

CSI PROJECT

**MILL CREEK / GREEN RIVER SUBREGIONAL
PLANNING AREA**

**FINAL TASK 250 SUPPLEMENT REPORT
WORKING ALTERNATIVE 3A
SOOS PLANNING ZONE**

MAY 2002

HDR
In Association with

Herrera Environmental Consultants, Inc.

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INTRODUCTION

The King County Conveyance System Improvements Project (CSI) is a comprehensive evaluation of the county conveyance system and an assessment of requirements to transport flows projected to the year 2050. General alternatives for additional capacity in the Mill Creek/Green River Subregional Planning Area (MC/GR) were identified and subsequently developed into working alternatives. The work progress and results were reported in Task 210 through 250 for the MC/GR. This 250 supplemental report describes additional engineering planning level analysis performed for the Soos planning zone, as described below.

Wastewater flow projections by decade to year 2050 were developed for the MC/GR and presented in the Task 240 report. The flow projections were distributed throughout the MC/GR SPA to specific areas called Flow Projection Areas (FPAs), which generally conform to local agency collection systems. Using the King County hydraulic model, the flow was then routed into the King County conveyance system to assess future lack of capacity. Based on these results, alternatives for providing the required conveyance capacity were developed. For purposes of organizing results and describing alternatives, the MC/GR was divided into three areas or planning zones: Kent, Auburn, and Soos, as shown in Figure 250S-1.

The CSI project has adopted a set of objectives to be considered as the alternatives are evaluated and developed into a working alternative. The objectives to be considered as alternatives were developed included:

- Maximize service by gravity;
- Provide flexibility for adapting to changing growth patterns;
- Maximize long-term facility use;
- Optimize capital and operating cost;
- Provide benefit to regional and local systems;
- Provide certainty to local service providers;
- Integrate projects with other RWSP programs.

The alternatives developed in Task 240 were defined to planning level for comparative evaluation. Initial definition of alternatives included pipe size; general alignment; and recognition of significant features such as roadways, railroads, streams, and wetlands. Comparative evaluation of alternatives was presented in the Task 250 report. Pipe size estimates were used for selecting construction cost unit prices. However, the alternatives were not detailed to the extent that a specific project budget could be identified. The potential impact of infiltration and inflow (I/I) reduction on alternative design and cost was also evaluated and presented in the Task 250 report.

Four alternatives for the Soos planning zone were developed in the Task 250 report. Alternative 3, shown in Figure 250S-2, was chosen as the working alternative for the Soos Planning Zone and was evaluated in the *July 2001 Final Task 250 Supplement Report for Soos Creek*.

In December 2001, King County (County) and the Soos Creek Water and Sewer District (District) began discussing revisions to working alternative 3. The County and the District jointly developed working alternative 3A, which is described and evaluated in this 250 Supplemental Report. Alternative 3A incorporates flow split options described in various District configuration and cost estimate memos (in particular, those dated 3/29/01, 11/29/01, and 1/25/02) and discussed with the District on 7/20/01, 2/4/02, 2/13/02, and 2/14/02.

Working alternative 3A includes five variations, or subalternatives. These subalternatives are referred to as working alternatives 3A(1), 3A(1A), 3A(2), 3A(3), and 3A(4), and are generally shown in Figures 250S-3 and 250S-3A.

