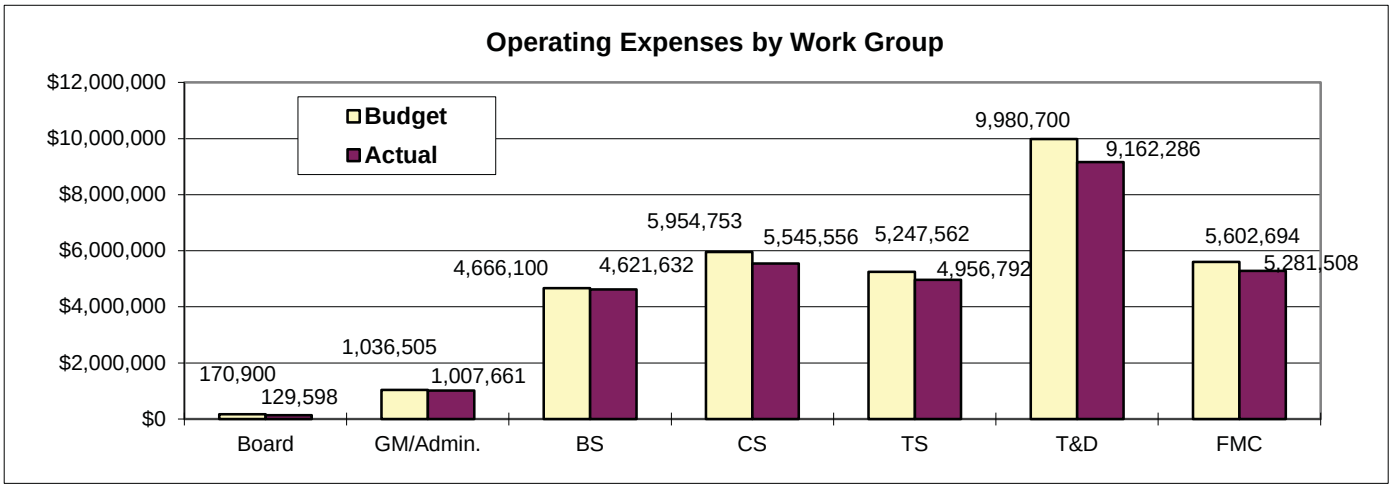
Operating Expenses by Type

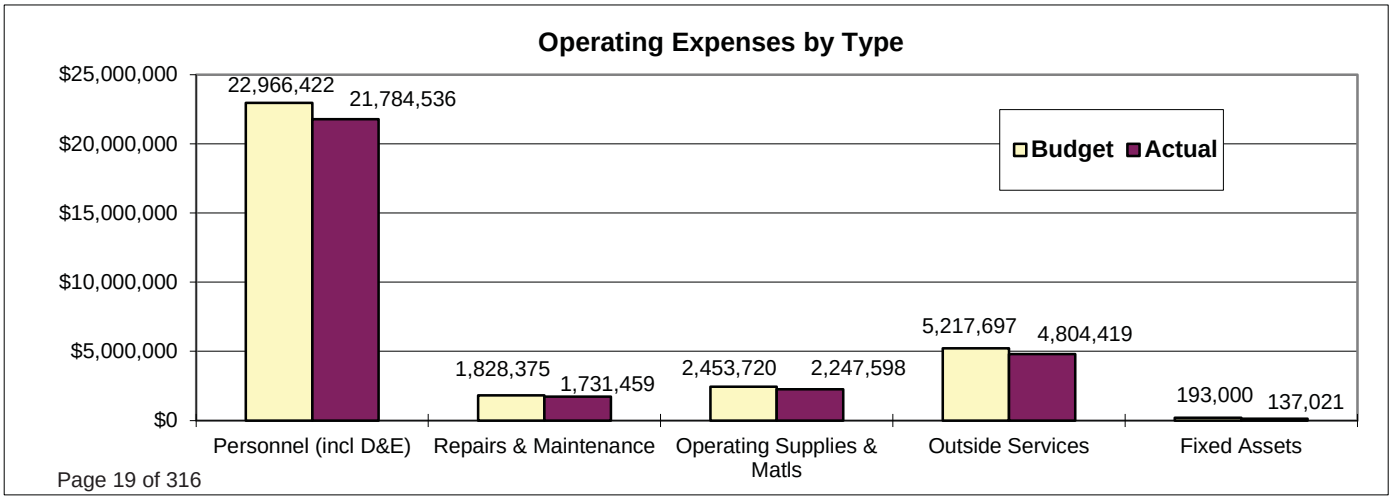
	Budget	Actual	% of Budget Used		Last Year Actuals
Personnel (incl D&E)	$22,966,422	$21,784,536	95%	(100%)*	$21,125,985
Repairs & Maintenance	1,828,375	1,731,459	95%		1,615,427
Supplies & Matls (chemicals, small tools)	2,453,720	2,247,598	92%		2,442,617
Outside Services (utilities, biosolids, legal)	5,217,697	4,804,419	92%		5,493,010
Fixed Assets	193,000	137,021	71%		74,927
Total	$32,659,214	$30,705,033	94%		**$30,751,966**

* Personnel Budget Target

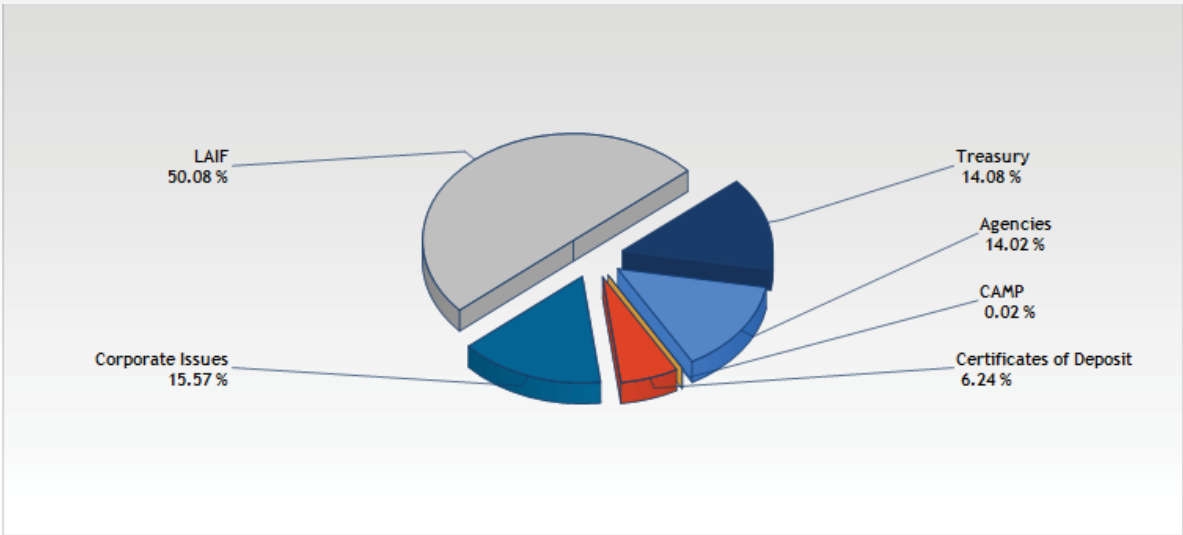

USD Revenues
$50,000,000
$45,000,000
$40,000,000
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$0
Budget
Actual
2,700,000
4,820,637
47,448,461
46,014,344
848,500
1,016,859
299,000
309,600
5,384,200
6,628,715
Capacity Fees
Sewer Service Charges
Operating
Interest
Misc. (incl. SRF proceeds, LAVWMA)


Total USD Expenses
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$0
Budget
Actual
14,872,500
14,644,634
32,666,214
30,757,093
1,708,478
864,281
543,540
543,540
1,057,700
786,059
1,216,000
611,242
250,000
168,089
3,233,389
3,232,669
CIP
Operating/PRTM
Spec. Proj.
Retiree Med.
Vehic & Equip.
Info. Systems
Plant&P.S.
Debt+CntyFee+Misc

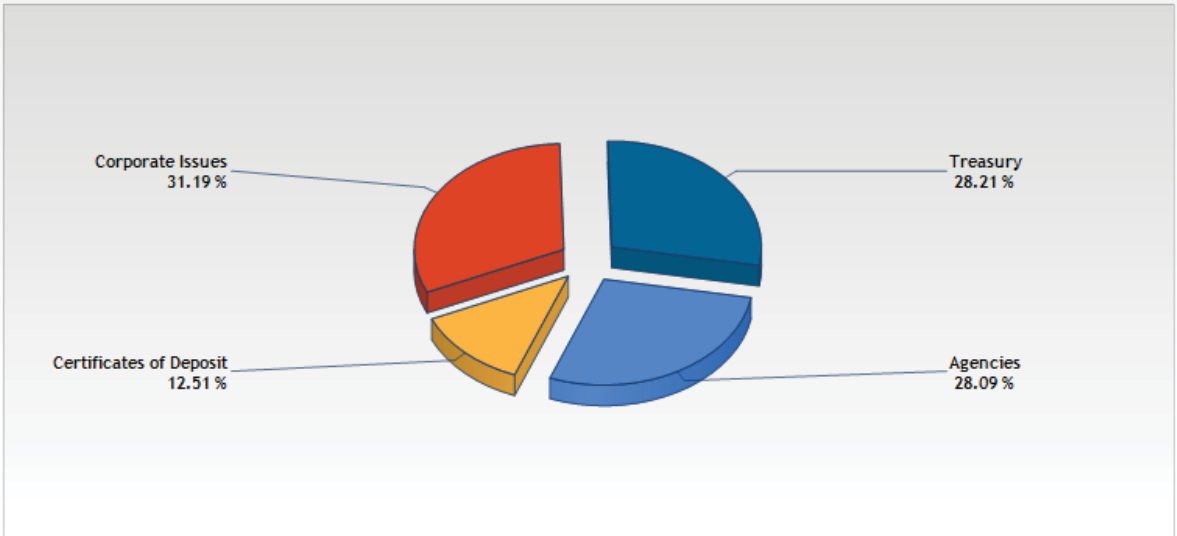

Operating Expenses by Work Group
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
Budget
Actual
170,900
129,598
1,036,505
1,007,661
4,666,100
4,621,632
5,954,753
5,545,556
5,247,562
4,956,792
9,980,700
9,162,286
5,602,694
5,281,508
Board
GM/Admin.
BS
CS
TS
T&D
FMC


Operating Expenses by Type
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$0
Budget
Actual
22,966,422
21,784,536
1,828,375
1,731,459
2,453,720
2,247,598
5,217,697
4,804,419
193,000
137,021
Personnel (incl D&E)
Repairs & Maintenance
Operating Supplies & Matls
Outside Services
Fixed Assets

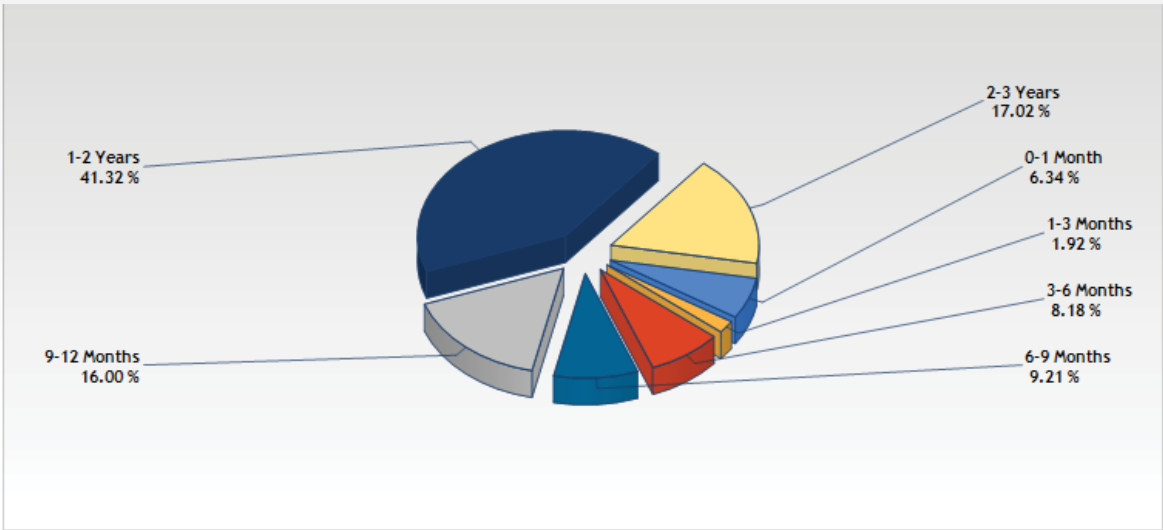
All Portfolio Holdings Distribution by Asset Class



Operating Fund Holdings Distribution by Asset Class



Operating Fund Maturity Distribution



Maturity Range	Face Amount/Shares	YTM @ Cost	Cost Value	Days To Maturity	% of Portfolio	Market Value	Book Value	Duration To Maturity
0-1 Month	1,565,000.00	0.446	1,581,948.20	8	6.34	1,565,152.55	1,565,165.06	0.02
1-3 Months	480,000.00	0.400	480,000.00	65	1.92	480,163.60	480,000.00	0.18
3-6 Months	2,000,000.00	0.330	2,040,480.00	153	8.18	2,010,780.00	2,008,723.16	0.42
6-9 Months	2,286,000.00	0.530	2,296,808.10	223	9.21	2,292,057.95	2,291,360.02	0.61
9-12 Months	4,000,000.00	0.514	3,991,650.00	314	16.00	4,002,350.00	3,996,870.12	0.86
1-2 Years	10,168,000.00	0.877	10,306,422.42	580	41.32	10,286,652.67	10,279,567.87	1.57
2-3 Years	4,240,000.00	0.809	4,246,680.00	829	17.02	4,245,283.04	4,246,623.83	2.24
Total / Average	**24,739,000.00**	**0.694**	**24,943,988.72**	**466**	**100**	**24,882,439.81**	**24,868,310.06**	**1.26**

Union Sanitary District
Board Report - Holdings
Report Format: By Transaction
Group By: Asset Class
Portfolio/Report Group: All Portfolios
As of 6/30/2015

Description	CUSIP/Ticker	Credit Rating 1	Settlement Date	Face Amount/Shares	Cost Value	Coupon Rate	Market Value	YTM @ Cost	Next Call Date	Maturity Date	% of Portfolio
Agencies											
FHLB 0.75 7/28/2017-16	3130A4ZV7	Moodys-Aaa	4/28/2015	1,000,000.00	1,000,000.00	0.750	999,170.00	0.750	4/28/2016	7/28/2017	2.00
FHLB 0.8 3/17/2017-16	3130A4GT3	Moodys-Aaa	3/17/2015	1,000,000.00	1,000,000.00	0.800	1,001,630.00	0.800	3/17/2016	3/17/2017	2.00
FHLB 0.8 5/17/2017	3130A4Q54	Moodys-Aaa	3/27/2015	1,000,000.00	1,001,690.00	0.800	997,860.00	0.720		5/17/2017	2.00
FHLB 0.85 6/16/2017-16	3130A4GU0	Moodys-Aaa	3/16/2015	1,000,000.00	1,000,000.00	0.850	1,001,900.00	0.850	3/16/2016	6/16/2017	2.00
FHLMC 0.75 2/13/2017	3134G6BQ5	Moodys-Aaa	2/13/2015	1,000,000.00	1,000,000.00	0.750	1,000,360.00	0.750		2/13/2017	2.00
FHLMC 1 7/25/2017	3134G3ZH6	Moodys-Aaa	6/24/2015	1,000,000.00	1,004,540.00	1.000	1,003,770.00	0.780		7/25/2017	2.01
FNMA 0.5 3/30/2016	3135GOVA8	Moodys-Aaa	1/24/2014	1,000,000.00	1,000,750.00	0.500	1,001,390.00	0.465		3/30/2016	2.00
Sub Total / Average				**7,000,000.00**	**7,006,980.00**	**0.779**	**7,006,080.00**	**0.731**			**14.02**
CAMP											
CAMP LGIP	LGIP4000	None	5/31/2011	9,795.01	9,795.01	0.090	9,795.01	0.090	N/A	N/A	0.02
Sub Total / Average				**9,795.01**	**9,795.01**	**0.090**	**9,795.01**	**0.090**			**0.02**
Certificates of Deposit											
Ally Bank 1 10/24/2016	02006LKM4	None	10/23/2014	240,000.00	240,000.00	1.000	240,928.12	1.000		10/24/2016	0.48
American Express Bank 1.1 10/24/2016	02587CBZ2	None	10/23/2014	240,000.00	240,000.00	1.100	241,247.31	1.100		10/24/2016	0.48
	02587DYJ1	None	6/5/2015	240,000.00	240,000.00	1.050	240,851.58	1.050		6/5/2017	0.48

Description	CUSIP/Ticker	Credit Rating 1	Settlement Date	Face Amount/Shares	Cost Value	Coupon Rate	Market Value	YTM @ Cost	Next Call Date	Maturity Date	% of Portfolio
American Express Centurian 1.05 6/5/2017											
Bank of China NY 0.5 2/4/2016	06426TCH0	None	2/4/2015	240,000.00	240,000.00	0.500	240,119.64	0.500		2/4/2016	0.48
Bar Harbor Bank 0.7 1/30/2017	066851TT3	None	6/30/2015	240,000.00	240,000.00	0.700	239,662.00	0.700		1/30/2017	0.48
Beal Bank USA 0.45 9/2/2015	07370WLQ7	None	12/3/2014	240,000.00	240,000.00	0.450	240,102.13	0.450		9/2/2015	0.48
BMW Bank North America 0.5 3/14/2016	05568P6V4	None	3/31/2014	240,000.00	239,760.00	0.500	240,080.29	0.552		3/14/2016	0.48
Capital One Bank 1 10/24/2016	140420QG8	None	10/22/2014	240,000.00	240,000.00	1.000	240,928.12	1.000		10/24/2016	0.48
Compass Bank 0.95 6/5/2017	20451PLE4	None	6/5/2015	240,000.00	240,000.00	0.950	240,385.93	0.950		6/5/2017	0.48
Goldman Sachs Bank 1 10/16/2017	38148JQX2	None	4/27/2015	240,000.00	239,520.00	1.000	240,153.04	1.069		10/16/2017	0.48
Great Midwest Bank 0.75 7/27/2016	39083PCK6	None	10/27/2014	240,000.00	240,000.00	0.750	240,261.00	0.750		7/27/2016	0.48
Mizuho Bank USA 0.35 9/4/2015	60688MKK9	None	3/4/2015	240,000.00	240,000.00	0.350	240,061.47	0.350		9/4/2015	0.48
Santander Bank 0.5 2/4/2016	80280JDH1	None	2/4/2015	240,000.00	240,000.00	0.500	240,119.64	0.500		2/4/2016	0.48
Sub Total / Average				**3,120,000.00**	**3,119,280.00**	**0.758**	**3,124,900.27**	**0.767**			**6.24**
Corporate Issues											
Caterpillar Financial 1 3/3/2017	14912L5Z0	Moodys-A2	12/23/2014	1,313,000.00	1,307,603.57	1.000	1,315,914.86	1.190		3/3/2017	2.62
General Electric Capital Corp 1.625 7/2/2015	36962G5Z3	Moodys-A1	3/31/2014	1,000,000.00	1,014,530.00	1.625	1,000,000.00	0.460		7/2/2015	2.03

Description	CUSIP/Ticker	Credit Rating 1	Settlement Date	Face Amount/Shares	Cost Value	Coupon Rate	Market Value	YTM @ Cost	Next Call Date	Maturity Date	% of Portfolio
General Electric Capital Corp 5.4 2/15/2017	36962G2G8	Moodys-A1	3/2/2015	1,085,000.00	1,179,514.35	5.400	1,159,441.85	0.890		2/15/2017	2.36
Internaltional Business Machs 0.45 5/6/2016	459200HL8	Moodys-Aa3	11/26/2013	1,000,000.00	996,840.00	0.450	999,390.00	0.580		5/6/2016	1.99
JP Morgan Chase 2.6 1/15/2016	46625HHW3	Moodys-A3	12/1/2014	566,000.00	577,518.10	2.600	570,488.38	0.775		1/15/2016	1.16
Royal Bank of Canada 2.3 7/20/2016	78008TLB8	Moodys-Aa3	12/23/2014	1,190,000.00	1,217,310.50	2.300	1,209,765.90	0.830		7/20/2016	2.44
US Bankcorp 2.2 11/15/2016	91159HHB9	Moodys-A1	3/31/2015	900,000.00	920,304.00	2.200	915,516.00	0.797		11/15/2016	1.84
Well Fargo Bank 0.75 7/20/2015	94985H5F7	Moodys-Aa2	3/31/2014	565,000.00	567,418.20	0.750	565,152.55	0.420		7/20/2015	1.14
Sub Total / Average				**7,619,000.00**	**7,781,038.72**	**2.124**	**7,735,669.54**	**0.782**			**15.57**
LAIF											
LAIF LGIP	LGIP1002	None	4/30/2011	25,032,178.12	25,032,178.12	0.290	25,032,178.12	0.290	N/A	N/A	50.08
Sub Total / Average				**25,032,178.12**	**25,032,178.12**	**0.290**	**25,032,178.12**	**0.290**			**50.08**
Treasury											
T-Bond 0.25 5/16/2016	912828VC1	Moodys-Aaa	1/24/2014	1,000,000.00	994,530.00	0.250	999,690.00	0.488		5/16/2016	1.99
T-Note 0.375 2/15/2016	912828UM0	Moodys-Aaa	1/24/2014	1,000,000.00	999,530.00	0.375	1,001,250.00	0.398		2/15/2016	2.00
T-Note 0.5 6/15/2016	912828VG2	Moodys-Aaa	3/27/2014	1,000,000.00	999,530.00	0.500	1,001,880.00	0.521		6/15/2016	2.00
T-Note 0.875 1/15/2018	912828H37	Moodys-Aaa	6/1/2015	1,000,000.00	1,001,560.00	0.875	1,000,310.00	0.815		1/15/2018	2.00
T-Note 0.875 11/15/2017	912828G20	Moodys-Aaa	6/24/2015	1,000,000.00	1,001,060.00	0.875	1,001,880.00	0.830		11/15/2017	2.00
T-Note 1.375 11/30/2015	912828PJ3	Moodys-Aaa	12/20/2013	2,000,000.00	2,040,480.00	1.375	2,010,780.00	0.330		11/30/2015	4.08

Description	CUSIP/Ticker	Credit Rating 1	Settlement Date	Face Amount/Shares	Cost Value	Coupon Rate	Market Value	YTM @ Cost	Next Call Date	Maturity Date	% of Portfolio
Sub Total / Average				**7,000,000.00**	**7,036,690.00**	**0.807**	**7,015,790.00**	**0.529**			**14.08**
Total / Average				**49,780,973.13**	**49,985,961.85**	**0.746**	**49,924,412.94**	**0.492**			**100**

All investment actions executed since the last report have been made in full compliance with the District's Investment Policy.
The District will meet its expenditure obligations for the next six months.
Market value sources are the LAIF, CAMP, and BNY Mellon monthly statements.

Union Sanitary District
Board Report - Activity
Portfolio/Report Group: All Portfolios
From 5/31/2015 To 6/30/2015

Description	CUSIP/Ticker	Face Amount/Shares	Principal	Interest/Dividends	Coupon Rate	YTM @ Cost	Settlement Date	Total
BUY								
American Express Centurian 1.05 6/5/2017	02587DYJ1	240,000.00	240,000.00	0.00	1.050	1.050	6/5/2015	240,000.00
Bar Harbor Bank 0.7 1/30/2017	066851TT3	240,000.00	240,000.00	0.00	0.700	0.700	6/30/2015	240,000.00
Compass Bank 0.95 6/5/2017	20451PLE4	240,000.00	240,000.00	0.00	0.950	0.950	6/5/2015	240,000.00
FHLMC 1 7/25/2017	3134G3ZH6	1,000,000.00	1,004,540.00	4,138.89	1.000	0.780	6/24/2015	1,008,678.89
T-Note 0.875 1/15/2018	912828H37	1,000,000.00	1,001,560.00	3,311.46	0.875	0.815	6/1/2015	1,004,871.46
T-Note 0.875 11/15/2017	912828G20	1,000,000.00	1,001,060.00	951.09	0.875	0.830	6/24/2015	1,002,011.09
Sub Total / Average		**3,720,000.00**	**3,727,160.00**	**8,401.44**				**3,735,561.44**
CALLED								
FHLMC 0.5 6/20/2016-14	3134G4N38	1,000,000.00	1,000,000.00	0.00	0.500	0.000	6/20/2015	1,000,000.00
FHLMC 1.05 6/30/2017-15	3134G5TE5	1,000,000.00	1,000,000.00	0.00	1.050	0.000	6/30/2015	1,000,000.00
Sub Total / Average		**2,000,000.00**	**2,000,000.00**	**0.00**				**2,000,000.00**
DEPOSIT								
CAMP LGIP	LGIP4000	0.71	0.71	0.00		0.000	6/30/2015	0.71
LAIF LGIP	LGIP1002	900,000.00	900,000.00	0.00		0.000	6/19/2015	900,000.00
Sub Total / Average		**900,000.71**	**900,000.71**	**0.00**				**900,000.71**
INTEREST								
CAMP LGIP	LGIP4000	0.00	0.00	0.71		0.000	6/30/2015	0.71
Discover Bank 0.5 6/11/2015	254671D72	0.00	0.00	598.36	0.500	0.000	6/11/2015	598.36
FHLMC 0.5 6/20/2016-14	3134G4N38	0.00	0.00	2,500.00	0.500	0.000	6/20/2015	2,500.00
FHLMC 1.05 6/30/2017-15	3134G5TE5	0.00	0.00	5,250.00	1.050	0.000	6/30/2015	5,250.00
General Electric Capital Corp 2.375 6/30/2015	36962G5F7	0.00	0.00	5,937.50	2.375	0.000	6/30/2015	5,937.50

Description	CUSIP/Ticker	Face Amount/Shares	Principal	Interest/Dividends	Coupon Rate	YTM @ Cost	Settlement Date	Total
Great Midwest Bank 0.75 7/27/2016	39083PCK6	0.00	0.00	152.88	0.750	0.000	6/27/2015	152.88
Merrick Bank 0.5 6/30/2015	5912Y5Y9	0.00	0.00	101.92	0.500	0.000	6/28/2015	101.92
T-Note 0.5 6/15/2016	912828VG2	0.00	0.00	2,500.00	0.500	0.000	6/15/2015	2,500.00
Sub Total / Average		**0.00**	**0.00**	**17,041.37**				**17,041.37**
MATURED								
Discover Bank 0.5 6/11/2015	254671D72	240,000.00	240,000.00	0.00	0.500	0.000	6/11/2015	240,000.00
General Electric Capital Corp 2.375 6/30/2015	36962G5F7	500,000.00	500,000.00	0.00	2.375	0.000	6/30/2015	500,000.00
Merrick Bank 0.5 6/30/2015	5912Y5Y9	240,000.00	240,000.00	0.00	0.500	0.000	6/30/2015	240,000.00
Sub Total / Average		**980,000.00**	**980,000.00**	**0.00**				**980,000.00**
WITHDRAW								
LAIF LGIP	LGIP1002	2,300,000.00	2,300,000.00	0.00		0.000	6/1/2015	2,300,000.00
LAIF LGIP	LGIP1002	600,000.00	600,000.00	0.00		0.000	6/12/2015	600,000.00
LAIF LGIP	LGIP1002	770,000.00	770,000.00	0.00		0.000	6/17/2015	770,000.00
LAIF LGIP	LGIP1002	1,300,000.00	1,300,000.00	0.00		0.000	6/23/2015	1,300,000.00
LAIF LGIP	LGIP1002	1,100,000.00	1,100,000.00	0.00		0.000	6/26/2015	1,100,000.00
Sub Total / Average		**6,070,000.00**	**6,070,000.00**	**0.00**				**6,070,000.00**

MONTHLY OPERATIONS REPORT FOR THE MONTH OF JUNE 2015
TECHNICAL SUPPORT WORK GROUP SUMMARY

Capital Improvement Program

Cogeneration Project – The Board accepted the project on June 8, 2015.

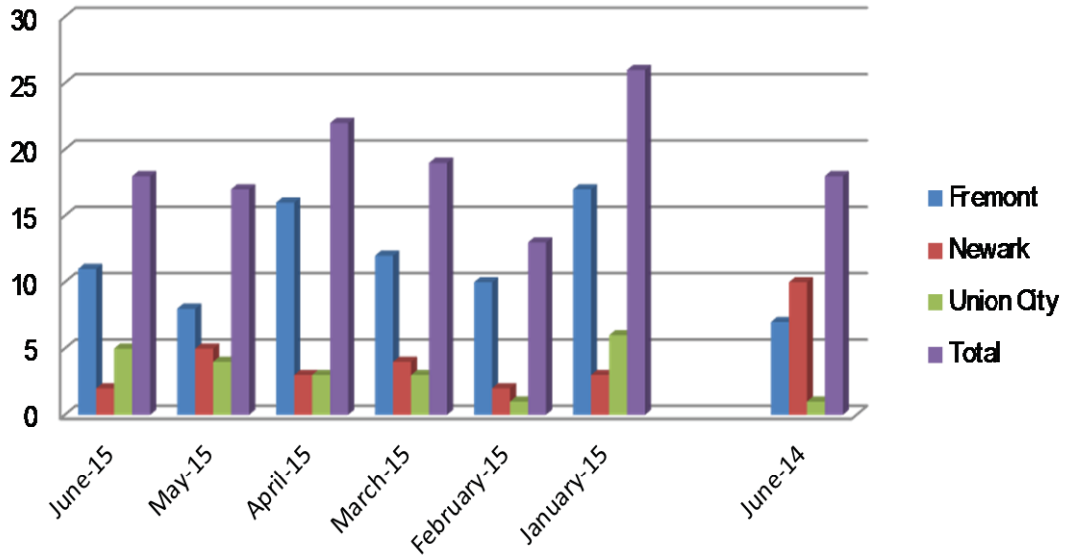
Thickener Control Building Improvements Project – The contractor completed the installation of the concrete thrust wall east of the Thickener Control Building. Installation of the power feeds for new MCC-31 at the Thickener Electrical Building and MCC-32 at the Heating and Mixing Building No. 1 Electrical Room has been completed. Contractor has commenced the incorporation of new PLC-44 and PLC-45 into USD's existing SCADA network. Equipment cutovers inside of Heating and Mixing Building No. 1 and the replacement of scum pumps in Sludge Pump Room No. 3 is scheduled to take place in July.

Newark Backyard Sanitary Sewer Relocation Project Phase 2 – The mains and sanitary sewer laterals on George Avenue, Jennifer Street and Zulmida Avenue have been completed.

