4/20/2015

SCOPE OF SERVICES **ITEM 9**

PRELIMINARY DESIGN SERVICES FOR
RECOMMISSIONING THE CITY'S DESALINATION PLANT
(Subsurface Desalination Intake and Potable Reuse Feasibility Studies).
(Project)

AUTHORIZATION #1: WORK PLAN DEVELOPMENT

BACKGROUND

On September 23, 2014 the City of Santa Barbara City Council directed Public Works Department staff to report back on a plan to evaluate the feasibility of subsurface desalination intake and potable reuse, including indirect and direct potable reuse options. The direction given by CITY Council was to report back on a plan for this evaluation following award of the desalination plant contract in April 2015. Furthermore, on January 30, 2015, the Central Coast Regional Water Quality Control Board (RWQCB) adopted an amendment to the CITY's El Estero Wastewater Treatment Plant (WWTP) Waste Discharge Requirements (WDR) that included a condition that the CITY should report back to the RWQCB by August of 2015 with a Work Plan for these studies that will have the work completed by June 2017. This scope of services was therefore developed to satisfy the direction of City Council and the RWQCB by preparing a feasibility analysis for subsurface desalination intakes and potable reuse alternatives. This information can be used as part of future planning efforts to will be designed to help the CITY plan for future drought emergencies.

PURPOSE

The purpose of this scope of services is to present the initial tasks required for evaluating the feasibility of subsurface desalination plant intakes and potable reuse alternatives. The feasibility study work product will be developed in a manner so as to accomplish the following objectives:

- Satisfy the requirements of the CITY's amended Waste Discharge Requirements for the El Estero WWTP.
- Support a future California Environmental Quality Act (CEQA) process in the event that the CITY may update their Long Term Water Supply Plan to include alternatives considered in this study.

This scope of services is the first of three authorizations required to complete this study effort. The three separate authorizations include:

- Authorization #1: Work plan development and literature review.
- Authorization #2: Subsurface desalination intake basis of design and fatal flaw analysis; Potable Reuse Feasibility Study.
- Authorization #3: Subsurface desalination intake feasibility study and entrainment study.

The steps involved in this study are described graphically in the programmatic work flow diagrams presented in Figures 1 and 2.

CAROLLO'S SERVICES

TASK 1 – SUBSURFACE DESALINATION INTAKE FEASIBILITY STUDY
The tasks required to perform the services associated with ***TASK 1 – Subsurface Desalination Intake Feasibility Study*** are presented below and summarized graphically in the attached Programmatic Work Plan.

1.1 – Work Plan Development
The CITY of Santa Barbara is required to submit a Work Plan for evaluating subsurface desalination intakes to the Central Coast Regional Water Quality Control Board (RWQCB) by August 2015. As part of CAROLLO's services included in this Scope of Work, CAROLLO will conduct a kickoff meeting with the CITY to develop a Work Plan that has the following objectives:

- Establish the project schedule.
- Establish technical advisory panel role, procedures and objectives.
  - It is anticipated that the technical advisory process will be facilitated by the National Water Research Institute (NWRI). The technical advisors will include a panel of approximately four (4) experts (chosen and retained by NWRI).
  - It is anticipated that up to three (3) technical advisory workshops will be included in the Work Plan. These workshops will occur throughout the project at points that coincide with project work product development and completion. The points at which these technical advisory workshops occur will be established in the Work Plan.
  - It is anticipated that the panel will review and advise on technical studies and conclusions of CAROLLO and CITY.
  - It is anticipated that public comments will be facilitated by NWRI as part of the Technical Advisory Panel meetings. Applicable public comments/sentiment (i.e., consistent with CEQA and regulatory framework) will be incorporated thereafter into the feasibility screening analysis.
- Establish the role of outside agencies (e.g., RWQCB, California Coastal Commission, etc.) and City residents.
- Establish the methods by which the design basis will be established. Design basis includes:
  - Intake capacity
  - Candidate sites for study
- Establish the types of subsurface intakes that will be studied (e.g., vertical wells, lateral beach wells, horizontal collector wells (i.e., Ranney wells), slant wells, subsurface infiltration galleries (SIG), and horizontally directionally drilled (HDD) wells (i.e., Neodren))
- Establish and define fatal flaws that may limit further consideration of project sites, which may include: available land, known geologic hazards/conditions (e.g., proximity of faults, depth to bedrock, transmissivity of soils, etc.), proximity to marshes that may be affected by intake use, anticipated loss of facilities due to erosion, etc.
- Establish and define feasibility screening criteria (e.g., constructability, permitability, impact to the CITY's drinking water aquifers, estimated environmental impacts during construction, impact to rate payers, etc.).
- Establish sequencing of analyses and application of feasibility screening criteria.
- Establish procedure to identify sites for subsurface intakes and raw water conveyance piping
- Procedure to determine subsurface properties (if applicable). Examples include:

  - Review literature data to establish sites to focus study.
  - Collect new data:
    - Identify permits required and establish application procedure
    - Sequence of subsurface data collection.
- Establish procedure to model subsurface intake's influence on the sustainability of the CITY's drinking water aquifer.
- Establish procedure to estimate subsurface intake water quality and additional treatment needs.
- Establish and define metrics to compare subsurface intake alternatives to the CITY's current open ocean intake. These metrics may include:
  - Reliability of intake water supply
  - Benefit to treatment process costs
  - Impact to CITY's groundwater supply
  - Construction phase environmental impact (monetized)
  - Operation phase environmental impacts (monetized)
  - Impact to rate payers
- Establish scoring methodology to use.

To maximize the Work Plan development / kickoff meeting's potential, CAROLLO will distribute kickoff meeting agenda, which will include some assignments for CITY staff to consider before the meeting date (e.g., possible feasibility screening criteria and their definitions, site alternatives for facilities and conveyance of raw water, etc.). Following the kickoff meeting, CAROLLO will:

- Prepare meeting minutes to identify action items and data needs.
- Develop a draft Work Plan that will be submitted to the Central Coast RWQCB staff for review.
  - Upon receipt of the RWQCB's comments, CAROLLO will prepare a final Work Plan.

