

AGENDA BILL

**Beaverton City Council
Beaverton, Oregon**

SUBJECT: Contract Award - Beaverton Sewer System
Master Plan Update

FOR AGENDA OF: 03-22-16 **BILL NO:** 16065

MAYOR'S APPROVAL: *[Signature]*

DEPARTMENT OF ORIGIN: Public Works

DATE SUBMITTED: 2-24-16

CLEARANCES: City Attorney *[Signature]*
CAO *[Signature]*
Purchasing *[Signature]*
Finance *[Signature]*
Planning *[Signature]*
Engineering *[Signature]*

PROCEEDING: CONSENT AGENDA
(CONTRACT REVIEW BOARD)

- EXHIBITS:**
1. Scope of Services, HDR Engineering
 2. Master Plan Schedule
 3. Level of Effort

BUDGET IMPACT

EXPENDITURE	AMOUNT	\$50,000 (FY 2015-16)	APPROPRIATION
REQUIRED -- \$288,000	BUDGETED	\$238,000 (FY 2016-17)	REQUIRED \$0

* Account Number 502-75-3811-683 – Sewer Construction Fund– Design Account. The proposed \$50,000 in FY 15/16 assumes partial project completion, with the remaining \$238,000 of work completed in FY 16/17.

RECOMMENDED ACTION:

City Council, acting as the Contract Review Board, authorizes the Mayor to sign a contract with HDR Engineering, Inc. for the Sewer Master Plan Update Project (CIP 6000) in a form approved by the City Attorney, and directs the Finance Director to include the additional \$238,000 in the Fiscal Year 2016-17 Proposed Budget.

HISTORICAL PERSPECTIVE:

The City last updated the Sewer System Master Plan January 2004 by Tetra Tech/KCM. The City has completed numerous construction projects that were identified in the 2004 Plan. They included capital improvement projects that addressed capacity increase, replacement, and rehabilitation. These projects were accomplished by both contract bid and in-house Public Works Operations crews. Additional discrepancies were addressed by maintenance crews from Public Works Operations. Some of the projects were accomplished in conjunction with Clean Water Services (CWS) I & I (inflow and infiltration) reduction program. Where high I & I areas were identified CWS partnered with the City to replace the sewer mainline and all laterals up to the house.

CWS has updated their Master Plan and also made a subsequent Model update:

- Clean Water Services, Sanitary Sewer Master Plan Update, March 2009, West Yost, Associates.
- CWS Wastewater Model, June 2013, HDR/CH2MHill.

It is recommended that the City Sewer System Master Plan be updated on a 10 year basis. The new Plan will provide new perspectives on the requirements and needs of our collection system. The Master Plan will also identify and set out a program with costs for the next 20 years of replacing and rehabilitating aging infrastructure in the City's sanitary sewer system as well as identify future increased capacity sewer infrastructure to serve more businesses and a larger citizen population. This 20-year schedule of estimated future costs will be vital to evaluating the adequacy of rates and system development charges (SDCs) needed to fund the sewer system improvements.

INFORMATION FOR CONSIDERATION:

A request for proposals was advertised in the Daily Journal of Commerce on December 7, 2015. Representatives from 12 firms attended the mandatory pre-proposal meeting on December 16, 2015, and the City received proposals from four local engineering firms on January 20, 2016. Staff used a Qualification Based Selection (QBS) process to evaluate the proposals, as required by Oregon Administrative Rules (Division 48), and two firms were selected for interviews.

The City selected HDR as the top candidate and began negotiating the scope of work and fee amount for the project. Staff negotiated with HDR to refine the scope of work (see Exhibit 1) and bring the proposed fee to \$287,785 (see Exhibit 3, Level of Effort/Fee Schedule). Staff believes the proposed HDR scope of work and fee is reasonable.

HDR estimates approximately 20 percent of the work will be performed by subconsultants, and anticipates that Minority, Women, and Emerging Small Business (M/W/ESB) utilization will exceed ten percent. Project work is anticipated to take about one year to complete (see Exhibit 2). Staff recommends contract award to HDR.

