

## TECHNICAL MEMORANDUM

To: John Rickenbach  
From: Michael Nunley, PE  
Date: 4/25/2014  
Re: Morro Bay Water Reclamation Facility – 5-Year Work Plan and Cashflow Analysis

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### INTRODUCTION

Michael K. Nunley & Associates, Inc., and John F. Rickenbach Consulting (JFR) are providing project management support for the City of Morro Bay's new Water Reclamation Facility (WRF). The purpose of this memorandum is to propose a work plan for developing and implementing this project, as well as a preliminary cashflow analysis that will assist the City in understanding the timing requirements for acquiring funds to keep the project moving forward. The work plan identifies anticipated studies, reports, permits, design, bidding, and construction activities and provides a brief description and duration for each. The work plan also identifies whether the activities will be performed by the Project Team, City staff, outside consultants, or other agencies.

The City Council with Resolution 17-14 has directed staff to implement the project within five (5) years. Therefore, MKN has developed a 5-year approach that relies on design/build of a new treatment facility. A cashflow analysis has been prepared as well.

City staff and the project management team will expand and revise the work plan and develop a more detailed schedule and task list as the project proceeds. This Technical Memorandum identifies the major cost items, including planning, engineering, construction, and major permitting steps required to meet the City's schedule. Other efforts not specifically identified in this Work Plan include public outreach, funding, rate studies, and legal agreements among entities participating in the project (if the WRF becomes a regional project led by another agency, such as the County).

### BACKGROUND AND CITY PROJECT GOALS

JFR and MKN completed an Options Report that compared seventeen (17) potential water reclamation facility sites based on their ability to meet the following City goals:

- Produce tertiary, disinfected wastewater in accordance with Title 22 requirements for unrestricted urban irrigation
- Design to be able to produce reclaimed wastewater for potential users, which could include public and private landscape areas, agriculture, or groundwater recharge. A master reclamation plan should include a construction schedule for bringing on customers in a cost effective manner.
- Allow for onsite composting
- Design for energy recovery
- Design to treat contaminants of emerging concern in the future
- Design to allow for other possible municipal functions
- Ensure compatibility with neighboring land uses

The Options Report focused on a City-only facility, with only a brief discussion of potential benefits or constraints associated with a regional facility in partnership with other agencies.

## **PROJECT DESCRIPTION**

At this time, no conceptual layout or project cost opinion have been developed for the City's Water Reclamation Facility. A comparative project cost analysis was presented in the Options Report solely for the purpose of evaluating relative costs to develop a new WRF capable of meeting the City goals at each of the seventeen (17) sites. One of the first objectives for the Preliminary Planning Phase (discussed later in this memorandum) is to present alternatives for new facilities to the City, recommend an alternative, and provide sufficient information for City staff and Council to select project elements and move forward with a well-defined project.

For the purposes of developing this work plan and providing a preliminary project budget (for refinement/revision later), JFR and MKN will use the project costs from the Options Report. These costs are expected to be revised significantly during the Facility Master Plan but are considered appropriate for providing a conservative order-of-magnitude for total project cost.

It is our understanding that the City will move forward with a phased water reclamation program. Phase I will include the following program elements:

- New lift station and force main to the new WRF site;
- New WRF providing full secondary, tertiary, and disinfection treatment compatible with a wide variety of reuse options (processes to be determined);
- Biosolids processing facility on the WRF site with technology that will promote reuse and possibly energy recovery (processes to be determined); and
- Phaseable effluent reuse system that will allow temporary discharge of fully-treated effluent during "wet weather" periods and initial plant operation while the phased recycled water delivery system is designed and constructed

Phase II will include full development of the recycled water delivery system, including salts removal for sensitive agricultural users if needed.

The following table identifies the major project elements from the Options Report, the "midpoint" of each cost opinion based on the unit cost ranges presented in Appendix D of the Report, and notes whether the cost of that element will be included in Phase I of the new WRF (the "project" as described in this Work Plan).