Following acceptance of the Work Plan by the RWQCB, in concert with the data collected as part of Task 1.2 (Literature Review), CAROLLO will prepare a draft Technical Memorandum (TM) that will be used as part of the technical advisory process (TM 1 (Revision 0)) and summarizes the pertinent background information, definitions for feasibility screening criteria that were established, and the subsurface desalination intake alternatives that will be evaluated. The CITY will review this TM and provide comments back to CAROLLO within 1 week following submission of the draft TM. CAROLLO will incorporate any comments into a revised TM (TM 1 (Revision 1)) that will be used as supporting material for the technical advisory process discussed in Task 4.1 (Technical Advisory Process). After the technical advisory process is complete, the final TM contents will be used as chapters in the Desalination Subsurface Intake Feasibility Report.

Task 1.1 Deliverables by CAROLLO

1. Kickoff Meeting Agenda and Assignments
2. Kickoff Meeting Minutes
3. Draft Work Plan
4. Final Work Plan
5. TM 1 (Revision 0): Introduction, Background and Project Alternatives
6. TM 1 (Revision 1): Introduction, Background and Project Alternatives

1.2 – Literature Review

CAROLLO will collect, review and prepare data to evaluate the subsurface intake alternatives identified. CAROLLO will prepare a formal list of data needs that are either independently collected or requested from the CITY. CAROLLO will provide weekly data gathering list updates during the first month of the project and monthly updates thereafter. It is anticipated that the list will include items such as, but not limited to:

- Published geologic/hydrogeologic studies in the area, including:
  - USGS reports
  - Prior hydrologic and geotechnical studies conducted by the CITY.
- The CITY's 1989 and 1990 subsurface intake studies conducted on East, West and Ledbetter Beaches.
- Geotechnical data associated with the design and installation of piles supporting Stearns Warf.
- Any data related to tsunami hazards, sea level rise and sediment transport (i.e., erosion and deposition) in the areas of East, West and Ledbetter Beaches that may be associated with harbor dredging and mooring. The CITY Waterfront Department may be consulted for this information.
- Basis of design reports for the CITY's desalination plant (after reactivation and associated improvements).
- Water, sewer, (existing) recycled water and stormwater atlas data in GIS format
- Current or anticipated flood plain maps
- Hydrologic data and studies on existing wells and the groundwater aquifer used for drinking water production, including various USGS hydrogeological and modelling studies..
- Data related to baseline environmental conditions that could be affected by one or more of the intake options.
- California State Waters Map Series—Offshore of Santa Barbara, California http://pubs.usgs.gov/sim/3281/

CAROLLO will use the CITY's Map Analysis and Printing System (http://gismaps.santabarbaraca.gov/) to facilitate development of scaled site plans and graphics.

Task 1.2 Deliverables by CAROLLO

1. Data collection lists and updates

Summary of TASK 1 Project Meetings

Task No.	Meeting Name	Purpose
1.1	Kickoff Meeting	CAROLLO and CITY will meet to: • Discuss CAROLLO's proposal for Work Plan content • Identify candidate project sites for initial feasibility screening ***(This meeting will be held at the same time as the kickoff meeting in Task 3.1)***
	Draft Work Plan Meeting	CAROLLO and CITY will meet to review draft work plan before it is submitted to the RWQCB and Technical Advisory Panel. ***(This meeting will be held at the same time as the Draft Work Plan Meeting in Task 3.1)***

TASK 3 – POTABLE REUSE FEASIBILITY STUDY

The tasks required to perform the services associated with ***TASK 3 – Potable Reuse Feasibility Study*** are presented below and summarized graphically in the attached Programmatic Work Plan.

3.1 – Work Plan Development

The CITY of Santa Barbara is required to submit a Work Plan for evaluating potable reuse alternatives to the Central Coast Regional Water Quality Control Board (RWQCB) by August 2015. As part of CAROLLO's services included in this Scope of Work, CAROLLO will conduct a kickoff meeting with the CITY to develop a Work Plan that has the following objectives:

- Establish the project schedule.
- Establish technical advisory panel role, procedures and objectives.
  - It is anticipated that the technical advisory process will be facilitated by the National Water Research Institute (NWRI). The technical advisory panel will include a panel of approximately four (4) experts (chosen and retained by NWRI) as well as representatives from various regulatory agencies as determined appropriate.
  - It is anticipated that up to three (3) technical advisory panel workshops will be included in the Work Plan. These workshops will occur throughout the project at points that coincide with project work product development and completion. The points at which these technical advisory panel workshops occur will be established in the Work Plan.
  - It is anticipated that the panel will review and advise on technical studies and conclusions of CAROLLO and CITY.
  - It is anticipated that public comments will be facilitated by NWRI as part of the Technical Advisory Panel meetings. Public comments/sentiment will be incorporated thereafter into the feasibility screening analysis.
- Establish the role of outside agencies (e.g., RWQCB, California Coastal Commission, etc.) and City residents.
- Establish and define fatal flaws that may limit further consideration of project sites, which may include: poor aquifer tranmissivity, known geologic hazards, small site, etc.
- Establish and define feasibility screening criteria (e.g., estimated environmental impacts, permitability, improves the reliability of the CITY's water supply, impact to rate payers, potable water quality benefits, etc.).
- Establish sequencing of analyses and application of feasibility screening criteria.
- Procedure to identify the capacity of potable reuse supply that is available.
- Identify possible sites for treatment, storage and distribution facilities to evaluate when considering both Direct Potable Reuse (DPR) and Indirect Potable Reuse (IPR) alternatives.
  - It is anticipated that up to twenty (20) site/process/routing/size alternatives may be considered for further analysis against the feasibility screening criteria identified. Possible treatment facility location options may include (but may not be limited to):
    - 401 E. Yanonali Street (i.e., City Corporation Yard, APN #017-540-006), and
    - 103 S. Calle Cesar Chavez (APN #017-113-020)
    - Repurposing the Charles Meyer Desalination Plant located at 525 E. Yanonali Street

    Possible indirect potable recharge locations may include (but may not be limited to):
    - Recharge wells in the foothills basin (near Route 154 and Highway 101)
    - Recharge wells in groundwater basin referred to as "Unit 1" (north of Highway 101)

    - Infiltration of water (i.e., like a spreading basin) in Mission Creek before Oak Park.