Corrected Agenda Bill
March 18, 2016

Scope of Services Sewer Master Plan

for City of Beaverton Oregon
by HDR Engineering, Inc.
March 1, 2016

Background

The City of Beaverton (City) has retained HDR Engineering, Inc. (HDR) to complete a Sanitary Sewer Master Plan update. With this Sewer Master Plan (SMP), the City's goal is to have a plan to implement and fund renewal and replacement, capacity expansion and extension of services, and operational strategy for the next 20 years and beyond. The City needs to consider Clean Water Services (CWS) objectives to meet these goals.

Since the 2004 Sewer Master Plan was completed, the City has continued to grow with in-fill and through expansion of its service area, including the recently annexed South Cooper Mountain area, which is anticipated to develop over the next 20 years. The City is also focused on ensuring its ability to attract and secure economic development, especially to meet Enterprise Zone Program (EZIP) and Beaverton Creek Plan objectives. The City is also looking to strengthen its ability to implement its capital improvement program by effectively prioritizing and coordinating with CWS, and identifying system development charge (SDC) eligible projects.

The City has decided to update their Water Master Plan in parallel to the Sewer Master Plan, and have contracted with a separate consultant (referred to as the Water Consultant in the scope of work below). The City requested that HDR and the Water Consultant coordinate on relevant parts of both plans to avoid duplication of efforts, maintain consistency, and reduce costs for the City. The scope of work below reflects the tasks that the City, Water Consultant, and HDR have agreed to achieve this coordination.

Objectives

Project objectives include:

- Develop a reliable projection of flow capacity and maintenance needs to serve growth and expansion areas
- Develop a sewer system model and complete analysis to understand how to effectively serve new developments by extension of the existing or planned City system.
- Improve the City's operational strategy in the context of the intergovernmental agreement with CWS.
- Prioritize the sewer CIP and O&M and provide sufficient funding to meet City's sewer objectives.

Scope of Services

Task 1. Project Management

Activities:

1. Prepare Project Management Plan and Quality Assurance Plan; conduct management review and quality assurance coordination.
2. Conduct bi-weekly coordination calls (approximately ½ hour) with project team and City staff.
3. Conduct bi-weekly (approximately ½ hour) coordination calls with City project manager.
4. Prepare monthly invoice and progress (task completion) reports.

Assumptions:

- Task order will be completed within 15 months (invoice periods) of notice-to-proceed.
- Key schedule milestones will be aligned with the concurrent development of the Beaverton Water Master Plan, which is expected to be conducted from March 2015 to May 2015.

Deliverables:

- Invoice and progress report.

Task 2. Facilities Inventory – Existing System Description

Activities:

1. Conduct Kick-off TAC Meeting/Workshop (approximately 2 hours) and prepare/submit data request in electronic format.
2. Conduct data transfer coordination with City's consultant on the Water Master Plan (Water Consultant). HDR staff will conduct a 1-hour meeting with City's consultant to confirm data transfer needs and protocol/format for data transfer. HDR will provide up to 4 hours of support to Water Consultant to transfer data after the data has been queried and collected by HDR.
3. Conduct data collection and processing of GIS and water- and sewer-asset-related database files from Granite XP, Cityworks and Lucity. This data includes installation date, material, condition data (including leak data for water pipe, or CCTV data for sewer pipe); size, maintenance and repair data. HDR will coordinate with City staff to query the City's databases and obtain direct access to the database to conduct the data extraction.
4. Review and process sewer data compiled from previous subtasks for use in spreadsheet and GIS for system analysis.
5. Prepare draft chapter: Existing Sanitary System. Draft chapter will be no more than 8 pages in length, and will include up to two maps showing information on sewer system infrastructure components, service area boundaries, land use/zoning and customer features.
6. Provide technical support to City's Water Consultant to convert City's existing WaterGEMS hydraulic model to Infowater platform. HDR's Hydraulic Modeling Lead will

provide up to 24 hours of technical support and coordination, which includes two 1-hour check-in conference calls during the model conversion and calibration process, and review of model scenarios to maintain and validation of operational controls for EPS functionality