Table 1 – Preliminary Phase I/Phase II Project Elements from Options Report

Project Component	Included in Phase I	Midpoint of Cost Range	
Sewer force main (18 inch)	Y	\$5,250,000	Allowance - TBD during Facility Master Plan
Lift Station (4,200 gpm)	Y	\$4,200,000	Allowance - TBD during Facility Master Plan
Earthwork allowance	Y	\$2,760,000	Allowance - TBD during Facility Master Plan
Secondary treatment system	Y	\$10,500,000	Allowance - TBD during Facility Master Plan
Supporting treatment plant facilities (Paving, buildings, roads, etc.)	Y	\$7,450,000	Allowance - TBD during Facility Master Plan
Disinfection system	Y	\$2,250,000	Allowance - TBD during Facility Master Plan
Tertiary filtration	Y	\$2,500,000	Allowance - TBD during Facility Master Plan
Solids handling facilities	Y	\$7,500,000	Allowance - TBD during Facility Master Plan
Advanced treatment (RO & oxidation)	N	\$13,427,000	Phase II
Recycled water storage (0.75 MG)	N	\$844,000	Phase II
Recycled water pump station (1,500 gpm)	N	\$487,500	Phase II
Recycled water pipeline (12 inch)	N	\$650,000	Phase II
Treated effluent disposal pump station (1,500 gpm)	Y	\$487,500	Allowance - Percolation ponds and stream discharge to be explored for Phase I and wet weather disposal
Treated effluent disposal pipeline (12 inch)	Y	\$3,900,000	Allowance - Percolation ponds and stream discharge to be explored for Phase I and wet weather disposal
Estimated Construction Cost Subtotal		\$47,000,000	"Reclamation Ready" Project
Project Administration, Design, Permitting, and Construction Management Allowance		\$14,000,000	Assumed 30% of Construction Subtotal - TBD during Facility Master Plan
Construction/Project Contingency		\$14,000,000	Assumed 30% Of Construction Subtotal - TBD during Facility Master Plan
Preliminary Phase I Project Cost (with Contingency)		\$75,000,000	TBD during Facility Master Plan

## **CRITICAL ELEMENTS OF PROJECT SCHEDULE**

JFR and MKN have developed two schedules for implementation of the WRF within the 5-year timeframe required by the City:

- Long-Term (5 year+) schedule with major project elements; and
- Short-Term (first year) schedule of activities to lay the groundwork for the 5-year schedule

A detailed presentation of the major tasks within the schedule is provided later in this memorandum. The critical requirements to achieve a 5-year timeframe are described below:

### **Pursue design-build or construction management at risk (CMAR) approach for project design and construction**

Design-build (DB) and construction management at risk (CMAR) are project delivery techniques that differ from the typical public agency design-bid-build process. The advantages of both approaches are the reduction in overall project delivery schedules and the ability to develop a partnering relationship among the designer, contractor, and owner. Advocates of both approaches claim that there are cost savings as a result of close collaboration and early consultation between the contractor and design. This reduces potential for change orders that arise during the construction process. There are many variations on both delivery approaches: the general definitions and typical practices are described below.

In a conventional design-bid-build delivery approach, the designer and contractor are separate entities. A designer completes plans and specifications which are released for competitive bidding by the project owner. Contractors bid on the construction contracts and the lowest qualified bidder is awarded the work. This process is well-defined in state law and is allowed by current City ordinances.

DB projects are defined by the combination of the designer and contractor into one team or contracting entity. The one entity takes full responsibility for design and construction – as a result, the City can expedite both phases and long lead-time activities (such as ordering equipment) can begin as the final design is being completed. If this approach is pursued, it is recommended that the City hire an Owner's Representative or authorize their Project Management Team to define the procurement strategy, develop the request for qualifications (RFQ) and request for proposal (RFP) for the DB team, develop the bridging documents that become the basis of the bid, and provide value engineering for the design-build team. Design-build projects move quickly and there are few opportunities to review interim submittals and provide detailed input to the design process, unlike design-bid-build projects. Modifications to City ordinances may also be required and the state limitations on allowing design-build projects should be reviewed by legal counsel to confirm the City has or can pass an ordinance to grant the authority to perform design-build.

In CMAR projects, the construction manager (CM) and designer can be separate entities. This allows the City to select and coordinate with each entity independently and may increase the level of control City staff can have over the project. Both entities are typically selected based on qualifications and are often selected at the same time by an owner. The CM serves as the prime contractor for construction and can issue requests for bids for different construction work items or can self-perform the work. In CMAR, an owner's representative is not required to develop bridging documents to acquire bids for the work since the selection of the CM is qualification-based. A guaranteed maximum price (GMP) is typically negotiated between the owner and CM during design development and the CM provides input to the designer in order to reduce construction cost and risk and promote efficiency. CMAR is allowed in California, according to the Association for General Contractors, but legal counsel should confirm the City has or can pass an ordinance to grant the authority to perform CMAR.

A hybrid approach may be preferred for delivery of the project. The City may opt for an approach that splits the project into design-bid-build and design-build or CMAR components. For example, the raw wastewater lift station and force main from the existing wastewater treatment plant (WWTP) site to the new WRF site could follow a design-bid-build track that is parallel to the design-build or CMAR plant development. The lift station and force main will not require the same amount of time for permitting, design, equipment procurement, and construction as the new WRF so the City may wish to pursue a strategy that separates the two projects. The proposed project schedule and work plan allow flexibility for modifying the approach in this manner.