    Possible potable reuse options may include (but may not be limited to):
    - Discharge of advanced treated wastewater into Lauro Canyon Reservoir (a.k.a., raw water production).
    - Dilution and off-setting the intake volume of seawater flowing to the Charles Meyer Desalination Plant
- Establish and define metrics to compare potable reuse alternatives to the CITY's current drought plan (i.e., desalination).
- Establish scoring methodology to use

To maximize the Work Plan development / kickoff meeting's potential, CAROLLO will distribute kickoff meeting agenda, which will include some assignments for CITY staff to consider before the meeting date (e.g., possible feasibility screening criteria and their definitions, site alternatives for facilities and distribution of treated water, etc.). Following the kickoff meeting, CAROLLO will:

- Prepare meeting minutes to identify action items and data needs.
- Develop a draft Work Plan that will be submitted to the Central Coast RWQCB staff for review.
    - Upon receipt of the RWQCB's comments, CAROLLO will prepare a final Work Plan.

Following acceptance of the Work Plan by the RWQCB, in concert with the data collected as part of Task 3.2 (Data Gathering), CAROLLO will prepare a draft Technical Memorandum (TM) that will be used as part of the technical advisory process (TM 1 (Revision 0)) and summarizes the pertinent background information, definitions for feasibility screening criteria that were established, and the IPR/DPR alternatives that will be evaluated. The CITY will review this TM and provide comments back to CAROLLO within 1 week following submission of the draft TM. CAROLLO will incorporate any comments into a revised TM (TM 1 (Revision 1)) that will be used as supporting material for the technical advisory process discussed in Task 4.1 (Technical Advisory Process). After the technical advisory process is complete, the final TM contents will be used as chapters in the Potable Reuse Feasibility Report.

Task 3.1 Deliverables by CAROLLO

1. Kickoff Meeting Agenda and Assignments
2. Kickoff Meeting Minutes
3. Draft Work Plan
4. Final Work Plan
5. TM 1 (Revision 0): Introduction, Background and Project Alternatives
6. TM 1 (Revision 1): Introduction, Background and Project Alternatives

3.2 – Data Gathering

CAROLLO will collect, review and prepare data to evaluate the study alternatives identified. CAROLLO will prepare a formal list of data requested and provide weekly data gathering list updates during the first month of the project and monthly updates thereafter. It is anticipated that the list will include items such as, but not limited to:

- Basis of design reports for the CITY's recycled water treatment system, which should include:
    - Historical effluent flow data (hourly flows over previous 10 years, including drought periods)

  - Existing and projected recycled water demands
  - Recycled water quality, including regulated primary and secondary drinking water standards, non-regulated treatment goals, and irrigation water standards (e.g., boron and sodium adsorption ratio).
- Water, sewer, (existing) recycled water and stormwater atlas data in GIS format
- Current or anticipated flood plain maps
- Hydrologic data, aquifer characteristics (thickness, orientation, extent, degree of confinement), estimates of aquifer properties (e.g., T, S), confining layer extent and properties, production well pumping rates, water quality, well logs, and studies on existing wells and the groundwater aquifer used for drinking water production.
- Location and nature of all existing wells in the study area including well logs, geophysical logs, water quality data, water level data, and yield data.
- Soil infiltration rates (for use in estimating infiltration basin capacities)
- Hydrologic data and studies on existing wells and the groundwater aquifer used for drinking water production (e.g., USGS Report).
- Regional (County-wide) reports on potable reuse opportunities that describe:
  - Regional groundwater balance that addresses sustainable yield of groundwater aquifers that are shared by more than one agency.
  - Aquifer adjudication between the City and neighboring agencies.
  - How excess groundwater use by one agency may be balanced by IPR.

CAROLLO will use the CITY's Map Analysis and Printing System (http://gismaps.santabarbaraca.gov/) to facilitate development of scaled site plans and graphics.

Task 3.2 Deliverables by CAROLLO

1. Data collection lists and updates

Summary of TASK 3 Project Meetings

Task No.	Meeting Name	Purpose
3.1	Kickoff Meeting	CAROLLO and CITY will meet to: • Discuss CAROLLO's proposals for Work Plan content • Identify candidate project sites for initial feasibility screening ***(This meeting will be held at the same time as the kickoff meeting in Task 1.1)***
	Draft Work Plan Meeting	CAROLLO and CITY will meet to review draft work plan before it is submitted to the RWQCB and Technical Advisory Panel. ***(This meeting will be held at the same time as the Draft Work Plan Meeting in Task 1.1)***

TASK 4 – PROJECT REVIEW

4.1 – Technical Advisory Process

CAROLLO will retain the services of NWRI to facilitate a technical advisory process that will be defined in the Work Plan developed in Task 1.1 and Task 3.1. It is anticipated the technical advisory process will consist of:

- Approximately four (4) technical advisors (selected and retained by NWRI) with the following qualifications in the areas of both potable reuse and subsurface desalination intakes:
    - Hydrogeologist
    - Engineer or contractor
    - Regulatory/permitting (e.g., CEQA consultant)
    - Water Quality
- Up to four (4) technical advisory panel workshops consisting of the following topics:
    - Workshop 1: Work Plan Review (Task 1 and Task 3) – ***Included in this Scope of Services (Authorization #1)***
    - Workshop 2: Fatal Flaw Analysis (Task 1 and Task 3) – ***Included in a separate Scope of Services (Authorization #2)***
    - Workshop 3: Feasibility Analysis (Potable Reuse) – ***Included in a separate Scope of Services (Authorization #2)***
    - Workshop 4: Feasibility Analysis (Subsurface Desalination Intake) – ***Included in a separate Scope of Services (Authorization #3)***

  CAROLLO will prepare technical materials and make presentations to the technical advisory panel.
- NWRI will facilitate technical advisory workshops and public comment.

The Technical Advisory Process will be formally adopted in the Work Plan developed in Task 3.1.

CAROLLO will be responsible for:

- Coordination of workshop dates with workshop participants.
- Preparing and distributing workshop materials to the technical advisors and workshop participants a minimum of 2 weeks prior to the workshop meetings.

CAROLLO's subconsultant (NWRI) will be responsible for:

- Facilitating the technical advisory panel workshops and public comment.
- Preparing draft and final meeting minutes.

Task 4.1 Deliverables

1. Meeting Agendas and Workshop Materials
2. Draft meeting minutes
3. Final meeting minutes

4.2 –CITY Council Workshops/Meetings

CAROLLO will attend up to three (3) CITY Council workshops or meetings to assist CITY staff in presenting the progress and findings of the studies completed in Tasks 1, 2 and 3.