Customer Service

Trouble Calls dispatched from the Front Desk during business hours:

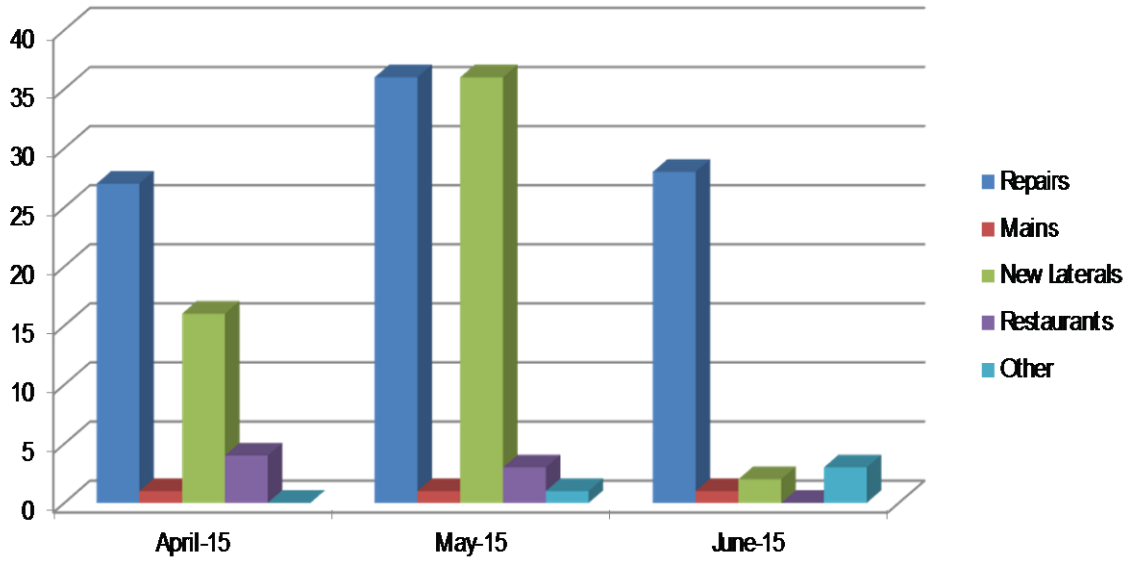
Month	Fremont	Newark	Union City	Total
June-15	11	2	5	**18**
May-15	8	5	4	**17**
April-15	16	3	3	**22**
March-15	12	4	3	**19**
February-15	10	2	1	**13**
January-15	17	3	6	**26**
June-14	*7*	*10*	*1*	*18*
			6-Month Total	**115**



Sewer Permits Issued

Month	Repairs	Mains	New Laterals	Restaurants	Other
June-15	28	1	2	0	3
May-15	36	1	36	3	1
April-15	27	1	16	4	0

New Laterals - New residential lateral connections
Other - Non-residential construction (except restaurants)



Communication & Graphics

- Developed District communications regarding budget, expenses and rates with General Manager
- Worked with web designer to create new sewer service charges menu bar and web page, formatted and uploaded budget, expenses and rates communication materials
- Union City Chamber of Commerce activities – Board President. Chaired Board meetings, met with office staff and chamber ambassadors, networked with contacts regarding future activities, met with staff members. Emceed and facilitated General Membership meeting on June 23, 2015. Sent thank-you notes to attendees
- Uploaded Ordinance 36.03 to Industrial ordinance page
- Forwarded photos and media info regarding Ring Rescue for WEF contact
- Forwarded plant photo for NACWA Platinum Award video
- Website redesign project activities – continued work with co-leader Richard Scobee; meeting for feedback from internal groups in July
- Participated in CASA Federal Legislative Committee conference call with General Manager

Environmental Compliance

Pollution Prevention Program

USD's Environmental Compliance team conducts pollution prevention inspections to restaurants, car wash business, and other commercial facilities. EC also conducts inspections and enforcement for the City of Fremont's Environmental Services group. We conduct over 600 Stormwater compliance inspections every year

to ensure that commercial facilities, including restaurants and auto shops, comply with City Ordinance requirements, and do not discharge pollutants to the creeks and bay.

For the past month, the EC team conducted 73 Stormwater (Urban Runoff), and 86 FOG (restaurant) inspections. Inspectors identified 23 Stormwater and 33 FOG enforcement actions. 11 of the Stormwater enforcements resulted in administrative fines ranging from $100 to $500. Five of the fines were for repeated violations, four were for illicit discharges to Fremont's storm drain systems, one for violation of Best Management Practices, and one in response to a call-out.

Urban Runoff Inspections and Enforcements

June 2015	No. of UR Inspections	VW	WL	NOV	AF	LA	Total Enforcements		No. of Illicit Discharge/s	4
	73	6	1	5	11	0	23		% enforcement	32%

FOG Inspections and Enforcements

June 2015	No. of FOG Inspections	VW	WL	NOV	AF	LA	Total Enforcements		% enforcement	38%
	86	22	11	0	0	0	33			

Enforcements:

VW –Verbal Warning *WL – Warning Letter* *NOV – Notices of Violation*
AF – Administrative Fine *LA – Legal Action* *NOD – Notice of Deficiency*
AO – Administrative Order *C&D – Cease & Desist Order* *SNC – Significant Non Compliance*

Dental Inspections, School Outreach, and Plant Tours

# of Dental Inspections	# of School Outreach Events including Sewer Science	# of Plant Tours
2	None	2-IAC members, Red Hat Ladies

Industrial Pretreatment

The Industrial Pretreatment program has a number of pending permits as shown in the table below. USD inspectors are working with each of these companies to establish permitted industrial discharges.

Pending Permits

New Industrial/Groundwater Permits	Groundwater/Temporary
Ceramic Tech-Class II	Ghilotti Construction Company-Groundwater
Gooch and Housego- Class II	Preston Pipelines- Groundwater
Mission Linen-Class I	
De Anza Tile-Class II	

Permits Issued

Company Name	Date Permit Issued
Cratus, Inc. (GW Permit)	6/30/2015

Industrial Closures

Company Name	Date of Closure
None	

Reports (Annual & Semi-Annual Pretreatment Report, Union City Report, etc.)

Report Name	Date Report Completed and Submitted
None	

Enforcement Action

IU Name & Nature of Business	Comments	City	Parameters Violated	Discharge concentration (mg/L)	USD/Fed Limit Violated (mg/L)	Enforcement *(1)*
Steve P. Rados Inc., Groundwater Permit	Failure to submit termination documentation for permit	F	Failure to submit required documents	N/A	N/A	WL

(1) WL – Warning Letter *NOV – Notices of Violation* *AO – Administrative Order*
C&D – Cease and Desist Order *SNC – Significant Non Compliance* *EM – Enforcement Meeting*

Other - Team training, Special Meetings, Conferences, Special Recognition, IAC (topics)

Activity	Date of Event	Attendees
BAPPG Meeting	June 3, 2015	Doug Dattawalker
MEDS Coalition Meeting	June 15, 2015	Doug Dattawalker
Industrial Advisory Council	June 24, 2015	Western Digital, Safety Kleen, Clean Sciences, Boehringer Ingelheim, Tesla
Annual Alameda County Stormwater Training	June 2, 2015	Pretreatment and Stormwater field staff

Engineering/Construction

No. of projects under construction: 3

	Construction Projects	Capital ($1000)	Scheduled Completion	Completed Scope	Completed Time	Comments for June 2015 Activity
1.	Cogeneration Project – Raymond	$10,566	2/15	100%	100%	The Board accepted the project on June 8th.
2.	Thickener Control Building Improvements Project – Curtis	$9,990	9/16	45%	45%	Contractor has commenced the incorporation of new PLC-44 and PLC-45 into USD's existing SCADA network.
3.	Newark Backyard SS Relocation – Phase 2 – Rollie/Al B.	$2,100	10/15	30%	30%	Mains and SS laterals on George, Jennifer and Zulmida complete.

Design/Study

No. of projects in design/study phase: 13

	Design/Study Projects	Capital ($1000)	Scheduled Completion	Completed Scope	Completed Time	Comments for June 2015 Activity
1.	Irvington Basin Master Plan Update – Capacity Assessment - Rollie	$231	6/15	90%	95%	Draft report submitted for staff review.
2.	Seismic Study - Raymond	$210	6/15	95%	95%	Draft report of detailed seismic assessments submitted for staff review.
3.	Cast Iron Lining Phase VI – Andrew	In-House	12/14	100%	100%	Design completed.
4.	Miscellaneous Spot Repairs Phase VI – Andrew	In-House	4/15	100%	100%	Construction contract awarded to Cratus Inc. on June 22nd. Pre-construction meeting held on June 30th.
5.	Alvarado-Niles Road SS Rehabilitation – Chris E.	$248	4/15	95%	95%	Project design on hold; pending schedules of other construction activities on Alv.-Niles Rd.
6.	Pine St. Easement Improvements – Chris E.	$59	7/15	75%	95%	Rehabilitation alternative being evaluated.
7.	Plant Site Use Study – Curtis	$200	6/15	100%	100%	Staff presented findings to the Board on June 15th.
8.	MCC and PLC Replacement Project, Phase 3 – Chris P.	$78	6/15	80%	90%	PLC programmer proposals were received. ANC has been selected. The design will be completed in July.
9.	Generator Controls Upgrade Project – Chris P.	$72	6/15	55%	80%	Draft predesign report will be due in August.
10.	Plant Facilities Improvements Project – Thomas	$318	10/15	10%	10%	Consultant is working on 50% design and estimate. Reviewing District selection criteria to sole-source four pieces of equipment in the project.
11.	Pump Station Master Plan – Raymond	$175	7/15	85%	85%	Draft report submitted for staff review.

	Design/Study Projects	Capital ($1000)	Scheduled Completion	Completed Scope	Completed Time	Comments for June 2015 Activity
12.	Aeration Blower Project – Curtis	$96	12/15	40%	48%	Received intermediate submittal on June 2nd. Blower needs to be relocated to the east aeration blower building. Re-submittal of 50% design will be due in July.
13.	Newark Backyard SS Relocation Phase 3 – Al/Rollie	$160	02/16	16%	16%	Site visit to 67 out of 72 homes complete. Lateral plans are being designed for property owner approval.

COLLECTION SERVICES
ACTIVITIES REPORT
June 2015

Progress/Accomplishments

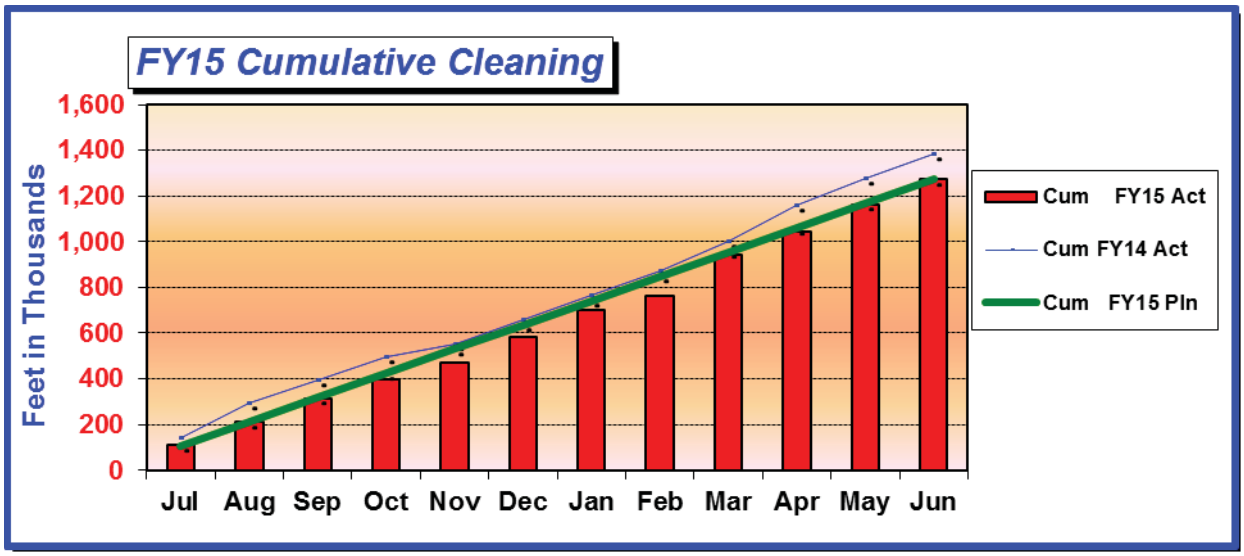
- Completed over 21 miles of cleaning and over 15 miles of televising of sewer lines in June
- Responded to 17 service request calls in June
- Completed a total of 7 main repairs in June
- Marked and located all sewer lines (Underground Service Alerts)
- Provided support on the following projects: City of Fremont and Union City chip seal and overlay projects, Mobile Technologies' Study, Newark Lateral Relocation
- Continued on our progress on catching up on 72 Month Cleaning and Inspection PMP

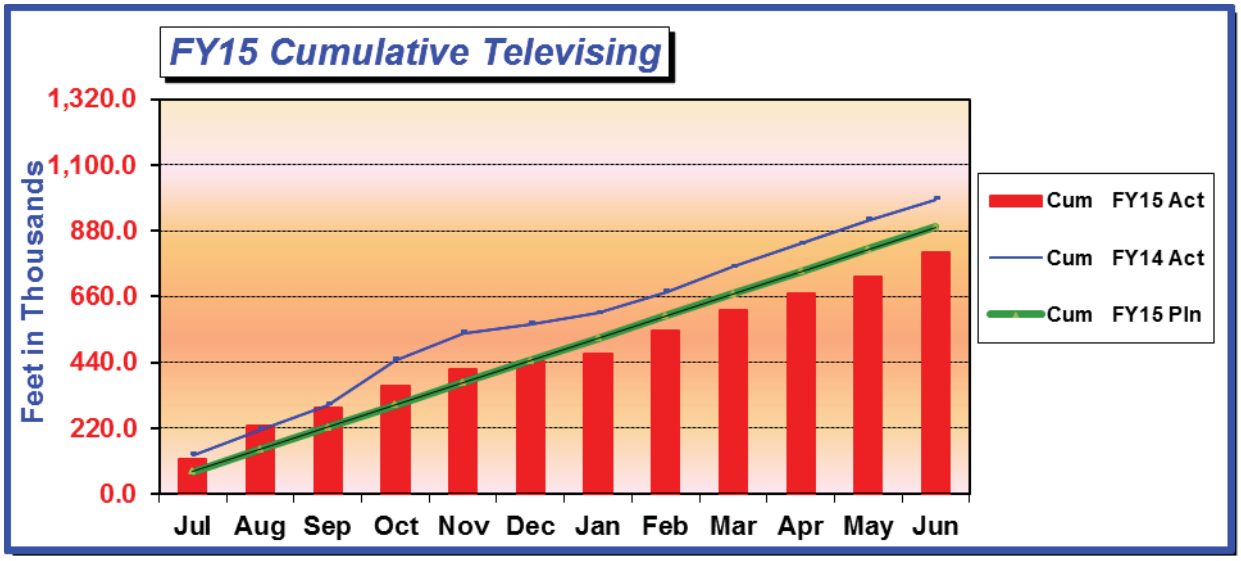
Training for Collections included; Tractor Loader/Back Hoe training and assessments on 18 employees, USA, Trouble Call and SSO training and assessments on 2 employees, Vactor operation assessments on 18 employees. Back Safe and IIPP training for the work group.

Future Planning

- Evaluation of our Collection System Preventative Maintenance Program

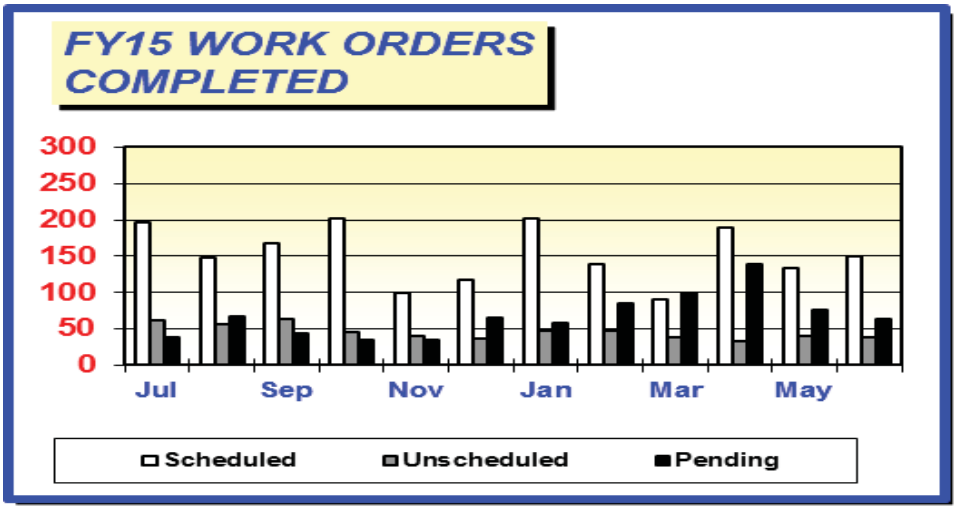
Performance Measures



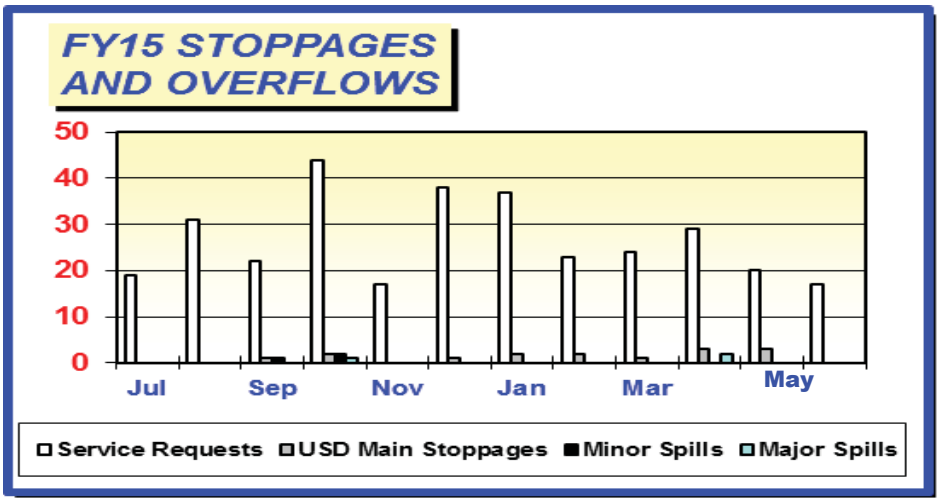


Other Collection Services Status Data:

Support Team Work Order Status:



C/S Maintenance Status:



FMC
Activities Report
June 2015

Progress/Accomplishments

- Completed 98% of preventive maintenance activities for the month of June
- Completed 103 corrective maintenance work orders for the month of June
- Overhauled Centrifuge #4
- Modified GBT Poly Tank ladders
- Replaced actuators at Boyce Lift Station
- Replaced actuator for West Force Main valve at Headworks

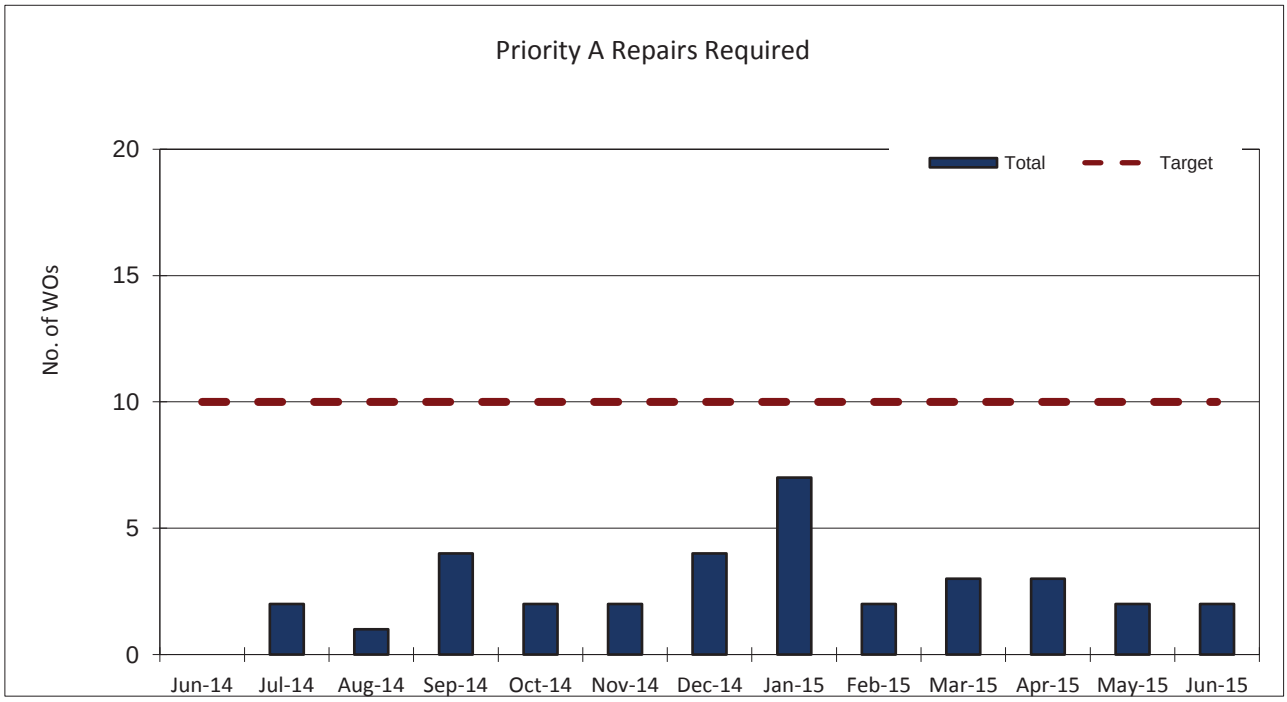
Future Planning

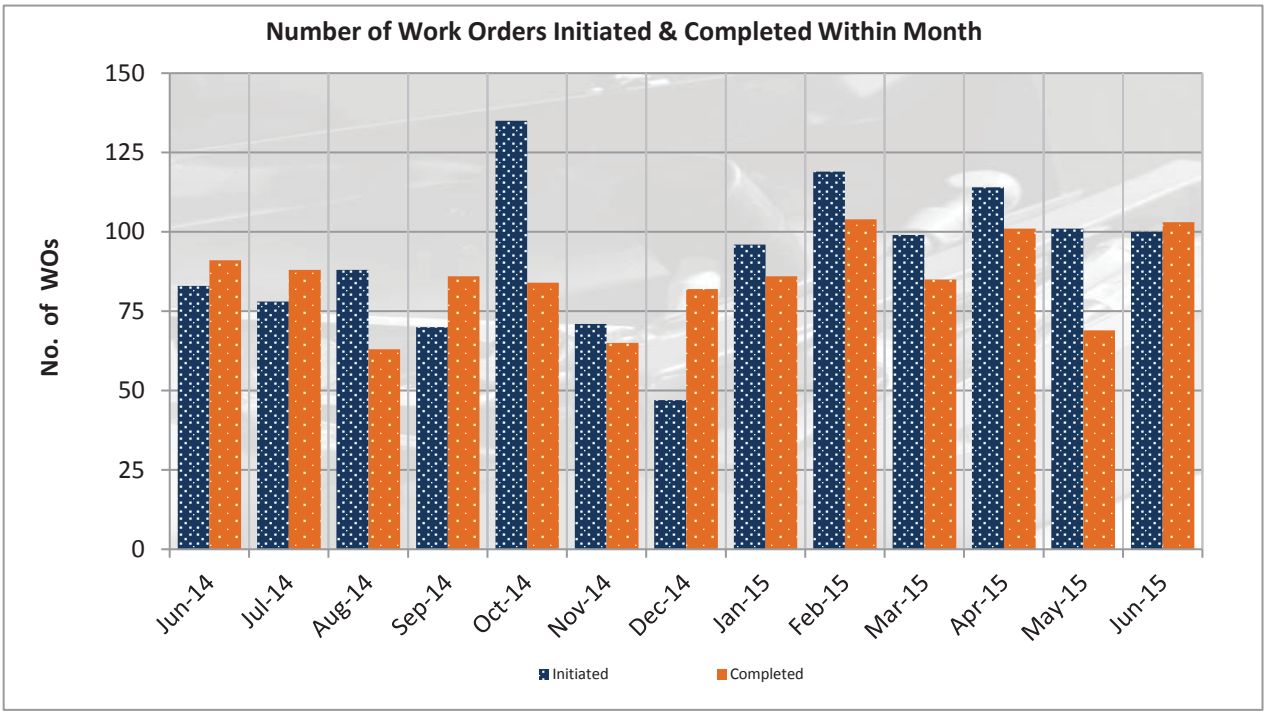
- Complete Cheese Waste Project
- Cherry St. pH probe installation
- Headworks sampler installation

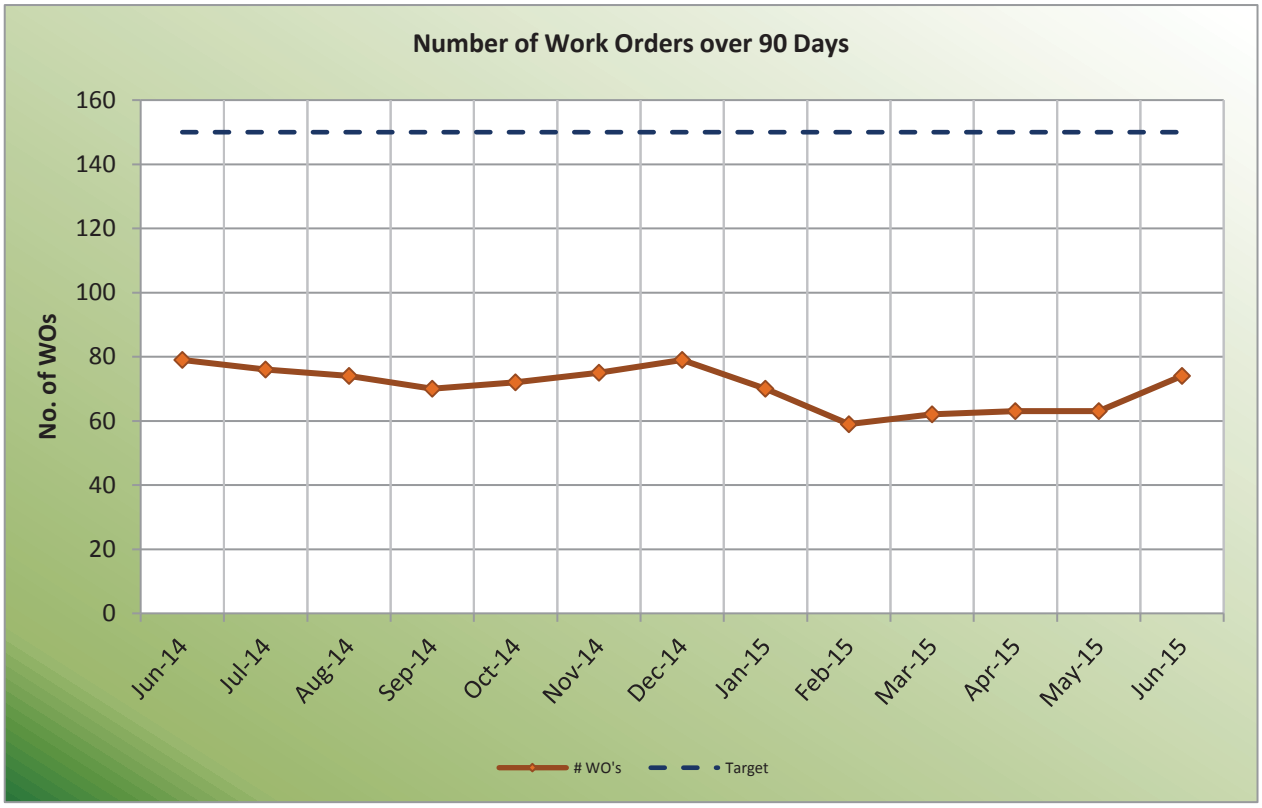
Other

- Isolated the East Force Main
- Recruitment for Planner/Scheduler
- New FMC Coach was appointed

Performance Measurements




Number of Work Orders Initiated & Completed Within Month
No. of WOs
150
125
100
75
50
25
0
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Initiated
Completed


Number of Work Orders over 90 Days
No. of WOs
160
140
120
100
80
60
40
20
0
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
WO's
Target

Treatment & Disposal
Activities Report
June 2015

Progress/Accomplishments

- Completed 99.5% preventive maintenance activities for the month of June.
- Prepared and submitted the Annual Information Update for the treatment plant to BAAQMD.
- Finalized the Hayward Marsh Rehabilitation Options Study and conducted a USD Board workshop.
- Attended WEF Residual/Biosolids specialty conference.
- Conducted QAI for TPO Coach recruitment.
- Conducted fourth quarter and annual safety recommendation for the R&S team.
- Completed layup of the east forcemain.
- Attended the annual meeting of BACWA air permit committee with the BAAQMD.
- Answered EPA and Regional Board technical questions for the renewal of the Old Alameda Creek Wet Intermittant Wet Weather Discharge permit.
- Discussed scoping for the CIP sudy to determine solids handling capacity and optimization options.
- Calculated toxic pollutant loading to determine cost for Regional Monitoring Program fees.

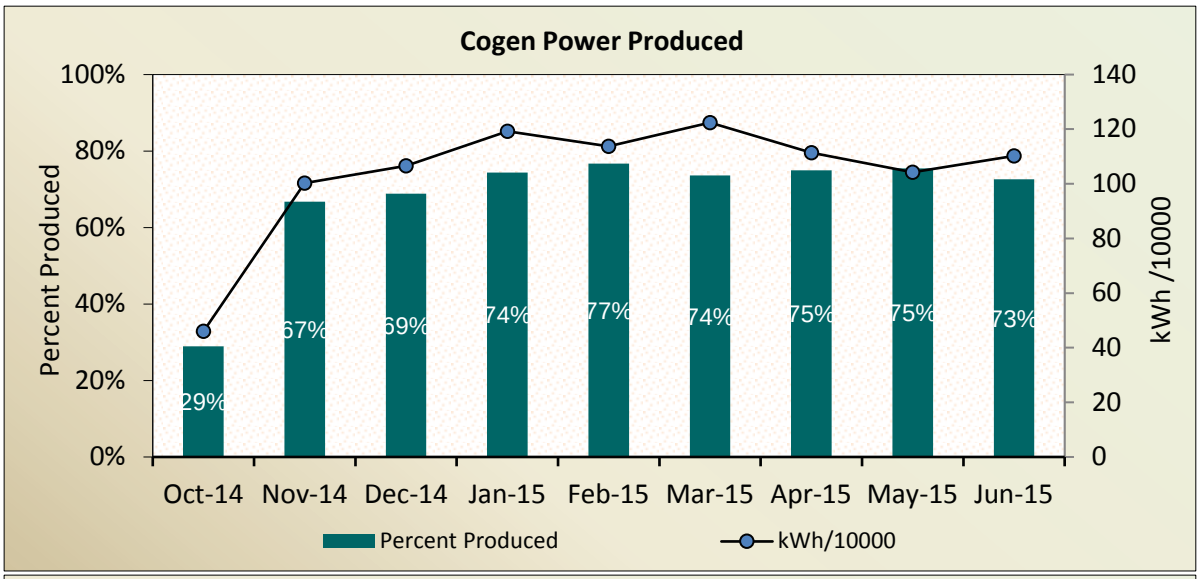
Future Planning

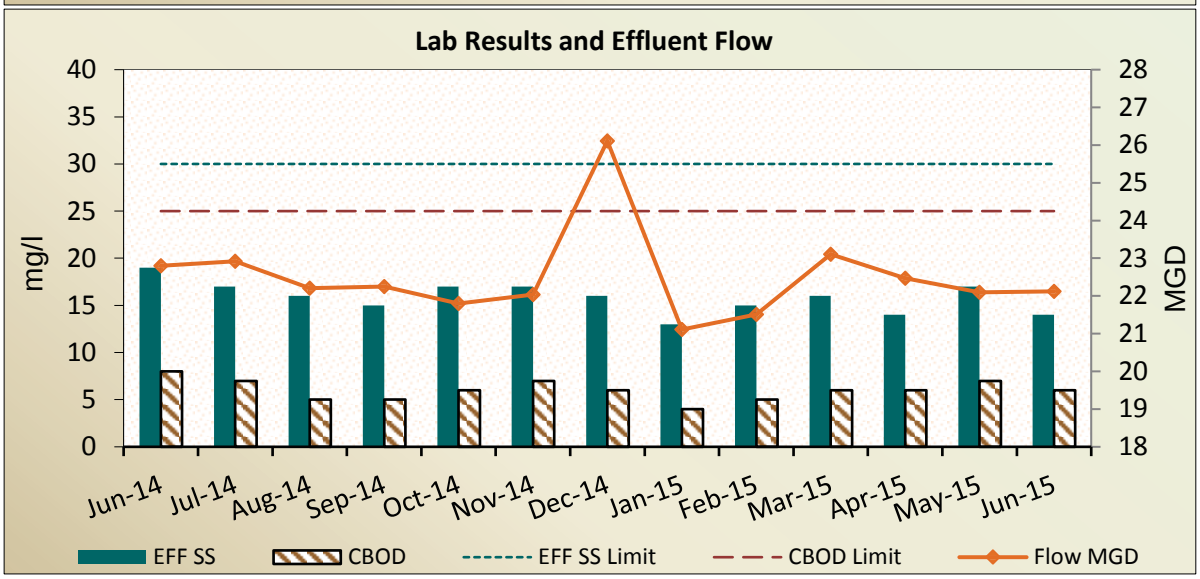
- Review administrative draft of the Old Alameda Creek Intermittant Wet Weather Discharge permit.
- Pursue accelerated approval by the State for the field measurement of chlorine residual by DPD during wet weather operations.
- Prepare for the ELAP recertification of the treatment plant laboratory.
- Research opportunities for testing digester enzymes to increase digester gas production at the treatment plant.
- Investigate in-situ aeration basin membrane cleaning methods to improve aeration efficiency.
- Conduct side stream sampling as part of the nutrient reduction project required by the nutrient watershed permit.
- Conduct dye testing of the Old Alameda Creek intermittant wet weather discharge dechlorination system to confirm proper mixing.

Other

- Cogen system produced 73% of power consumed for the month of June.