### **Combine owner's representative (DB) or design (CMAR) and facility master planning**

Including both major responsibilities in one team will ensure consistency between the facility master planning, conceptual design and value engineering efforts. The facility master planning work will be performed prior to releasing the RFQ and RFP for the design-build or CMAR team. Master Planning could include preliminary alignment and cost opinion for the raw wastewater lift station and force main; a site plan for the new WRF site; identification of the most feasible recycled water customers, water quality requirements, and quantity; layout and cost opinion for "wet weather" disposal, streamflow augmentation, or percolation system; and phasing plan for the water reclamation pumping and transmission system.

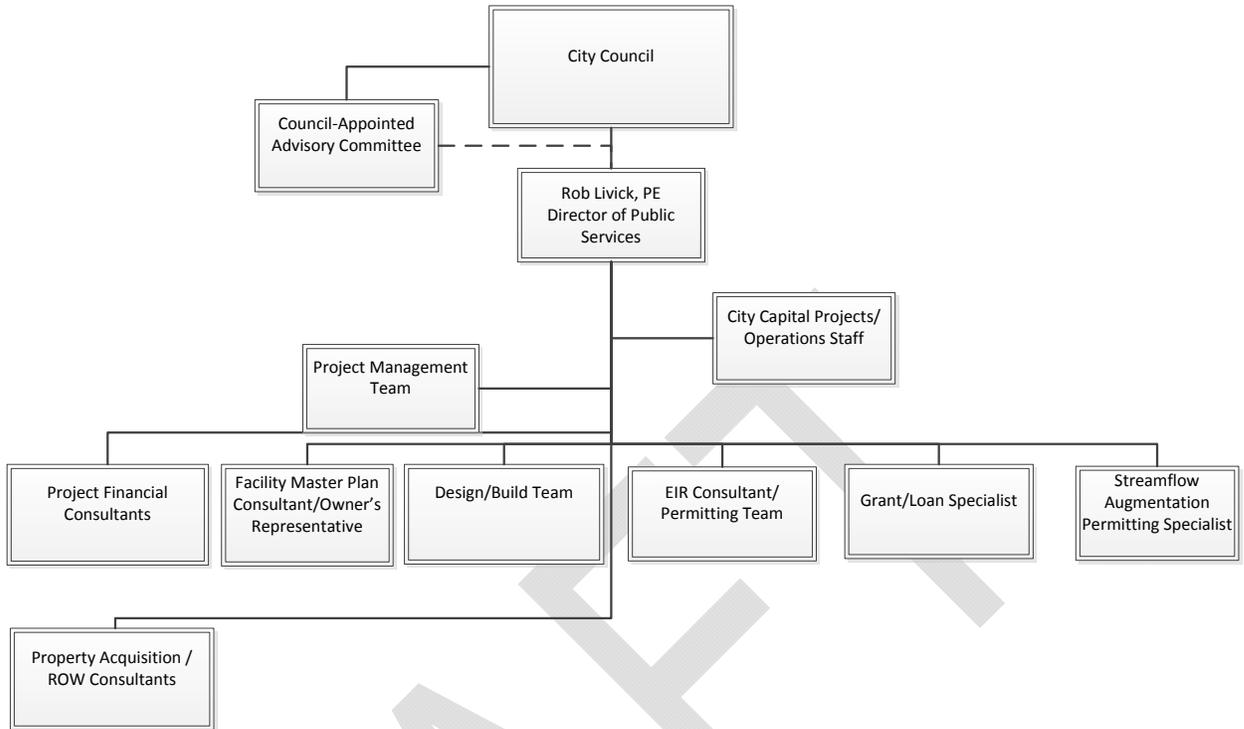
If the City has not selected a site by the end of August 2014, the Master Plan budget should be increased to allow development of projects at the top-ranked or most likely sites. This will be required if the City meets their 5-year deadline, since the Master Plan must be finished within the timeframe shown on the schedule to stay on track. If two or more sites are explored, the Master Plan budget could increase by \$200,000 or more.

## **PROJECT TEAM APPROACH**

In order to implement the work plan most efficiently, MKN and JFR recommend the following simplified organizational structure:

1. All team members will report directly to the City;
2. The Director of Public Services will serve as the City project manager;
3. The council-appointed advisory committee will advise the City project manager and provide input during project development, as discussed during City Council meetings;
4. The Facility Master Plan Consultant/Owner's Representative (DB), Construction Manager (CMAR), grant/loan strategy specialist, and streamflow augmentation specialist will serve in roles described above; and
5. Project financial consultants could include project financing experts, underwriters, and other funding-specific specialists.

Figure 1 below describes a simplified organizational chart for development of the new WRF if a DB approach is implemented.