Task 4.2 Deliverables by CAROLLO

1. Powerpoint presentation for City Council workshop or meeting

Summary of TASK 4 Project Meetings (Authorization #1)

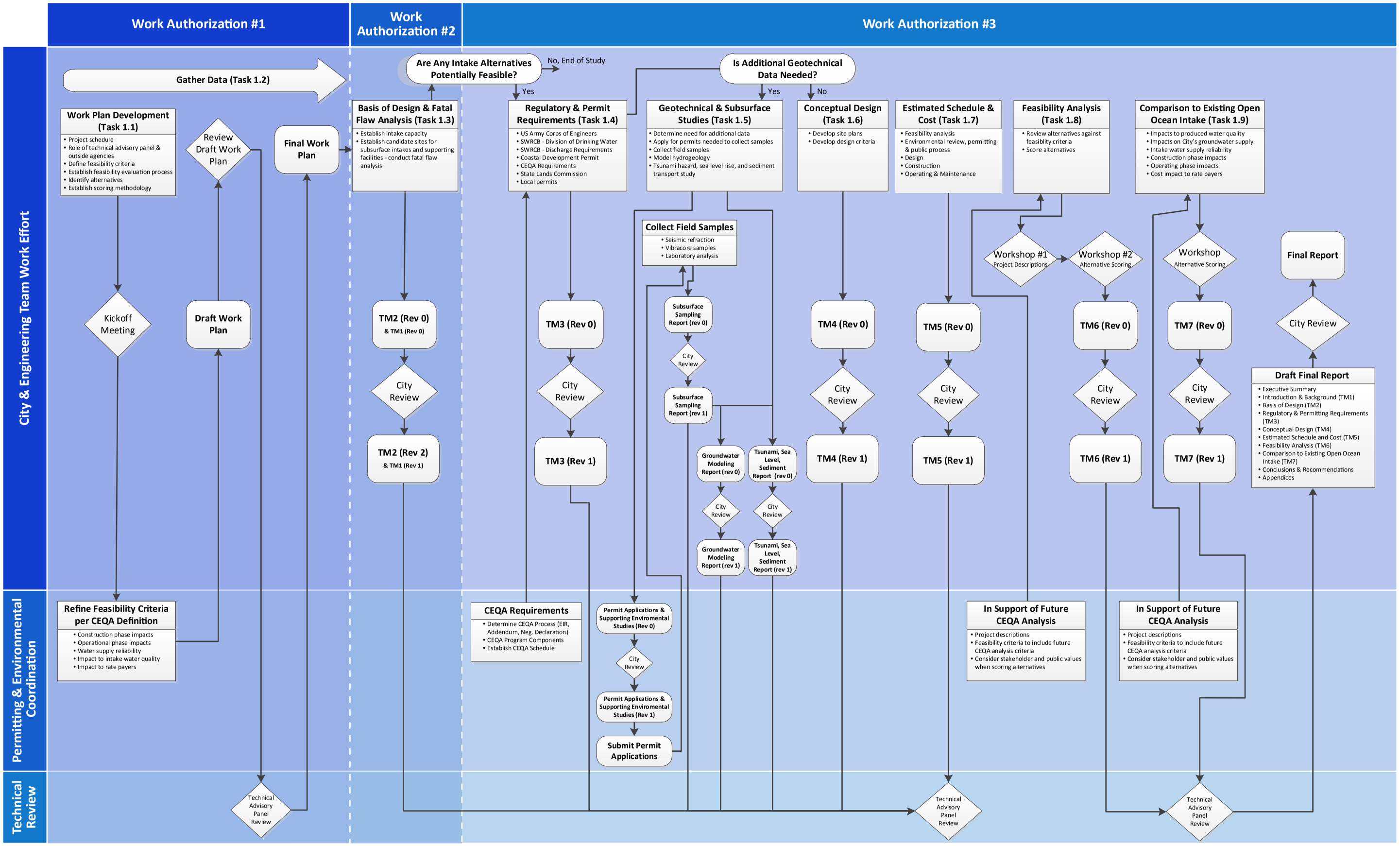
Task No.	Meeting Name	Purpose
4.1	Technical Advisory Panel Workshop #1 (Task 1.1 and 3.1)	This meeting will be facilitated by NWRI and have the following objectives: • Following meeting with CITY staff to review Draft Work Plans submitted under Tasks 1.1 and 3.1, CAROLLO and CITY will meet with Technical Advisory Panel to review Draft Work Plans. CAROLLO will present Draft Work Plan to technical advisory panel and interested parties. • NWRI will facilitate and receive comments from the audience on work plan approach.

TIME OF PERFORMANCE

The project schedule will be further refined during the work plan development, however the CITY is required to submit a draft work plan to the RWQCB by August 2015 and a final Feasibility Study Report by June 2017. It is anticipated that CAROLLO will provide services based upon the schedule presented in Attachment A.

PAYMENT

Payment will be based upon the terms stated in the contract Agreement between CAROLLO and the CITY. Invoices will be submitted by CAROLLO to the CITY on a monthly basis and will include CAROLLO's labor hours and direct costs, along with supporting invoices and the CITY's invoice cover sheet. Refer to the attached table for a schedule of fees involved with this Scope of Services.