Performance Measurements





USD's Final Effluent Monthly Monitoring Results				
Parameter	**EBDA Limit**	**Apr 2015**	**May 2015**	**Jun 2015**
Copper, µg/l	78	4.6	4.6	6.6
Mercury, µg/l	0.066	0.00219	0.00259	0.00450
Cyanide, µg/l	42	< 3.0	< 3.0	3.0 E
Ammonia- N, mg/L (Range)	130	36 - 43	42 - 44	36 - 42
Dioxin-Toxicity Equivalent (TEQ), µg/l	2.8×10^{-8}	not tested	not tested	not tested
Fecal Coliform, MPN/100ml (Range)				
• 5-Sample Geometric Mean	500	11 - 45	21 - 30	19 - 37
• 11-Sample 90th Percentile	1100	52 - 172	40 - 107	40 - 57
Enterococci *				
• 5-Sample Geometric Mean	242	30 - 63	10 - 75	10 - 75

E = Estimated value, concentration outside calibration range. For SIP, E = DNQ, estimated concentration.

* Enterococci values are the weekly concentration range not the 5-Sample Geometric Mean range.

Resolution Number 2765

Honoring District General Counsel David M. O'Hara Upon His Retirement

***WHEREAS**, David M. O'Hara has served as District General Counsel for over 37 years since beginning his tenure in October 1977, following Marvin Haun; and*

***WHEREAS**, David M. O'Hara served the District during the Union City Waste Water Treatment Plant construction and expansion circa 1987; and*

***WHEREAS**, David M. O'Hara served as Chair of the California Association of Sanitation Agencies Attorneys Committee from 1998-2000; and*

***WHEREAS**, David M. O'Hara has served as General Counsel for five Union Sanitary District General Managers: Boege, Daniels, Hayashi, Currie, and Eldredge; and*

***WHEREAS**, David M. O'Hara has exhausted (the patience of) 23 Board Members.*

***NOW, THEREFORE, BE IT RESOLVED** that the Union Sanitary District Board of Directors hereby expresses congratulations and best wishes to David M. O'Hara on his retirement.*

***APPROVED THIS DATE**: July 27, 2015*

_____

PRESIDENT, Board of Directors

ATTEST:

_____

SECRETARY, Board of Directors

UNION SANITARY DISTRICT

Directors
Manny Fernandez
Tom Handley
Pat Kite
Anjali Lathi
Jennifer Toy

Officers
Paul R. Eldredge
General Manager/
District Engineer

David M. O'Hara
Attorney

DATE: July 17, 2015

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul Eldredge, General Manager/District Engineer
Rich Cortes, Business Services Manager
Kathryn Destafney, Business Services Coach

SUBJECT: Agenda Item No. 9 – Meeting of July 27, 2015
APPROVE THE SALARY FOR THE POSITION OF BUYER I

Recommendation

Approve the salary recommendation.

Background

The District has not had a Buyer I in many years; however, due to the current Buyer II's retirement in early September, for the upcoming recruitment we plan to recruit at the Buyer I/II level. Therefore, the Buyer I job description (dated 10/25/1993) was reviewed and numerous updates were made (Attachment 1).The most significant changes include:

- Updated language to reflect language on current District job descriptions.
- Changed from "entry" level to "sub-journey" level, as some experience is required for the Buyer I position. Generally, entry level signifies no experience is required.
- Changed requirement for alternate staffing to Buyer II from 1 year to "after completing the probationary period and meeting the qualifications for and demonstrating the proficiencies required of the Buyer II classification." This was changed because the Buyer I will come in with a college degree and some experience/advanced certification and must take on the responsibilities at the Buyer II level as soon as possible.
- Added that incumbents must promote to Buyer II within 2 years or their employment will be terminated. The reason for this change is that because the

Buyer must back up the Purchasing Agent when he/she is out of the office; therefore, the Buyer must be able to perform all of the requirements of the Buyer II position. This requirement has been adopted for the Junior Engineer to Assistant Engineer and Planner/Scheduler I to II.

- Examples of Duties were updated to accurately reflect current Buyer tasks.
- Qualifications: Changed Education and Experience from “completion of twelfth grade or its equivalent and two years of experience” to “completion of a 4 year degree in business administration or a related field and 1 year of experience….”.

HR researched both the job descriptions and salaries for Buyer I and II (or equivalent) positions at other agencies (Attachment 2). The results of this research are attached. Most of the agencies surveyed require a 4 year degree for a Buyer I, which makes sense because the Buyer I must back up the Purchasing Agent, which has always required a 4-year degree at the District.

Currently, the salary of the Buyer I is set 15% lower than that of the Buyer II with the Buyer I requiring only a high school education or the equivalent and the Buyer II requiring a 4-year degree. Because the Buyer I job description now requires a 4-year degree, the pay difference between the Buyer I and II levels should reflect this higher-level qualification and align with the differences in pay of the other agencies. There is no recommendation for any increase to the Buyer II salary range.

Recommendation:

- Based on the results of the HR salary survey and the per cent difference between the salaries of the Buyer I and II obtained in that survey, that the proposed salary change to the Buyer I classification be approved.

Attachments:

1. Revised Buyer I job description
2. HR salary survey

Union Sanitary District

Buyer I

Class Description

Definition

~~As a team member, u~~Under general supervision in a team environment, performs basic administrative and purchasing duties, and specialized, technical, and administrative functions in the purchasing of materials, supplies, services, and capital equipment; ~~, including assisting in inventory control and materials handling;~~ provides information related to purchasing policies and procedures to staff and vendors; and performs ~~related work as required and~~ other duties as assigned. As experience and proficiency are gained, assignments become more varied and complex, and levels of independent action increase within established guidelines. ~~This class is alternately staffed, and a Buyer I normally advances to Buyer II after gaining experience and achieving proficiency that meet the requirements of the higher-level classification.~~

This is a sub-journey level position in the Buyer Series. This classification is alternately staffed and incumbents may advance to the Buyer II classification after completing the probationary period and meeting the qualifications for and demonstrating the proficiencies required of the higher-level classification. Incumbents must promote to Buyer II within 2 years or employment will be terminated.

Examples of Duties *(Illustrative Only)*

- Reviews requisitions for completeness; ~~the purchase of materials, supplies, equipment, and services;~~ checks for proper authorization, complete descriptions and specifications, proper terms, conditions, and ~~proper~~ account allocation; contacts appropriate ~~department~~ Team/Work Group ~~and/or division~~ for further information as needed.

- ~~prepares,~~ ~~S~~sources and compares information on requisitions; issues purchase orders for procurement of goods and services in conformance with established procurement and correct bidding procedures;~~,~~ ~~places,~~ monitors progress of purchase orders; ensures accuracy and timely delivery; investigates overdue orders; and reconciles ~~delivered merchandise with purchase order/invoice~~discrepancies on delivered orders.

- ~~Assists with procurement of goods and services in conformance with established procurement and correct bidding procedures.~~

- ~~Receives, sorts, shares, and distributes supplies in a timely manner.~~

- Confers with a variety of vendors regarding availability, costs, quality, quantity, and delivery of materials by phone, letter, personal visits or bids; reviews catalogues for information on new merchandise and new sources of supply.

- Assists in the preparation of informal requests for quotation (RFQs), ~~requests for proposal (RFPs),~~ and specifications; updates vendor listing for bidding purposes; ~~learns to~~ evaluates bids received and assists with recommendations of contract awards..

- Assists with ~~the development of diversified sources for the purchasing of supplies, services, and equipment~~the identification of potential vendors for supplies, services, and equipment.

- Provides information regarding established purchasing policies and procedures to staff and vendors.

- ~~Learns to and maintains adequate stock; assists in establishing order points and determining standard and economic order quantities for materials and supplies; assists in pricing and inventory control; picks up and delivers parts and supplies as needed.~~

- ~~Assists with warehouse inventory control, including reviewing inventory records, calculating new prices, and updating catalogue.~~

- Resolves ~~Reviews and resolves~~ Purchase Order discrepancies; ~~in invoices, statements, and deliveries; learns to negotiate~~ processes settlement of claims and price changes for damaged and disputed shipments and change orders.

- Assists in developing and maintaining purchasing policies and procedures in accordance with state and federal guidelines.

- Maintains ~~files, catalogues, and pamphlets of commodities, supplies, equipment, and services~~contract and purchase order files.

- Develops and maintains records to reflect status of current purchasing transactions; develops and ~~maintains a variety of lists and files; designs and revises forms~~revises purchasing-related forms.

- ~~Arranges~~Nnegotiates/arranges for the rental of equipment.

- ~~Confers with~~Assists District staff ~~to~~ in determining~~e~~ needs;~~,~~ ~~expedite orders, and~~ advises on materials, supplies, and services.

- Provides backup coverage to warehouse staff and Purchasing Agent when needed.

- Keeps informed of current and long-range trends in the purchasing field.

The Buyer I will also perform any other duties that are appropriate for ~~its~~ the scope and level of responsibility of the Buyer I classification in the organization.

Qualifications

Education and Experience: Any combination of education and experience that has led to the acquisition of the knowledge, skills, and abilities as indicated above. A typical way of acquiring the knowledge, skills and abilities is:

Completion of ~~the twelfth grade or its equivalent~~~~equivalent~~ four-year degree in business administration or a related field and ~~two~~ one year~~s~~ of experience in the administrative functions of ordering and receiving supplies and/or equipment. ~~Two years of college may be substituted for one year of the required experience.~~Relevant certification may substitute for up to one year of experience. Experience in public procurement is desirable.

Knowledge of: Principles, practices, and methods of purchasing; applicable laws and regulations; office and statistical methods and procedures; accounting as applied to the purchasing function; inventory control; warehousing and stock record keeping systems.

Skill in: Principles and practices of bidding and purchasing in the public sector; ~~Receiving and storing supplies and materials;~~knowledge of applicable laws and regulations in public procurement; reconciling discrepancies; organizing and prioritizing work; working independently within procedural guidelines; performing ~~accurate mathematical computations~~market research practices and pricing methods; contract management and inventory control principles;~~;~~ organizing and maintaining a wide variety of files; ~~researching, compiling, and summarizing a variety of materials~~standard office practices; operating standard office equipment including computers and calculators; typing with accuracy to complete forms and other purchasing documents; business English and basic mathematics..

Ability to: Understand and carry out oral and written instructions in English; rapidly ~~L~~learn to interpret and apply policies, procedures, and guidelines related to public agency purchasing and accounting; learn to collect and interpret complex data; learn to negotiate and administer contracts; understand and carry out both oral and written instructions; quickly identify problem areas or situations, isolate problem causes and take appropriate action to resolve problems identified; communicate effectively and tactfully in both oral and written form; write clear and concise reports; develop and maintain accurate records and files; maintain attention to detail despite frequent interruptions; use tact and discretion in establishing and maintaining effective working relationships with those contacted in the course of the work; use initiative and sound independent judgment within established guidelines; prioritize work, coordinate several activities, and meet critical deadlines; work under limited supervision; express self clearly and concisely; ~~and establish and maintain effective working relationships with those contacted in the course of business;~~ and provide effective and efficient service to internal and external customers.

Interpersonal Effectiveness: Ability to work effectively in a team-based organization focused on continuous improvement; establish and maintain a positive customer service attitude and effective working relationships with customers; ~~demonstration of~~possess strong two-way communication skills, including the ability to listen, explain, and facilitate; ability to ask for input; offer help without being asked; accept suggestions; work with others to solve problems; and provide recognition and encouragement.

Licenses, Certificates, or Credentials: Must possess a valid Class C California driver's license, have and maintain a satisfactory driving record, and be insurable by the District to operate District vehicles.

Other Requirements: Must possess the physical characteristics to perform the critical and important duties of the class, including the ability to lift objects weighing up to 10 pounds.~~, including the ability to lift objects weighing up to 50 pounds.~~

ADDITIONAL INFORMATION:

Disaster Service Worker: Employees of Union Sanitary District are, by State and Federal law, Disaster Service Workers. In the event of a declaration of emergency, any employee may be assigned activities that promote the protection of public health and safety of the preservation of lives and property, either at the District or within the local or their own community.

Approved by Board of Directors: 10/25/93
Updated: 7/1/2015
Position Status: Unclassified, Non-exempt (~~Bridge Class – Office Support to~~Sub-journey, Professional)
Recruitment: Internal and External

Buyer Survey - Proposed Salary/Education Changes to Buyer I

Buyer II Survey Matching Agency *(USD surveys Journey class)*	Match (Journey level)		Entry (or Sub-Journey)		Difference *calculation based on % entry level is paid below Buyer II (or Senior) level*	Requirements		
	Title	Pay	Title	Pay		Education	Experience (Entry)	Experience (Journey)
ACWD	**Buyer II**	105,328	**Buyer I**	93,873	**11.00%**	**Both** - Bach.	None	2 years
CCCSD	**Sr. Buyer**	96,048	**Buyer**	83,256	**13.20%**	**Buyer** - HS & training or course work; **Sr. Buyer** - Bach	2 years purchasing	3 years purchasing
EBMUD	**Buyer II**	91,800	**Buyer I**	83,136	**9.50%**	**Both** - Bach	Exp in 2 areas of purchasing may sub for degree on yr for yr basis; no other exp listed	2 years purchasing, dev specs, sourcing, solicit price bids; add'l exp may sub for degree on yr for yr basis
SCVWD	**Buyer II**	97,212	**Buyer I**	88,104	**9.60%**	**Both** - Bach	1 yr clerical acctg or purch; sub add'l exp on 1.5 yrs exp to 1 yr ed basis	3 yrs; sub add'l exp on 1.5 yrs exp to 1 yr ed basis
Sunnyvale	**Buyer II**	90,314	**Buyer I**	80,205	**11.00%**	**Both** - Assoc.	1 yr purch clerical or asst, or 2 yrs AP or Shipping/Rec	2 yrs purchasing
USD (current)	**Buyer II**	98,592	**Buyer I**	83,803	**15.00%**	**Buyer I** - HS; **Buyer II** - Bach	2 years purchasing ordering, receiving	2 years purchasing duties
USD (proposed)	**Buyer II**	98,592	**Buyer I**	88,733	**10.00%**	**Both** - Bach	1 yr purchasing ordering, receiving; relevant cert may sub for up to 1 yr exp.	3 years purchasing; relevant cert may sub up to 1 yr exp.

	Buyer backs up Purchasing Agent; proposal is for Buyer I is to promote within 2 years or be terminated			
USD Buyer I		80%	MSA	105%
	Current Pay Range	$67,042.56	$83,803.20	$87,993.36
	Proposed Pay Range	$70,986.24	$88,732.80	$93,169.44

Directors
Manny Fernandez
Tom Handley
Pat Kite
Anjali Lathi
Jennifer Toy

Officers
Paul R. Eldredge, P.E.
General Manager
District Engineer

David M. O'Hara
Attorney

DATE: July 20, 2015

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer
Armando Lopez, Operations Manager, T&D Work Group
Tim Grillo, Research and Support Team Coach

SUBJECT: Agenda Item 10 - Meeting of July 27, 2015
Action Item: Accept the Final Report for the Hayward Marsh Rehabilitation Options Study from RMC Water and Environment

Recommendation:

Staff recommends the Board accept the Technical Memorandum titled "Development of Revised Rehabilitation options" (Report) dated May 2015, prepared by RMC Water and Environment (RMC) for the Hayward Marsh Rehabilitation Options Study (Project).

Background:

Since 1988 the Hayward Marsh (Marsh) has provided the District with 20 MGD of wet weather flow capacity that is not available in the EBDA force main. Sedimentation due to natural processes has resulted in a blockage of the inlet to pond 3B in the summer of 2013. The District had agreed to conduct a planning level study at the request of the East Bay Regional Parks District to identify options for the rehabilitation of the Marsh.

The General Manager executed an agreement and task order no.1 in the amount of $49,048 on January 15, 2014. The Board authorized the General Manager to execute Task Order no.2 in the amount of $389,730 to fund the remainder of the study project. The General Manager executed Amendment no.1 to task Order 2 in the amount of $58,121 on August 27, 2014 to provide for the evaluation of additional scope that was recommended by the project team. The Total amount of consultant fees for this project is not to exceed $496,899.

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The Report presents the conceptual level design and associated planning level cost for the following five rehabilitation options:

1. Maintenance dredging and restoration to original condition with some operational enhancements. This option is described as the baseline option or condition.

2. Minimal maintenance dredging project to restore flow to basin 3B only.

3. Use Basin 1 for wet weather equalization and convert basin 2A and 2B to muted tidal marsh.

4. Use basin1 for wastewater equalization and convert basin 2A and 2B to muted tidal marsh with the connection to the adjacent Salt Marsh Harvest Mouse Preserve.

5. Restoration of the Hayward Marsh to the baseline with additional operational enhancements to Basins 2A and 2B.

Two alternatives to Marsh rehabilitation are identified though not detailed in the Report.

1. Equalization Storage at City of Hayward Ponds

2. Equalization Storage at Alvarado Wastewater Treatment Plant

Staff provided hard copies of the Report and presented the Project's findings to the Board during a workshop held on June 17, 2015.

Staff recommends the Board accept the Report, dated May 2015, prepared by RMC Water and Environment for the Hayward Marsh Rehabilitation Options Study.

PRE/AL/TG

Attachments: Technical Memorandum: Development of Revised Rehabilitation Options, dated May 2015

Hayward Regional Shoreline

Hayward Marsh Rehabilitation Options Study

Technical Memorandum: Development of Revised Rehabilitation Options

REVISED FINAL

May 2015

Prepared by:

RMC water and environment

moffatt & nichol

wra ENVIRONMENTAL CONSULTANTS

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Executive Summary

ES-1 Background and Purpose

The Hayward Marsh Rehabilitation Options Study is being conducted to develop and evaluate various options for rehabilitation of Hayward Marsh, including accommodation for wet weather flow of treated wastewater from the Union Sanitary District. As part of the study effort, several additional operational improvements (e.g. drying of Basins 2A and 2B, levee reinforcement, etc.) were incorporated, in addition to rehabilitating the marsh. The conceptual plan to return the Hayward Marsh to a condition similar to the original design and improve operational functions within the marsh was outlined in the Final Baseline Condition Technical Memorandum (Baseline Condition TM) dated November 20, 2014, which is included as Attachment A. A detailed summary of the current marsh and operational challenges is presented in the Baseline Condition TM.

The Baseline Option is considered Option 1 in this TM. This TM includes information on four rehabilitation options that were developed in addition to the baseline condition. Options 2 through 4, presented in this technical memorandum, are focused on a reduced level of marsh restoration using alternate approaches and therefore a lower cost for maintaining wet weather flow capacity for Union Sanitary District. Option 5 was developed to specifically add enhancements requested by EBRPD to the marsh. Descriptions of two “Other Options” that were developed, but are not directly equivalent to the Baseline Condition, are also included.

ES-2 Options Summary and Recommendations

Including the baseline condition, Option 1, there are five conceptual options, plus two additional storage options, which are include as “Other Options.” Each option was developed in the same manner as the baseline condition to facilitate evaluation and comparison. Descriptions of the rehabilitation options presented in this TM, including the baseline condition, are shown in **Table ES - 1.**

Option 2 involves restoring flow to Basin 3B with minimal dredging of the inlet of Basin 3B and the Mixing Channel. Option 2 would require less dredging and material placement than Option 1, the baseline condition. Excavated material would be placed in Basin 3B. This option would not change the current operation of the Hayward Marsh nor provide for any operational improvements; it would restore flow to Basin 3B only and would be the lowest cost of all the options. An optional item to expand Island 5 is included in this option.

Options 3 and 4 provide for muted tidal salt water flow into Basins 2A and 2B and include the conversion of Basin 1 into equalization storage for USD. Effluent discharge from USD to the Hayward Marsh would be discontinued. Within Options 3 and 4, muted tidal exchange would occur within Basins 3A, 3B, 2A, and 2B. Option 3 involves dredging and two way culverts between the Mixing Channel and Basins 2A and 2B, while Option 4 also incorporates flow to and from the Mouse Preserve through levee breaches along Basins 2A and 2B. To facilitate muted tidal flow into the Hayward Marsh the inlets to the Mixing Channel, Northwest Channel,

and outlets from Basin 2A and Basin 2B would be replaced to allow flow in both directions. Material would be removed to restore flow and placed on levees based on priority.

Table ES - 1 : Hayward Marsh Rehabilitation Options

Option Number	Option Name	Summary Description
1	Maintenance Dredging and Rehabilitation of Hayward Marsh (baseline condition)	This option includes dredging existing channels, levee repair and maintenance, island modification, and operational improvements to return the marsh to the original design condition and provide operational improvements and habitat enhancement.
2	Maintenance Dredging to Restore Flow to Basin 3B Only	This option includes dredging and placement activities associated with restoring the hydraulic function of Basin 3B (only), which would allow flow to enter and exit the basin again. Expansion of Island 5 for habitat enhancement is included as an optional item.
3	Convert Basin 2A and 2B to Muted Tidal Marsh and Use Basin 1 for Equalization	This option would provide muted tidal exchange for Basins 3A and 3B as well as for Basins 2A and 2B for the purpose of avian bird health. Basin 1 would be converted to equalization storage for USD's treated wastewater during wet weather. USD would construct a pumping station in Basin 1 to return wastewater to the EBDA pipeline. Fresh water flow would no longer exist in the marsh.
4	Convert Basin 2A and 2B to Muted Tidal Marsh with Mouse Preserve Interaction	This option is the same as Option 3, except portions of the levee between the Hayward Marsh and the Mouse Preserve to the south would be breached to allow tidal exchange between the two areas.
5	Additional Enhancements to Basins 2A and 2B	This option includes elements in the baseline condition plus dredging and regrading of Basins 2A and 2B to facilitate avian disease control. Basins 2A and 2B would be re-graded to allow gravity drainage of both basins to the Mixing Channel.
Other Options		
-	Equalization Storage at City of Hayward Ponds	During wet weather, USD would use the City of Hayward ponds for equalization storage. Storage at Hayward Ponds could be combined with any of the other options.
-	Equalization Storage at Alvarado Wastewater Treatment Plant (REMOVED FROM TM)	Storage at the Alvarado Wastewater Treatment Plant was removed because it would not provide sufficient storage to offset the loss of USD's discharge to the Hayward Mash.

Option 5 is the same as Option 1, the baseline condition, except it adds dredging and regrading of Basins 2A and 2B to control avian disease. The additional excavation and regrading of Basins 2A and 2B allow for the basins to be gravity drained into the Mixing Channel without additional equipment.

Other options focused on developing equalization storage for USD's effluent were also developed as part of the Options TM. The storage options could be implemented with any of the five options. The primary storage option includes the use of the old oxidation ponds at the City

of Hayward. A storage option at the USD treatment plant site was previously included in the options evaluation, but was removed because a sufficient storage volume would not fit at the treatment plant site.

The capital costs for each option are summarized in **Table ES - 2.**

Table ES - 2 : Capital Cost Estimate Summary

Option Number	Option Name	Estimated Total Capital Cost
1	Maintenance Dredging and Rehabilitation of Hayward Marsh (baseline condition)	$20,100,000
2	Maintenance Dredging to Restore Flow to Basin 3B Only	$1,860,000 ($2,460,000 w/ Optional Island 5 Expansion)
3	Convert Basin 2A and 2B to Muted Tidal Marsh and Use Basin 1 for Equalization	$15,040,000
4	Convert Basin 2A and 2B to Muted Tidal Marsh with Mouse Preserve Interaction	$14,630,000
5	Additional Enhancements to Basins 2A and 2B	$26,700,000

The development of options in this technical memorandum is based on information readily available. The next steps for the Hayward Marsh Rehabilitation Options Study will be to develop criteria for various features of the alternatives, in addition to cost, and evaluate the remaining five options. Additional details on the selected option will be developed during the design phase.

Chapter 1 Background and Purpose

The Hayward Marsh Rehabilitation Options Study is being conducted to develop and evaluate various options for rehabilitation of Hayward Marsh, including the accommodation for wet weather flow of treated wastewater from the Union Sanitary District. This TM includes information on six rehabilitation options that were developed in addition to the baseline condition. Summary information on the baseline condition is provided below as background information to the six additional options.

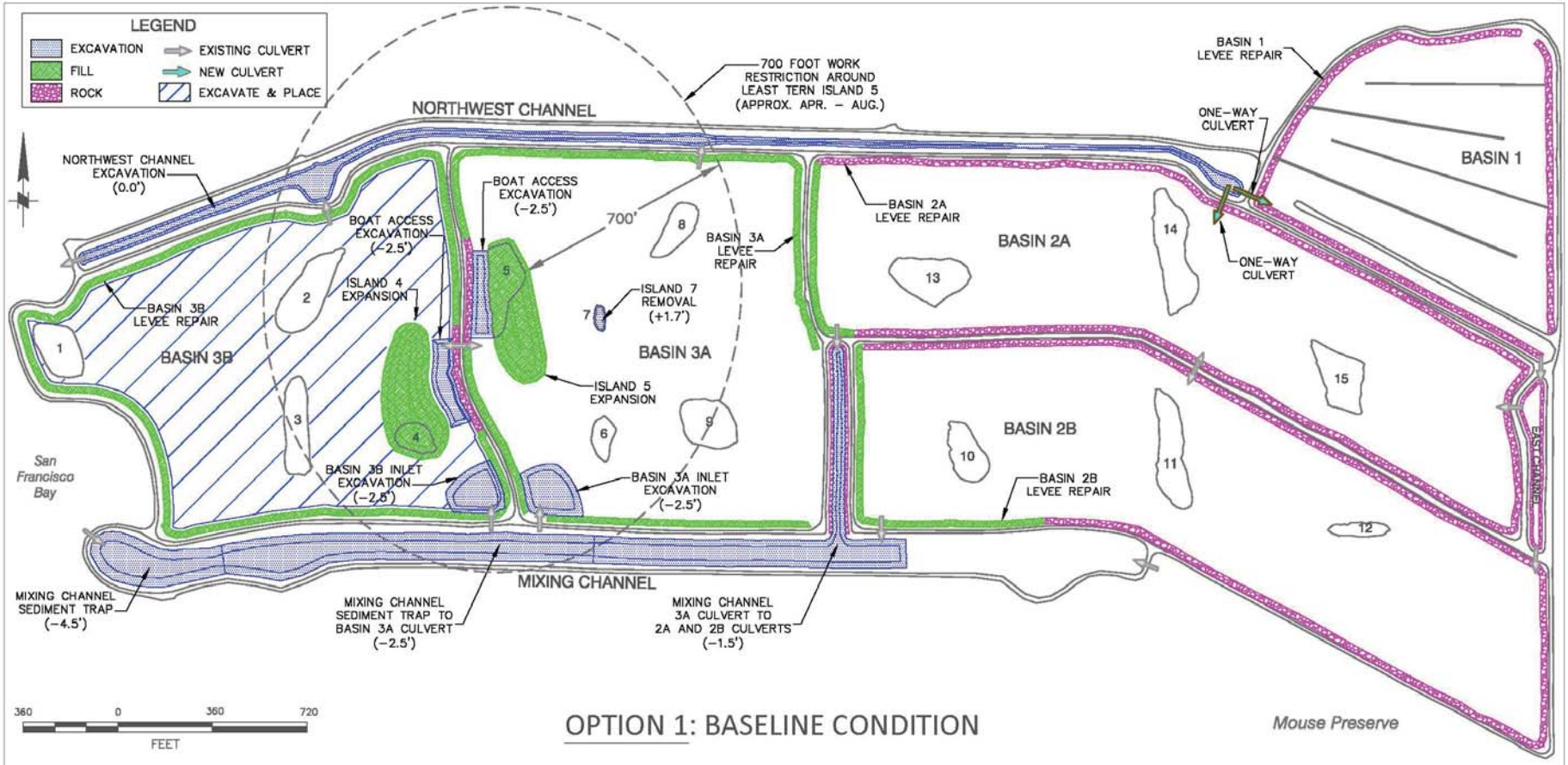
1.1 Option 1: Baseline Condition Summary

The original plan for the restoration project was to return the Hayward Marsh to a condition similar to the original design. During the development of the baseline condition, additional improvement such as levee reinforcement and operational improvements within the marsh were added. The revised objectives of the baseline project are outlined in the Final Baseline Condition Technical Memorandum (Baseline Condition TM), which is included as Attachment A. The field work performed to describe the existing conditions with the marsh included bathymetry, geotechnical analysis, and staff interviews. A detailed summary of the current marsh and operational challenges is presented in the Baseline Condition TM. The baseline Option is considered Option 1 in this TM and is shown in **Figure 1-1.** The core components of the Hayward Marsh baseline condition Option 1 are presented in **Table 1-1.**

Table 1-1: Summary of Restoration Work for Baseline Condition (Option 1)

Activity	Description
Material Excavation	
Mixing Channel Improvements	(1) Dredging of the Mixing Channel would improve Bay flow into Basins 3A and 3B. (2) A new sediment trap immediately following the bay intake would be dredged approximately three feet below original design to provide a confined area for sedimentation, to facilitate maintenance.
Basin 3A Inlet Improvement	New sediment depression on basin side of inlet would facilitate flow into Basin 3A.
Basin 3A Island 7 Removal	Island removal would support predator control in the marsh.
Basin 3B Inlet Improvement	(1) Remove sediment "plug". (2) New sediment depression on basin side of inlet would facilitate flow into Basin 3B.
Northwest Channel Improvements	(1) Dredging of the Northwest Channel would improve flow from Basins 3A and 3B to Bay. (2) Lower bottom elevation would facilitate use of salt water in Basins 1, 2A, and 2B for avian disease control.
Material Placement	
Levee Repair for All Basins	Additional material placed on levees at a lower slope than the existing condition with rip rap would facilitate a wider range of maintenance vehicle access and prevent future erosion.
Basin 3A - Island 5 Expansion and Perimeter Slope Repair	Island expansion would provide additional nesting habitat for California least tern.
Infrastructure Improvements	
Infrastructure Replacement	Improvements to culverts, weirs, valves, etc. would facilitate future maintenance of the marsh as well as avian disease control
Basin 2A and 2B Isolation	To provide additional flexibility to address avian disease, new isolation valves would be provided at the inlets to Basin 2A and 2B. The levee between Basin 2A and 2B would be replaced.
Northwest Channel connection to Basin 2A	A new culvert and gate valve would be placed at the eastern end of the Northwest Channel connecting to Basin 2A, to allow salt water inflow into Basin 2A as a maintenance activity for avian disease control.

The raw construction cost for the Baseline Condition (Option 1) is estimated at a planning level to be $12,455,000, with a total planning-level capital cost estimate of $20,100,000.