**Figure 1 - Organization Chart for WRF Project Team Members - DB Project Delivery**

Figure 2 describes a simplified organizational chart for development of the new WRF if a CMAR approach is implemented.

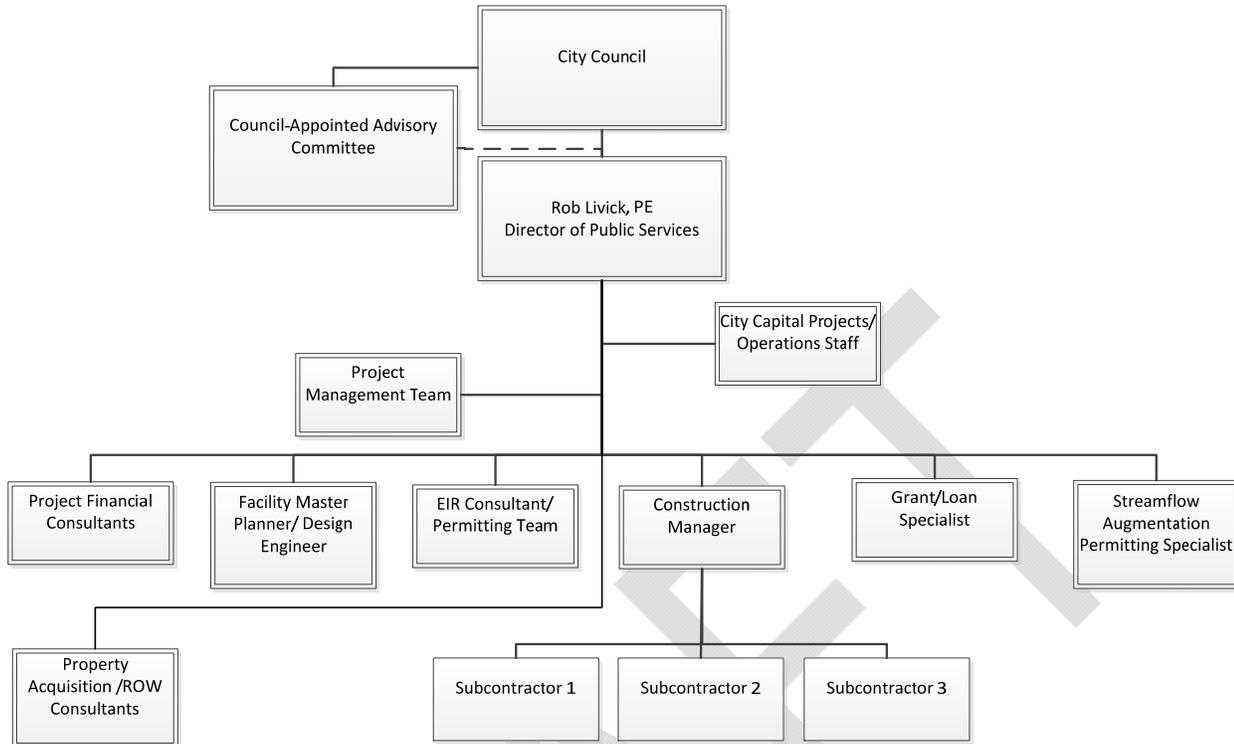


Figure 2 - Organization Chart for WRF Project Team Members - CMAR Project Delivery

## PROJECT SCHEDULE

In order to meet the 5-year goal for project development, several activities must be undertaken and completed within the next year. Figure 3 and Table 2 identify the recommended major tasks for this period.