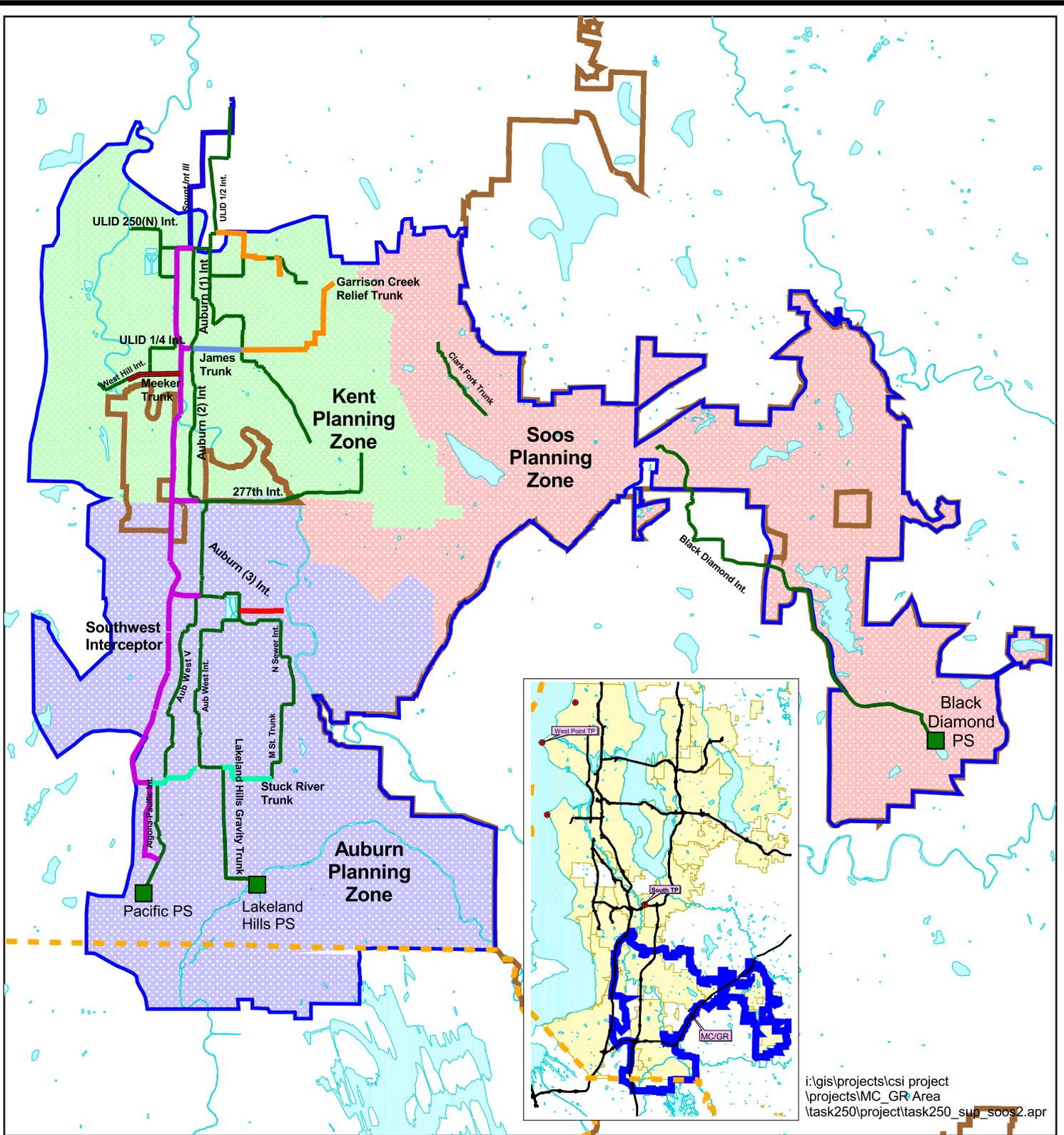
Under working alternatives 3A(1-4), the County has responsibility for some regional service components, and the District has responsibility for local service components. These responsibilities are discussed under each alternative.

The County and the District use different naming conventions and labeling schemes for various components of the wastewater system. For example, the County uses the term “pump station” for County owned and operated pumping facilities, while the District uses the term “lift station” for District owned and operated pumping facilities. This report generally uses the County naming convention, with the District naming convention in parenthesis for pump stations C and F. One exception to this is lift station 11, a District facility, which roughly corresponds to the County’s point E.

The additional engineering analysis described in this supplemental report focuses on optimizing the hydraulic capacity of the proposed project and validates or revises alignments and grades to accommodate critical service elevations and physical constraints. Alignment improvements were developed based on existing construction corridors, opportunities to minimize impacts on the public, and existing improvements as well as supporting the earlier identified planning principles.

COST ESTIMATE METHODOLOGY

Cost estimates for the general alternatives developed in the MC/GR Task 250 report were developed using County costing methodologies. Cost estimates for working alternatives 3A(1-4) in this Task 250 supplemental report were developed using either County or District costing methodologies, depending on ownership of each facility under the different subalternatives. The two costing methodologies are briefly described below. Variations between County and District cost estimates include differences in specifications for regional facilities and pipe material, flow assumptions, allied costs, and methods of allocating costs for staff time. The costs for working alternatives 3 and 3A(1-4) are summarized in Table 250S-1. In general, County allied costs were applied to County facilities and District allied costs were applied to District facilities. A column is provided that applies the District allied costs to all facilities using either County or District construction estimates as may be the case.