Task 1 - Subsurface Desalination Intake Feasibility Study
Programmatic Work Plan

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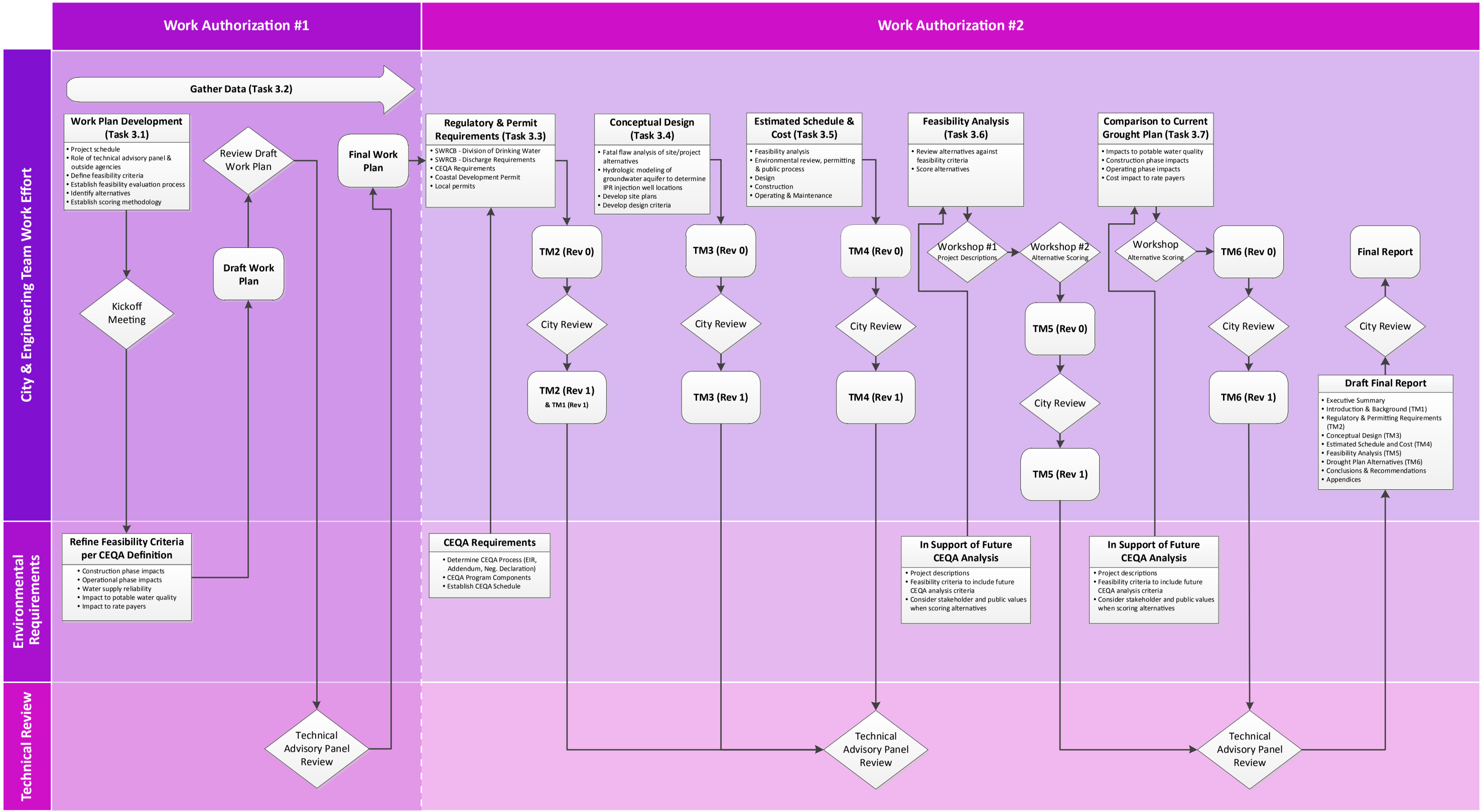


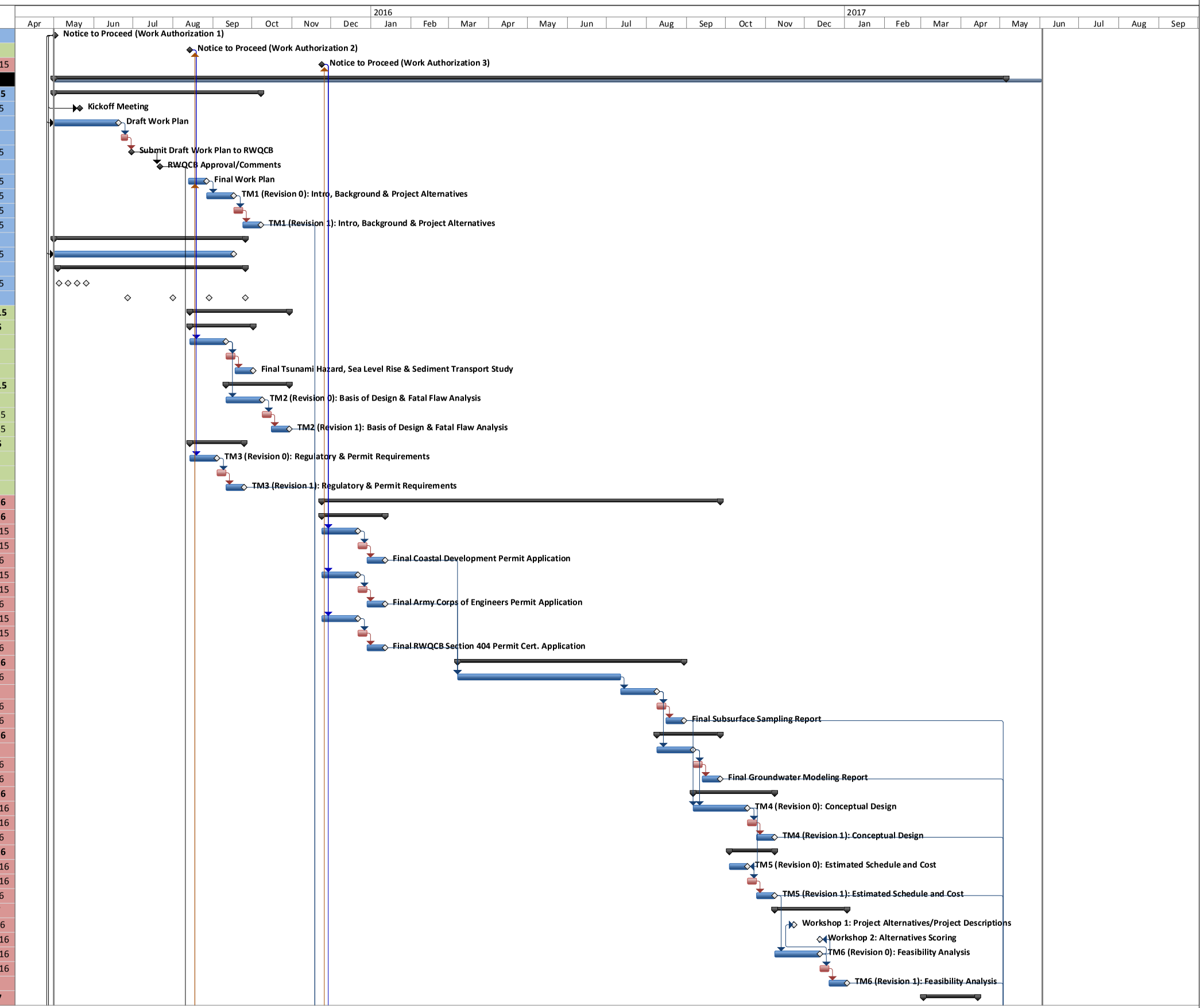
Task 3 - Potable Reuse Feasibility Study
Programmatic Work Plan