Assumptions:

- Kick-off TAC Meeting/Workshop will be attended by HDR Project Manager and up to two task leads.
- Logistics for meeting space and City staff invitations will be coordinated by City staff.
- City will provide access to relevant water and sewer databases for HDR to access for data download; or submit all data request information electronically to HDR. The data extraction process will be completed over the equivalent of one work day (8 hours). HDR's data extraction role will be for water and sewer asset data only; City will compile and process water use data for Water Consultant.
- City will provide consistent and compiled set of comments on draft chapter to HDR.
- Comments on draft chapter will be addressed and incorporated in a revised chapter for the Draft Sewer Master Plan document (Task 9).

Deliverables:

- Draft chapter: Existing Sanitary System.

Task 3. Service Area and Capacity Needs Analysis

Activities:

1. Prepare for and conduct Planning TAC Meeting/Workshop (approximately 2 hours) to define growth, development and service area boundary assumptions.
2. Coordinate with City and City's Water Consultant on planning assumptions and water and land use data analysis. Up to eight hours of meeting/coordination time by project manager is allotted for conference calls or in-person meetings, including a meeting to discuss draft flow loading projections.
3. Develop flow loading projections by applying reduction factors by land use type to water demand forecast provided by the City's Water Consultant; reduction factors will be based on input and discussions from TAC Planning TAC Meeting/Workshop.
4. Develop flow loading projections spreadsheet tool and up to two system maps to present the flow loading projections information

Assumptions:

- Planning TAC Meeting/Workshop will be attended by HDR Project Manager in coordination with the City's Water Consultant.
- Up to five planning scenarios will be developed for flow loading projections based on the water use and scenario decisions derived from the Planning Workshop. Scenarios include: existing system, mid-range year and build-out; and two other scenarios to be defined in the planning workshop.
- City's Water Consultant will provide water demand forecasting at the land use level and parcel level, for use in the sewer model flow loading.

- Logistics for meeting space and City staff invitations will be coordinated by City staff.
- City will provide consistent and compiled set of comments on system maps and flow loading projections tool to HDR.

Deliverables:

- System maps and flow loading spreadsheet tool (information from workshop and planning analysis will be documented in the Task 4 draft chapter).

Task 4. System Planning and Analysis Criteria

Activities:

1. Review regulatory requirements, existing Clean Water Services IGA and operational requirements and strategy (includes management, operational, financial policies).
2. Prepare for and conduct Level-of-Service and Operations TAC Meeting/Workshop (approximately 2 hours) to identify issues with how the City currently works with CWS.
3. Conduct up to three 1-hour follow-on meetings with operations staff to obtain additional input from City staff on their primary technical/operational issues.
4. Prepare for and participate in up to two 2-hour meetings with City and City's Water Consultant to discuss resiliency goals and plans and definition of critical facilities for water supply and sewer service.
5. Develop planning and analysis criteria that define sewer capacity requirements based on workshop input and resiliency goals developed by the City.
6. Prepare a draft chapter: Goals of Sanitary Sewer Master Plan Update. Draft chapter will be no more than 5 pages in length, and will document the planning and analysis criteria and key input/discussions used to define the criteria.

Assumptions:

- City will provide all relevant and available documents related to CWS IGA and existing operations requirements and processes.
- Level-of-Service and Operations TAC Meeting/Workshop will be attended by HDR Project Manager and up to two task leads.
- Follow-on meetings with operations staff will be attended by up to two HDR team members.
- Resiliency meetings will be attended by HDR Project Manager; and Senior Engineer.
- Based on the outcome the resiliency workshop, and if the City decides on additional analysis, HDR will work with the City and City's Water Consultant to develop a contract amendment for a sewer system resiliency plan.
- Logistics for meeting space and City staff invitations will be coordinated by City staff.
- City will provide consistent and compiled set of comments on draft chapter to HDR.
- Comments on draft chapter will be addressed and incorporated in a revised chapter for the Draft Sewer Master Plan document (Task 9).