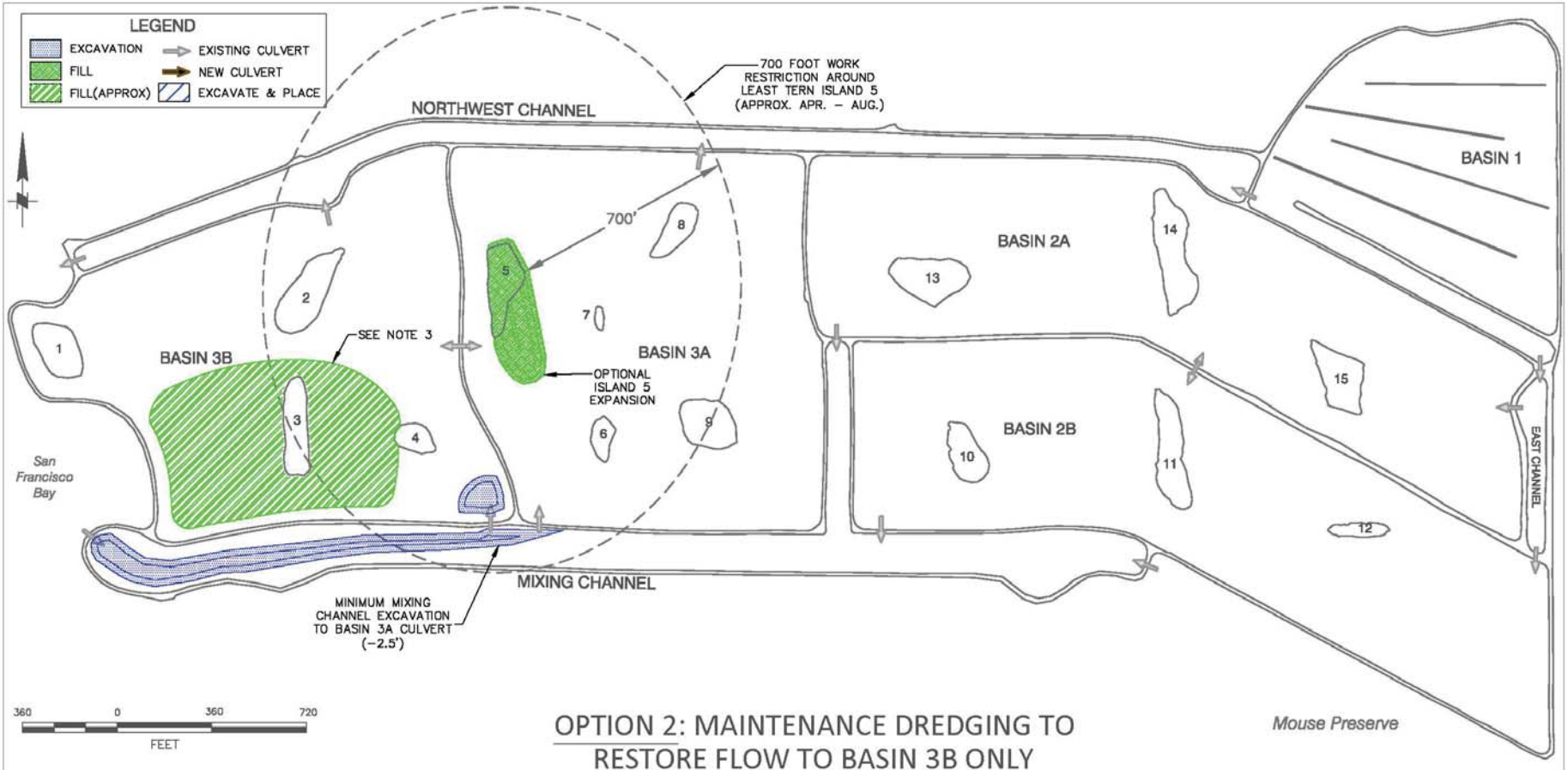

LEGEND
EXCAVATION
FILL
ROCK
EXISTING CULVERT
NEW CULVERT
EXCAVATE & PLACE
700 FOOT WORK RESTRICTION AROUND LEAST TERN ISLAND 5 (APPROX. APR. – AUG.)
NORTHWEST CHANNEL
BASIN 1 LEVEE REPAIR
ONE-WAY CULVERT
BASIN 1
NORTHWEST CHANNEL EXCAVATION (0.0')
BOAT ACCESS EXCAVATION (-2.5')
700'
BASIN 3A LEVEE REPAIR
BASIN 2A LEVEE REPAIR
BASIN 2A
ONE-WAY CULVERT
BOAT ACCESS EXCAVATION (-2.5')
ISLAND 4 EXPANSION
ISLAND 7 REMOVAL (+1.7')
BASIN 3B LEVEE REPAIR
BASIN 3B
BASIN 3A
ISLAND 5 EXPANSION
BASIN 2B
BASIN 2B LEVEE REPAIR
San Francisco Bay
BASIN 3B INLET EXCAVATION (-2.5')
BASIN 3A INLET EXCAVATION (-2.5')
EAST CHANNEL
MIXING CHANNEL
MIXING CHANNEL SEDIMENT TRAP (-4.5')
MIXING CHANNEL SEDIMENT TRAP TO BASIN 3A CULVERT (-2.5')
MIXING CHANNEL 3A CULVERT TO 2A AND 2B CULVERTS (-1.5')
360 0 360 720
FEET
OPTION 1: BASELINE CONDITION
Mouse Preserve
LAST SAVED: 4/8/15
Figure 1-1. Option 1
HAYWARD MARSH REHABILITATION PROJECT
NOTES:
1. ALL ELEVATIONS ARE IN FEET NGVD29.
2. PROPOSED 30-INCH DIAMETER HDPE PIPELINE TO BYPASS BASIN 1 (NOT SHOWN) SHALL EXTEND FROM RECOMMISSIONED DECHLORINATION STATION TO EAST CHANNEL.

Chapter 2 Option 2: Maintenance Dredging to Restore Flow to Basin 3B Only

2.1 Description of Option 2

The intent of Option 2 is to improve water circulation to Basin 3B with minimal dredging and cost. Option 2 includes conducting maintenance dredging within the Mixing Channel and inlet to Basin 3B, to restore saline to brackish flow which is currently restricted due to a buildup of silt within the channel and inlet. Under Option 2, the current marsh operation would remain unchanged: fresh water would continue to flow through Basins 1, 2A, and 2B and mix with salt water in the Mixing Channel before entering the brackish Basins 3A and 3B, and flowing out the Northwest Channel to San Francisco Bay. The expansion of Island 5 is included with Option 2 as an optional item.

The Mixing Channel would be excavated to original design conditions upstream to the inlet of Basin 3A (immediately east of the Basin 3B inlet). The inlet within Basin 3B would also be excavated to original design conditions. Excavated wet material would be placed in Basin 3B or along nearby levee slopes. As an optional item, Island 5 would be expanded with imported material. Improvements to existing levees, modifications for avian disease control, or other operational improvements are not included in Option 2. Excavation and placement locations for Option 2 are shown in **Figure 2-1.**



OPTION 2: MAINTENANCE DREDGING TO RESTORE FLOW TO BASIN 3B ONLY

LAST SAVED: 4/8/15

Figure 2-1. Option 2

HAYWARD MARSH REHABILITATION PROJECT

NOTES:
1. ALL ELEVATIONS ARE IN FEET NGVD29.
2. PROPOSED 30–INCH DIAMETER HDPE PIPELINE TO BYPASS BASIN 1 (NOT SHOWN) SHALL EXTEND FROM RECOMMISSIONED DECHLORINATION STATION TO EAST CHANNEL.
3. APPROXIMATE PLACEMENT AREA OF EXCAVATED MATERIAL. ACTUAL PLACEMENT AREA DEPENDENT ON MATERIAL COMPOSITION AND MOISTURE CONTENT.

2.2 Dredging and Placement Considerations

2.2.1 Material Excavation

Wet sediment would be removed from the Mixing Channel and Basin 3B inlet, and placed in Basin 3B. A summary of the excavation sites proposed for Option 2 is shown in **Table 2-1.** Approximately 13,000 cubic yards of material would be excavated.

Table 2-1: Option 2 - Excavation Areas, Elevations, Slopes, and Volumes

Excavation Location	Area (acres)	Original Ground Average Elevation (ft. NGVD29)	Original Marsh Design Elevation (ft. NGVD29)	Target Elevation (ft. NGVD29)	Slope (H:V)	Volume (CY)
Mixing Channel - Minimized Excavation to Basin 3A Culvert	2.1	2.6	-1.5	-2.5	4:1	11,500
Minimized Basin 3B Inlet Excavation	0.2	0.9	-1.5	-2.5	4:1	1,500
					Total	**13,000**

Mixing Channel Excavation

A small channel at a depth of -2.5’ would be excavated out of the Mixing Channel, ranging 30 to 50 feet in width. Approximately 11,500 cubic yards of material would be removed from the Mixing Channel, which is about half of the volume that would be excavated in the Mixing Channel under Option 1. Because the focus of Option 2 is to restore flow to Basin 3B, full excavation of the Mixing Channel is not warranted. Material would be removed up to the Basin 3A culvert, which is just beyond the Basin 3B culvert, because the additional cost is minimal and it would help to maintain flow into Basin 3A in the near term.

Minimized Basin 3B Inlet Excavation

Option 2 includes excavating approximately 1,500 cubic yards of material within Basin 3B, near the Basin 3B inlet, which is needed to restore flow into the basin from the Mixing Channel. Compared to Option 1, the excavation area was minimized to reduce the overall scope of the excavation work (although the inlet would still be excavated down to the original design elevation of -2.5’).

2.2.2 Material Placement

All of the excavated material (13,000 cubic yards) from Option 2 would be placed within Basin 3B, as detailed in **Table 2-2**. The excavated would be placed along the levee within Basin 3B and would not have an impact on the flow through Basin 3B or provide access for predators. As an optional item, approximately 5,200 cubic yards of material would be imported to expand Island 5.

Table 2-2: Option 2 - Material Placement Locations and Fill Volumes

Placement Location	Type	Slope (H:V)	Fill Volume (CY)	Rock Volume (tons)
Basin 3B Placement	Fill	4:1	13,000	0
Island 5 Expansion	Fill	6:1	5,200	0
		Total	**18,200**	**0**

2.3 Infrastructure Modifications

2.3.1 Infrastructure Replacement

As the goal of Option 2 is to restore flow to Basin 3B, no culverts would be replaced in Option 2.

2.3.2 Operational Improvements

Option 2 is configured to be a lower cost option to allow the marsh to continue to operate in its present condition. No operational improvements would be made in Option 2.

2.4 Habitat Considerations

This option would only restore flow to Basin 3B which would increase circulation of salt water from San Francisco Bay through that one basin. This increased circulation, however, would re-establish open water habitat within the Basin (which is currently dry), improve water quality, and stimulate benthic productivity in the basin that would benefit shorebirds, water fowl, and/or fish. Because inlet and outlet flow would be through culverts, the fish in the system are more likely to be juveniles which may use the basin as nursery habitat. The improved circulation would also support the salt marsh plant community that has established in the basin as a fringe around the shoreline or on islands; however it is not likely that salt marsh would expand substantially throughout the basin in the near future.

2.5 Permitting Considerations

The environmental and NPDES permitting conditions for Option 2 are expected to be the same as for the Baseline Condition.

2.6 Option 2 Cost Estimate

The planning-level cost estimate for Option 2 was developed using the same basis and implementation factors as presented in the Baseline Condition TM. A summary of the implementation factors is presented in **Table 2-3** for reference.

Table 2-3: Cost Estimate Implementation Factors

Component	Allowance
Environmental Documentation and Permits	6%
Design Service	6%
Legal and Administrative Services	1%
Engineering Services During Construction	4%
Construction Management and Inspection	6%

The implementation factors presented in **Table 2-3** are appropriate for projects that primarily involve earthwork (i.e. excavation and material placement). As with the baseline condition, an inflation/escalation rate of 3% was used for estimating the future cost at the midpoint of construction, and a project contingency of 20% was used. Please see the Baseline Condition TM for more details regarding these cost-estimating factors.

2.6.1 Construction Methods and Equipment

The construction equipment and materials for Option 2 are the same as those proposed for Option 1, the baseline condition, and are described in further detail within the Baseline Condition TM. Unlike the baseline condition however, Option 2 does not include repair of the levees. The excavator removing material from the Mixing Channel and Basin 3B inlet will dig, turn, and place the material near or within Basin 3B. Depending on the material composition and moisture content, the material may spread over Basin 3B when placed. Small earthen berms or typical best management practices, such as staked hay bales, may be utilized to direct the material away from the Basin 3B inlet.

Expanding Island 5 is an optional item in Option 2. If included, approximately 5,200 cubic yards would be trucked to the site. A temporary land bridge would be constructed from the Basin 3A western levee out to Island 5 (approximately 85 feet) to allow equipment access and material placement. The land bridge would be constructed with about 200 cubic yards, which would be placed either on Island 5 or placed on the Basin 3A levee at the completion of the Island expansion work.

2.6.2 Capital Cost Estimate

A construction cost breakdown by item and total capital cost estimate are presented in **Table 2-4**. Including the cost estimating allowances, the total estimated capital cost for Option 2 is $1,860,000, with the option to expand Island 5 for an additional $600,000 (totaling to $2,460,000). Actual project costs are typically expected to be within +30% to -20% of the planning-level cost estimate.

Table 2-4: Option 2 - Construction and Capital Cost Estimate (Base & Option)

Item	Quantity	Unit	Unit Cost	Total Cost
Mobilization & Demobilization	1	LS	$740,500	$740,500
USD Effluent Bypass Pumping and/or NPDES Waiver	1	ALLOW	$50,000	$50,000
Excavate Mixing Channel	11,500	CY	$34.75	$399,600
Excavate Basin 3B Inlet	1,500	CY	$34.75	$52,100
			Raw Construction Cost	**$1,242,200**
			Escalation to Midpoint of Construction (3%/Year)	$60,000
			Total Bid Amount	**$1,302,200**
			Contingency (20%)	$260,000
			Total Construction Amount	**$1,562,200**
			Environmental Documentation and Permitting (6%)	$80,000
			Design Allowance (6%)	$80,000
			Legal/Admin Allowance (1%)	$10,000
			Construction Management Allowance (6%)	$80,000
			Engineering Services During Construction Allowance (4%)	$50,000
			Base Total Capital Cost	**$1,860,000**

Item	Quantity	Unit	Unit Cost	Total Cost
Optional Item – Island 5 Expansion	5,200	CY	$77.15	$401,200
			Raw Construction Cost	**$401,200**
			Escalation to Midpoint of Construction (18 months at 3%/Year)	$20,000
			Total Bid Amount	**$421,200**
			Contingency (20%)	$80,000
			Total Construction Amount	**$501,200**
			Environmental Documentation and Permitting (6%)	$25,000
			Design Allowance (6%)	$25,000
			Legal/Admin Allowance (1%)	$4,000
			Construction Management Allowance (6%)	$25,000
			Engineering Services During Construction Allowance (4%)	$17,000
			Additional Capital Cost for Island 5 Expansion	**$600,000**
			Total Capital Cost with Island 5 Expansion	**$2,460,000**

Notes:
- The excavation items include placement costs at those locations identified in Figure 2-1.
- Apparent errors in totals are due to rounding.

Chapter 3 Option 3: Convert Basin 2A and 2B to Muted Tidal Marsh and Basin 1 for Equalization

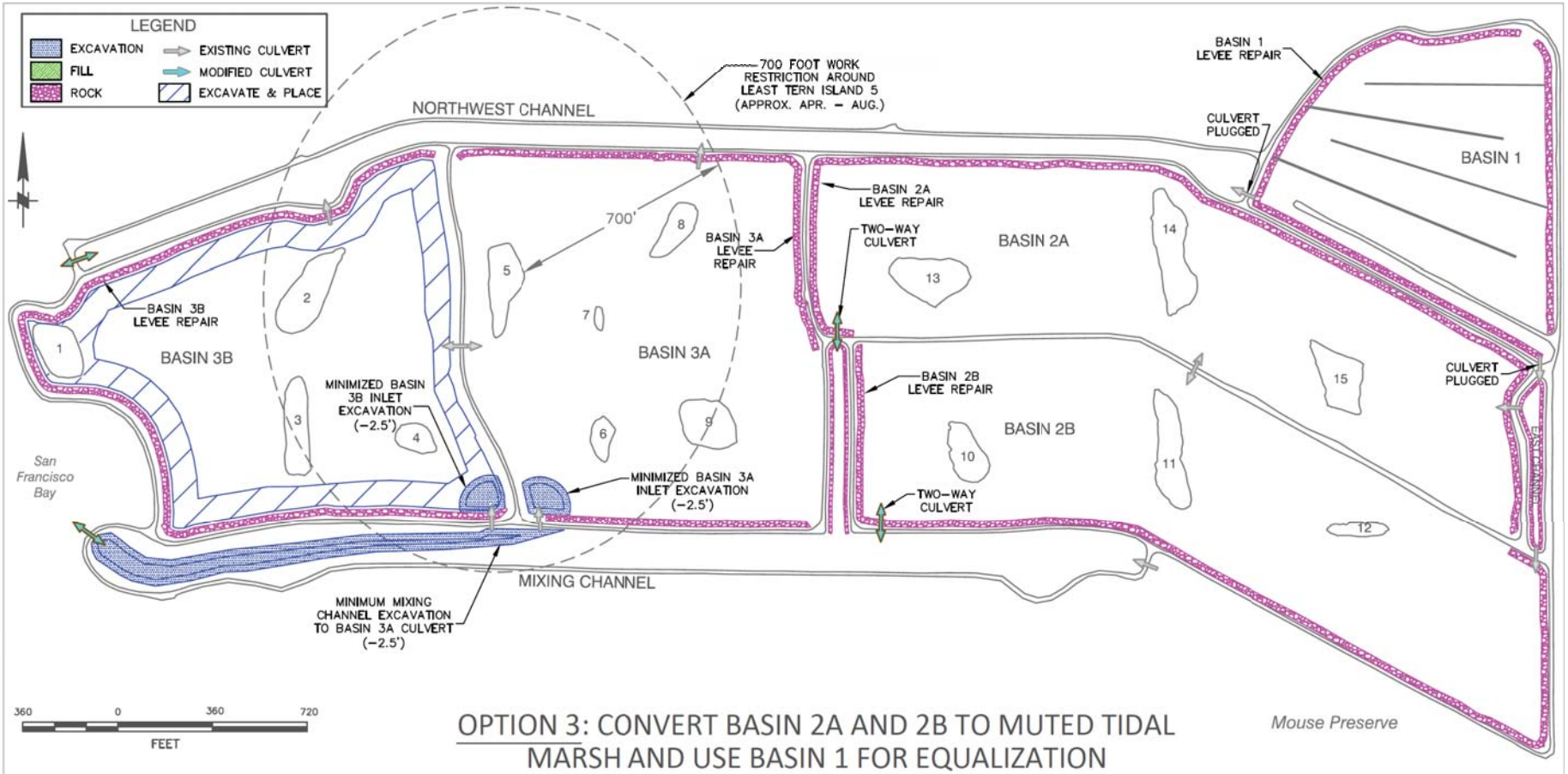
3.1 Description of Option 3

Under Option 3, Basin 1 would be converted to an equalization storage basin for USD treated wastewater, and Basins 2A, 2B, 3A and 3B would receive controlled tidal exchange through modified infrastructure. The introduction of tidal flows to Basins 2A and 2B may improve habitat conditions and reduce avian disease. The Mixing Channel and inlets to Basins 3A and 3B would be minimally excavated to enhance tidal exchange in Basins 3A and 3B. In turn, Basin 3B would also be excavated minimally to allow for adequate disposal space onsite, as well as sufficient dry material for levee repair (i.e. base material for rock placement).

Compared to Option 1, Option 3 includes minimal excavation and placement of material for rehabilitation of nearby levees. Levee repair is limited to perimeter levees and/or levees needed for vehicle access (i.e. all levees in the baseline condition except the ones between Basins 3A & 3B and Basins 2A & 2B). The culverts leading to Basins 2A and 2B from the Mixing Channel would be modified into two-way culverts to allow tidal inflow and outflow. Flash boxes would also be provided at the inlets to Basins 2A and 2B so that a minimum depth in the basins can be maintained during low tides.

Under Option 3, 4 of the existing 14 culverts (gate structures and pipes) would be modified for operational changes in the marsh, such as allowing tidal exchange in and out of all basins (except Basin 1). Two existing culvers in Basin 1 would be plugged. The other 8 existing culverts are operational and would remain so after the placement of rock or material on the levees. The excavation and placement locations are shown in **Figure 3-1.**

Basin 1 would be hydraulically separated from the rest of Hayward Marsh, and would be used for storage of USD effluent during peak wet weather events. Specifically, flow would enter Basin 1in the same manner as currently, from the East Bay Dischargers Association (EBDA) pipeline. Effluent stored in Basin 1 would be pumped back to the EBDA pipeline through a new pump station, but using the existing Hayward Marsh connection, after peak flows in the EBDA system have subsided. Due to the large surface area of Basin 1 and the presence of water fowl, it may be necessary to chlorinate return flow to the EBDA system, therefore the existing dechlorination facility was converted to a chlorination facility under this option. It is possible that re-chlorination may not be required. The provision to chlorinate was included in case it is needed and can be further evaluated during detailed design.


LEGEND
EXCAVATION
FILL
ROCK
EXISTING CULVERT
MODIFIED CULVERT
EXCAVATE & PLACE
NORTHWEST CHANNEL
700 FOOT WORK RESTRICTION AROUND LEAST TERN ISLAND 5 (APPROX. APR. – AUG.)
BASIN 1 LEVEE REPAIR
CULVERT PLUGGED
BASIN 1
BASIN 2A LEVEE REPAIR
TWO-WAY CULVERT
BASIN 2A
BASIN 3A LEVEE REPAIR
700'
BASIN 3B LEVEE REPAIR
BASIN 3B
BASIN 3A
MINIMIZED BASIN 3B INLET EXCAVATION (–2.5')
BASIN 2B LEVEE REPAIR
BASIN 2B
CULVERT PLUGGED
MINIMIZED BASIN 3A INLET EXCAVATION (–2.5')
TWO-WAY CULVERT
San Francisco Bay
MIXING CHANNEL
MINIMUM MIXING CHANNEL EXCAVATION TO BASIN 3A CULVERT (–2.5')
360 0 360 720
FEET
OPTION 3: CONVERT BASIN 2A AND 2B TO MUTED TIDAL MARSH AND USE BASIN 1 FOR EQUALIZATION
Mouse Preserve
LAST SAVED: 5/11/15
Figure 3-1. Option 3
HAYWARD MARSH REHABILITATION PROJECT
NOTES:
1. ALL ELEVATIONS ARE IN FEET NGVD29.
2. PROPOSED 30–INCH DIAMETER HDPE PIPELINE TO BYPASS BASIN 1 (NOT SHOWN) SHALL EXTEND FROM RECOMMISSIONED DECHLORINATION STATION TO EAST CHANNEL.

3.2 Dredging and Placement Considerations

3.2.1 Material Excavation

Minimal sediment would be removed from Basin 3B, the Mixing Channel, and inlets in Basins 3A and 3B. A summary of the excavation sites proposed for Option 3 is shown in **Table 3-1**. A total of approximately 30,900 cubic yards of material would be excavated under Option 3.

Table 3-1: Option 3 - Excavation Volumes, Areas, Target Elevations, and Slopes

Excavation Location	Area (acres)	Original Ground Average Elevation (ft. NGVD29)	Original Marsh Design Elevation (ft. NGVD29)	Target Elevation (ft. NGVD29)	Slope (H:V)	Volume (CY)
Basin 3B Excavation	6.9*	0.8	-2.5 to 1.5	-0.7	4:1	16,400
Mixing Channel - Minimized Excavation to Basin 3A Culvert	2.1	2.6	-1.5	-2.5	4:1	11,500
Minimized Basin 3A Inlet Excavation	0.2	1.9	-1.5	-2.5	4:1	1,500
Minimized Basin 3B Inlet Excavation	0.2	0.9	-1.5	-2.5	4:1	1,500
					Total	**30,900**

* Acreage includes 30-ft. offset from levee toe and excludes islands. Area covered to remove 18" of top material to obtain desired volume.

Basin 3B Excavation

To reduce the amount of dry material import and wet offsite disposal, the top 18" of Basin 3B (excluding existing Islands 1 through 4) would be excavated and used as borrow material for improving levees. Approximately 16,400 cubic yards will be removed from Basin 3B. After excavation of dry material in Basin 3B, wet excavated material from the channels and basins would be placed within Basin 3B to return the bottom elevation at or below existing levels.

Mixing Channel

Similar to Option 2, a small channel at a depth of -2.5' would be excavated out of the Mixing Channel, ranging 30 to 50 feet in width. Approximately 11,500 cubic yards of material would be removed from the Mixing Channel, which is about half of the volume that would be excavated in the Mixing Channel under Option 1. Although the excavated channel would be smaller, it would still enhance tidal flow to the Basin 3A and 3B inlet culverts. The current sedimentation in the Mixing Channel occurred over approximately 25 years. The hydraulic configuration of the marsh would be restored under Option 3, but it is unknown if a similar sedimentation rate would occur in the future. Maintenance dredging of the Mixing Channel would likely be required in the future to maintain flow to the inlets of Basins 3A and 3B.

Northwest Channel

Although only a minor amount of sedimentation has occurred in the Western End of the Northwest Channel, additional sedimentation could reduce flow from Basins 3B and 3A in the

future. Excavation of the Northwest Channel from the Bay culvert to the Basin 3A culvert was investigated for Option 3, however the majority of sedimentation has occurred on the east end of the Basin 3A culvert. If excavation were performed in the Northwest Channel from the Bay culvert to the Basin 3A culvert, only 280 cubic yards would be removed (assuming the channel is excavated down to an elevation of 0.0'). Approximately 1,360 cubic yards of material lies east of the Basin 3A culvert to the Basin 1 culvert; however with Basin 1 out of service, this portion of the Northwest Channel will no longer be used. Therefore, excavation of the Northwest Channel was not included in this option due to the cost associated with removing only 280 cubic yards of material.

Minimized Basin 3A and 3B Inlets Excavation

A total of 3,000 cubic yards of material would be excavated within Basins 3A and 3B near the Basin 3A and 3B inlets, to restore flow from the Mixing Channel into the basins. Compared to Option 1, the excavation areas were minimized to reduce the overall scope of the excavation work (although the inlets would still be excavated down to the original design elevation of -2.5'). The expected sedimentation rate within the basins is relatively unknown. The tidal prism at the inlets to Basin 3A and 3B may increase in this option with Basins 2A and 2B now part of the tidal exchange, therefore the time it would take for sediment to fill the inlets is difficult to determine.

3.2.2 Material Placement

Excavation material from Option 3 would be placed within Hayward Marsh, as detailed in Table 3-2. All the material would be placed on levees in need of repair, with priority given to nearby levees to reduce hauling costs. A total of 16,400 cubic yards of material and 25,490 tons of rock would be placed on 21,200 linear feet of levees in this option. In Basin 1 only, 3,900 cubic yards of material and 6,320 tons of rock would be placed on 5,200 linear feet of levees. Approximately 14,500 cubic yards would be returned to Basin 3B.

Table 3-2: Option 3 - Material Placement Locations and Fill Volumes

Placement Location	Length (ft.)	Slope (H:V)	Fill Volume (CY)	Rock Volume (tons)
Rock Levee Repair (See Figure 3-1)	Rock	2:1	16,400	25,490
Basin 3B Refill	Fill	4:1	14,500	0
		Total	**30,900**	**25,490**

3.3 Infrastructure Modifications

3.3.1 Infrastructure Replacement

The gate valves between Basin 1 and the East Channel and the Northwest Channel would be removed and the culverts to Basin 1 would be permanently plugged. Basins 3A and 3B currently receive muted tidal flow from the San Francisco Bay through the Mixing Channel. To allow muted tidal action to occur in Basins 2A and 2B, two-way directional culverts would be installed between the Mixing Channel and Basins 2A and 2B. Additionally, two-way directional culverts would also be installed on the bayside of both the Mixing and Northwest Channels.

3.3.2 Operational Modifications

Basin 1 would be reconfigured for equalization flow and would be operated independently of the Hayward Marsh. As described above, the gates between Basin 1 and the Northwest Channel and the East Channel would be removed and the culverts would be plugged. The existing culverts between the bay and the Northwest and Mixing Channels would be modified to allow flow in both directions, as well as between the Mixing Channel and Basins 2A and 2B. A new culvert between the Northwest Channel and Basin 2A would enhance tidal flow in the marsh. Tidal flow from the Mixing and Northwest Channels to Basins 2A, 2B, 3A and 3B would be controlled as needed for muted tidal marsh operation.

3.3.3 Equalization Storage

Currently, USD can discharge treated wastewater effluent in multiple ways, namely to the EBDA system (42.9 MGD), to the Hayward Marsh (up to 20 MGD), and during storm events, to Old Alameda Creek (8.4 million gallons per storm event). USD equalization storage requirements for a 10-year storm event, previously evaluated by Brown and Caldwell[1], were used as the basis for determining the storage volume needed if the (peak) 20 MGD discharge to Hayward Marsh was no longer used.

Although the current peak flow of 56.9 MGD[1] would exceed USD's EBDA capacity in the EBDA pipeline, Brown and Caldwell concluded that the excess flow could currently be discharged to Old Alameda Creek without the need for additional storage. It is expected that storage requirements will change in the future however.

For the full buildout condition of USD's service area, the 10-year storm event would result in a flow of 73.3 MGD. Under this condition, 53.6 million gallons (MG) of equalization storage would be required if there was no discharge to Hayward Marsh, even with 8.4 MG of capacity through Old Alameda Creek. Although an exact time frame for buildout is not defined, it is believed that buildout conditions would occur 20 years from now, probably later. It is also worth noting that in recent years, influent flow to USD has actually slightly decreased, possibly due to water conservation.

At an operating depth of 6 feet, it is estimated that Basin 1 (approximately 15.4 acres) would provide about 30 MG of storage. Although 30 MG is less than the future required storage volume of 53.6 MG, it would provide enough storage for the near future. With 30 MG of storage in Basin 1, additional storage or discharge options could be postponed and implemented when future flows actually increase. To improve drainage within Basin 1, the basin would be graded to direct flow towards a new pump station. It is likely that some residual amount of water would remain in the basin after it is emptied.

The new equalization return pump station would be located in the northeast corner of Basin 1, as shown in **Figure 3-2**. Return flow from the equalization basin would be pumped back into the EBDA 60-inch diameter pressurized main using the existing 30-inch diameter pipeline connection to the marsh. The equalization return pump station would be sized for 10 MGD flow, which would allow the basin to be emptied in three days. The equalization pump station would include two 100 horse power duty pumps. New or expanded electrical service would be required

[1] Brown and Caldwell Flow Equalization Report Update, November 2013.

to provide sufficient power to operate the new 100 horsepower return pumps. Backup power and telemetry would be provided. In order to control flow in and out of the equalization basin, isolation valves would be installed on the existing 30-inch pipeline as well as the new 30-inch equalization pipeline. The existing dechlorination facility would be converted to a chlorination facility to provide disinfection of return flows.

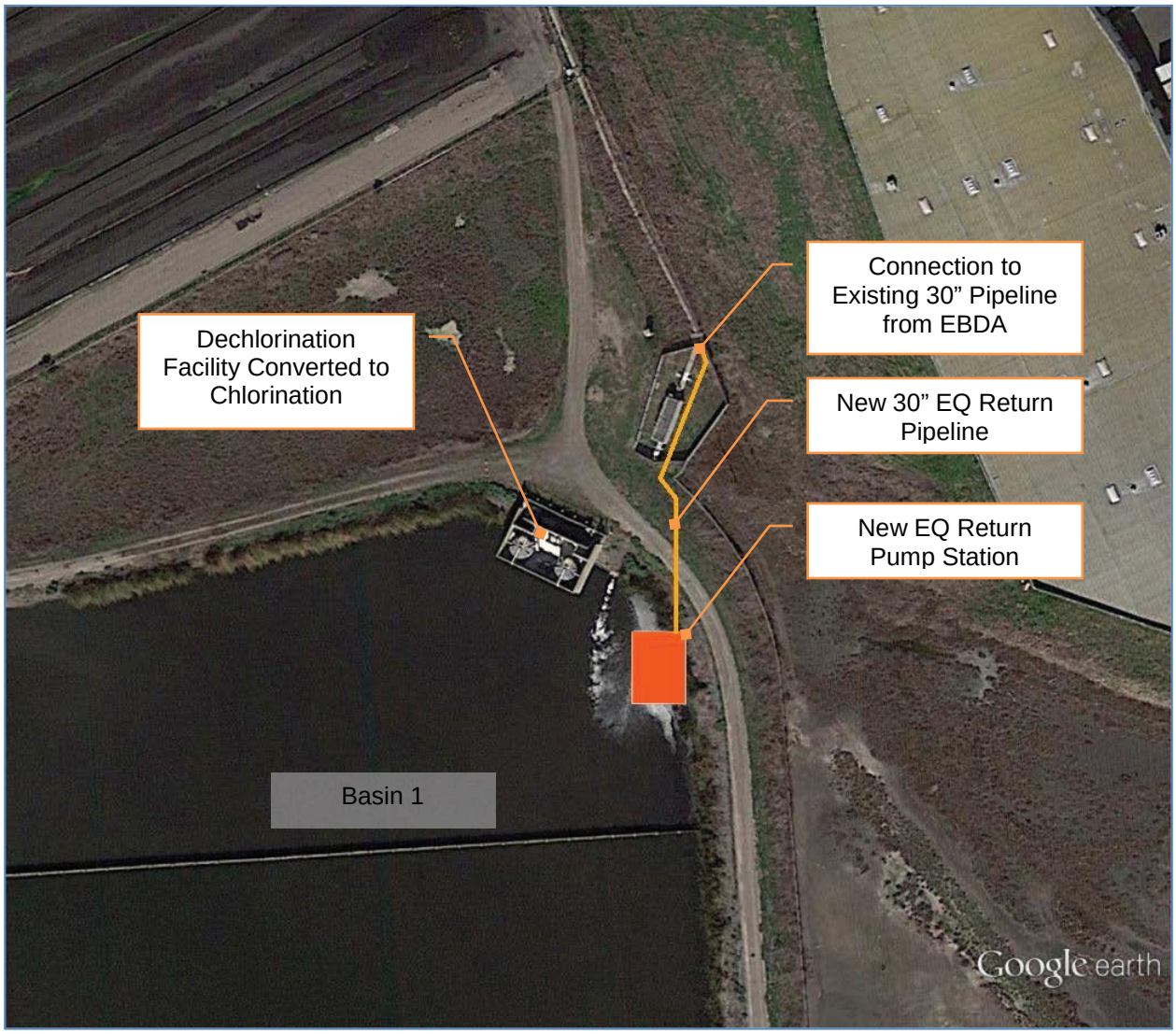


Figure 3-2: Option 3 - Basin 1 Equalization Return Pump Station and Pipeline

3.4 Habitat Considerations

Converting Basin 1 to equalization storage would not result in loss of habitat because the basin is already somewhat isolated from other basins and would continue to directly receive treated effluent. Basins 2A and 2B are currently considered wastewater treatment ponds. Under Option 3, Basins 2A and 2B would receive water from the San Francisco Bay and would be considered waters of the United Stated, which could be considered as a habitat creation.