ATTACHMENT A

SUBSURFACE DESALINATION INTAKE & POTABLE REUSE FEASIBILITY STUDIES

CITY OF SANTA BARBARA

ID	Task Name	Duration	Start	Finish
1	**Notice to Proceed (Work Authorization 1)**	1 day	Fri 5/1/15	Fri 5/1/15
2	Notice to Proceed (Work Authorization 2)	1 day	Thu 8/13/15	Thu 8/13/15
3	Notice to Proceed (Work Authorization 3)	1 day	Mon 11/23/1	Mon 11/23/15
4	**TASK 1 - SUBSURFACE DESALINATION INTAKE FEASIBILITY STUDY**	**526 days**	**Fri 5/1/15**	**Fri 5/5/17**
5	**1.1 Work Plan Development**	**114 days**	**Fri 5/1/15**	**Wed 10/7/15**
6	Kickoff Meeting	1 day	Wed 5/20/15	Wed 5/20/15
7	Draft Work Plan	36 days	Fri 5/1/15	Fri 6/19/15
8	City Review	5 days	Mon 6/22/15	Fri 6/26/15
9	Submit Draft Work Plan to RWQCB	1 day	Mon 6/29/15	Mon 6/29/15
10	RWQCB Approval/Comments	1 day	Tue 7/21/15	Tue 7/21/15
11	Final Work Plan	10 days	Thu 8/13/15	Wed 8/26/15
12	TM1 (Revision 0): Intro, Background & Project Alternatives	15 days	Thu 8/27/15	Wed 9/16/15
13	City Review	5 days	Thu 9/17/15	Wed 9/23/15
14	TM1 (Revision 1): Intro, Background & Project Alternatives	10 days	Thu 9/24/15	Wed 10/7/15
15	**1.2 Literature Review**	**106 days**	**Fri 5/1/15**	**Fri 9/25/15**
16	Collect Literature	99 days	Fri 5/1/15	Wed 9/16/15
17	Data Collection List Updates	**105 days**	**Mon 5/4/15**	**Fri 9/25/15**
18	Weekly Data Collection Updates	16 days	Mon 5/4/15	Mon 5/25/15
23	Monthly Data Collection Updates	66 days	Fri 6/26/15	Fri 9/25/15
28	**1.3 Basis of Design & Fatal Flaw Analysis**	**55 days**	**Fri 8/14/15**	**Thu 10/29/15**
29	**1.3.1 Prelim. Geophysical Studies (Tsunami, Sea Level Rise & Sediment Transport)**	**35 days**	**Fri 8/14/15**	**Thu 10/1/15**
30	Draft Tsunami Hazard, Sea Level Rise & Sediment Transport Study	20 days	Fri 8/14/15	Thu 9/10/15
31	City Review	5 days	Fri 9/11/15	Thu 9/17/15
32	Final Tsunami Hazard, Sea Level Rise & Sediment Transport Study	10 days	Fri 9/18/15	Thu 10/1/15
33	**1.3.2 Basis of Design and Fatal Flaw Screening**	**35 days**	**Fri 9/11/15**	**Thu 10/29/15**
34	TM2 (Revision 0): Basis of Design & Fatal Flaw Analysis	20 days	Fri 9/11/15	Thu 10/8/15
35	City Review	5 days	Fri 10/9/15	Thu 10/15/15
36	TM2 (Revision 1): Basis of Design & Fatal Flaw Analysis	10 days	Fri 10/16/15	Thu 10/29/15
37	**1.4 Regulatory Requirements**	**30 days**	**Fri 8/14/15**	**Thu 9/24/15**
38	TM3 (Revision 0): Regulatory & Permit Requirements	15 days	Fri 8/14/15	Thu 9/3/15
39	City Review	5 days	Fri 9/4/15	Thu 9/10/15
40	TM3 (Revision 1): Regulatory & Permit Requirements	10 days	Fri 9/11/15	Thu 9/24/15
41	**1.5 - Geotechnical & Subsurface Studies**	**220 days**	**Tue 11/24/15**	**Mon 9/26/16**
42	**1.5.1 Permitting for Subsurface Data Collection/Sampling**	**35 days**	**Tue 11/24/15**	**Mon 1/11/16**
43	Draft Coastal Development Permit Application	20 days	Tue 11/24/15	Mon 12/21/15
44	City Review	5 days	Tue 12/22/15	Mon 12/28/15
45	Final Coastal Development Permit Application	10 days	Tue 12/29/15	Mon 1/11/16
46	Draft Army Corps of Engineers Permit Application	20 days	Tue 11/24/15	Mon 12/21/15
47	City Review	5 days	Tue 12/22/15	Mon 12/28/15
48	Final Army Corps of Engineers Permit Application	10 days	Tue 12/29/15	Mon 1/11/16
49	Draft RWQCB Section 404 Permit Cert. Application	20 days	Tue 11/24/15	Mon 12/21/15
50	City Review	5 days	Tue 12/22/15	Mon 12/28/15
51	Final RWQCB Section 404 Permit Cert. Application	10 days	Tue 12/29/15	Mon 1/11/16
52	**1.5.2 Field Activities for Geotechnical and Subsurface Data Collection/Sampling**	**125 days**	**Tue 3/8/16**	**Mon 8/29/16**
53	Subsurface Sampling Field Activities	90 days	Tue 3/8/16	Mon 7/11/16
54	Draft Subsurface Sampling Report	20 days	Tue 7/12/16	Mon 8/8/16
55	City Review	5 days	Tue 8/9/16	Mon 8/15/16
56	Final Subsurface Sampling Report	10 days	Tue 8/16/16	Mon 8/29/16
57	**1.5.3 Groundwater Modeling**	**35 days**	**Tue 8/9/16**	**Mon 9/26/16**
58	Draft Groundwater Modeling Report	20 days	Tue 8/9/16	Mon 9/5/16
59	City Review	5 days	Tue 9/6/16	Mon 9/12/16
60	Final Groundwater Modeling Report	10 days	Tue 9/13/16	Mon 9/26/16
61	**1.6 Conceptual Design**	**45 days**	**Tue 9/6/16**	**Mon 11/7/16**
62	TM4 (Revision 0): Conceptual Design	30 days	Tue 9/6/16	Mon 10/17/16
63	City Review	5 days	Tue 10/18/16	Mon 10/24/16
64	TM4 (Revision 1): Conceptual Design	10 days	Tue 10/25/16	Mon 11/7/16
65	**1.7 Estimated Schedule and Cost**	**25 days**	**Tue 10/4/16**	**Mon 11/7/16**
66	TM5 (Revision 0): Estimated Schedule and Cost	10 days	Tue 10/4/16	Mon 10/17/16
67	City Review	5 days	Tue 10/18/16	Mon 10/24/16
68	TM5 (Revision 1): Estimated Schedule and Cost	10 days	Tue 10/25/16	Mon 11/7/16
69	**1.8 Feasibility Analysis**	**40 days**	**Tue 11/8/16**	**Mon 1/2/17**
70	Workshop 1: Project Alternatives/Project Descriptions	1 day	Tue 11/22/16	Tue 11/22/16
71	Workshop 2: Alternatives Scoring	1 day	Mon 12/12/1	Mon 12/12/16
72	TM6 (Revision 0): Feasibility Analysis	25 days	Tue 11/8/16	Mon 12/12/16
73	City Review	5 days	Tue 12/13/16	Mon 12/19/16
74	TM6 (Revision 1): Feasibility Analysis	10 days	Tue 12/20/16	Mon 1/2/17
75	**1.9 Comparision to Existing Open Ocean Intake**	**30 days**	**Fri 3/3/17**	**Thu 4/13/17**