Deliverables:

- Draft chapter: Goals of Sanitary Sewer Master Plan Update

Task 5. Renewal and Replacement Analysis

Activities:

1. Use InfoMaster to score existing Lucity CCTV data to determine the condition and remaining useful life of the City's sewer pipes in the system based on available condition assessment information. Integrate data/analysis into GIS CMMS.
2. Develop a planning level cost curve for renewal and replacement using the useful life estimates from previous subtask; develop map of areas where renewal and replacement projects would occur.
3. Prepare Renewal & Replacement Analysis Tech Memo. Tech memo will be no more than 8 pages in length, and will document the renewal and replacement needs analysis, useful life projections, and cost curve.

Assumptions:

- No new CCTV or condition data will be collected.
- City will provide HDR access to Lucity database.
- City will provide consistent and compiled set of comments on draft tech memo to HDR.
- Comments on draft tech memo will be addressed and incorporated in a revised chapter for the Draft Sewer Master Plan document (Task 9).

Deliverables:

Renewal & Replacement Analysis Tech Memo.

Task 6. Sewer System Analysis

Activities:

1. Review CWS InfoSWMM model information, including flow loading, boundary conditions for Beaverton models, flow monitoring data and calibration/validation data.
2. Prepare for and conduct Model Development meeting. The meeting will: identify the extent of the Beaverton InfoSWMM models; identify the 10 largest water users to add them into the models as point loads.
3. Evaluate Cityworks CMMS and GraniteXP data and operations staff input on system performance to inform and incorporate into model parameters for inflow and infiltration, pipe roughness.
4. Build and develop InfoSWMM models, including flow loading and scenario development for capacity analysis. Perform a preliminary validation of the InfoSWMM models using available information.
5. Conduct up to two 1-hour follow-on meetings with City staff and CWS to refine assumptions and model parameters.
6. Conduct system analysis and hydraulic modeling; and identify system capacity deficiencies and identify critical areas for prioritizing flow monitoring.
7. Review and analyze flow monitoring needs; develop recommendations for future flow monitoring data collection including duration and location of any monitors (see also Task 11 – Flow Monitoring Support Contingency).
8. Export and package model results for inclusion in the CIP prioritization tool (Task 7.5)

9. Prepare a draft technical memorandum: InfoSWMM Sewer Model Development and Validation (includes appendix on flow monitoring recommendations). Tech memo will be no more than 10 pages in length, and will document the model development and validation approach, and results of the analysis.

Assumptions:

- InfoSWMM Model Development meeting will be held at HDR's office and will be attended by City staff with HDR Project Manager and up to two HDR team members.
- City will work with CWS to obtain necessary files for most recent CWS InfoSWMM model and relevant flow loading and flow monitoring data to pass on the HDR.
- The InfoSWMM software by Innovyze will be used for this project.
- Two models will be prepared – one for the CWS Durham drainage area and one for the CWS Rock Creek drainage area. The models will be constructed in accordance with CWS modeling standards.
- The InfoSWMM models will be developed for most gravity sewers with a diameter of eight (8) inches and greater, and all pump stations and force mains. The decision to include sewer pipes that define a specific development or area will be based on current flow loading and plans for development.
- The extent of the models will be determined during the Model Development Workshop.
- Data gaps in the collection system model will be discussed with the City and determined whether additional field information will need to be obtained or if reasonable modeling assumptions can be made.
- Existing system flow loading will be estimated using water billing data (Springbrook database). Flow loading for future areas will be based on procedures used by HDR in the preparation of the CWS system models.
- Diurnal patterns used in the models for each land use type will be obtained from the CWS models.
- Inflow and infiltration (I/I) will initially be based on I/I assumptions included in the CWS models. Additional information may be obtained during future flow monitoring (Task 10).
- Preliminary calibration will be performed using existing flow monitoring data and field observations.
- Capacity analysis will be performed for the planning scenarios identified in Task 3.
- Follow-on meetings with operations staff will be attended by up to two HDR team members.
- Logistics for meeting space and City staff invitations will be coordinated by City staff.
- City will provide consistent and compiled set of comments on draft tech memo to HDR.
- Comments on draft tech memo will be addressed and incorporated in a revised chapter for the Draft Sewer Master Plan document (Task 9).