Tidal exchange and fluctuation would shift the existing plant community in the Basin 3A and 3B from brackish to salt marsh which would become stabile and self-maintaining and possibly provide habitat for species that are closely associated with salt marsh habitat.

Increasing flow of salt water through the basins may reduce the occurrence of avian diseases, especially in Basins 2A and 2B. However, if improved salt water circulation does not produce expected results, having the ability to occasionally dry the ponds would also be a tool for reducing avian disease, either through the reduction of organisms responsible for the disease or passively removing birds from the basins so they do not come into contact with the disease.

3.5 Permitting Considerations

The environmental permitting conditions for Option 3 are expected to be substantially similar to the Baseline Condition. In addition, the State Lands Commission and City of Hayward would need to be consulted for regrading of Basin 1 and connection of Basins 2A and 2B. Any improvements within the area under the jurisdiction of the State Land Commission would require a modification of the existing lease.

An NPDES permit for discharge of USD's reclaimed water to Hayward Marsh would no longer be required. The RWQCB would issue an order rescinding the existing Hayward Marsh NPDES permit. There may be conditions placed on the recession of the NPDES permit to provide assurance that there would be no future discharge to Hayward Marsh.

3.6 Option 3 Cost Estimate

The planning-level cost estimate for Option 3 was developed using the same basis and implementation factors as presented in the Baseline Condition TM. A summary of the implementation factors is presented in **Table 3-3** for reference.

Table 3-3: Cost Estimate Implementation Factors

Component	Allowance
Environmental Documentation and Permits	6%
Design Service	6%
Legal and Administrative Services	1%
Engineering Services During Construction	4%
Construction Management and Inspection	6%

The implementation factors presented in **Table 3-3** are appropriate for projects that primarily involve earthwork (i.e. excavation and material placement). More complex construction work, such as pump stations and pipelines, may require more effort during the design phase. However, the portion of work involving these types of facilities is less than the earthwork component of Option 3. An additional contingency was included in the raw construction cost line items for more complex facilities to account for the additional design cost. As with the baseline condition, an inflation/escalation rate of 3% was used for estimating the future cost at the midpoint of construction.

3.6.1 Construction Methods and Equipment

The construction equipment and materials for the excavation and placement activities in Option 3 are the same as indicated for Option 1. Option 3 does not include repair of the levee between Basins 2A and 2B. The levee between Basins 3A and 3B is also not included, as it is not needed for vehicle access. The tasks and sequencing for the excavation and placement activities in Options 1 and 3 are similar.

In order to convert Basin 1 to an equalization storage basin, portions of the existing baffle walls would be removed where the baffles connect to the side of the basin. Removing portions of the baffle walls would help with basin drainage. A low ground pressure bulldozer or similar equipment would be used to convert the slope of the existing bottom of Basin 1 towards the new equalization return pump station. It is expected that Basin 1 would remain unlined for equalization storage. The installation of a membrane liner is not included in the cost estimate.

The new equalization return pump station would be a new concrete structure located in the northeast corner of Basin 1. A new 30-inch diameter pipeline to convey flow from the new pump station to the EBDA pipeline would be installed using open-cut construction between the pump station and the existing 30-inch diameter marsh pipeline, just upstream of the existing flume structure.

3.6.2 Capital Cost Estimates

A construction cost breakdown by item and total capital cost estimate are presented in **Table 3-4**. Including the cost estimating allowances, the total estimated capital cost for Option 3 is $15,040,000. The estimated capital cost for providing equalization storage in Basin 1 is $7,230,000 of the estimated $15,040,000 total project capital cost. Actual project costs are typically expected to be within +30% to -20% of the planning-level cost estimate.

Table 3-4: Option 3 - Construction and Capital Cost Estimate

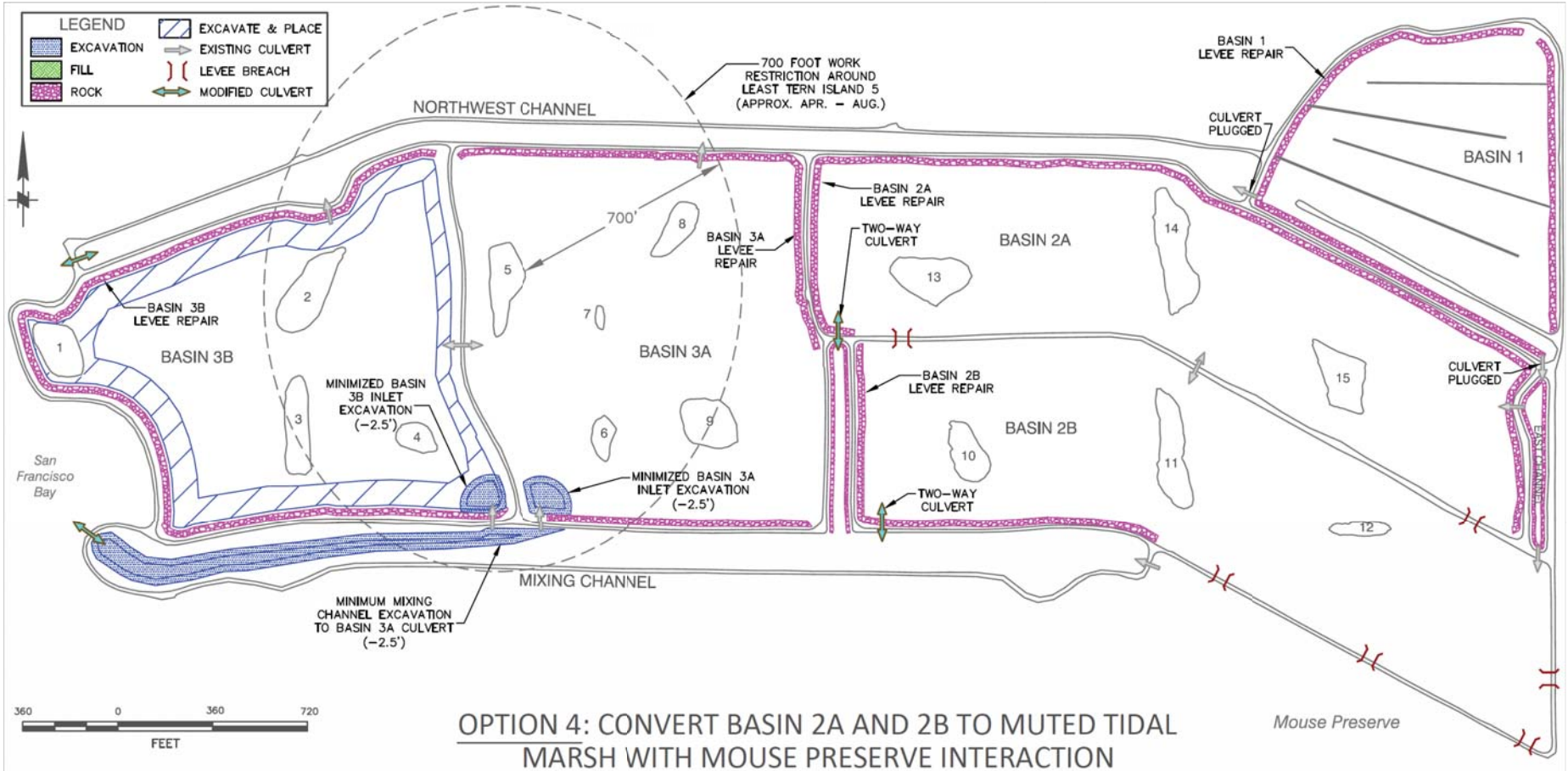
Item	Quantity	Unit	Unit Cost	Total Cost
Mobilization & Demobilization	1	LS	$1,107,200	$1,107,200
Clearing and Grubbing	9.5	ACRE	$74,617	$708,900
USD Effluent Bypass Pumping and/or NPDES Waiver	1	ALLOW	$50,000	$50,000
Excavate Basin 3B	16,400	CY	$112	$1,836,800
Rock Slope Protection (Except Basin 1)	19,170	TON	$61	$1,169,400
Rock Slope Protection (Basin 1)	6,320	TON	$61	$385,500
Excavate Mixing Channel	11,500	CY	$35	$399,600
Excavate Basin 3A Inlet	1,500	CY	$35	$52,100
Excavate Basin 3B Inlet	1,500	CY	$35	$52,100
Operational Improvements				
New culvert gates at NW Channel (bayside), Mixing Channel (bayside), Basin 2A (Mixing Channel), Basin 2B (Mixing Channel)	4	EACH	$30,000	$120,000
Plug culverts from Basin 1 to NW and East Channel	2	EACH	$15,000	$30,000
Basin 1 Grading	15.4	ACRE	$63,027	$970,600
Basin 1 Baffle Wall Demolition	1	LS	$100,000	$100,000
Basin 1 EQ Pump Station (10 MGD Firm Capacity)	200	HP	$6,500	$1,300,000
30" dia. EQ Return Pipeline	300	LF	$360	$108,000
Electrical Service Upgrade	1	LS	$250,000	$250,000
Motorized Gate Valves for EQ Return Pipeline	2	EACH	$75,000	$150,000
Dechlorination Conversion to Chlorination Facility	1	LS	$200,000	$200,000
Telemetry	1	LS	$100,000	$100,000
Backup Power	1	LS	$300,000	$300,000
Misc. Improvements (25% of operational improvements)	1	ALLOW	$907,000	$907,000
			Raw Construction Cost	**$10,063,900**
			Escalation to Midpoint of Construction (18 months at 3%/Year)	$460,000
			Total Bid Amount	**$10,523,900**
			Contingency (20%)	$2,100,000
			Total Construction Amount	**$12,623,900**
			Environmental Documentation and Permitting (6%)	$630,000
			Design Allowance (6%)	$630,000
			Legal/Admin Allowance (1%)	$110,000
			Construction Management Allowance (6%)	$630,000
			Engineering Services During Construction Allowance (4%)	$420,000
			Total Capital Cost	**$15,040,000**

Notes:
- The excavation items include placement costs at those locations identified in Figure 3-1.
- The estimated capital cost for providing equalization storage in Basin 1 is $7,230,000 of the estimated $15,040,000 total project capital cost
- Apparent errors in totals are due to rounding.

Chapter 4 Option 4: Convert Basin 2A and 2B to Muted Tidal Marsh with Mouse Preserve Interaction

4.1 Description of Option 4

Option 4 is the same as Option 3, except that the north, south, and east levees of Basin 2B would be breached in order to hydraulically connect the Hayward Marsh with the southerly Mouse Preserve. The Mouse Preserve is currently tidally influenced. Basins 2A and 2B would also be more significantly connected through the levee breaches between them. This option would provide additional pathways (i.e. flow from Mouse Preserve) for the introduction of salt water throughout the marsh. Details on the excavation and placement locations are shown in **Figure 4-1**. As with Option 3, Basin 1 would be converted to equalization storage.



OPTION 4: CONVERT BASIN 2A AND 2B TO MUTED TIDAL MARSH WITH MOUSE PRESERVE INTERACTION

LAST SAVED: 5/11/15

Figure 4-1. Option 4

HAYWARD MARSH REHABILITATION PROJECT

NOTES:
1. ALL ELEVATIONS ARE IN FEET NGVD29.
2. PROPOSED 30–INCH DIAMETER HDPE PIPELINE TO BYPASS BASIN 1 (NOT SHOWN) SHALL EXTEND FROM RECOMMISSIONED DECHLORINATION STATION TO EAST CHANNEL.

4.2 Dredging and Placement Considerations

4.2.1 Material Excavation

In addition to the excavation sites listed for Option 3, Option 4 includes six levee breaches along Basin 2B's north, south, and east levees. Levee breaches would have the following characteristics: 8' tall, 20' crest, 10' breach width, and 2H:1V slopes. Each breach would involve removal of approximately 200 cubic yards of material, which would be placed along nearby levee slopes. A summary of the excavation sites in Option 4 is shown in **Table 4-1**. A total of approximately 29,600 cubic yards of material would be excavated.

Table 4-1: Option 4 - Excavation Volumes, Areas, Target Elevations, and Slopes

Excavation Location	Area (acres)	Original Ground Average Elevation (ft. NGVD29)	Original Marsh Design Elevation (ft. NGVD29)	Target Elevation (ft. NGVD29)	Slope (H:V)	Volume (CY)
Basin 3B Excavation	6.4*	0.8	-2.5 to 1.5	-0.7	4:1	13,900
Mixing Channel - Minimized Excavation to Basin 3A Culvert	2.1	2.6	-1.5	-2.5	4:1	11,500
Minimized Basin 3A Inlet Excavation	0.2	1.9	-1.5	-2.5	4:1	1,500
Minimized Basin 3B Inlet Excavation	0.2	0.9	-1.5	-2.5	4:1	1,500
Levee Breaches (Basin 2B N, S, and E levees)	<0.1	7.0	8.3	-1.0	2:1	1,200
					Total	**29,600**

* Acreage includes 30-ft. offset from levee toe and excludes islands. Area covered to remove 18" of top material to obtain desired volume.

Basin 3B Excavation

Basin 3B will be excavated in Option 4 as described in Option 3. Because more dry material from the levee breaches will be available for levee repair, and the southeast levee of Basin 2B won't be repaired near the breaches, less material will be excavated from Basin 3B in this Option (compared to Option 3).

Mixing Channel

The Mixing Channel would be minimally excavated in Option 4 as described in Option 3.

Northwest Channel

As with Option 3, Option 4 does not include excavation of the Northwest Channel since only a small volume would be excavated over a large area with minimal benefit.

Minimized Basin 3A and 3B Inlets Excavation

Basin 3A and 3B inlets would be minimally excavated in Option 4 as described in Option 3.

4.2.2 Material Placement

Excavation material from Option 4 would be placed within Hayward Marsh as detailed in Table 4-2. Material excavated from Basin 3B would be placed on levees in need of repair, and then covered with rock. A total of 15,100 cubic yards of material and 24,000 tons of rock would be placed on 19,800 linear feet of levees in this option. In Basin 1 only, 3,900 cubic yards of material and 6,320 tons of rock would be placed on 5,200 linear feet of levees. Approximately 14,500 cubic yards of material would be placed in Basin 3B. Excess excavated material would be placed along the levee within Basin 3B and would not have an impact on the flow through Basin 3B or provide access for predators.

Table 4-2: Option 4 - Material Placement Locations and Fill Volumes

Placement Location	Type	Slope (H:V)	Fill Volume (CY)	Rock Volume (tons)
Rock Levee Repair (See Figure 4-1)	Rock	2:1	15,100	24,000
Basin 3B Refill	Fill	4:1	14,500	0
		Total	**29,600**	**24,000**

4.3 Infrastructure Modifications

4.3.1 Infrastructure Replacement

Infrastructure replacement would be similar to Option 3, whereby salt water would be introduced into Basins 2A and 2B through two-way culverts and connection to the Mouse Preserve, and the basins would no longer receive fresh water flow from Basin 1. Levee breaches would be installed between the Mouse Preserve and Basin 2B, and between Basins 2A and 2B.

4.3.2 Operational Improvements

As with Option 3, Basin 1 would be reconfigured for equalization flow and would be operated independently of the Hayward Marsh. The gates between Basin 1 and the Northwest Channel and the East Channel would be removed and the culverts would be plugged. The existing culverts between the bay and the Northwest and Mixing Channels would be modified to allow flow in both directions, as well as between the Mixing Channel and Basins 2A and 2B. Tidal flow from the Mixing and Northwest Channels to Basins 2A, 2B, 3A and 3B would be controlled as needed for muted tidal marsh operation.

Basin 1 would provide approximately 30 MG of equalization storage. Stored effluent would be pumped back to the EBDA system through a new equalization return pump station located in the northeast corner of Basin 1. The modifications to Basin 1, configuration of the equalization return pump station and the return pipeline connection would be the same as with Option 3.

4.4 Habitat Considerations

As with Option 3, converting Basin 1 to equalization storage would not result in loss of habitat because the basin is already somewhat isolated from other basins and would continue to directly receive treated effluent. Basins 2A and 2B are currently considered wastewater treatment ponds.

Under Option 4, Basins 2A and 2B would receive water from the San Francisco Bay and would be considered waters of the United Stated, which could be considered as a habitat creation. Tidal exchange and fluctuation would shift the existing plant community in Basin 3A and 3B from brackish to salt marsh which would become stabile and self-maintaining and possibly provide habitat for species that are closely associated with salt marsh habitat. Finally, connecting flow between Basin 2B and the Mouse Preserve would increase habitat quality in the Mouse Preserve through additional water circulation and improvement of water quality in the preserve.

Increasing flow of salt water through the basins may reduce the occurrence of avian diseases, especially in Basins 2A and 2B. However, breaching of the Basin 2B levees would not allow for drying of Basins 2A and 2B as an alternate method for avian disease control.

4.5 Permitting Considerations

The environmental permitting conditions for Option 4 are expected to be substantially similar to Option 3. For Option 4 however, work in the vicinity of the Mouse Preserve has the potential to adversely affect the salt marsh harvest mouse, so construction would need to be accomplished in a way that would protect the mouse. Practical measures for this purpose have been implemented on many other projects within the Bay Area. An example would be to remove habitat in the immediate vicinity of the construction to ensure the salt marsh harvest mouse is not present during construction, and installing silt fencing around undisturbed habitat. In addition, since salt water would enter the marsh uncontrolled through the Mouse Preserve, some levee elevations may need to be increased in the future for sea level rise at an earlier time than with Options 1 through 3.

As with Option 3, an NPDES permit for discharge of USD's reclaimed water to Hayward Marsh would no longer be required. The RWQCB would issue an order rescinding the existing Hayward Marsh NPDES permit. There may be conditions placed on the recession of the NPDES permit to provide assurance that there would be no future discharge to Hayward Marsh.

4.6 Option 4 Cost Estimate

The planning-level cost estimate for Option 4 was developed using the same basis and implementation factors as presented in the Baseline Condition TM. A summary of the implementation factors is presented in **Table 4-3** for reference.

Table 4-3: Cost Estimate Implementation Factors

Component	Allowance
Environmental Documentation and Permits	6%
Design Service	6%
Legal and Administrative Services	1%
Engineering Services During Construction	4%
Construction Management and Inspection	6%

The implementation factors presented in **Table 4-3** are appropriate for projects that primarily involve earthwork (i.e. excavation and material placement). More complex construction work, such as pump stations and pipelines, may require more effort during the design phase. However,

the portion of work involving these types of facilities is less than the earthwork component of Option 3. An additional contingency was included in the raw construction cost line items for more complex facilities to account for the additional design cost. As with the baseline condition, an inflation/escalation rate of 3% was used for estimating the future cost at the midpoint of construction.

4.6.1 Construction Methods and Equipment

The construction equipment and materials for Option 4 are the same as for Option 1. Option 4 includes breaching Basin 2B's north, south and east levees to restore tidal interaction with the adjoining Mouse Preserve. Material removed from the breached sections would be placed on nearby levees. The proposed tasks and sequencing for Options 1 and 4 are similar. Because the proposed levee breach locations are outside the 700 foot work restriction around the least terns on Island 5, the breaches could be constructed after the other excavation sites were completed within the work window. Continued access along the south levee along Basin 2B would be desirable during construction, therefore the breaches would likely be constructed after the other excavation sites were completed.

The construction methods for the conversion of Basin 1 to equalization storage, including the equalization return pump station, pipeline connection, and dechlorination facility conversion would be the same as for Option 3.

4.6.2 Capital Cost Estimates

A planning-level construction cost breakdown by item and total capital cost estimate are presented in **Table 4-4**. Including the cost estimating allowances, the total estimated capital cost for Option 4 is $14,630,000. The estimated capital cost for providing equalization storage in Basin 1 is $7,230,000 of the estimated $14,630,000 total project capital cost. Actual project costs are typically expected to be within +30% to -20% of the planning-level cost estimate.

Table 4-4: Option 4 - Construction and Capital Cost Estimate

Item	Quantity	Unit	Unit Cost	Total Cost
Mobilization & Demobilization	1	LS	$1,107,200	$1,107,200
Clearing and Grubbing	9.5	ACRE	$74,617	$708,900
USD Effluent Bypass Pumping and/or NPDES Waiver	1	ALLOW	$50,000	$50,000
Excavate Basin 3B	13,900	CY	$112	$1,556,800
Rock Slope Protection (Except Basin 1)	17,680	TON	$61	$1,078,500
Rock Slope Protection (Basin 1)	6,320	TON	$61	$385,500
Excavate Mixing Channel	11,500	CY	$35	$399,600
Excavate Basin 3A Inlet	1,500	CY	$35	$52,100
Excavate Basin 3B Inlet	1,500	CY	$35	$52,100
Levee Breaches	1,200	CY	$80	$96,000
Operational Improvements				
New culvert gates at NW Channel (bayside), Mixing Channel (bayside), Basin 2A (Mixing Channel), Basin 2B (Mixing Channel)	4	EACH	$30,000	$120,000
Plug culverts from Basin 1 to NW and East Channel	2	EACH	$15,000	$30,000
Basin 1 Grading	15.4	ACRE	$63,027	$970,600
Basin 1 Baffle Wall Demolition	1	LS	$100,000	$100,000
Basin 1 EQ Pump Station (10 MGD Firm Capacity)	200	HP	$6,500	$1,300,000
30" dia. EQ Return Pipeline	300	LF	$360	$108,000
Electrical Service Upgrade	1	LS	$250,000	$250,000
Motorized Gate Valves for EQ Return Pipeline Connection	2	EACH	$75,000	$150,000
Dechlorination Conversion to Chlorination Facility	1	LS	$200,000	$200,000
Telemetry	1	LS	$100,000	$100,000
Backup Power	1	LS	$300,000	$300,000
Misc. Improvements (25% of operational improvements)	1	ALLOW	$907,000	$907,000
Raw Construction Cost				**$9,789,000**
Escalation to Midpoint of Construction (18 months at 3%/Year)				$450,000
Total Bid Amount				**$10,239,000**
Contingency (20%)				$2,050,000
Total Construction Amount				**$12,289,000**
Environmental Documentation and Permitting (6%)				$610,000
Design Allowance (6%)				$610,000
Legal/Admin Allowance (1%)				$100,000
Construction Management Allowance (6%)				$610,000
Engineering Services During Construction Allowance (4%)				$410,000
Total Capital Cost				**$14,630,000**

Notes:
- The excavation items include placement costs at those locations identified in Figure 4-1.
- The estimated capital cost for providing equalization storage in Basin 1 is $7,230,000 of the estimated $14,630,000 total project capital cost.
- Apparent errors in totals are due to rounding

Chapter 5 Option 5: Additional Enhancements to Basins 2A and 2B

5.1 Description of Option 5 (Introduced at the Request of EBRPD)

Option 5 is similar to Option 1, but includes excavation of the top 4 inches within and regrading of Basins 2A and 2B to control avian disease. Regrading the Basins will also allow gravity drainage to the Mixing Channel. The material excavated from Basins 2A and 2B would be trucked offsite and disposed of at a nearby landfill, to avoid recontamination, although this is a costly approach. Finding an onsite or nearby location where the material can be permanently disposed of would reduce costs. Excavation and placement locations for Option 5 are shown in **Figure 5-1.**

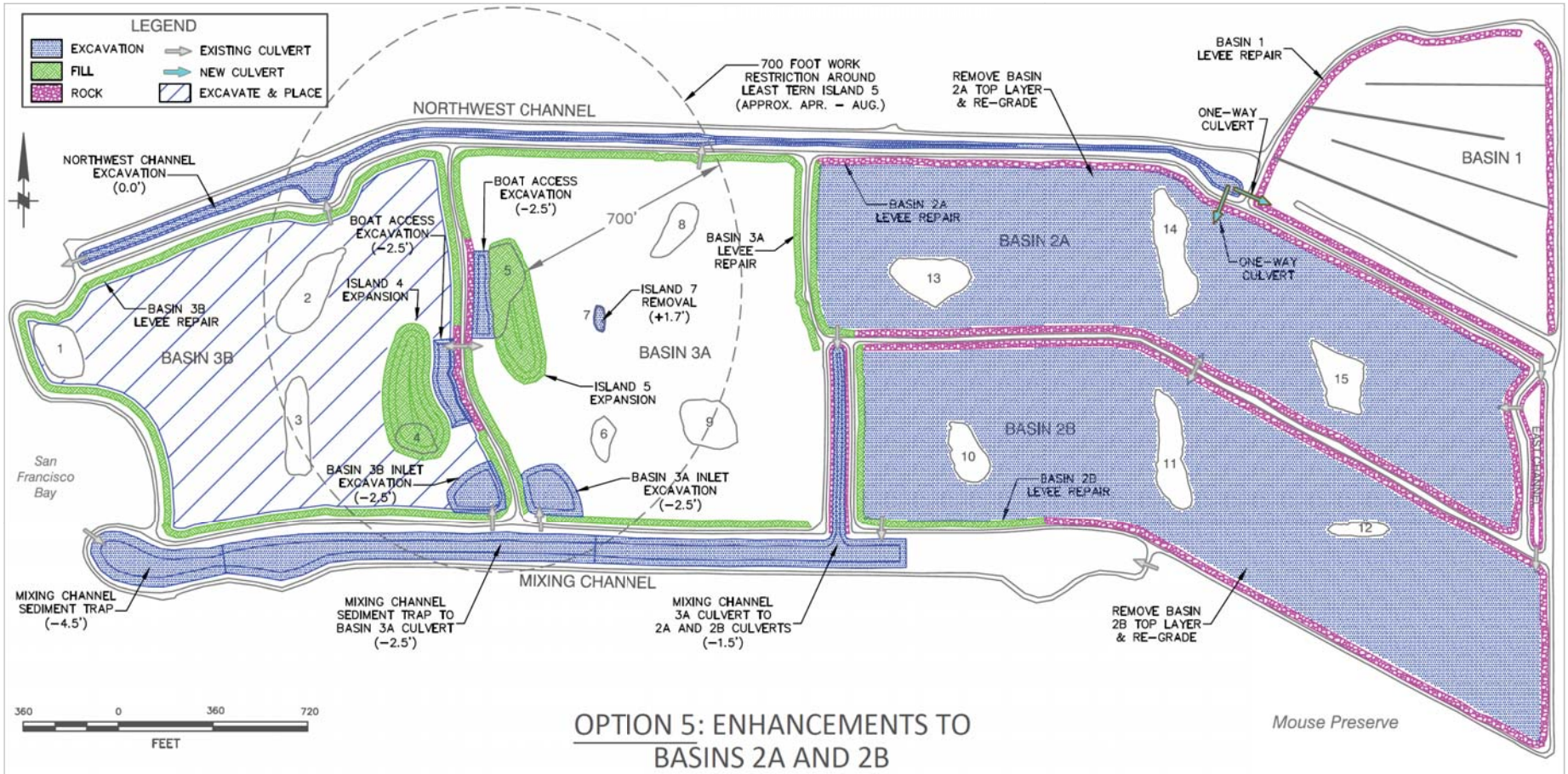


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Figure 5-1. Option 5

HAYWARD MARSH REHABILITATION PROJECT

NOTES:
1. ALL ELEVATIONS ARE IN FEET NGVD29.
2. PROPOSED 30-INCH DIAMETER HDPE PIPELINE TO BYPASS BASIN 1 (NOT SHOWN) SHALL EXTEND FROM RECOMMISSIONED DECHLORINATION STATION TO EAST CHANNEL.

Material Excavation

In addition to the excavation sites listed for Option 1, Option 5 includes excavation of the top 4" of Basins 2A and 2B (excluding the islands). Given the accuracy of scraping wet material, a depth of 4" + 6" was used for the volume estimate. All material from Basins 2A and 2B was assumed to be transported offsite by trucks and disposed of at a nearby landfill, although a closer option would reduce costs significantly. A summary of the excavation sites in Option 5 is shown in **Table 5-1**. A total of approximately 169,800 cubic yards of material would be excavated, including excavation volumes from Option 1.

Table 5-1: Option 5 - Excavation Volumes, Areas, Target Elevations, and Slopes

Excavation Location	Area (acres)	Original Ground Average Elevation (ft. NGVD29)	Original Marsh Design Elevation (ft. NGVD29)	Target Elevation (ft. NGVD29)	Slope (H:V)	Volume (CY)
Basin 2A and 2B Excavation	56.9	2.0	-1.5 to 2	1.2	4:1	76,200
Basin 3B Excavation	15.5*	0.8	-2.5 to 1.5	-0.7	4:1	46,300
Mixing Channel – Sediment Trap Excavation	1.2	2.6	-1.5	-4.5	4:1	8,400
Mixing Channel – Sediment Trap to Basin 3A Culvert Excavation	2.6	2.2	-1.5	-2.5	4:1	15,700
Mixing Channel – Basin 3A Culvert to Basins' 2A and 2B Culverts Excavation	2.8	1.9	-1.5	-1.5	4:1	10,800
Northwest Channel Excavation	2.6	1.1	0.3	0.0	4:1	1,700
Basin 3A Inlet Excavation	0.6	1.9	-1.5	-2.5	4:1	3,400
Basin 3B Inlet Excavation	0.5	0.9	-1.5	-2.5	4:1	2,600
Island 4 Boat Access Channel	0.5	0.7	-2.5 to 1.5	-2.5	4:1	2,100
Island 5 Boat Access Channel	0.5	2.1	-2.5 to 1.5	-2.5	4:1	2,300
Basin 3A Island 7 Removal	<0.1	4.5	5.5	+1.7	4:1	300
					Total	**169,800**

* Acreage includes 30-ft. offset from levee toe and excludes islands. Area covered to remove 18" of top material to obtain desired volume.

Basin 2A and 2B Excavation

The top 4" of Basins 2A and 2B would be excavated (excluding the islands). Approximately 4.7 additional acres within the shallow areas of the basins have vegetation, and removal of that vegetation is included in this line item. All material would be transported offsite and disposed of at a nearby landfill.

Basin 3B Excavation

Basin 3B would be excavated as described in Option 1.

Mixing Channel

The Mixing Channel would be excavated as described in Option 1.

Northwest Channel

The Northwest Channel would be excavated as described in Option 1.

Basin 3A and 3B Inlets Excavation

The Basin 3A and 3B inlets would be excavated as described in Option 1.

Islands 4 & 5 Boat Access Channels

The Island 4 & 5 Boat Access Channels would be excavated as described in Option 1.

Island 7 Removal

Island 7 would be removed as described in Option 1.

5.1.2 Material Placement

Other than the material removed from Basin 2A and 2B, excavated material from Option 5 would be placed within Hayward Marsh as detailed in **Table 5-2.** Material excavated from Basin 3B would be placed on levees in need of repair, and then covered with rock. A total of 34,000 cubic yards of material and 15,640 tons of rock would be placed on levees in this option. Approximately 46,000 cubic yards of material would be placed in Basin 3B. Approximately 76,200 cubic yards would be hauled offsite for disposal.

Table 5-2: Option 5 - Material Placement Locations and Fill Volumes

Placement Location	Type	Slope (H:V)	Fill Volume (CY)	Rock Volume (tons)
Bench Fill Levee Repair (See Figure 5-1)	30' Bench	3:1	24,100	0
Rock Levee Repair (See Figure 5-1)	Rock	2:1	9,900	15,640
Basin 3B Refill	Fill	4:1	46,000	0
Island 4 Expansion	Fill	6:1	8,600	0
Island 5 Expansion	Fill	6:1	5,000	0
Offsite Disposal	-	-	76,200	0
Total			**169,800**	**15,640**

5.2 Infrastructure Modifications

Infrastructure modifications for Option 5 are the same as those proposed for Option 1, the baseline condition, and are described in further detail within the Baseline Condition TM.

5.3 Habitat Considerations

The habitat considerations for Option 5 are expected to be the same as for the Baseline Condition.