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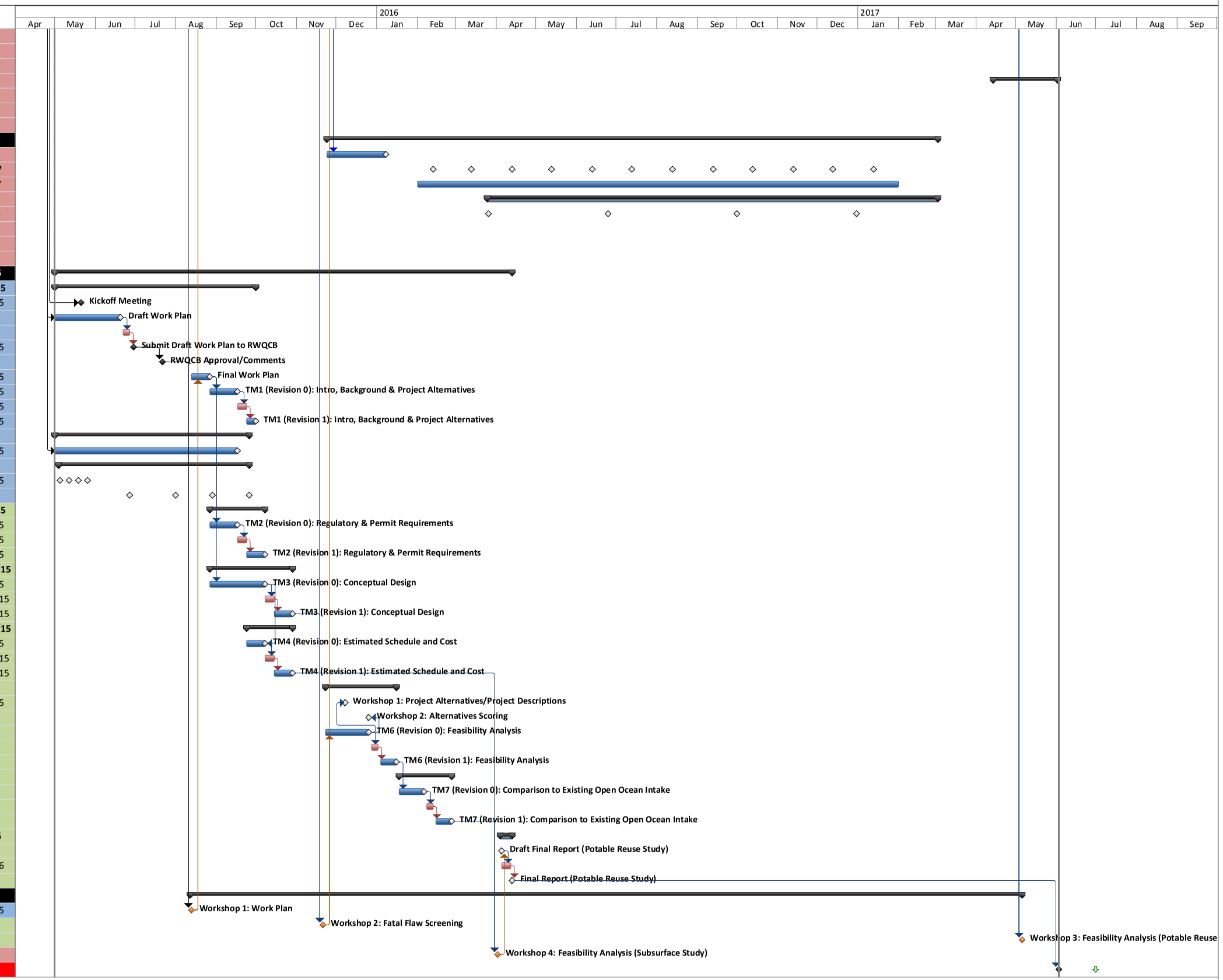
ATTACHMENT A