Deliverables:

- Draft tech memo: InfoSWMM Sewer Model Development and Validation.
- InfoSWMM model files.
- GIS Files to be loaded into the City's GIS

Task 7. Alternatives Analysis and CIP

Activities:

1. Develop improvement alternatives to address deficiencies identified in the system analysis identified Task 5. Projects will be identified by type: capacity, structural or inflow and infiltration.
2. Develop operations and maintenance recommendations to address system performance issues identified from the system analysis and operations workshop information.
3. Develop preliminary cost estimates for the capital improvement alternatives and operations recommendations. Specify any system development charge (SDC) eligible portions with City and CWS SDC qualified identified.
4. Prepare for and conduct Alternatives/Improvements TAC Meeting/Workshop.
5. Prepare a draft chapter: Alternatives Evaluation. Draft chapter will be no more than 10 pages in length, and will document the improvement alternatives development and evaluation, and selection approach. Up two maps will be prepared documenting the locations of improvement projects.

Assumptions:

- Alternatives/Improvements TAC Meeting/Workshop will be attended by HDR Project Manager and up to two HDR team members.
- Logistics for meeting space and City staff invitations will be coordinated by City staff.
- City will provide consistent and compiled set of comments on draft chapter to HDR.
- Comments on draft chapter will be addressed and incorporated in a revised chapter for the Draft Sewer Master Plan document (Task 9).

Deliverables:

- Draft chapter: Alternatives Evaluation.

Task 8. Recommended Plan and Implementation Plan

Activities:

1. Prepare for and attend a 2-hour CIP coordination workshop with City and City's Water Consultant. Outcome of the workshop will identify "packaging" opportunities to coordinate water and sewer improvements geographically.
2. Use information from Alternatives/Improvements TAC Meeting/Workshop to develop preliminary prioritization criteria and prioritization of improvements identified in Task 6.
3. Revise and prepare draft final cost estimates, including revisions to SDC eligible portions based on workshop input. Conduct cash flow analysis and funding evaluation using the City's past three year's audited financial statements as a basis. Analysis will be projected out no more than ten years at current bond interest rates for both the sewer fund and the SDC fund.
4. Prepare for and conduct CIP and implementation/funding TAC Meeting/Workshop.
5. Revise and prepare draft final CIP and O&M prioritization.

6. Integrate CIP prioritization tool into City's systems.
7. Evaluate rate/SDC cost share and surcharge requirements with up to two scenarios.
8. Conduct Funding TAC Meeting/Workshop (review findings and recommendations).
9. Prepare a draft chapter: Recommended Plan and Implementation Plan. Draft chapter will be no more than 10 pages in length, and will document the recommended plan and implementation plan, including funding evaluation and recommendations.

Assumptions:

- CIP coordination workshop with Water Consultant will be attended by HDR Project Manager and Project Engineer.
- CIP and Implementation TAC Meeting/Workshop and Funding TAC Meeting/Workshop will be attended by HDR Project Manager and up to two HDR team members.
- Logistics for meeting space and City staff invitations will be coordinated by City staff.
- The SDC evaluation is a preliminary, high-level evaluation to assist with the City's decision to request changes to current cost share agreement with CWS. A full rate/SDC study would need to be conducted for a final recommendation on the rate surcharge and SDC.
- City will provide consistent and compiled set of comments on draft tech memo to HDR.
- Comments on draft chapter will be addressed and incorporated in a revised chapter for the Draft Sewer Master Plan document (Task 9).

Deliverables:

Draft chapter: Recommended Plan and Implementation Plan.

Task 9. Prepare Sewer Master Plan Report

Activities:

1. Prepare Sewer Master Plan report; incorporate comments from draft chapters and other information from workshops. HDR will compile the draft chapters and incorporate comments from the City. Technical memoranda (deliverables from Tasks 5, 6 and 11) will be included as appendices.
2. Conduct Draft Sewer Master Plan report Review TAC Meeting/Workshop. Meeting will be used to resolve major comments and to prepare for Council work session.
3. Prepare Final Sewer Master Plan report.