5.4 Permitting Considerations

The environmental and NPDES permitting considerations for Option 5 are expected to be the same as for the Baseline Condition. Basins 2A and 2B are considered to be water treatment basins, are regulated as such, and are not jurisdictional waters of the U.S. or state. They may be dredged without acquiring typical 404 Clean Water Act, 401 Clean Water Act, or waste discharge permits. Standard BMPs would need to be implemented during construction to prevent sediment runoff into jurisdictional waters, etc.

The dredged material could be used in a suitable uplands location where the botulism organism (Clostridium botulinum), an anaerobic bacteria, would not be active and where the cholera organism (Pasteurella multocida), a facultative (mostly) anaerobic bacteria, activity would be reduced. Excavating the dredged materials, moving them to an upland location, and grading would cause mixing that would aerate the material during construction, and aeration would continue permanently in uplands. Dredged wetland soils and bay muds also tend to become acidic with aeration and may have elevated salt concentrations because of residual marine salts often found in dredged materials. Both of these factors inhibit plant growth for several years, so this condition should be considered in determining the location where these materials will be placed.

Dredging of Basins 2A and 2B would not be expected to cause impacts to special-status plant and wildlife species or their habitat. There are a few special-status wildlife species widely known to be present in the vicinity of the basins, however these species are associated with special habitats, such as salt marsh and/or tidal habitat (salt marsh harvest mouse and California clapper rail) or barren islands (such as least tern). Because Basins 2A and 2B are enclosed freshwater treatment basins and do not have special habitat qualities needed by special-status species, no special-status species would be directly impacted by dredging. During construction activities, there would likely need to be construction work windows and buffer zones, surveys, and monitoring required by U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife. Existing plants in the basins are not likely to include any special-status species, therefore no impacts to special-status plants would be expected from dredging.

5.5 Option 5 Cost Estimate

The planning-level cost estimate for Option 5 was developed using the same basis and implementation factors as presented in the Baseline Condition TM. A summary of the implementation factors is presented in **Table 5-3** for reference.

Table 5-3: Cost Estimate Implementation Factors

Component	Allowance
Environmental Documentation and Permits	6%
Design Service	6%
Legal and Administrative Services	1%
Engineering Services During Construction	4%
Construction Management and Inspection	6%

The implementation factors presented in Table 5-3 are appropriate for projects that primarily involve earthwork (i.e. excavation and material placement). As with the baseline condition, an inflation/escalation rate of 3% was used for estimating the future cost at the midpoint of construction, and a project contingency was embedded with each raw construction cost line item. Please see the Baseline Condition TM for more details regarding these cost-estimating factors.

5.5.1 Construction Methods and Equipment

The construction equipment and materials for Option 5 are the same as for Option 1. The proposed tasks and sequencing for Options 1 and 5 are similar, except that the excavation, material disposal, and regrading of Basins 2A and 2B would occur at the same time as the other excavation and placement activities. No additional overhead costs have been included for excavation of Basins 2A and 2B.

5.5.2 Capital Cost Estimates

A planning-level construction cost breakdown by item and total capital cost estimate are presented in **Table 5-4**. Including the cost estimating allowances, the total estimated capital cost for Option 5 is $26,700,000. Actual project costs are typically expected to be within +30% to -20% of the planning-level cost estimate.

Table 5-4: Option 5 - Construction and Capital Cost Estimate

Item	Quantity	Unit	Unit Cost	Total Cost
Mobilization & Demobilization	1	LS	$1,107,200	$1,107,200
Clearing and Grubbing	10.5	ACRE	$74,617	$783,500
USD Effluent Bypass Pumping and/or NPDES Waiver	1	ALLOW	$50,000	$50,000
Excavate Basin 3B and Levee/Island 4&5 Placement	46,300	CY	$131	$6,065,300
Repair Basin 2A and 2B Levee	1	LS	$1,200,900	$1,200,900
Excavate Island 7	300	CY	$131	$39,300
Rock Slope Protection	15,632	TON	$61	$953,600
Excavate Mixing Channel	34,900	CY	$11	$383,900
Excavate Northwest Channel	1,700	CY	$48	$81,600
Excavate Basin 3A Inlet	3,400	CY	$48	$163,200
Excavate Basin 3B Inlet	2,600	CY	$48	$124,800
Island 5 Boat Access Channel	2,300	CY	$80	$184,000
Island 4 Boat Access Channel	2,100	CY	$81	$170,100
Excavate Basin 2A & 2B Top Layer & Re-grade	76,200	CY	$67	$5,114,500
Operational Improvements				
New gates at Basin 1 (bayside), 2A, and 2B inlet culverts and NW Channel to 2B culvert	4	EACH	$30,000	$120,000
NW Channel to 2A 30" dia. culvert	60	LF	$360	$21,600
30" dia. freshwater bypass around Basin 1	1000	LF	$360	$360,000
Gate valve for freshwater bypass line	2	EACH	$30,000	$60,000
Dechlorination System Recommissioning	1	LS	$75,000	$75,000
			Raw Construction Cost	**$17,049,400**
			Escalation to Midpoint of Construction (24 months at 3%/Year)	$1,050,000
			Total Bid Amount	**$18,099,400**
			Contingency (20%)	$3,620,000
			Total Construction Amount	**$21,719,400**
			Environmental Documentation and Permitting (6%)	$1,300,000
			Design Allowance (6%)	$1,300,000
			Legal/Admin Allowance (1%)	$220,000
			Construction Management Allowance (6%)	$1,300,000
			Engineering Services During Construction Allowance (4%)	$870,000
			Total Capital Cost	**$26,700,000**

Notes:
- The excavation items include placement costs at those locations identified in Figure 5-1.
- Apparent errors in totals are due to rounding

Chapter 6 Other Options

6.1 Equalization Storage at City of Hayward Oxidation Ponds (Storage at City of Hayward Option)

6.1.1 Description of Storage at City of Hayward

USD could use the existing oxidation ponds located near the City of Hayward wastewater treatment plant for equalization storage. The use of the Hayward oxidation ponds could be combined with any of the five Hayward Marsh options. For example, USD could develop storage at the Hayward oxidation ponds and EBRPD could implement the marsh improvements outlined in Options 3 or 4. Hayward Marsh improvements are not included as part of this option. Storage at Hayward oxidation ponds could also be combined with Options 1, 2 or 5.

As stated under Option 3, USD would need 53.6 MG of storage at future buildout flows if the Hayward Marsh discharge was discontinued. Storage could be developed at the City of Hayward oxidation ponds. The City of Hayward oxidation ponds consist of seven clay-bottom ponds near the Hayward wastewater treatment plant. The ponds have an estimated total storage capacity of 200 MG. In order to provide 53.6 MG of equalization storage, Ponds 3 and 4 (or their equivalent) could be converted to storage basins.

A new connection could be made on the existing 60-inch diameter EBDA pipeline, in order to divert USD effluent to Ponds 3 and 4. After the peak flow event, stored effluent would be metered back into the EBDA system through a new equalization return pump station. A schematic of the proposed storage configuration is shown in Figure 6-1.

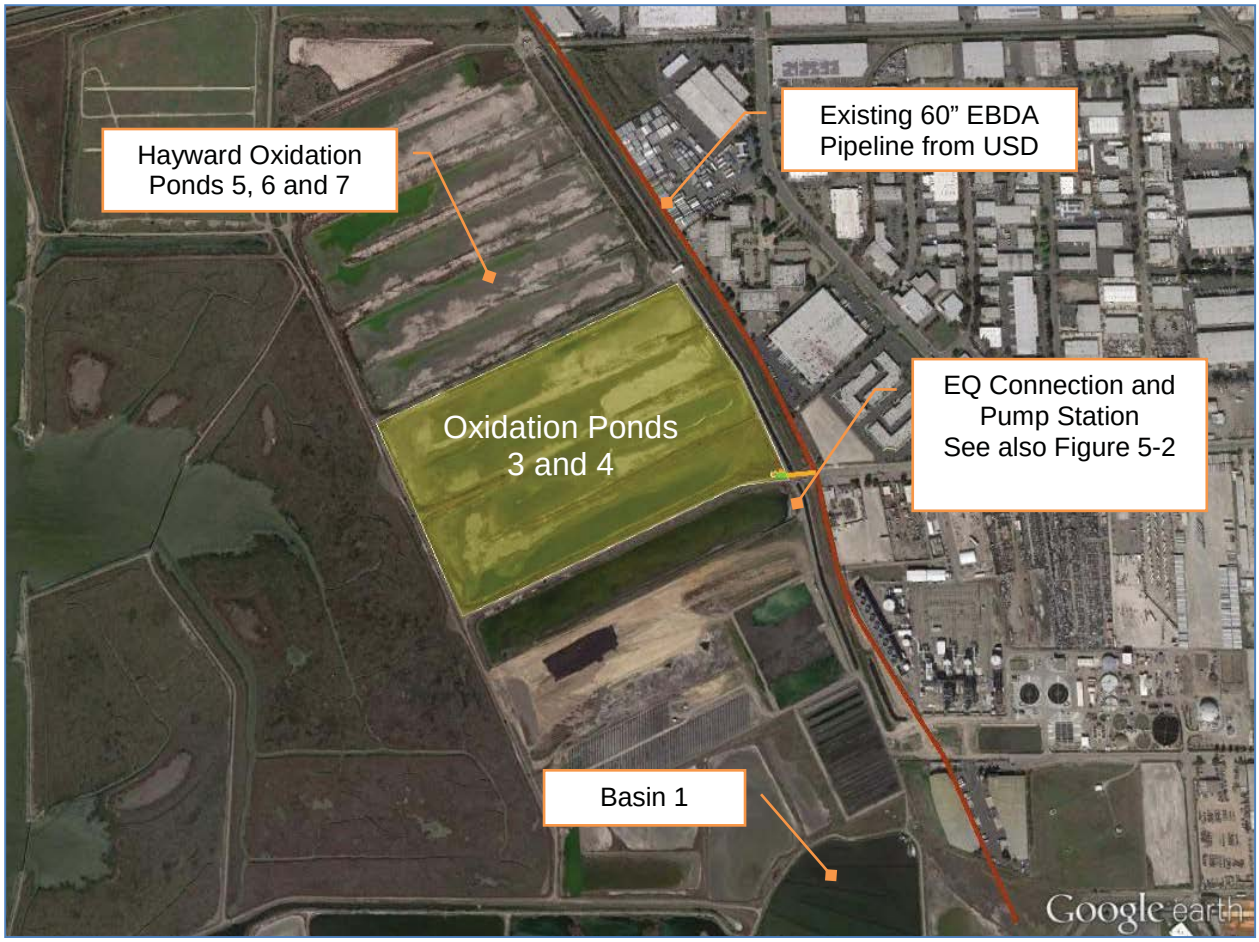

Figure 6-1: Oxidation Pond Equalization Storage Configuration

6.1.2 Infrastructure Modifications

Ponds 3 and 4 have an estimated area of 62.7 acres. It is estimated that the existing ponds could accommodate a water depth of up to 3.5 feet. At a water depth of 3.5 feet, Ponds 3 and 4 would be capable of providing 71.5 MG of storage, which is significantly more than the 53.6 MG required. The required hydraulic gradeline to send flow to the Hayward Ponds is not significantly different than the hydraulic conditions for the existing connection to the Hayward Marsh.

Given the amount of storage potentially available, minimal effort would be made to regrade the existing pond bottom. Some effluent may not be completely removed from the storage basins during dewatering, but it would evaporate after the wet season.

A new 48-inch diameter equalization diversion and return pipeline would be connected to the 60-inch diameter EBDA pipeline on the east side of the oxidation ponds, at Depot Road. The invert of the existing EBDA pipeline is approximately 16 feet below ground surface in this area. There are also several large diameter culverts between the EBDA pipeline and the oxidation ponds, therefore it is expected that the new equalization pipeline would be installed using trenchless construction methods. Isolation valves and a flow metering flume would also be installed on the discharge end of the new 48-inch diameter pipeline. A 48-inch diameter (or larger) pipeline

could potentially allow for greater flow to the Hayward Ponds, relative to the Hayward Marsh, which has a 30-inch diameter connection.

A new equalization return pump station could be constructed in the southeast corner of Pond 3 or another location in consultation with the City of Hayward. The equalization return pump station would have a capacity of 10 MGD and would include two 100 HP duty pumps. Backup power would be provided to allow for pump station operation during a power outage. Telemetry for remote monitoring and operation would also be provided. A schematic of the new connection to the EBDA pipeline and the equalization return pump station is shown Figure 6-2. It is assumed that abandoned USD facilities at Hayward Marsh would be demolished as part of this option.

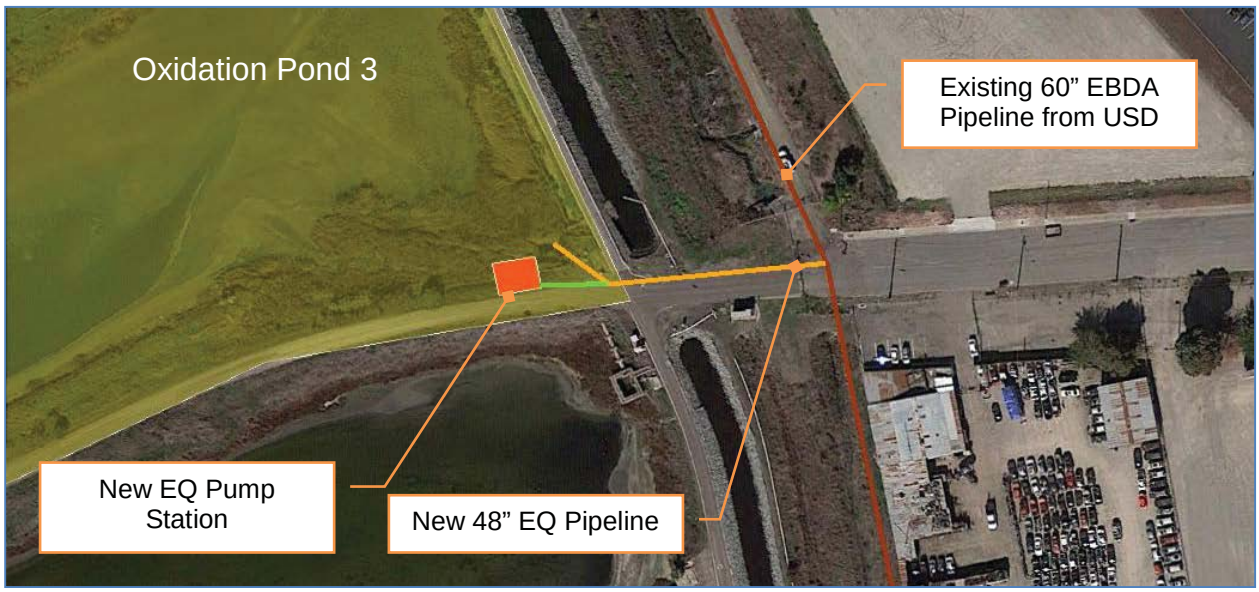

Figure 6-2: Hayward Pond Equalization Pipeline and Pump Station Location

6.1.3 Habitat Considerations

If USD ceased the discharge of treated wastewater to the Hayward Marsh, it is possible that EBRPD could provide Basins 1, 2A, 2B, 3A, and 3B with tidal salt water exchange and essentially restore tidal wetlands that historically existed at this location. Tidal fluctuation would provide regular circulation throughout the system. Salt marsh plant communities would develop and possibly provide habitat for species that are closely associated with salt marsh habitat.

EBRPD has asserted that introducing salt water through the basins may reduce the occurrence of bird diseases, especially Basins 1, 2A, and 2B. However, if salt water circulation does not produce expected results, having the ability to occasionally dry the ponds would be another tool to reduce avian disease either through reduction of organisms responsible for the diseases or passively removing birds from the basins so that they do not come into contact with the disease.

6.1.4 Permitting Considerations

Environmental Permits

Use of the old Hayward oxidation ponds for effluent equalization would require physical modifications of the ponds and construction of a new pump station. Construction of such facilities would be a "project" as defined in §21065 of the California Environmental Quality Act (CEQA), which is a project undertaken by a public agency that may cause a direct physical change in the environment. It is expected that a Class 1 Categorical Exemption, as described in §15301 of the CEQA Guidelines, would be used, which is appropriate for the repair, maintenance, and minor alteration of existing public facilities that involve negligible or no expansion of an existing use. However, if new facilities are extensive, or if the project involves expansion of capacity it would be advisable to prepare an Initial Study/Mitigated Negative Declaration.

NPDES Permit

If combined with Options 3 or 4, an NPDES permit for discharge of USD's reclaimed water to Hayward Marsh would no longer be needed. The RWQCB would issue an order rescinding the existing Hayward Marsh NPDES permit. There may be conditions placed on the recession of the NPDES permit to provide assurance that there would be no future discharge to Hayward Marsh.

6.2 Equalization Storage at Alvarado Wastewater Treatment Plant Option (Storage at AWTP Option)

Under the Equalization Storage at Alvarado Wastewater Treatment Plant (AWTP Storage Option), USD would build a new equalization diversion pump station and new effluent flow equalization storage tanks at the Alvarado Wastewater Treatment Plant (AWTP). The equalization storage tanks would be constructed on two acres of currently open land at the north end of the existing AWTP site and would store disinfected secondary effluent. The AWTP Storage Option was removed from the Options TM because it would not provide sufficient storage to offset the loss of USD's discharge to the Hayward Marsh. Additional detail on equalization storage at the AWTP can be found in the Brown and Caldwell *Flow Equalization Update Project Report*, dated November 27, 2013.

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Attachment A - Technical Memorandum: Development of Baseline Condition

Hayward Regional Shoreline

Hayward Marsh Rehabilitation Options Study

Technical Memorandum: Development of Baseline Condition

Final
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Appendix

Appendix A – Existing Marsh Data

Chapter 1 Background and Purpose

The Hayward Marsh is a 145-acre improved marsh system within the Hayward Regional Shoreline and adjacent to Lower San Francisco Bay. The marsh receives secondary-treated effluent from the Union Sanitary District's (USD's) Alvarado Wastewater Treatment Plant as its freshwater source. The marsh comprises three freshwater treatment marsh basins (1, 2A, and 2B, 85 acres), two brackish water basins (3A and 3B, 60 acres), and 15 islands, shown in **Figure 1-1**.

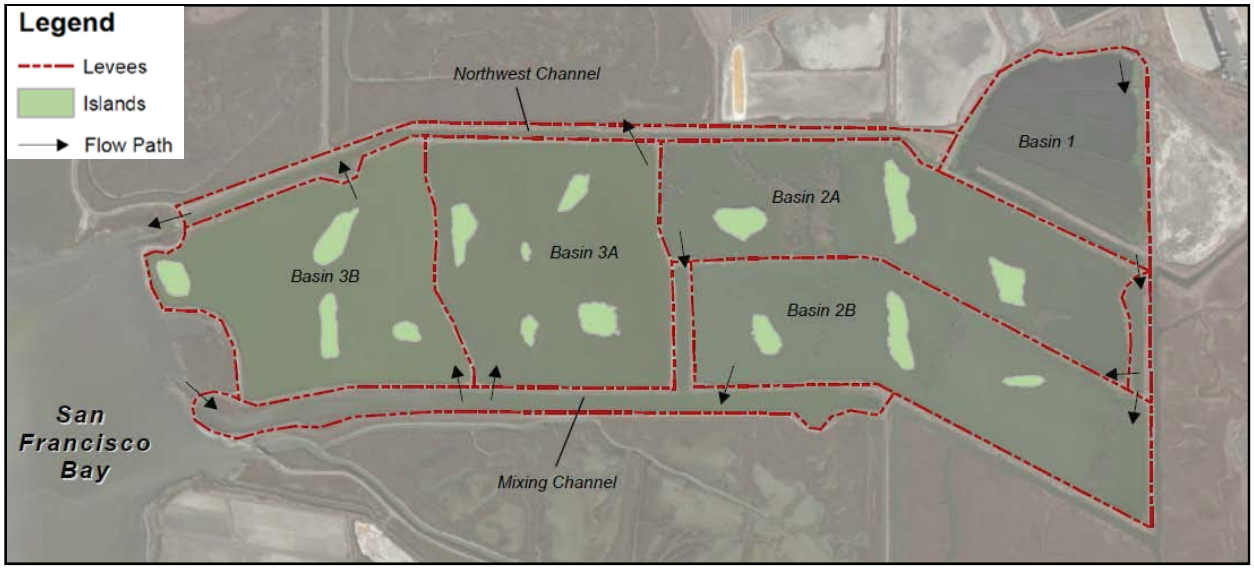

Figure 1-1: Plan View of Hayward Marsh Existing Condition

Water flow through the five basins is controlled by a series of weirs, valves, and channels, and has historically provided flexibility in operation, management and biological research. East Bay Regional Parks District (EBRPD) manages and operates the marsh.

The marsh islands support a significant density of wintering waterfowl and the marsh is an important migratory stopover for shorebirds each spring and fall. The marsh is also a refuge for nesting shorebirds and waterfowl, including the Forster's tern, Caspian tern, black skimmer, the federally-threatened western snowy plover, and the California clapper rail and California least tern, which are both federal and state endangered species. At least 200 species of birds have visited the marsh. The avian diversity and density attracts researchers, recreational bird watchers, and organized environmental groups who visit the marsh regularly. Due to the sensitive habitat and species, the marsh is not open or accessible to the public except for viewing from the San Francisco Bay Trail located on the bayside levee.

1.1 Current Marsh Status

In recent years, gradual silt build-up has been observed at various locations in the marsh, including at the intake from San Francisco Bay, in the Mixing Channel (south side of the marsh), and in the Northwest Channel. In addition, in June 2012, EBRPD staff discovered significant silt deposits that were impeding water flow into Basin 3B from the Mixing Channel. Eventually the silt completely plugged the culvert connecting the Mixing Channel to Basin 3B. To address this situation, EBRPD maintained a water depth in Basin 3B by manually filling it from the

Northwest Channel (north side of the marsh). However, by the spring of 2013, sedimentation continued to build-up in Basin 3B, creating a situation whereby mammals could walk through it. In order to prevent the Forster's terns from nesting in Basin 3B and having mammalian predators consume their eggs, EBRPD stopped activating the gates in the Northwest Channel and Basin 3B has now become dry.

The side slopes of levees and islands in the marsh have also experienced erosion, most likely due to wind-induced wave action. To address sedimentation and erosion issues, and increase tidal exchange in Basins 3A and 3B, EBRPD planned to restore selected portions of the marsh by dredging. However, by June 2013, this dredging activity was put on hold due to the increased magnitude of the restoration that was believed to be needed.

After discussion with EBRPD regarding various options for how to proceed with the marsh, USD offered to conduct a feasibility study to identify the estimated cost, scope, and other considerations for rehabilitating the marsh.

1.2 Hayward Marsh Rehabilitation Options Study

The Hayward Marsh Rehabilitation Options Study is being conducted to develop and evaluate various options for rehabilitation of Hayward Marsh. The rehabilitation options are being developed with the following objectives in mind:

- Preserve wet weather flow capacity,
- Restore regular salt water flow to marsh,
- Provide levee and island repair, and
- Incorporate features to more easily control future sedimentation

This Technical Memorandum (TM) on the Baseline Condition documents the option for rehabilitating the marsh to its original condition, and includes dredging, levee restoration, island restoration, and other improvements to restore flows throughout the marsh.

Chapter 2 Site Assessment

2.1 Bathymetry and Topographic Survey

A bathymetric and topographic survey of the Hayward Marsh was performed by CLE Engineering, as part of the RMC team, to assess the current basin and channel bottom elevations. The survey effort consisted of a blend of different survey equipment and platforms. All-terrain vehicle (ATV)-based survey crews utilizing Real-Time Kinematic GPS (RTK-GPS) collected topographic data along the levees, fringing marshes and water control structures. Sonar-based shallow water hydrographic gear was used within Basin 1 and the Mixing Channel. An airboat outfitted with an RTK-GPS sled was used to collect bathymetric data within Basins 2A, 2B, 3A and 3B. Due to the varying survey techniques, equipment, and locations, the survey field crew used RTK-GPS to ensure that data collected across the aforementioned platforms were consistent, independent of the survey equipment used. Raw data were collected in the North America Vertical Datum 1988 (NAVD 88) and converted to a National Geodetic Vertical Datum of 1929 (NGVD29) height. Unless noted otherwise, all elevations presented in this document are based on the NGVD29 datum. Additional details on the survey are included in *Hayward Marsh Bathymetric and Topographic Survey, Field Data Collection Procedures*, March 2014.

Although record drawings for the original Hayward Marsh restoration project are not available, the design drawings for the restoration project were reviewed and compared to the recent survey information. The recent survey information indicates that the majority of sedimentation, in terms of sedimentation depth, has occurred in the Mixing Channel. Some sedimentation within Basins 3A and 3B has occurred, which has filled in much of the original borrow channels; however there has not been a significant amount of sedimentation on the flatter areas of Basin 3A and 3B. No sedimentation has occurred in the active portion of the Northwest Channel (i.e. between the Basin 3A and 3B inlets to the channel and bay outlet), while the less active portion (i.e. east of the Basin 3A inlet) has significant sedimentation. The degree of sedimentation also varies within the basins and channels, with more sedimentation occurring in the areas with the most bay water influence. A comparison of current elevations and original design elevations is presented in **Table 2-1**.

Table 2-1: Current and Original Design Elevations

Location	Current Elevation (average for location) (ft NGVD 29)	Original Design Elevation (ft NGVD 29)
Basin 1	1.5	1.3
Basin 2A	2.5	2.0
Basin 2B	2.3	2.0
Mixing Channel	2.2	-1.5
Basin 3A	1.7	1.5
Basin 3B	0.8 (dry)	1.5
Northwest Channel	1.1	0.3

Note: Elevations vary within each location. The elevations listed are the estimated average bottom elevations.

At the time of the survey, Basin 3B had been out of service for several months. As a result of being out of service, the sediment in Basin 3B had dried, which resulted in consolidation and

shrinkage of the sediment. The elevation difference between Basin 3A and 3B is likely due to the dry conditions in Basin 3B.

2.2 Sediment Quality

Sediment sampling and analysis was performed by URS (under contract to EBRPD) in January 2014, to evaluate dredging and excavation of sediment within the Hayward Marsh. The purpose of the sediment sampling was to identify potential restrictions on use and/or disposal of the dredged material. The testing program was adequate for generating data that would allow the Dredged Material Management Office (DMMO) to make a sediment suitability determination for the majority of proposed placement options (i.e., levee repair, bird island construction, etc.). If other placement options are considered, additional testing would be required. The sampling plan was reviewed by the DMMO prior to sampling.

At total of ten sediment cores were extracted within Basin 2A (one sample), Basin 3A (two samples), Basin 3B (two samples), Mixing Channel (three samples) and the Northwest Channel (two samples). Each of the sediment cores was individually homogenized and proportionate amounts of the homogenized sediment from each core was combined and homogenized to form a composite sample representing each basin/channel. Samples of the composited sediments were submitted for bulk sediment analysis and a modified elutriate test (MET). The MET was analyzed for dissolved metals while the bulk sediment analysis was analyzed for the remaining constituents of concern. Equal amounts of the remaining sediments were combined to create one homogenized sample representative of the to-be-excavated sediment, which was analyzed for physical properties (sieve, Atterberg, hydrometer, etc.).

As part of the RMC project team, Pacific EcoRisk (PER) performed a technical review of the draft sampling and analysis report. The review focused specifically on assessing the adequacy of the sampling and testing program and subsequent analytical chemistry results in providing the necessary information for the DMMO to make a suitability decision for the proposed sediment placement options.

In general, the analytical chemistry results indicated that the sediment composite samples were below San Francisco Bay ambient concentrations (SFRWQCB 1998) and below screening criteria for upland beneficial reuse (SFRWQCB 2000). The complete PAH and PCB congener analyte lists were not analyzed and these constituents may be under reported, however there is no reason to believe these constituents to be of concern for the project site (such as historical use). For the Modified Elutriate Test (MET) elutriates, total selenium was slightly above the screening level. The MET dissolved zinc was below the screening level for each of the composite samples except Basin 3A, which was significantly elevated above the screening level. However, the bulk sediment zinc concentration for the composite sample from Basin 3A was the lowest of all sediment samples tested. Therefore, based on multiple lines of evidence, it appears the MET dissolved zinc results were an analytical error.

As noted in the final sample analysis report by URS, dredged material from the Hayward Marsh appears to be acceptable for levee / levee road repairs and expansion of islands within the marsh.

2.3 Geotechnical Evaluation of Soil Conditions

As noted above, a compaction curve, Atterberg limits, and sieve analysis were performed by URS as part of the sediment analysis. Based on the results of the analysis URS indicated that the following items should be considered if the dredged material is used for levee restoration: (1) mild levee side slopes of 5:1 or shallower be used, and (2) if the levees are expected to hold heavy maintenance vehicles, the dredged material should be well compacted.

In addition to the analysis performed by URS, Hultgren-Tillis Engineers (HTE), as part of the RMC team, performed a more comprehensive geotechnical analysis of the Hayward Marsh sediment in Basin 3B, as representative of marsh sediment generally. Hand auger borings were performed to depths of up to 5 feet below existing grade to collect data for the analysis.

HTE found that the interior of Basin 3B is underlain by bay mud. The bay mud within the basin consists of highly plastic fat clay with variable organic material including peat stringers. Because Basin 3B has been out of service, the upper 1 to 2 feet of the bay mud has been desiccated, resulting in an increase in strength, with lesser desiccation occurring to about 3 feet of depth. Below a depth of 3 feet, bay mud is weak and highly compressible, and is estimated to be normally-consolidated or slightly over-consolidated. Settlement will occur under the loading of fill, so it is estimated that for every 1 foot of fill, approximately 2.5-inches of consolidation settlement will occur.

The embankment slopes within the basins have eroded from wave action over a period of approximately 28 years. New embankment will need to have wider bases and/or flatter slopes and/or a cobble rip rap surface layer to protect them from waves. A qualitative assessment of the deterioration of the levees in Basin 2A, 2B, 3A and 3B was performed by HTE in October 2014. The level of deterioration for the basin levees is shown in Figure 2-1. The estimated level of erosion was classified defined in **Table 2-2**.

Table 2-2: Existing Levee Condition Classification

Erosion Rating	Definition	Recommended Repair Method
Extreme	Commonly eroded back to and/or into the levee crest.	Armor with riprap
Severe	Commonly eroded to within 6 feet of levee crest.	Armor with riprap or place 30 feet wide sacrificial fill bench with bench elevation 0.5 to 1.0 foot above operating pool elevation.
Moderate	Commonly 10 feet of un-eroded material remaining between levee crest and erosion scrap.	Place 10 feet wide horizontal bench at scarp elevation. Final slope below bench at 3H:1V or flatter.
Light	Small scarp commonly 1.5 feet at toe of existing slope.	Existing configuration expected to last another 20 years. No remediation needed at this time.

Having dried the Basin 3B for approximately one year has been beneficial in gaining information about the dry sediment, and in considering the dry sediment for uses within the marsh. For example, fill for the basin embankment slopes may consist of desiccated fat clay derived from

shallow excavations in Basin 3B (which is currently dry). The goal for levee improvements would be to develop a fill that would support low-ground-pressure construction equipment and that can be sufficiently compacted to provide improved erosion resistance.

Fill for the embankment slopes should have a moisture content suitable for achieving a moderate degree of compaction. Higher compaction would lead to a greater erosion resistant material. Desiccated bay mud material with an average moisture content of 40 percent should be able to achieve a relative compaction of about 80 percent. An average moisture content of 30 percent can achieve a relative compaction of about 92 percent. The lower elevations of fill towards the bottom of a basin may extend outward (pump) under equipment loads. Moderate amounts of pumping on the order of 2- to 3-inches (thickness of material placed) can likely be tolerated. If the fill surface is pumping excessively, alternative methods should be employed such as increasing the thickness of the initial lift to bridge over the soft subgrade.

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Figure 2-1. Levee Status Assessment

HAYWARD MARSH REHABILITATION PROJECT

NOTES:
1. LEVEE STATUS ASSESSMENT CONDUCTED OCTOBER 6, 2014 BY HULTGREN–TILLIS GEOTECHNICAL ENGINEERS. MIXING CHANNEL, NORTHWEST CHANNEL, BASIN 1 AND EXTERIOR LEVEES NOT INCLUDED UNLESS OTHERWISE INDICATED.
2. CONDITION OF BASIN 3A EASTERN LEVEE (SOUTH PORTION NEAR BASIN 2B) IS SUFFICIENT TO MEET APPROXIMATELY 20 YEAR LIFE SPAN.

To further aid desiccation, the surface water level within the Basin 3B interior channels could be pumped down prior to the placement of fill. This could be accomplished by excavating sumps in the sediment filled channels (near the levees) and keeping the accumulating water pumped down. The sediment within basins and channels, where material haulers or construction equipment cross, may need to be reinforced with fabric and gravel to provide adequate support for equipment.