Table 2 – Overview of Tasks for WRF Work Plan - First Year

Task Name	Recommendations/Comments
Review of Morro Valley and Chorro Valley Sites	<ul style="list-style-type: none"> <li>• JFR providing support now</li> </ul>
Confirmation of Project Management Approach	<ul style="list-style-type: none"> <li>• City to confirm project management approach as soon as possible. Given the number of outside consultants, internal coordination, budget management, and general coordination required for a project in this cost range and with a high level of complexity, and commitment of existing City staff to ongoing projects and responsibilities, outside support is recommended.</li> </ul>
Regional CMC Facility Evaluation	<ul style="list-style-type: none"> <li>• County is leading efforts to evaluate CMC; JFR will report on County efforts to City Council in August 2014 to help Council choose whether or not to pursue this approach with the County</li> </ul>
Preliminary Wet Weather Disposal Evaluation	<ul style="list-style-type: none"> <li>• City is directing hydrologic and legal review of recharge opportunity for CMC regional alternative</li> <li>• As describe above, this will include an evaluation of the feasibility of streamflow augmentation and permitting strategy for wet weather disposal. Focus will be an assessment of seasonal creek discharge (elimination of outfall) and a “fatal flaw” analysis of CMC discharge improvements. Could include this as part of the DB or Owner’s Rep team but many efforts could start now to stay on course</li> <li>• Expand legal review to other streams/tributaries at most promising HWY 41 sites Consider addressing pretreatment (salts) in collection system now to improve opportunities for discharge and reuse</li> </ul>
Site Selection (CRITICAL DECISION)	<ul style="list-style-type: none"> <li>• Staff review and City Council action will be required</li> <li>• This item is on the critical path for meeting the 5-yr schedule</li> </ul>
Property Negotiation	<ul style="list-style-type: none"> <li>• City to hire outside consultant for appraisal/negotiation</li> <li>• City to make decision on CMC before presenting final offer</li> </ul>
RFP/Selection of Facilities Master Plan Consultant / DB Owner’s Representative	<ul style="list-style-type: none"> <li>• Need to have go/no-go decision on CMC at this point (9/1/14) to prevent major investment</li> <li>• City staff or Project Management Team to develop</li> </ul>
Facilities Master Plan	<ul style="list-style-type: none"> <li>• Owner’s Representative to develop Master Plan</li> <li>• Focus areas:               <ul style="list-style-type: none"> <li>○ Site planning</li> <li>○ Recycled water distribution system planning</li> <li>○ Project budget</li> </ul> </li> </ul>

In addition to site investigations and participating in discussions about the regional CMC alternative, MKN recommends conducting two studies now that could significantly affect project direction: an evaluation of wet weather disposal methods and an analysis of grants and loan funding opportunities. Wet weather disposal options will drive the treatment process and capital, operations and maintenance costs for effluent disposal. Various grant and loan opportunities could be available if the

City modified the project's design goals or added elements to increase likelihood of funding from some specific programs.

### **Preliminary Wet Weather Disposal Evaluation**

The recommended evaluation includes a Streamflow Augmentation Permitting Analysis and a Preliminary Percolation Evaluation.

*Initial Streamflow Augmentation Permitting Analysis:* One of the most critical design and capital cost issues will be determining whether surface water discharge is valid either for disposal of effluent during wet weather; or for streamflow augmentation to supplement water supplies. This will be a critical issue for involvement in a regional California Men's Colony facility or for a standalone City facility at one of the preferred sites, and evaluating permitting constraints early could help determine the most cost-effective plant site.

The City has expressed a goal of reclaiming as much water as possible. As established in prior studies, wet weather disposal must be addressed for a project that primarily relies on recycled plant effluent even if streamflow augmentation is not feasible.

Permitting for surface water discharges requires an evaluation of receiving water impacts based on the projected water quality from the new WRF. Policy and regulations related to beneficial uses of the receiving water must be reviewed and a permitting strategy developed to comply with these requirements if streamflow augmentation or surface water discharge are deemed feasible. A detailed study should be scoped and initiated during the initial planning stages of the project.

Use of the existing ocean outfall is also an alternative for wet weather disposal and should be considered as part of this analysis.