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Figure 250 S - 1: Kent, Auburn, and Soos Planning Zones
Mill Creek / Green River Subregional Planning Area

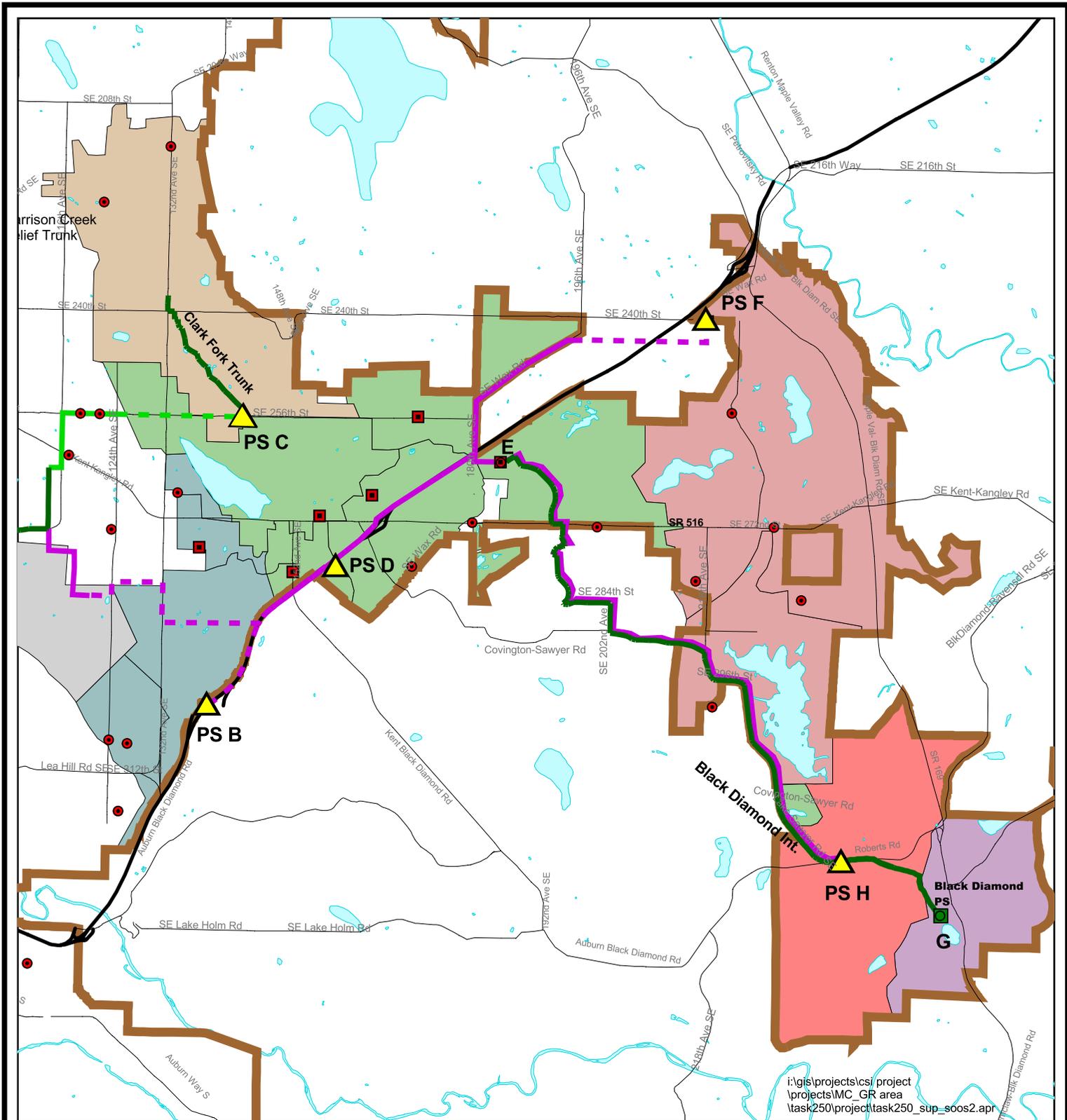
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0.4 0 0.4 0.8 1.2 1.6 2 Miles

March 14, 2002

- Legend**
- County Boundary
 - Stuck-1
 - Meeker-1
 - James-1
 - Gar-1
 - 26th ave ne trk
 - MC/GR King Co Pump Stations
 - Sw-1
 - MC/GR Sewerlines
 - MC/GR Boundary
 - South Interceptor III
 - Urban Growth Line 2000
 - MC/GR Planning Zones
 - Auburn Planning Zone
 - Kent Planning Zone
 - Soos Planning Zone



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Figure 250 S - 2 : Soos Planning Zone
Mill Creek / Green River Subregional Planning Area
Working Alternative 3