Based on the geological investigation it is estimated that an allowable bearing pressure of 400 pounds per square foot (psf) could be used for moderate-weight construction equipment on mats. An allowable bearing pressure of 800 psf could be used for light weight low-ground-pressure equipment. A lower allowable bearing pressure for moderate-weight equipment is suggested in order to have the weight of the equipment spread out over a larger area. The existing levee roads are suitable to support low-ground-pressure equipment and infrequent rubber tire equipment.

2.4 Avian Health in Hayward Marsh

EBRPD staff have observed significant avian botulism and cholera in the marsh, especially in recent years, possibly due to reduced flow in some areas of the marsh. An increasing presence of water pennywort, a floating plant in the *Hydrocotyle* genus is potentially influencing the magnitude of these outbreaks (Taylor and Graul, 2012).

Avian botulism is a paralytic, often fatal disease of birds that results when they ingest a toxin produced by the bacterium *Clostridium botulinum*. The toxin can feed off rotting vegetation, such as the decaying detritus of the water pennywort, as a potential source of energy for production (USGS, 1999). To prevent toxin growth, EBRPD staff performed *Hydrocotyle* removal in October 2012 in Basin 1.

Avian cholera is a contagious disease resulting from infection by the bacterium *Pasteurella multocida*. Acute *P. multocida* infections are common and they can result in bird deaths 6–12 hours after exposure, although 24–48 hours is more common. Environmental contamination from diseased birds is a primary source for infection.

EBRPD staff work to rehabilitate injured birds, increase influent flows to the Marsh to flush out botulism toxins, and remove botulism-infected bird remains that can contribute to outbreak acceleration (Taylor, 2012).

Chapter 3 Baseline Condition Description

The Baseline Condition involves restoration of Hayward Marsh to the original (design) condition, with selected improvements to optimize future marsh operations and habitat value. It includes material excavation, material placement, and infrastructure extension/replacement activities.

Material excavation and placement activities for the Baseline Condition are shown in **Figure 3-1**. In addition, several facility infrastructure improvements are included in the baseline condition, as detailed later in this chapter. Details on excavation and placement of dredged material are described below. It is expected that Basin 3B would need to remain dry until the construction project begins. Drainage ditches around the perimeter of the basin bottom (in the lower borrow areas) could be added within Basin 3B. Excavating small drainage ditches and using a small sump pump to remove pooled water from Basin 3B will enhance drying and speed excavation of Basin 3B. Drainage ditches could be created at the beginning of summer (before the least terns arrive) and a pump could operate intermittently over the summer prior to construction beginning in approximately mid-August (after the least terns have left). Black skimmers have also been observed in the marsh near the end of September. During detailed design a decision will need to be made on whether to work with the shorter construction window or to develop protective measures to prevent nesting.

A summary of the activities and information regarding improvements for the baseline condition are presented in **Table 3-1**.

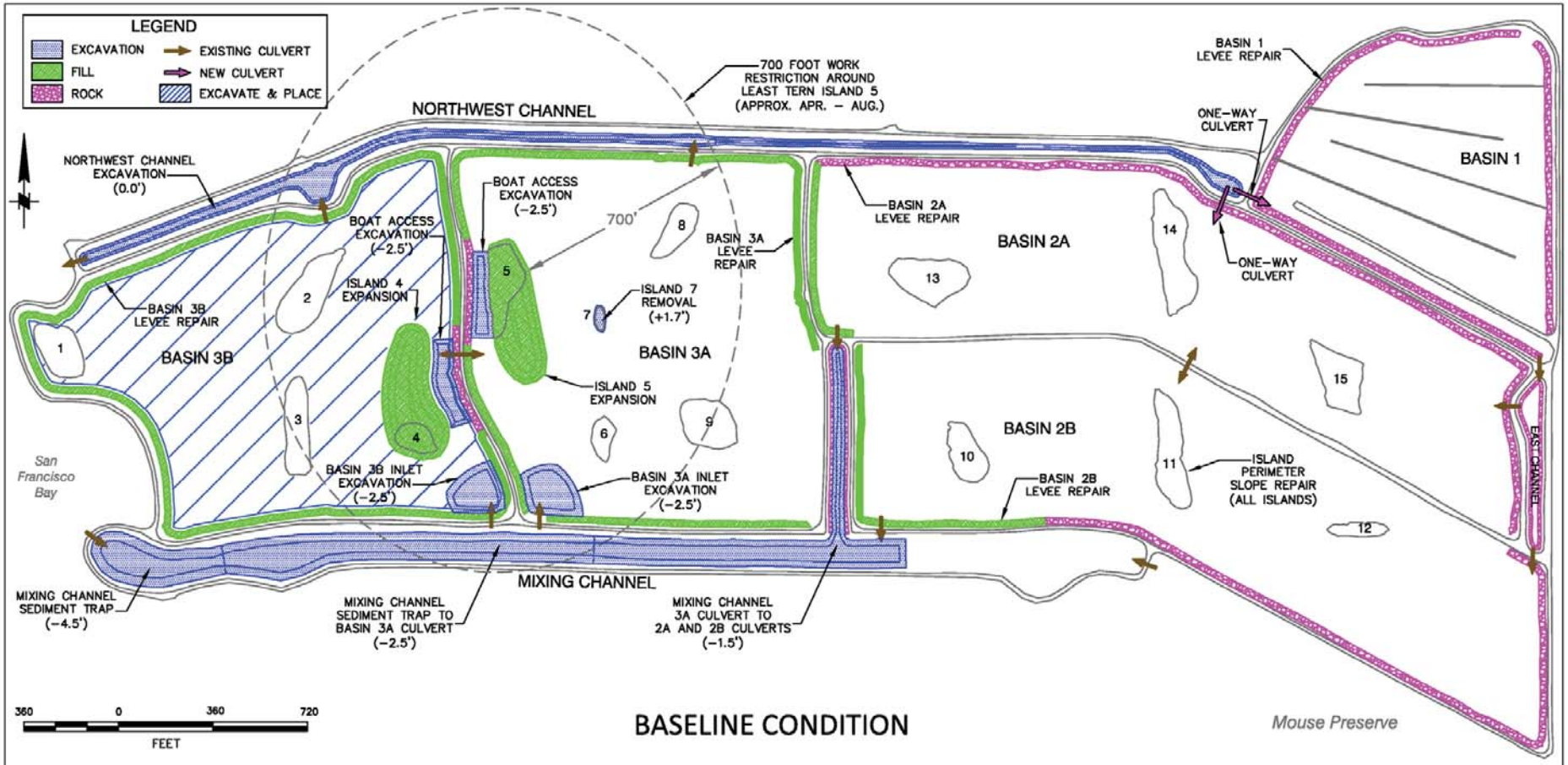

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Figure 3-1. Material Placement & Excavation

HAYWARD MARSH REHABILITATION PROJECT

NOTES:
1. ALL ELEVATIONS ARE IN FEET NGVD29.
2. VOLUME ESTIMATE OF ARMOR ROCK ON BASIN 3A WEST AND 3B EAST LEVEE IS 250 CY EACH (1 FOOT THICK LAYER).
3. PROPOSED 30-INCH DIAMETER HDPE PIPELINE TO BYPASS BASIN 1 (NOT SHOWN) SHALL EXTEND FROM RECOMMISSIONED DECHLORINATION STATION TO EAST CHANNEL.

Table 3-1: Summary of Restoration Work for Baseline Condition

Activity	Description
Material Excavation	
Mixing Channel Improvements	(1) Dredging of the Mixing Channel would improve Bay flow into Basins 3A and 3B. (2) A new sediment trap immediately following the bay intake would be dredged approximately three feet below original design to provide a confined area for sedimentation, to facilitate on-going future maintenance.
Basin 3A Improvement	New sediment depression on basin side of inlet would facilitate flow into Basin 3A. The boat access channel just to the west of Island 5 will be extended to the length of the existing Island 5
Basin 3A Island 7 Removal	Island removal would support predator control in the marsh.
Basin 3B Inlet Improvement	(1) Remove sediment "plug". (2) New sediment depression on basin side of inlet would facilitate flow into Basin 3B.
Northwest Channel Improvements	(1) Dredging of the Northwest Channel would improve flow from Basins 3A and 3B to Bay. (2) Lower bottom elevation would facilitate use of salt water in Basins 1, 2A, and 2B for avian disease control.
Material Placement	
Levee Repair for All Basins	Additional material placed on levees at a lower slope than the existing condition with rip rap would facilitate a wider range of maintenance vehicle access and prevent future erosion.
Basin 3A - Island 5 Expansion and Perimeter Slope Repair	Island 5 expansion would provide additional nesting habitat for California least terns.
Infrastructure Improvements	
Infrastructure Replacement	Improvements to culverts, weirs, valves, etc. would facilitate future maintenance of the marsh as well as avian disease control
Basin 2A and 2B Isolation	New isolation valves would be provided at the inlets to Basin 2A and 2B. The levee between Basin 2A and 2B would be replaced
Northwest Channel connection to Basin 2A	A new culvert and gate valve would be placed at the eastern end of the Northwest Channel connecting to Basin 2A, to allow isolation of Basin 2A with salt water inflow as a maintenance activity for avian disease control.

3.1 Dredging and Placement Considerations

3.1.1 Material Excavation

As indicated above, sedimentation in the Mixing Channel, Northwest Channel, and Basins 3A and 3B has impeded flow in some areas of Hayward Marsh. Additionally, water control structures throughout the marsh have developed reduced functionality due to the accumulated sediment. Specific areas within each of these locations were identified for excavation to restore flow and regain functionality of water control structures. The following sections describe each proposed excavation area and associated volumes, based on Hayward Regional Shoreline Drawings (EBRPD, 1983) and operational knowledge gained over the years. The Hayward Regional Shoreline Drawings are used as reference for the intended design, with the knowledge

that the existing marsh is different in some ways than originally proposed in the drawings. As-built drawings are not available.

Excavation volumes for each location were estimated using AutoCAD Civil 3d, based on the recent survey by CLE Engineering, and are listed in **Table 3-2**. Also included in **Table 3-2** are excavation areas, target elevations and slopes. All excavation areas are proposed to have at least slopes of 4horizontal:1vertical (4H:1V) or flatter according to the original design presented in the Hayward Regional Shoreline Drawings.

Table 3-2: Excavation Areas, Elevations, Slopes, and Volumes

Excavation Location	Area (acres)	Original Ground Average Elevation (ft. NGVD29)	Original Marsh Design Elevation (ft. NGVD29)	Target Elevation (ft. NGVD29)	Slope (H:V)	Volume (CY)
Mixing Channel - Sediment Trap Excavation	1.2	2.6	-1.5	-4.5	4:1	8,400
Mixing Channel - Sediment Trap to 3A Culvert Excavation	2.6	2.2	-1.5	-2.5	4:1	15,700
Mixing Channel - 3A Culvert to 2A and 2B Culvert Excavation	2.8	1.9	-1.5	-1.5	4:1	10,800
Northwest Channel Excavation	2.6	1.1	0.3	+0.0	4:1	1,700
Basin 3A Inlet Excavation	0.6	1.9	-1.5	-2.5	4:1	3,400
Basin 3B Inlet Excavation	0.5	0.9	-1.5	-2.5	4:1	2,600
Island 5 Boat Access Channel	0.5	2.1	-2.5 to 1.5	-2.5	4:1	2,300
Island 4 Boat Access Channel	0.5	0.7	-2.5 to 1.5	-2.5	4:1	2,100
Basin 3A Island 7 Removal	<0.1	4.5	5.5	+1.7	4:1	300
					Total	**47,300**

Over the past 28 years, approximately 40,000 CY have accumulated in the Mixing Channel (from the tide gate up to Basin 2A and 2B culverts). This deposition rate equates to about 0.15 ft./year (2 in./yr.). If the a new sediment trap is excavated down to -4.5’ and maintained below -2’, it should require maintenance dredging about every 5-10 years. Changes to trigger maintenance elevation (assumed -2’) would also change the cleaning frequency. These rates are best-guess based on the “original design” elevation and current average elevation. If implemented the sediment trap should be monitored annual for deposition rates.

Mixing Channel Excavation

Under the baseline condition, the Mixing Channel would be excavated to remove sediment that has accumulated over the past 28 years of operation. To minimize operation and maintenance costs in the future, a sediment trap would be constructed inside the mixing channel immediately adjacent to the culvert connecting to the Bay. The sediment trap would be approximately 100 feet wide by 450 feet long and have a bottom elevation of -4.5’ NGVD29. This depression would encourage sedimentation in a confined area that can be periodically cleaned out (with the

material available for levee maintenance). Approximately 8,400 cubic yards of material would be removed in this area.

Extending from the sediment trap to the Basin 3A culvert, the Mixing Channel would be excavated to an elevation of -2.5', approximately 1 foot below the original design, to provide additional mixing and sedimentation capacity. Approximately 15,700 cubic yards of material would be removed. Past the Basin 3A culvert to the Basin 2A and 2B culverts, approximately 10,800 cubic yards would be excavated to reach the original design elevation, -1.5'. The invert elevation of the Basin 2A and 2B culverts into the Mixing Channel are both -1.0' (EBRPD, 1983), which would allow for approximately 0.5 feet of sedimentation in front of the culvert prior to significant conveyance disruptions. Excavation would not be performed within the Mixing Channel east of the Basin 2B culvert.

Northwest Channel Excavation

The Northwest Channel has significantly less sedimentation compared to the Mixing Channel, likely due to the flushing effects of the outflow from Basins 3A and 3B through the Northwest Channel and out into the Bay. The majority of suspended solids have also likely settled in the lower-velocity basins (3A and 3B) prior to reaching the channel. East of the Basin 3A culvert however, the Northwest Channel has accumulated sediment, blocking an unused gated culvert leading to Basin 1. To allow access to this culvert for potential use in the future, approximately 1,700 cubic yards of material would be excavated along the entire Northwest Channel length to an elevation of 0'. The Bay as well as Basins 3A and 3B culvert invert elevations are at approximately 0.5' (EBRPD, 1983). The Basin 1 invert elevation is at 1.0'.

Basin 3A Inlet Excavation

To enhance flow into Basin 3A, a depressed area 150 feet in radius from the basin inlet would be excavated to an elevation of -2.5'. This corresponds to the original design of the channels within Basin 3A. The inlet excavation would result in removal of 3,400 cubic yards.

Basin 3B Inlet Excavation

Similar to Basin 3A, approximately 2,600 cubic yards of material would be excavated down to an elevation of -2.5' near the Basin 3B inlet. Currently Basin 3B is dry and the top of the culvert pipe used to convey water into the basin is visible. However, the remaining pipe is blocked by sediment.

Island 5 Boat Access Channel Excavation

A channel approximately 275 feet long and 50 to 75 feet wide would be excavated between Island 5 and the levee immediately to the west, to accommodate boat access to the island for maintenance of the least tern habitat. The amount excavated would be approximately 2,300 cubic yards. The channel would be excavated to an elevation of -2.5' and approximately 250 cubic yards of armor rock would be placed on the adjoining levee (assuming a 1 foot thick layer of rock). Because of the long and narrow configuration of the channel between the levee and Island 5, almost half of the excavation area would need to maintain side slopes down to the channel. Because the area with side slopes would not be fully excavated the boat access channels have a smaller-than-expected excavation volume compared to other excavation sites, (such as the Basin 3A inlet which is similar in acreage and original grade, but about 1,000 CY more in excavation).

Island 4 Boat Access Channel Excavation

A channel approximately 280 feet long and 50 to 75 wide would be excavated between Island 4 and the levee immediately to the east, to accommodate boat access to the island for maintenance of the proposed least tern habitat. The amount excavated would be approximately 2,100 cubic yards. The channel would be excavated to an elevation of -2.5' and approximately 250 cubic yards of armor rock would be placed on the adjoining levee (assuming a 1 foot thick layer of rock). Because of the long and narrow configuration of the channel between the levee and Island 4, almost half of the excavation area would need to maintain side slopes down to the channel.

Basin 3A Island 7 Removal

Approximately 300 cubic yards of material would be excavated to lower Island 7 down to the existing basin bottom surface, (approximate elevation +1.7 NGVD). The island removal would support predator control in the marsh, as predators swim to Island 7 and rest prior to approaching the least tern colony on Island 5.

3.1.2 Material Placement

Significant volumes of material are needed to repair deteriorating interior levee slopes within Hayward Marsh. Without material placement on the eroding slopes, levees would eventually fail and disrupt, if not prevent ongoing, system operations. The condition of existing levees has also been impacted by deferred maintenance. Under the baseline condition, material would be placed on interior levee slopes to improve levees and protect against erosion caused by wave action. If the levees are repaired, periodic maintenance would help to keep the levees in relative good condition and reduce the need for complete levee restoration. Improved levees are not designed for flood control. A minimum width of 12' for levee crests was assumed, similar to the original design width of the levee crests. Existing levees heights are assumed adequate and were not increased; only levee widths were increased to the 12' minimum where needed.

Durability of the repaired levees is also an important component of this project. Levees are desired to have a lifespan of approximately 20 years, which cannot be achieved by using wet material excavated from the channels and basins due to limited effective compaction of the wet material. To reduce the amount of dry material import and wet offsite disposal, the top 18" of Basin 3B (excluding existing islands 1 through 4) will be excavated and used as borrow material for improving priority levees. Approximately 46,300 cubic yards will be removed from Basin 3B. After excavation of dry material in Basin 3B, wet excavated material from the channels and basins will be placed within Basin 3B to return the bottom elevation to or below existing levels. In order to minimize the amount of material needed for levee improvement, "benches" would be used instead of full slopes. Benches would consist of a 10 to 30 foot extended flat areas approximately 1 foot higher than the normal operating water line and would help dissipate wave energy before it reaches the sloped section of the levees. Rock will be imported to repair the remaining levees where there is insufficient dry material from Basin 3B to build up the levee slope to provide an approximately 20 year lifespan. Levees with the most extreme or severe deterioration will be prioritized to receive rock, although the distance (and cost to transport material) from Basin 3B is also taken into consideration.

A slightly different approach was taken to estimate the cost of repairing the interior levee between Basins 2A and 2B due to cost consideration and the limited amount of dry material

available. The assumptions are described in greater detail in following sections. The repair of the interior levee between Basin 2A and Basin 2B is included in the baseline project as a separate line item so it may be included or removed in the Baseline Options as desired.

In addition to interior levee repair, material from Basin 3B will be used for Island 4 and 5 expansions. The expanded islands will create additional bird nesting habitat and protect the basin levees from future erosion due to wind-induced waves. These placement activities are described in greater detail below.

The levee repair type (and corresponding material placement volume) was selected based on levee status (severe, extreme, moderate, or light) as shown in Figure 2-1. The selection of the levee repair type was also based on the following considerations:

1. The amount of material that is readily available within the top 18” of Basin 3B;
2. The need to have sufficient volume excavated from Basin 3B to “refill” it with dredged material from the Mixing Channel and other areas;
3. Available area for a 30’ or 10’ bench on the levee (a potential issue in some of the narrower channels); and
4. Cost. For example, there are cost tradeoffs between:
    a. A 3H:1V slope with a 10’ bench levee (more earth movement, more fill needed, less rip rap) vs.
    b. A 2H:1V slope with a more durable rip rap levee (less earth movement overall, less soil needed, but more costly rip rap).

Levee length, status and selected repair type are summarized in **Table 3-3**. EBRPD repaired and placed Caltrans Class 2 rock in an 18” layer on a small length of deteriorating levees Basin 3A in 2007. A similar size rock and layer depth was assumed for this analysis.

Table 3-3: Levee Status and Repair Type

Placement Location	Length (ft.)	Levee Status [a]	Repair Type
Island 4 Expansion & Slope Repair	400	-	6H:1V slope
Island 5 Expansion & Slope Repair	700	-	6H:1V slope
Basin 2A Levee Repair (N)	2,500	Severe	2H:1V fill, Riprap
Basin 2A Levee Repair (E)	600	Extreme	2H:1V fill, Riprap
Basin 2B Levee Repair (E)	600	Severe	2H:1V fill, Riprap
Basin 2B Levee Repair (SE)	1,400	Severe	2H:1V fill, Riprap
Basin 3A Levee Repair (N)	1,100	Severe	3H:1V fill, 30' bench
Basin 3A Levee Repair (E near 2A)	600	Severe	3H:1V fill, 30' bench
Basin 3B Levee Repair (E)	900	Severe	3H:1V fill, 30' bench
East Channel Levee Repair (W)	600	Severe	2H:1V fill, Riprap [b]
Basin 1 Levee Repair (N)	400	-	2H:1V fill, Riprap
Basin 1 Levee Repair (E)	1,000	-	2H:1V fill, Riprap
Basin 1 Levee Repair (S)	3,000	-	2H:1V fill, Riprap [b]
Basin 1 Levee Repair (W)	800	-	2H:1V fill, Riprap
Basin 2A Levee Repair (W)	600	Moderate	3H:1V fill, 10' bench
Basin 2B Levee Repair (SW)	900	Moderate	3H:1V fill, 10' bench
Basin 2B Levee Repair (W)	600	Moderate	3H:1V fill, 10' bench
Basin 3A Levee Repair (S)	800	Moderate	3H:1V fill, 10' bench
Basin 3A Levee Repair (W)	1,200	Moderate	3H:1V fill, 10' bench
Basin 3B Levee Repair (N)	1,600	Light	3H:1V fill, 10' bench
Basin 3B Levee Repair (S)	1,100	Moderate	3H:1V fill, 10' bench
Basin 3B Levee Repair (W)	1,000	Light	3H:1V fill, 10' bench
East Channel Levee Repair (E)	600	Light	2H:1V fill, Riprap [b]
Mixing Channel Levee Repair (N-S near 3A)	700	Moderate	2H:1V fill, Riprap [b]
Mixing Channel Levee Repair (N-S near 2B)	700	Moderate to Light	2H:1V fill, Riprap [b]
Basin 2A Levee Repair (S)	2,400	Extreme	2H:1V fill, Riprap
Basin 2B Levee Repair (N)	2,400	Extreme	2H:1V fill, Riprap
Basin 3A Levee Repair (E near 2B)	700	-	3H:1V fill, 10' bench
Mixing Channel Levee Repair (N)	3,400	-	2H:1V fill, Riprap [b]
Mixing Channel Levee Repair (S)	3,500	-	2H:1V fill, Riprap [b]
Northwest Channel Levee Repair (N)	3,900	-	2H:1V fill, Riprap [b]
Northwest Channel Levee Repair (S)	3,900	-	2H:1V fill, Riprap [b]

Footnotes:

[a] Levee status of Basin 1, Mixing and Northwest Channel not included in site walk on October 6, 2014.
[b] Levee repair type (rock) selected based on insufficient space for a 3H:1V fill with a 10-30' bench.

Material placement volumes assuming the above repair types were estimated using digital terrain modelling and are summarized in **Table 3-4**. Volumes include considerations for settlement (2.5" for every 1 foot of material placed) and consolidation (25%)[1] (HTE, 2014). Also included in **Table 3-4** is the priority class of 1, 2, or 3. Priority identification was made based on the existing condition of levees and islands (as shown in Figure 2-1), the need to place dredged material, and requested improvements by EBRPD. Priority 1 placement activities would stabilize critically eroding areas. Priority 2 activities would stabilize less critical areas, and provide a placement location to avoid off-site hauling and disposal costs. Priority 3 activities are of lesser importance than Priority 1 and 2, and may require offsite fill if onsite excavated material is unavailable. Activities classified as Priority 1 and 2 are included in the Baseline Condition, and total 51,200 cubic yards of material and 12,620 cubic yards of rock. Existing acreages for basins and islands and lengths for levees and islands are provided in Appendix A.

Table 3-4: Prioritized Placement Locations and Volumes

Placement Location	Fill Volume (CY)[a]			Rock Volume (CY) [b]		
	PR 1	PR 2	PR 3	PR 1	PR 2	PR 3
Island 4 Expansion & Slope Repair [c]	8,600					
Island 5 Expansion & Slope Repair [d]	5,000					
Basin 2A Levee Repair (N)	1,800			1,960		
Basin 2A Levee Repair (E)	900			550		
Basin 2B Levee Repair (E)	400			470		
Basin 2B Levee Repair (SE)	1,300			930		
Basin 3A Levee Repair (N)	5,200					
Basin 3A Levee Repair (E near 2A)	2,200					
Basin 3B Levee Repair (E)	3,700					
East Channel Levee Repair (W)	600			460		
Basin 1 Levee Repair (N)		500			330	
Basin 1 Levee Repair (E)		1,300			810	
Basin 1 Levee Repair (S)		1,100			2,240	
Basin 1 Levee Repair (W)		1,000			570	
Basin 2A Levee Repair (W)		1,200				
Basin 2B Levee Repair (SW)		2,200				
Basin 2B Levee Repair (W)		1,200				
Basin 3A Levee Repair (S)		1,500				
Basin 3A Levee Repair (W)		1,100				
Basin 3B Levee Repair (N)		2,300				

[1] A consolidation of 25% was assumed for the material excavated from Basin 3B as the material was not fully dried when surveyed, and is not anticipated to be fully dried when excavated despite drying efforts. Material excavated from channels and basins and placed in Basin 3B is not anticipated to consolidate, as the material is wet and will become wet again once operations resume in Basin 3B.

Placement Location	Fill Volume (CY)[a]			Rock Volume (CY) [b]		
	PR 1	PR 2	PR 3	PR 1	PR 2	PR 3
Basin 3B Levee Repair (S)		1,800				
Basin 3B Levee Repair (W)		1,700				
East Channel Levee Repair (E)		400			450	
Mixing Channel Levee Repair (N-S near 3A)		300			470	
Mixing Channel Levee Repair (N-S near 2B)		300			530	
Basin 2A Levee Repair (S)		1,900			1,500	
Basin 2B Levee Repair (N)		1,700			1,350	
Basin 3A Levee Repair (E near 2B)			900			0
Mixing Channel Levee Repair (N)			400			2,240
Mixing Channel Levee Repair (S)			700			2,180
Northwest Channel Levee Repair (N)			800			3,350
Northwest Channel Levee Repair (S)			1,800			3,300
Subtotals	29,700	21,500	4,600	4,370	8,250	11,070
Baseline Condition Total (Priority 1&2)	**51,200**			**12,620**		
Total	55,800			23,690		

Footnotes:

a. Placement volumes include considerations for foundation settlement (2.5” for every 1 foot of material placed) and consolidation (25%). Priority 1 is placement for stabilization purposes, Priority 2 includes areas considered more stable but still useful (if needed) to avoid off-hauling, and Priority 3 placement includes the most stable areas (Priority 3 placement locations are not shown on Figure 3-1).

b. Class 2 rock in 18” thick layer, similar to that used by EBRPD in 2007 for levee repairs.

c. Island 4 Expansion increases Island 4 by approximately 0.6 acres, to a total of 1.1 acres. A crest elevation of 6.1’ was assumed. Imported habitat material (sand and shells) was not included.

d. Island 5 Expansion increased Island 5 by approximately 0.8 acres, to a total of 1.0 acres. The island was shaped in similar orientation to expanded Island 4. A crest elevation of 6.1’ was assumed. Imported habitat material (sand and shells) was not included.

e. The material volume for the Basin 2A South and Basin 2B North levee repairs is assumed to be imported, not excavated from Basin 3B.

Levee Repair at Basins 2A, 2B, 3A, and 3B and East Channel

To prevent further erosion and to reestablish safe vehicle use of the levees, material would be prioritized (Priority 1) for placement on the following levees to create a minimum 12-foot crest width and either 2H:1V side slopes covered with a layer of filter fabric and riprap, or 3H:1V side slopes with a 30’ bench at about 1.0’ above operating pool elevation: (existing levee crest elevation will remain unchanged)

- Basin 2A: north and east levees
- Basin 2B: east and south (eastern bend – see figure) levees
- Basin 3A: north levee and half of the east levee (near Basin 2A)
- Basin 3B: east levee
- East Channel: west levee

Material placement volume at these levee sites totals to approximately 16,100 cubic yards, plus 4,370 cubic yards of rock, and are included in the Baseline Condition.

Priority 2 levee placement areas, also included in the Baseline Condition, require about 21,500 cubic yards of material and 8,250 cubic yards of rock to build 3H:1V side slopes with a 10' bench at about 1.0' above operating pool elevation, or 2H:1V side slopes covered with a layer of filter fabric and riprap. The following locations are defined as Priority 2 levee placement areas:

- Basin 1: north, east, south, and west levees
- Basin 2A: west and south levee
- Basin 2B: north, west and southwest levees
- Basin 3A: south and west levees
- Basin 3B: north, south and west levees
- East Channel: east levee
- Mixing Channel N-S portion: east levee near Basin 3A and west levee near Basin 2B

The Priority 2 levees were included in the Baseline Condition because there would be enough material from the excavation of Basin 3B, and to be cost effective enough material must be removed from Basin 3B for space to place excavated material from the Mixing Channel and other excavation sites. This statement does not include the levee between Basins 2A and 2B, which material will be needed to be imported for. Due to the deteriorated state of the levee between Basins 2A and 2B, repair of this levee would require working in difficult working conditions and would cost significantly more than repair of other levees. Because the system can maintain functionality if the levee were to fail and both basins would have to be taken offline to perform this work, repair of the levee has a lower cost-benefit ratio than other levees in the system. The construction method approach for repairing this levee is discussed in detail in Section 5.3. Basin 1 is located the farthest from the material source (in Basin 3B), therefore it would be most cost effective to use imported rock to repair these levees. The imported rock would also be delivered from the entrance to the marsh near Basin 1, which would reduce transport time and distances of rock deliveries Basin 1 also has the most constricted time period where it can be offline, due to USD's need to discharge effluent in the wet weather, therefore placing rock is slightly faster than placing material.

Priority 3 levee placement areas require about 4,600 cubic yards of material and 11,070 cubic yards of rock (also using either a 2H:1V side slope covered with a layer of filter fabric and riprap or 3H:1V side slopes with a 10' bench at about 1.0' above operating pool elevation) and include the following locations:

- Basin 3A: half of east levee (near Basin 2B) (received rock in 2007)
- Mixing Channel: all levees
- Northwest Channel: all levees

Levees surrounding the Mixing and Northwest Channels are in stable condition; therefore they are of lowest priority for material placement (Priority 3, excluded from Baseline Condition). Creating 10' or 30' benches along the levee slopes may also cause material to encroach into the channels and reduce conveyance through the system; therefore material placement in the channels is not included in the Baseline Condition.

Island 5 Expansion & Slope Repair

To increase nesting capacity for the existing least tern colony, Island 5 would be doubled in size by placing approximately 5,000 cubic yards of material to the south of the island. The expansion would extend the existing island elevations (a crest elevation of 6.1' and average elevation of 4.5') to the south. The perimeter of the existing island and expanded portion would be filled to achieve 6H:1V, except for the west side so as not to decrease the distance predators swim from the Basin 3A east levee to Island 5. As mentioned previously, sand and shells would have to be imported to create appropriate least tern habitat. The costs for the sand and shell material and placement are not included in the cost estimate.

Island 4 Expansion & Slope Repair

Island 4 would be expanded to approximately 1.0 acres; similar in size to the expanded Island 5. Approximately 8,600 cubic yards of material would be placed on and northward of Island 4. The expansion would increase the Island 4 elevations to have a crest of 6.1' and average elevation of 4.5', similar to Island 5. The perimeter of the existing island and expanded portion would be filled to achieve 6H:1V. A minimal distance of 50 feet would be maintained between the levee and island to discourage predator access to the proposed least tern habitat island. As mentioned previously, sand and shells would have to be imported to create appropriate least tern habitat. The costs for the sand and shell material and placement are not included in the cost estimate.

3.1.3 Infrastructure Modifications

Infrastructure Replacement

When material is placed on levees, culverts may need to be extended, or potentially replaced entirely depending on their current condition. Culverts located in the marsh are listed in **Table 3-5**, along with their operational status. Given the age (approximately 30 years) of most culverts, this project provides an opportunity to restore the original functionality of the system and replace deteriorated culverts while equipment and materials are onsite (eliminating the need for future equipment mobilization). Due to the uncertainty associated with culvert repair, replacement of all existing culverts has been included in the baseline project.