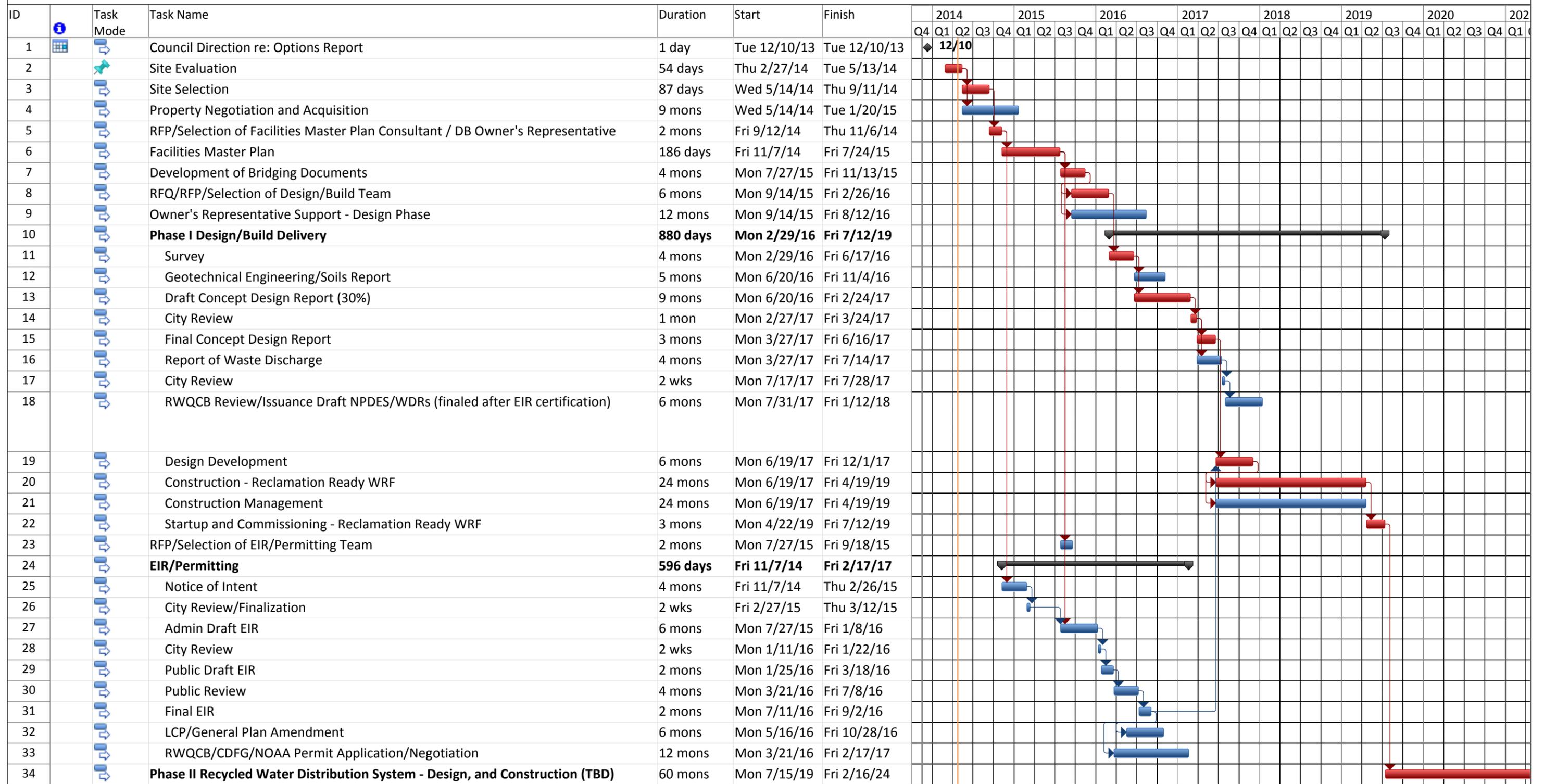
*Preliminary Percolation Evaluation:* Performing an initial assessment of percolation potential at the top-ranking treatment facility sites will allow the City to determine if some wet weather flow could be percolated at the proposed plant sites and could eventually recharge groundwater. The regulatory requirements for percolation are typically less stringent than those for surface water discharges since toxicity or risk to aquatic life is not a factor. However, this requires a site-specific assessment of soil percolation potential, groundwater depth, and groundwater quality.

### **Grant/Loan Strategy Analysis**

Project financing through both grants and low-interest loans should be pursued aggressively and early in the project development process, particularly for fast-track delivery projects. This will allow the permitting consultant, City, and master planning consultant to identify project elements that could improve possibility of receiving grants or low-interest loans.

Figure 4 and Table 3 describe the major tasks that would be performed throughout the remainder of the development of the new WRF, assuming the City selects a DB approach. The critical path is identified in red.

Figure 4 - Preliminary Project Schedule (Design-Build Approach)



Project: Project Schedule_5-Yr Date: Fri 4/25/14	Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		Inactive Summary		Manual Summary		Critical	
	Milestone		External Milestone		Manual Task		Start-only		Critical Split	
	Summary		Inactive Task		Duration-only		Finish-only		Progress	

**Table 3 – Overview of Major Tasks for WRF Work Plan – Five Year Plan**

Task Name	Recommendations/Comments
<b>Preliminary Planning</b>	<b>First 9 months detailed in Previous Section</b>
Survey	<ul style="list-style-type: none"> <li>• Owner’s Representative to perform – City to order Prelim Title Reports in advance to expedite the process</li> </ul>
Development of Bridging Documents	<ul style="list-style-type: none"> <li>• Owner’s Representative to develop bridging documents (preliminary plans) based on Master Plan</li> </ul>
RFQ/RFP/Selection of Design-Build Team	<ul style="list-style-type: none"> <li>• Owner’s Representative to develop RFP/RFQ and lead process</li> <li>• Two-stage process (RFQ and shortlist for RFP) anticipated; offering a stipend should be considered</li> <li>• Need rate increases in place to procure DB team</li> </ul>
<b>Design-Build Delivery</b>	
Geotechnical Engineering/Soils Report	<ul style="list-style-type: none"> <li>• DB Team to perform</li> </ul>
Concept Design Report (30%)	<ul style="list-style-type: none"> <li>• Basis of plant design</li> <li>• Equipment selection will be an integral part of this effort in order to allow lead time</li> </ul>
Report of Waste Discharge	<ul style="list-style-type: none"> <li>• DB Team to perform</li> </ul>
RWQCB Review/Issuance Draft NPDES/WDRs (finalized after EIR certification)	<ul style="list-style-type: none"> <li>• DB Team and Owner’s Representative to provide support</li> <li>• Critical step – final discharge permit issuance will determine the required treatment process elements. City will have some risk in proceeding with construction without having these in hand.</li> </ul>
Design Development	<ul style="list-style-type: none"> <li>• Internal to DB team</li> <li>• Limited opportunities for City input on design specifics</li> <li>• Record drawings produced at end</li> </ul>
Construction - Reclamation Ready WRF	<ul style="list-style-type: none"> <li>• Site preparation and grading can begin early in the process</li> <li>• Equipment procurement must start early – immediately after Concept Design Report is completed</li> </ul>