SUBSURFACE DESALINATION INTAKE & POTABLE REUSE FEASIBILITY STUDIES

CITY OF SANTA BARBARA

ID	Task Name	Duration	Start	Finish
76	TM7 (Revision 0): Comparison to Existing Open Ocean Intake	15 days	Fri 3/3/17	Thu 3/23/17
77	City Review	5 days	Fri 3/24/17	Thu 3/30/17
78	TM7 (Revision 1): Comparison to Existing Open Ocean Intake	10 days	Fri 3/31/17	Thu 4/13/17
79	**1.10 Subsurface Desalination Intake Feasibility Report**	**35 days**	**Fri 4/14/17**	**Thu 6/1/17**
80	Draft Final Report (Subsurface Desalination Intake Study)	15 days	Fri 4/14/17	Thu 5/4/17
81	City Review	5 days	Fri 5/5/17	Thu 5/11/17
82	Final Report (Subsurface Desalination Intake Study)	15 days	Fri 5/12/17	Thu 6/1/17
83	**TASK 2 - ENTRAINMENT STUDY**	**333 days**	**Tue 11/24/15**	**Thu 3/2/17**
84	**Task 2.1 - Study Plan**	**33 days**	**Tue 11/24/15**	**Thu 1/7/16**
85	**Task 2.2 - Sample Collection & Processing**	**240 days**	**Fri 2/12/16**	**Thu 1/12/17**
98	**Task 2.3 - Current Data Collection and Processing**	**262 days**	**Mon 2/1/16**	**Tue 1/31/17**
99	**Task 2.4 - Reporting**	**245 days**	**Fri 3/25/16**	**Thu 3/2/17**
100	Quarterly Reporting	201 days	Fri 3/25/16	Fri 12/30/16
105	Draft Final Report (E&I Study)	43 days	Tue 12/13/16	Thu 2/9/17
106	City Review	5 days	Fri 2/10/17	Thu 2/16/17
107	Final Report (E&I Study)	10 days	Fri 2/17/17	Thu 3/2/17
108	**TASK 3 - POTABLE REUSE FEASIBILITY STUDY**	**248 days**	**Fri 5/1/15**	**Tue 4/12/16**
109	**3.1 Work Plan Development**	**109 days**	**Fri 5/1/15**	**Wed 9/30/15**
110	Kickoff Meeting	1 day	Wed 5/20/15	Wed 5/20/15
111	Draft Work Plan	36 days	Fri 5/1/15	Fri 6/19/15
112	City Review	5 days	Mon 6/22/15	Fri 6/26/15
113	Submit Draft Work Plan to RWQCB	1 day	Mon 6/29/15	Mon 6/29/15
114	RWQCB Approval/Comments	1 day	Tue 7/21/15	Tue 7/21/15
115	Final Work Plan	10 days	Thu 8/13/15	Wed 8/26/15
116	TM1 (Revision 0): Intro, Background & Project Alternatives	15 days	Thu 8/27/15	Wed 9/16/15
117	City Review	5 days	Thu 9/17/15	Wed 9/23/15
118	TM1 (Revision 1): Intro, Background & Project Alternatives	5 days	Thu 9/24/15	Wed 9/30/15
119	**3.2 Literature Review**	**106 days**	**Fri 5/1/15**	**Fri 9/25/15**
120	Collect Literature	99 days	Fri 5/1/15	Wed 9/16/15
121	Data Collection List Updates	105 days	Mon 5/4/15	Fri 9/25/15
122	Weekly Data Collection Updates	16 days	Mon 5/4/15	Mon 5/25/15
127	Monthly Data Collection Updates	66 days	Fri 6/26/15	Fri 9/25/15
132	**3.3 Regualtory and Permit Requirements**	**30 days**	**Thu 8/27/15**	**Wed 10/7/15**
133	TM2 (Revision 0): Regulatory & Permit Requirements	15 days	Thu 8/27/15	Wed 9/16/15
134	City Review	5 days	Thu 9/17/15	Wed 9/23/15
135	TM2 (Revision 1): Regulatory & Permit Requirements	10 days	Thu 9/24/15	Wed 10/7/15
136	**3.4 Conceptual Design**	**45 days**	**Thu 8/27/15**	**Wed 10/28/15**
137	TM3 (Revision 0): Conceptual Design	30 days	Thu 8/27/15	Wed 10/7/15
138	City Review	5 days	Thu 10/8/15	Wed 10/14/15
139	TM3 (Revision 1): Conceptual Design	10 days	Thu 10/15/15	Wed 10/28/15
140	**3.5 Estimated Schedule and Cost**	**25 days**	**Thu 9/24/15**	**Wed 10/28/15**
141	TM4 (Revision 0): Estimated Schedule and Cost	10 days	Thu 9/24/15	Wed 10/7/15
142	City Review	5 days	Thu 10/8/15	Wed 10/14/15
143	TM4 (Revision 1): Estimated Schedule and Cost	10 days	Thu 10/15/15	Wed 10/28/15
144	**3.6 Feasibility Analysis**	**40 days**	**Mon 11/23/1**	**Fri 1/15/16**
145	Workshop 1: Project Alternatives/Project Descriptions	1 day	Mon 12/7/15	Mon 12/7/15
146	Workshop 2: Alternatives Scoring	1 day	Fri 12/25/15	Fri 12/25/15
147	TM6 (Revision 0): Feasibility Analysis	25 days	Mon 11/23/1	Fri 12/25/15
148	City Review	5 days	Mon 12/28/1	Fri 1/1/16
149	TM6 (Revision 1): Feasibility Analysis	10 days	Mon 1/4/16	Fri 1/15/16
150	**3.7 Comparison to Current Drought Plan**	**30 days**	**Mon 1/18/16**	**Fri 2/26/16**
151	TM7 (Revision 0): Comparison to Existing Open Ocean Intake	15 days	Mon 1/18/16	Fri 2/5/16
152	City Review	5 days	Mon 2/8/16	Fri 2/12/16
153	TM7 (Revision 1): Comparison to Existing Open Ocean Intake	10 days	Mon 2/15/16	Fri 2/26/16
154	**3.8 Potable Reuse Feasibility Report**	**7 days**	**Mon 4/4/16**	**Tue 4/12/16**
155	Draft Final Report (Potable Reuse Study)	1 day	Mon 4/4/16	Mon 4/4/16
156	City Review	5 days	Tue 4/5/16	Mon 4/11/16
157	Final Report (Potable Reuse Study)	1 day	Tue 4/12/16	Tue 4/12/16
158	**TASK 4 - TECHNICAL ADVISORY PROCESS**	**453 days**	**Wed 8/12/15**	**Fri 5/5/17**
159	Workshop 1: Work Plan	1 day	Wed 8/12/15	Wed 8/12/15
160	Workshop 2: Fatal Flaw Screening	1 day	Fri 11/20/15	Fri 11/20/15
161	Workshop 3: Feasibility Analysis (Potable Reuse Study)	1 day	Fri 5/5/17	Fri 5/5/17
162	Workshop 4: Feasibility Analysis (Subsurface Study)	1 day	Fri 4/1/16	Fri 4/1/16
163	**RWQCB FINAL REPORT DEADLINE**	1 day	Fri 6/2/17	Fri 6/2/17



DRAFT - 3/30/15