Operational Improvements

Although the intent of the baseline condition project is to restore the Hayward Marsh to its original condition, the restoration project would provide an opportunity to provide important operational improvements. Specifically, additional operational flexibility is required to address avian botulism and cholera, thereby reinforcing the long-term sustainability and viability of the marsh. The current planned approaches for addressing avian disease are to dry out one or more basins at a time, or add salt water to the affected basins. To provide this flexibility, gate valves at the inlet to Basins 2A and 2B and a 30-inch diameter freshwater bypass line around Basin 1 have been included in the baseline project. In addition, a one-way culvert, with an isolation valve, from the Northwest Channel to Basin 2A has been included to allow salt water to enter Basin 2A as a maintenance activity. With the ability to isolate Basins 2A and 2B independently, it will be possible to have one of the two basins out service, while keeping the other basin in operation. With one of Basin 2A or 2B out of service, there will be increase hydraulic pressure on the severely deteriorated levee between the two basins, which would increase the chances of the dividing levee failure. Failure of the dividing levee would have minimal impact on the

overall marsh operation and would not impact USD's ability to discharge to the marsh; however the ability to isolate the basins would no longer be available and both basins would need to be removed from service to repair the dividing levee (if desired).

Basin 1 is currently used for dechlorination of the USD effluent. In order to allow USD effluent to flow to the marsh, while allowing Basin 1 to be dried, the abandoned dechlorination facility next to Basin 1 would need to be re-commissioned. These improvements would allow Basin 1, 2A or 2B to be dried, if needed, while keeping the rest of the marsh available to receive wet weather flow. In addition, the existing connection between the Northwest Channel at the end of Basin 1 (just prior to the Basin 2A and 2B inlet), would be restored including the isolation gate, in order to allow for salt water to be added to Basins 1, 2A and 2B.

Table 3-5: Culvert Design Details and Improvements

Culvert Location	Pipe Size (Length)	Type	Inv. Elev. (ftNGVD29)	Status
Northwest Channel→Basin 2A (New)	30” (60’)	HDPE Pipe	-1.0’	New
Northwest Channel→Basin 1	24” (65’)	RPM pipe with slide gate valve and platform	1.0’	Needs Replacement/ Modification
Basin 1→East Channel	30” (80’)	RPM pipe with slide gate valve and platform	1.5’	Unknown
East Channel→Basin 2A	30” (65’)	RPM pipe	-1.0’	Needs Replacement /Add Isolation Gate
East Channel→Basin 2B	24” (80’)	RPM pipe	-1.0’	Needs Replacement /Add Isolation Gate
Basin 2A↔Basin 2B	24” (65’)	RPM pipe with slide gate valve and platform	-1.0’	Unknown
Basin 2A→Mixing Channel	24” (65’)	RPM pipe with flashboard box	-1.0’	Operational
Basin 2B→Mixing Channel	24” (65’)	RPM pipe with flashboard box	-1.0’	Operational
Mixing Channel→Basin 3A	30” (60’)	RPM pipe with slide gate valve and platform	-0.5’	Unknown
Mixing Channel→Basin 3B	30” (60’)	RPM pipe with slide gate valve and platform	-0.5’	Unknown
Basin 3A↔Basin 3B	24” (60’)	RPM pipe with slide gate valve and platform	-1.0’	Unknown
Basin 3A→Northwest Channel	36” (60’)	RPM pipe with flashboard box	0.5’	Needs Replacement
Basin 3B→Northwest Channel	36” (60’)	RPM pipe with flashboard box	0.5’	Operational
Northwest Channel→SF Bay	48” (60’)	RPM pipe with flap gate	0.5’	Operational
SF Bay→Mixing Channel	48” (60’)	RPM pipe with flap/slide gate & platform	0.5’	Needs Replacement
Mouse Preserve→Mixing Channel	36” (65’)	RPM pipe with slide gate valve and platform	-1.0’	No Longer Used

Notes:
- Existing information taken from Hayward Marsh Expansion Drawings (EBRPD, 1983). All culverts would be replaced under the baseline option.
- Culvert locations are shown on Figure 3-2.
- Acronym: RPM = Reinforced Plastic Mortar

3.2 Habitat Considerations

The Baseline Condition contains elements to expand habitat capacity for the endangered California least tern and improve habitat value by restoring eroding islands to their original condition. In particular, expansion of Island 5 in Basin 3A and Island 4 in Basin 3B would increase capacity of the existing successful least tern colony (which is currently at capacity).

In addition, improvements to Hayward Marsh are included to assist with control of avian disease in the marsh. Two options would be available to EBRPD staff for this purpose: (1) introducing salt water into Basins 1, 2A, and 2B to control disease spores, and (2) drying out Basins 1, 2A, or 2B for control or removal of disease spores.

The introduction of salt water into Basins 1, 2A, and 2B would most likely result in the loss of existing fresh water vegetation. However, the degree to which existing vegetation is contributing to ammonia reduction in the marsh is unknown. In any event, EBRPD would need to develop an operations plan describing the maintenance procedure of introducing salt water into the Basins as well as appropriate follow-up activities to ensure ammonia reduction consistent with requirements in the NPDES permit.

If EBRPD were to use the option of drying out Basin 1, a bypass line and two isolation valves are included in the baseline condition operational improvements to route influent flow around Basin 1 and directly into Basin 2A and/or Basin 2B. The dechlorination facility would need to be re-commissioned prior to this type of activity, to ensure adequate chlorine reduction in the wastewater treatment plant effluent. In addition, it would be important that at least Basin 2A or Basin 2B remain in operation at all times, for compliance with the current NPDES permit. Basins 2A and 2B could be taken out of service at the same time, as long as it does not impact USD's ability to discharge when needed for wet weather capacity or for other USD or EBDA projects requiring discharge to the Marsh.

If either salt water or basin drying were used for avian disease control, an operations plan will need to be developed jointly by EBRPD and USD, for the purpose of researching the effects of these avian disease control measures for optimal results, since limited experience with issue is available, locally or within the state of California.

A 5:1 levee slope provides benefits for maintenance as well as ecological functions. The less steep profile not only resists wave action and slumping better on a physical basis, but it also provides a wider planting surface of varying water depths across which a greater variety of wetland plants would grow. For example, emergent wetland plant communities can be encouraged along the edges of basins. In any event, the resulting wider and more diverse plant community would further stabilize soils and improve wildlife habitat.

Chapter 4 Permitting Considerations

4.1 Environmental Permitting

4.1.1 California Environmental Quality Act (CEQA)

Restoration of the Hayward Marsh is a "project" as defined in §21065 of the California Environmental Quality Act (CEQA): a project undertaken by a public agency that may cause a direct physical change in the environment. It may be possible to comply with CEQA using a Class 1 Categorical Exemption, as described in §15301 of the CEQA Guidelines which refers to the repair, maintenance, and minor alteration of existing public facilities that involve negligible or no expansion of an existing use. An example given within this category of exemption is maintenance of a wildlife habitat area to protect fish and wildlife resources. Another possible exemption is §15304 which allows for minor alterations of the land. An example given is maintenance dredging where the spoil is deposited in a spoil area authorized by applicable state and federal agencies. Use of a Categorical Exemption would require documentation that restoration can be completed without any adverse effects to sensitive resources, including species of concern such as the least tern, salt marsh harvest mouse, snowy plover or black skimmer.

4.1.2 Other Permits

It is expected that the following permits would be required for the "baseline condition", i.e. rehabilitating the marsh to its original function. Where possible, permits obtained for the rehabilitation project should include provisions that would allow for future maintenance dredging.

404 Permit from U.S. Army Corps of Engineers. Basins 3A and 3B are waters of the U.S., so dredging of the basins would require a Section 404 Permit. Depending on how the Corps views the baseline condition as returning the Basins to their original depth and configuration, it may be possible to qualify for a Nationwide Permit for maintenance dredging (NWP 35), where the dredged material is placed primarily in an upland site (i.e. levees). However, if the project involves substantial modification of the basins beyond which would be considered maintenance dredging, an Individual Permit would be necessary. It is recommended that the Corps be consulted regarding which permitting approach is applicable, because the Corps does have some discretion in this regard. In addition, dredging requires approval by the Dredged Material Management Office (DMMO) of the Corps of Engineers. As part of the 404 Permit process, the Corps would need to consult with other resource agencies as discussed below. It is therefore recommended that the project be presented at one of the monthly Interagency Meetings held by the U.S. Army Corps of Engineers to receive early feedback on options from regulatory agencies. Dredging permits (for restoration) should include an element for maintenance dredging, for at least the subsequent 10 years.

U.S. Fish and Wildlife Service (USFWS) Section 7 Consultation. The Corps would need to consult with USFWS to ensure compliance with Section 7 of the Endangered Species Act. The project would be designed to avoid or minimize any effects to listed species, including California least tern, western snowy plover, California clapper rail, salt marsh harvest mouse and black

skimmer. Listing status of each of these species is shown in **Table 4-1**. Based on conversations with East Bay Regional Park District (EBRPD) staff[2], dredging activity during the nesting season (March 1 to August 31), would need to be avoided within a 700-foot buffer around the least tern island, where both least tern and snowy plover nest. Because of potential annual variation in the timing of nesting, limitations on work windows would be coordinated with the EBRPD biologist to ensure that restoration work does not affect any birds that might start nesting early or still be nesting after the end of the typical nesting period. The project would not be expected to affect clapper rail in Cogswell Marsh, but may face similar restrictions should clapper rail habitat be within proximity to construction activities in Basin 3A and 3B. In addition, should some of the dredged material be used for levee construction, there may be effects on salt marsh harvest mouse and clapper rail in the adjoining bayside tidal marshes. A summary of protected species status is shown in **Table 4-1**.

Table 4-1. Federal and State-listed Species Known to Occur in Hayward Marsh

Common Name	Scientific Name	State Status	Federal Status
California clapper rail	*Laterallus jamaicensis coturniculus*	SE, SFP	FE
Western snowy plover	*Charadrius nivosus nivosus*	SSC	FT
California least tern	*Sternula antillarum browni*	SE, SFP	FE
Salt marsh harvest mouse	*Reithrodontomys raviventris*	SE, SFP	FE
Black skimmer	*Rynchops niger*	SSC	Not Listed

SE: State-listed Endangered, SFP: State Fully Protected, SSC; Species of Special Concern
FE: Federal-listed Endangered, FT: Federal-listed Threatened

Dredging of the eastern portion of the Mixing Channel would occur near the salt marsh harvest mouse preserve, but because there would be no construction within the preserve it is not expected that this would adversely affect the salt marsh harvest mouse.

It would be appropriate to discuss with USFWS whether or not formal consultation would be needed, and if so, the documentation would include preparation of a Biological Assessment, leading to issuance of a Biological Opinion. If impacts can be avoided, it may be possible to consult informally without the need for a Biological Opinion.

NOAA National Marine Fisheries Service (NMFS) Section 7 Consultation. The Corps would also need to consult with NMFS to ensure compliance with Section 7 of the Endangered Species Act, regarding potential effects on anadromous fish. All tidally influenced areas of San Francisco Bay are considered critical habitat for green sturgeon. The project would be designed to avoid or minimize any effects on fisheries. If impacts on fish can be avoided it may be possible to consult with NMFS on an informal basis.

State Historic Preservation Officer, Section 106 Consultation. Because all of the options would only remove sediment to restore the previous contours of the channels and basins, no effects on historic resources are expected. However, the Corps would still need to consult and demonstrate that the selected option would not adversely affect resources.

[2] Phone conversation with David Riensche, EBRPD biologist, April 9, 2014.

Regional Water Quality Control Board 401 Water Quality Certification. Before issuing a 404 Permit, it would be necessary to obtain 401 Water Quality Certification, which would demonstrate that the project includes feasible measures to protect water quality during the restoration process.

In addition to permits/approvals related to the 404 Permit, permits from state and local agencies would also be required, as discussed below.

Consultation with California Department of Fish and Wildlife (CDFW). The project has the potential to affect state-listed species, including the least tern, clapper rail and salt marsh harvest mouse. Because all three of these species are fully protected, CDFW should be consulted to ensure that all appropriate measures are taken to avoid effects. CDFW cannot issue an Incidental Take Permit for a fully protected species.

Bay Conservation and Development Commission (BCDC) Permit. The marsh is within BCDC's jurisdiction, so restoration activities would require a permit from BCDC. Two of the most important issues for BCDC are (1) public access, and (2) visual changes to the shoreline. The baseline condition would maintain existing public viewing access along the San Francisco Bay Trail (only), and there would be no changes to the visual aesthetics of the shoreline. As a result, early consultation with BCDC may enable the project to have an administrative permit, because the restoration would not change the use or function of the marsh or impair public access.

BCDC has also become interested in conditions related to sea level rise in recent years. Policies developed by BCDC on sea level rise are described in the updated *San Francisco Bay Plan* (BCDC, 2011). In particular, BCDC now requires sea level rise risk assessments when planning shoreline areas or designing larger shoreline projects. If sea level rise during the life of the project would result in public safety risks, the project must be designed to cope with flood levels expected by mid-century. If it is likely the project would remain in place longer than mid-century, the applicant must have a plan to address the flood risks expected at the end of the century.

However, although Hayward Marsh is surrounded by levees, the purpose of the levees is not the protection of the public against flood risk. For example, the levees are not under the jurisdiction of the Alameda County Water Conservation and Flood Control District (the local flood protection agency), and do not need to be Federal Emergency Management Act (FEMA)-certified. The only consideration for potential public safety risk is that the San Francisco Bay Trail runs along the levee on the bay side of the marsh, so the levee provides public access to this part of the bay shoreline.

If BCDC requires a project to address sea level rise, a sea level rise risk assessment must be conducted, although this assessment is not required for repairs of existing facilities. If a project would modify a levee that currently provides access (i.e. San Francisco Bay Trail), it is possible that a risk assessment would be required. Adequacy of the existing levee to address projected sea level rise has thus been evaluated for the baseline condition.

Tide elevations for current, mid-century and end of century sea level conditions, were compared to the current elevation of the top of the bayside levee at Hayward Marsh, as shown in **Table 4-2**. These values are based on estimates provided by BCDC[3]. As shown, sea level rise would be accommodated at the bayside levee beyond the year 2050, but not in the year 2100. Based on interpolation, the MHHW would reach the existing Bayside Levee elevation around the year 2080. USD also recently completed a *Preliminary Study of the Effect of Sea Level Rise on District Infrastructure* (ESA PSA June 2013), which contained information that indicates the MHHW sea level would equal the bayside level elevation around the year 2070. Based on current information, the bayside levee elevation would need to be increased prior to the year 2070 to accommodate sea level rise.

Table 4-2: Evaluation of Existing Levee in Relation to Projected Sea Level Rise

	Elevation (ft NGVD 29)		
	Current Sea Level	Mid Century Sea Level Rise	End of Century Sea Level Rise
Top of Existing Bayside Levee	**7.75**	**7.75**	*****
Mean Higher High Water (MHHW)	4.27	5.61	8.86
Mean High Water (MHW)	3.64	4.97	8.22
Mean Tide Level (MTL)	0.69	2.02	5.27
Mean Sea Level (MSL)	0.66	1.99	5.24
Mean Low Water (MLW)	-2.26	-0.93	2.32
Mean Lower Low Water (MLLW)	-3.45	-2.12	1.13

*Top of levee would be raised by end of century

Because sea level rise would be protected beyond the year 2050 using BCDC values, and because there is some likelihood that BCDC would not want the bayside levee of Hayward Marsh to be increased above the elevation of adjacent portions of the San Francisco Bay Trail (to retain visual aesthetics), the baseline condition has been developed to retain the existing levee elevations. Material may need to be added to increase levee height in the future, as needed.

It is possible that BCDC may request dredged material to be added to the bayside levee, to accommodate sea level rise for the current project, however it is recommended that the actual BCDC preferred approach be identified and addressed during development of options to the baseline condition or during detailed design of marsh restoration.

State Lands Lease. The Hayward Marsh property is not solely owned by EBRPD. 78 acres is leased from the State Lands Commission and a portion is owned by the City of Hayward. The extent of land ownership and operating agreements should be reviewed to determine whether the State Lands Commission would need to be consulted regarding Marsh improvements. It is expected that the project would require a lease amendment from the State Lands Commission.

[3] BCDC estimates of sea level rise were accessed on April 11, 2014 at http://www.bcdc.ca.gov/planning/climate_change/index_map.shtml

Levee Repair Permit. Because levees in the Hayward Marsh are not under the jurisdiction of Alameda County Flood Control and Water Conservation District, they do not need to be FEMA-certified. It is thus not anticipated that a levee repair permit would be required.

4.2 NPDES Permit

On September 14, 2011, a new NPDES permit for Hayward Marsh was reissued by the San Francisco Bay Regional Water Quality Control Board (Order No. R2-2011-0058, NPDES Permit No. CA0038636), and made effective November 1, 2011. The marsh discharge is currently in compliance with the NPDES permit.

Currently, updates related to the Hayward Marsh status and activity have been (and continue to be) provided to the Regional Water Board each August. In addition, semi-annual meetings are held with Regional Water Board staff to ensure timely transfer of information and facilitate any decision-making related to the NPDES permit.

If marsh restoration to the baseline condition is the selected alternative for the project, USD does not foresee the need for significant changes to the NPDES permit, depending on maintenance activities selected by the Parks District for avian disease control. These activities can be addressed with the next NPDES permit reissuance, anticipated for 2016.

Chapter 5 Planning Level Cost Estimates

5.1 Basis for Planning-Level Cost Estimates

The cost estimates provided in this section are based on the information available at the time of the estimate and are prepared for guidance in project evaluation and implementation. The final costs of the project and resulting feasibility will depend on a variety factors, including actual labor and material costs and competitive market conditions; therefore, the final project costs will vary from the estimate developed in this document.

The Association for the Advancement of Cost Engineering International (AACEI) developed metrics to classify estimating accuracy thru project development. The cost estimates presented in this document are considered planning-level estimates and represent a 15% level of project development. Based on AACEI guidelines, actual project costs are typically within +30% to -20% of the planning-level cost estimate. Project feasibility and funding should consider the inherent level of uncertainty associated with planning-level cost estimates.

5.2 Cost Contingencies and Factors

5.2.1 Project Contingency

Project or program contingencies are defined as unknown or unforeseen costs. The contingency provides allowance for design changes, market conditions, fuel cost changes, labor rate changes, and construction change orders. These may arise from unforeseen or changed conditions in the field. The amount of contingency applied to an estimate is typically based on the level of project definition. For planning studies, typical project contingencies can range between 20% and 30% for construction cost estimates. Based on the information available a 20% contingency factor is included in this cost estimate. Detailed construction quantities and equipment needs have been estimated, using conservative construction methods. It is likely that a bidding contractor would develop a more efficient or optimized approach to performing the work, therefore a 20% contingency factor was chosen.

5.2.2 Implementation Factors

Cost factors are included to estimate the entire capital costs associated with implementation of the project. Although these costs can vary greatly from project to project and from component to component, a standard factor on the estimated construction costs is typically used. The following typical factors for these additional services and contingencies were used.

- **Environmental Documentation and Permits.** These services include the early conceptual planning, environmental documentation and permits that are often required of capital improvement projects. This factor includes pre-construction fees that may be required. The amount of effort for such services can vary greatly depending on the type, scale, and location of the project. Typical costs for such services can vary from 2% to 10% of the construction costs. An allowance of 6% for environmental documentation and permits is included in the planning-level cost estimate, since the project is not complicated from an environmental documentation and permitting standpoint.
- **Design Service.** Engineering design services cover the detailed site confirmation and final design phases. These services also include the preparation of detailed cost estimates

and construction/phasing schedules. The typical costs for these services vary between 5% and 15% of the construction costs. An allowance of 6% for design services is included in the planning-level cost estimate, since a large portion of the construction cost is labor and equipment. Earthwork designs are generally less detailed when compared to a project more complex such as a treatment plant with a lot of piping and equipment.

- **Legal and Administrative Services.** These costs include such items as legal fees, financing expenses, general administration, and interest during construction. Typical costs for these items can vary from 1% to 15% percent of the construction costs depending on the size, complexity, and type of project. An allowance of 1% for legal and administrative services is included in the planning-level cost estimate, since a significant portion of the project's construction cost is for less complicated activities such as earthwork.
- **Engineering Services during Construction.** Engineering construction support services typically include submittal and shop drawing reviews as well as minor design modifications. The typical costs for these engineering construction support services vary between 4% and 10% of the construction costs. An allowance of 4% for engineering services during construction is included in the planning-level cost estimate.
- **Construction Management and Inspection.** Costs for these services can vary greatly with project size and whether an agency performs this work with in-house staff or through a consultant. Regardless of the staffing, the costs for these services should still be accounted for and applied to the overall capital costs of the project. Typical costs for such services can vary from 5% to 10% of the construction costs. An allowance of 6% for construction management is included in the planning-level cost estimate.

5.2.3 Inflation / Escalation

Escalation of capital cost is based on the average of annual Engineering News Record Engineering News Record (ENR) Construction Cost Index (CCI) data for the City of San Francisco. From 2004 to 2014, the average annual increase in the ENR CCI for San Francisco was 3%. An inflation/escalation rate of 3% was used for estimating the future cost at the midpoint of construction, which is estimated to be September 2017.

5.3 Baseline Condition Cost Estimate

5.3.1 Construction Methods and Equipment

The cost estimate is based on the following equipment and materials to be used for construction:

- Hydraulic Excavator
- Long-reach Excavator(s) and/or Drag-line Excavator (working off of crane mats in soft areas)
- End Dump Trucks (for onsite and offsite hauling)
- Low-ground Pressure (LGP) Truck(s) (except when hauling waste material off-site)
- LGP Dozer(s) (for material pushing around site)
- LGP Loader(s) (for material loading into trucks after material is dried)
- LGP Backhoe (for trenching basin channels)
- Motor Grader (for levee road leveling/upkeep)
- Temporary Matting (wood or plastic for equipment support)

All equipment would be low-ground pressure equipment suited with tracks, balloon tires, or similar to allow movement over soft soils. Matting and geogrid fabric would be employed to access areas, such as soft pond bottoms, that cannot otherwise support heavy equipment. Equipment and material staging would be on the levees within the Hayward Marsh, or in the higher elevation areas near the entrance to Hayward Marsh, near the City of Hayward Wastewater Treatment Plant. Bay Trail access would be restricted when equipment is positioned on the Bay Trail or outside the Hayward Marsh property fence. Flagmen would be provided to direct equipment and pedestrian access.

The work is based on the following sequence of tasks:

Year 1 (Approximately September through April)

- Mobilization (equipment and materials)
- Site preparation
    - Temporary fencing/fence removal where required for equipment staging
    - Removal and disposal of vegetation at excavation and placement sites (a significant effort)
    - Widening levee crests and corners where needed for truck traffic
    - Gravel placement on roads
    - Riprap removal between Basin 3A SE and SW levee corners and temporary storage on unused levee areas for placement after grading work
    - Turnout construction for truck passing zones or turnaround areas
    - Ramp construction from levee top down to basin bottoms
    - Road/matting construction within basin excavation areas
    - Traffic control & Best Management Practices (BMPs) (throughout project work)
- Culvert excavation and replacement; new culvert installation between the Northwest Channel and Basin 2A
- Establish bypass pumping for USD effluent
- Dechlorination facility rehabilitation
- Basin 1 freshwater bypass installation (30” diameter)
- Basin 2A and 2B levee repair (at the same time as Basin 3B excavation and placement)
- Basin 3B excavation of approximately the top 18”, reducing the basin bottom elevation to -0.7 feet on average. The semi-dry Basin 3B material will be excavated no closer than 30 feet from the levee toe, ensuring levee stability is maintained.
- Island 7 removal in Basin 3A.
- Material placement on levees and at Island 4 and 5 expansion sites would occur concurrently with Basin 3B excavation. Stabilize material on the levees with backhoes and track walk with low ground pressure (LGP) dozers where possible. Install filter fabric and rock where indicated.
- Complete placement during first year; demobilize.

Year 2 (Approximately September through March)

- Mobilization (equipment, including hydraulic dredge, and materials)

- Mixing Channel hydraulic excavation. Hydraulically slurry material and pump into Basin 3B for placement. Allow suspended sediments to settle. Use a closed-loop pumping system within the ponds and channels to prevent suspended sediment releases into the Bay.
- Northwest Channel excavation.
- Basin 3A excavation (including the boat access channel and inlet excavation).
- Basin 3B excavation (including boat access channel and inlet excavation).
- Demobilization

The cost estimate is based on using small equipment to clear and grub vegetation from levee placement areas and around excavation areas for equipment access. To create stabilized levees, the excavated material cannot be directly placed on vegetation on the existing levee slopes. Approximately 10.5 acres will have to be cleared and grubbed from the base of the levees and from the levee slopes that will be repaired. All vegetation material would be disposed of offsite, which is costly. Vegetation clearing, grubbing, and disposal will be a significant effort of this project.

The following work would be involved in repairing the levee between Basins 2A and 2B. Because the levee material is loose and un-compacted from deterioration, the top ~50% of the existing levee (about 3,750 CY) will be excavated and temporarily set to the side (in Basins 2A or 2B), assuming the basins have been drained (not completely dried). The material will be set back on the levee in 1 foot lifts and track-walked with dozers until the material is firm enough as a foundation for standard soil compaction equipment to compact it. Approximately 3,600 CY of material will be imported and placed on the levee to complete the levee template (12 ft. minimum crest width, existing elevation at approximately 7 to 7.5 ft. NGVD29, 2H:1V slopes). Filter fabric will then be placed on the slopes and 4,560 tons of rock on top of that for levee longevity purposes. The work to repair this levee is separated as a single line item in the cost estimate. It assumes this work is done at the same time as the other work and the total project duration does not increase, meaning there is no additional contract time (e.g. no overhead costs added).

The cost estimate is also based on the perimeter levees (southern Mixing Channel levee and northern Northwest Channel levee) being available for equipment to access and use for material excavation within the channels. Storage can be confirmed during detailed design, but it would need to be in one of the ponds, a blocked off levee section, or at the City of Hayward ponds. Mechanical excavation of the Northwest Channel, Basin 3A and Basin 3B would be performed with a long-reach or drag-line excavator (except Island 7 removal). Wet material would be trucked to Basin 3B and placed.

The proposed construction method requires the basins to be dry at the time of material placement along their levee slopes. If the basins were dried sufficiently and construction proceeded continuously in the summer months without protected species work windows, construction would be completed in approximately 8 months. If restrictions for protected species are considered and the marsh remains functional during wet weather conditions for USD discharges, then the construction for the baseline condition could take 2-4 years depending on how quickly the basins can dry for equipment to operate on and around them. During periods when USD

discharge cannot be routed through the specific portions of the marsh, required for treatment (i.e. Basins 2A or 2B), either a temporary NPDES waiver would be need to bypass Basins 2A and 2B, or Basin 1 would need to be used as equalization storage with temporary bypass pumping to return effluent to the EBDA system after peak flows subside.

5.3.2 Capital Cost Estimate

A construction cost breakdown by item and total capital cost estimate are presented in **Table 5-1**. Each excavation item includes the excavation, transport (hauling), placement, and shaping of the material. Including the cost estimating allowances, the total estimated capital cost for the baseline restoration project is $20,100,000.

Table 5-1: Construction and Capital Cost Estimate

Item	Quantity	Unit	Unit Cost	Total Cost
Mobilization & Demobilization	1	LS	$1,107,211	$1,107,200
Clearing and Grubbing	10.5	ACRE	$74,617	$783,500
USD Effluent Bypass Pumping and/or NPDES Waiver	1	ALLOW	$50,000	$50,000
Excavate Basin 3B and Levee/Island 4&5 Placement	46,300	CY	$131	$6,065,300
Repair Basin 2A and 2B Levee	1	LS	$1,200,900	$1,200,900
Excavate Island 7	300	CY	$131	$39,300
Rock Slope Protection	15,632	TON	$61	$953,600
Excavate Mixing Channel	34,900	CY	$11	$383,900
Excavate Northwest Channel	1,700	CY	$48	$81,600
Excavate Basin 3A Inlet	3,400	CY	$48	$163,200
Excavate Basin 3B Inlet	2,600	CY	$48	$124,800
Island 5 Boat Access Channel	2,300	CY	$80	$184,000
Island 4 Boat Access Channel	2,100	CY	$81	$170,100
Landscaping & Planting	10.5	ACRE	$10,100	$106,100
Gate Structures and Pipe	14	EACH	$28,922	$404,900
Operational Improvements				
New gates at Basin 1 (bayside), 2A, and 2B inlet culverts and NW Channel to 2B culvert	4	EACH	$30,000	$120,000
NW Channel to 2B 30" dia. culvert	60	LF	$360	$21,600
30" dia. freshwater bypass around Basin 1	1000	LF	$360	$360,000
Gate valve for freshwater bypass line	2	EACH	$30,000	$60,000
Basin 1 Dechlorination Station rehabilitation	1	LS	$75,000	$75,000
			Raw Construction Cost	**$12,455,000**
			Escalation to Midpoint of Construction (3%/Year)	$1,170,000
			Total Bid Amount	**$13,625,000**
			Contingency (20%)	$2,730,000
			Total Construction Amount	**$16,355,000**
			Environmental Documentation and Permitting (6%)	$980,000
			Design Allowance (6%)	$980,000
			Legal/Admin Allowance (1%)	$160,000
			Construction Management Allowance (6%)	$980,000
			Engineering Services During Construction Allowance (4%)	$650,000
			Total Capital Cost	**$20,100,000**

Notes:
- The excavation line items include excavation, hauling, placement, and shaping costs at those locations identified in Figure 3-1.
- Apparent errors in totals are due to rounding.

Chapter 6 Summary

The Baseline Condition option for the Hayward Marsh Rehabilitation Options Study was developed to restore Hayward Marsh to the original (design) condition, with selected improvements to optimize future marsh operations and habitat value without any contemplated CEQA-based impacts.

Expansion of Island 5 in Basin 3A would increase capacity of the existing successful Least Tern colony, which is currently at capacity. The expansion of Island 4 in Basin 3B would also provide additional least tern habitat, either temporarily while Basin 3B is being improved or long-term as a permanent installation. Improvements to Hayward Marsh were included to assist with control of avian disease in the marsh. Two options would be available to EBRPD staff for this purpose: (1) introducing salt water into Basins 1, 2A, and 2B to control disease spores, and (2) drying out Basins 1, 2A, or 2B for control or removal of disease spores.

To facilitate future maintenance of the marsh, a sediment trap would be constructed at the inlet to the Mixing Channel, so only limited dredging would be needed on a periodic basis (approximately every 5 to 10 years) in the future. To prevent further erosion and to reestablish safe vehicle use of the levees, dry material from Basin 3B and imported rock would be placed on Basin 2A, 2B, 3A, and 3B and East Channel levees to provide a 20-year lifespan for the levees. These levees would be restored to a minimum 12-foot crest width and 5:1 slope. The restoration of the existing levees is a significant portion of the raw construction cost for the Baseline Condition. A routine maintenance program for the levees would help reduce or eliminate the need for large scale levee restoration in the future.

The dredged material is approximately equal in quantity to material used for levee restoration and for island work identified in Table 3-4, therefore offsite dredged material disposal would not be necessary. The planning level cost estimate was developed to include raw construction costs, project contingency, implementation costs, and an escalation (inflation) factor, for construction anticipated to begin in September 2017. The raw construction cost is estimated to be $12,455,000 and the capital cost is estimated to be $20,100,000.

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Appendix A – Existing Marsh Data

Table A1: Existing Basin and Island Acreages

Basin and Island Footprints	Area* (acres)
Basin 1 (baffles)	0.2
Basin 1 (without baffles)	14.5
Basin 1 Total	14.7
Basin 2A Island 13	0.6
Basin 2A Island 14	0.8
Basin 2A Island 15	0.5
Basin 2A (without islands)	28.0
Basin 2A Total	29.9
Basin 2B Island 10	0.4
Basin 2B Island 11	0.6
Basin 2B Island 12	0.2
Basin 2B (without islands)	28.9
Basin 2B Total	30.1
Basin 3A Island 5	0.5
Basin 3A Island 6	0.2
Basin 3A Island 7	0.1
Basin 3A Island 8	0.3
Basin 3A Island 9	0.5
Basin 3A (without islands)	27.2
Basin 3A Total	28.7
Basin 3B Island 1	0.5
Basin 3B Island 2	0.7
Basin 3B Island 3	0.5
Basin 3B Island 4	0.2
Basin 3B (without islands)	24.6
Basin 3B Total	26.5

*Acreages calculated from slope toes.

Table A2: Existing Levee and Island Perimeter Lengths

Levee and Island Perimeters	Length (ft)
Basin 1 Levees	5,200
Basin 2A Levees	6,100
Basin 2B Levees	6,000
Basin 3A Levees	4,500
Basin 3B Levees	4,900
Mixing Channel Levees	8,300
Northwest Channel Levees	7,800
Island Perimeters (1-15 except 7)	9,300
Total	52,100