Task Name	Recommendations/Comments
Startup and Commissioning - Reclamation Ready WRF	<ul style="list-style-type: none"> <li>• DB Team to perform</li> <li>• Consider adding a short operations contract to ensure the plant meets its effluent goals and lifecycle cost commitments from the D-B team</li> </ul>
RFP/Selection of EIR/Permitting Team	<ul style="list-style-type: none"> <li>• Complete after Master Plan is finished in order to match qualifications with site/project needs</li> <li>• City staff or Project Management Team to develop</li> </ul>
<b>EIR/Permitting</b>	
Draft EIR Preparation and Circulation	<ul style="list-style-type: none"> <li>• City staff to develop concurrently with Master Plan</li> <li>• Recommend presenting alternatives for full analysis (ex. CMC Regional + City)</li> <li>• Will provide opportunity to coordinate with resource agencies and other stakeholders early in the Master Planning process in order to get input</li> </ul>
Final EIR and City Project Approval	<ul style="list-style-type: none"> <li>• City approves project after Final EIR is certified</li> </ul>
LCP/General Plan Amendment	<ul style="list-style-type: none"> <li>• City coordinates with CCC on LCP/GPA needed for project; this should begin during preparation of the Draft EIR</li> </ul>
Agency Permitting (RWQCB, CDFW, NOAA Fisheries or others) and	<ul style="list-style-type: none"> <li>• City coordinates with key regulatory agencies for permits that may be needed for project; this should begin during preparation of the Draft EIR</li> </ul>
<b>Phase II - Recycled Water Distribution System – Design, and Construction (TBD)</b>	Plant to be “Reclamation-Ready” and pursuit/development of reclamation opportunities to be ongoing through the facility planning and design process

If a CMAR approach is pursued, the general timeline is not likely to change. The tasks in Table 3 could change as follows:

- An Owner’s Representative could be replaced by a Design Team who would also perform the Facility Master Plan.
- The CMAR would be procured earlier in the process than the DB team. An RFQ is sufficient for procuring a CMAR.
- The level of detail in the design plans could vary. For example, the level of design could range from conceptual with development of a general site plan to full, 100% plans and specifications. The balance of the design work would be performed by the CMAR.

### Preliminary Cashflow Analysis

MKN and JFR worked with City staff to develop a preliminary cashflow analysis. The preliminary costs from Table 1 were allocated across the schedule included as Figure 4. Similar to the rest of the Work Plan, City staff will continue developing and refining this analysis as more information becomes

available – for example, the Facilities Master Plan will define the project description and associated cost opinions so a major update is expected after the draft Plan is available.

The following assumptions were applied to develop this analysis:

- The budgets for initial planning activities by JFR were allocated across the 4<sup>th</sup> quarter of 2013 and first two quarters of 2014.
- City staff time of \$8,000 per month was allocated to the 4<sup>th</sup> quarter of 2013 and the first two quarters of 2014.
- Cost escalation, inflation, finance charges, interest, and discount rate were not itemized since the project is on a very tight timeframe and the cost opinions presented in this Memorandum are preliminary planning-level budgets.
- The City is evaluating wastewater rates and impact fees separately. Their analysis will be informed by the Memorandum, but rates and fees will require an update within the first two years of project implementation to reflect more detailed planning information and project costs.
- Design-build and CMAR teams will need to see that the City has funding in place in order to propose on the City's project. Design-build and CMAR firms typically perform a rigorous financial analysis before they decide to proceed with a design-build pursuit.
- Offering a stipend to offset design proposal costs is typically applied to design-build pursuits after a shortlist of qualified teams is developed. This encourages participation by design-build teams and assures them that the owner is committed to move forward with the project. This stipend is not itemized separately in this cashflow analysis but expected to be on the order of \$100-200k for each proposer (two or three are typical) per discussions with City staff.
- A project-level contingency should be established and made available early in the process for unforeseen costs. The contingency is not included in the cashflow analysis since it may be required at any time during project implementation.