Assumptions:

- Draft SMP Review TAC Meeting/Workshop will be up to 2-hours and attended by HDR Project Manager and up to two HDR team members.
- Logistics for meeting space and City staff invitations will be coordinated by City staff.
- City will provide consistent and compiled set of comments on draft report to HDR.
- No major changes or re-analysis will be required to prepare the Final Plan based on City review comments.

Deliverables:

Draft chapter: Recommended Plan and Implementation Plan.

Task 10. Public Hearings and City Council/Commission Meetings

Activities:

1. Prepare for and conduct Public Hearing 1.
2. Prepare for and conduct City Council work session meeting presentation for Draft Sewer Master Plan.
3. Prepare for and conduct Public Hearing 2.
4. Prepare for and participate in City Council adoption of Final Sewer Master Plan.
5. Prepare for and conduct or support additional meetings with stakeholders and CWS (contingency). Up to 8 hours of each additional support will be provided by Project Manager and one task lead.

Assumptions:

- Public hearings and City Council meetings will be 2-hour in duration attended by the HDR Project Manager. Materials for the public hearings will include a brief (10-15 minute) presentation using Powerpoint.
- City will be responsible for developing meeting agenda and logging official meeting minutes.
- Logistics for meeting space and City staff invitations will be coordinated by City staff.

Deliverables:

Meeting materials for each meeting (Powerpoint presentation).

Task 11. Flow Monitoring Support (Contingency)

Activities:

1. Prepare draft Flow Monitoring Plan based on information from Subtask 6.7. Flow Monitoring Plan will identify the number, type and location of proposed flow monitoring stations for implementation. The Plan will be up to 8 pages long including a map of locations..
2. Conduct review meeting for Flow Monitoring Plan.
3. Prepare Final Flow Monitoring Plan based on review meeting input and discussions with City.
4. Support contractor procurement/selection. HDR will provide up to 8 hours of technical staff support as needed including reviewing proposals and interviewing contractors.
5. Support flow monitoring data collection efforts. HDR will provide up to 8 hours of direct field supervision of contractor activities.
6. Review flow monitoring data to confirm data quality is adequate for identified needs. Review of monitoring data will be done weekly throughout the monitoring period.
7. Prepare tech memo: Flow Monitoring Analysis.

Assumptions:

- Review meeting for Flow Monitoring Plan will be conducted at HDR's office with City staff attending.
- City will lead and coordinate procurement and selection of flow monitoring contractor; and will lead installation oversight.
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- Flow monitoring period will be no longer than 4 months or time to capture minimum of 3 storm events, whichever is shorter.
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Deliverables:

Draft and Final Flow Monitoring Plan; Flow Monitoring Analysis Tech Memo.

Task 12. Conversion of Lucity Data to PACP (Contingency)

Activities:

1. HDR will access Lucity database and update the existing condition assessment descriptions/notes to NASSCO PACP standards. This effort is a baseline (pilot) effort to go through the available condition data and evaluate the feasibility and effort to complete a full PACP-conversion process.
2. Conduct a 1-hour briefing meeting with City staff to decide on a path forward to continue a larger effort for the PACP conversion.

Assumptions:

- Only existing sewer lines with CCTV data will be reviewed and updated. No new condition assessment analysis will be conducted.
- Level of effort for the baseline (pilot) conversion process assumes reasonable consistency and quality of existing data to allow queries using limited (up to thirty) variations to condition description/notes. Additional time may be required if existing data quality is highly varied.