The preliminary cashflow analysis is provided in Figure 5. One of the most significant financial challenges with a DB or CMAR project is that funding is required earlier in the project development process than in a conventional design-bid-build process, often before the project is very well-defined beyond a basic planning level. In a conventional design-bid-build delivery approach, the owner/agency funds design, then can fund construction separately after design documents are fully developed. This schedule allows the owner to reassess the project description and their funding needs prior to soliciting construction bids.

The DB and CMAR processes are more fluid – there are many variations to DB and CMAR delivery methods, but a common approach is to negotiate a “guaranteed maximum price” with the top-ranked DB or CMAR team. If DB is pursued, an initial prequalification stage is recommended to reduce the number of design-build proposers to the most qualified teams, in order to limit the City's financial risk during project implementation.

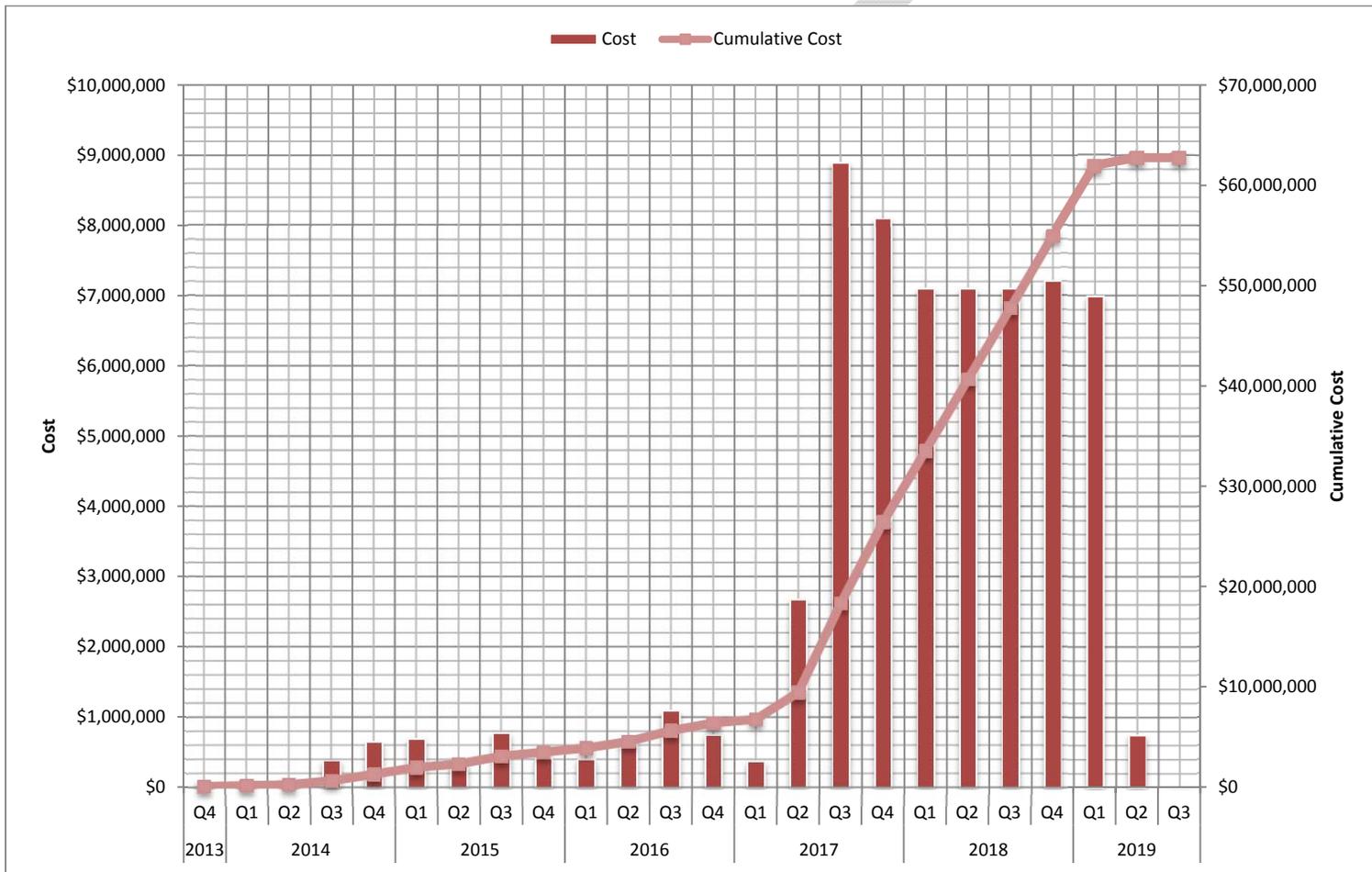


Figure 5 – Preliminary Cashflow Analysis