Deliverables:

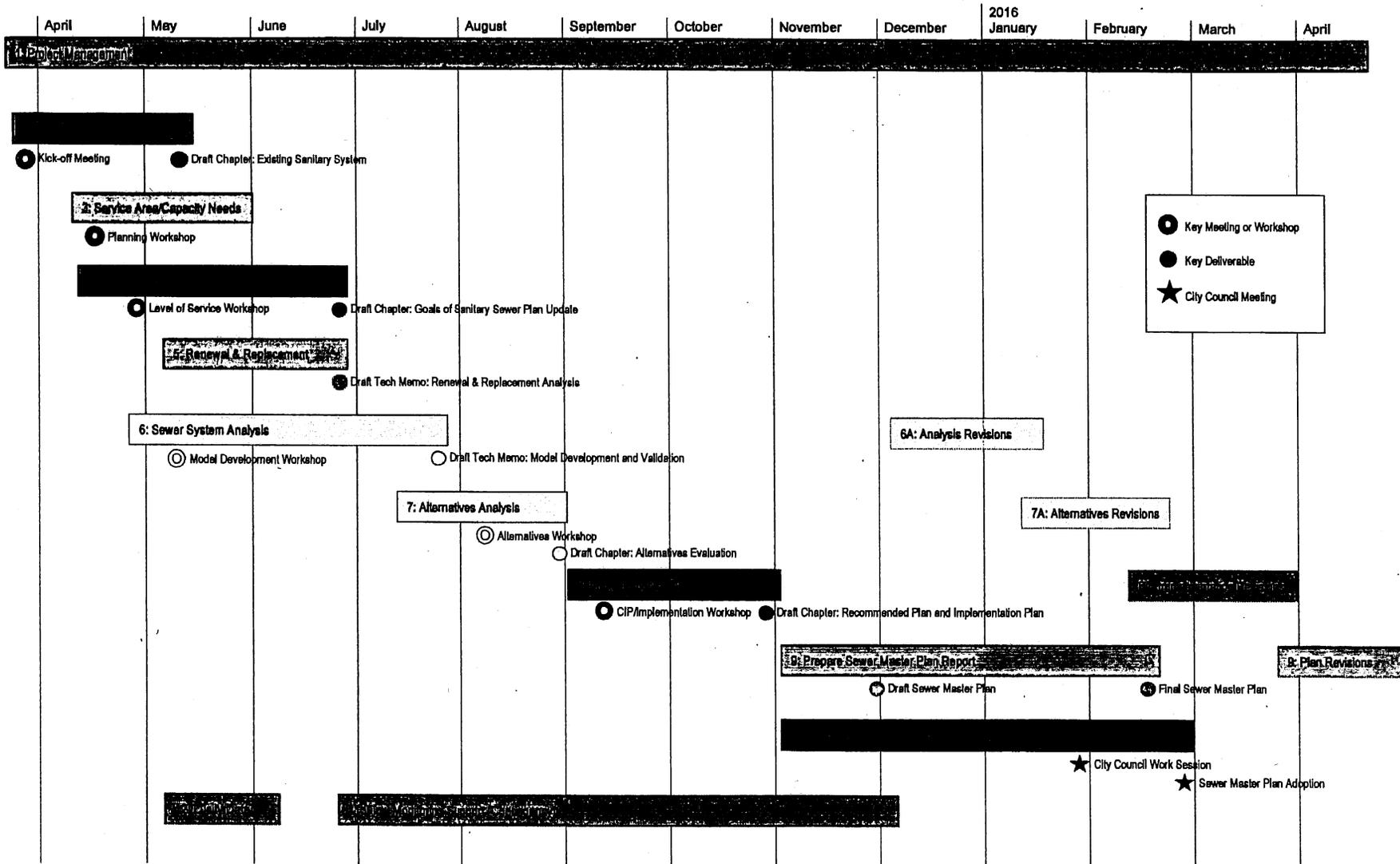
Updated Lucity database with additional PACP conversion data.

Schedule

The Sewer Master Plan project will be completed within fifteen (15) months of notice-to-proceed. Key schedule milestones will be aligned with the concurrent development of the Beaverton Water Master Plan, which is expected to be conducted from March 2015 to May 2015. Flow monitoring findings could result in the need for revisions to the model development and analysis findings, which would require an extension of the schedule.

City Beaverton Sewer Master Plan Schedule (March 2016 to April 2017)

2016
March



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