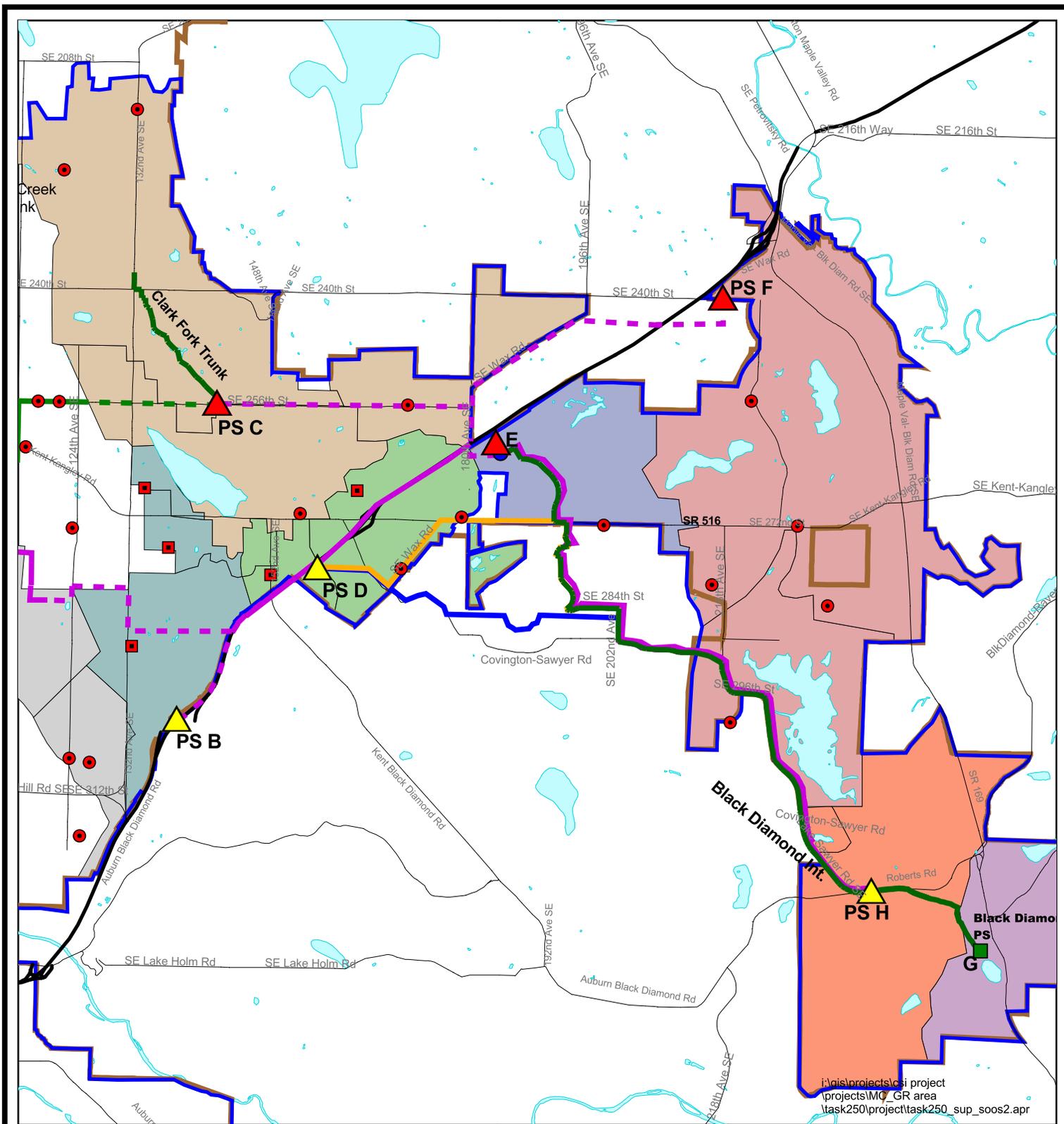
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May 6, 2002

Legend

Reference Point	MC/GR King Co Pump Stations
Proposed Regional PS	MC/GR Sewerlines
Existing Local PS	Streets - Freeways
Local PS Continues	MC/GR Boundary
Local PS Eliminated	South Interceptor III
	Urban Growth Line 2000
Flow Projection Area	
Proposed Gravity	A
Proposed Forcemain	B
Existing Local Gravity	C
Existing Local Forcemain	D
County Boundary	E
	F
	G
	H



**Figure 250 S - 3 : Soos Planning Zone
Mill Creek / Green River Subregional Planning Area
Working Alternative 3A**

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May 6, 2002

Legend

Reference Point	MC/GR King Co Pump Stations
Proposed Regional PS	MC/GR Sewerlines
Existing Local PS	Streets - Freeways
Local PS Continues	MC/GR Boundary
Local PS Eliminated	South Interceptor III
	Urban Growth Line 2000
Proposed Sewers	Flow Projection Area
Proposed Gravity	A
Proposed Forcemain	B
Existing Local Gravity	C
Existing Local Forcemain	D
Proposed Gravity Sewer	E
Proposed Gravity Sewer	F
	G
	H

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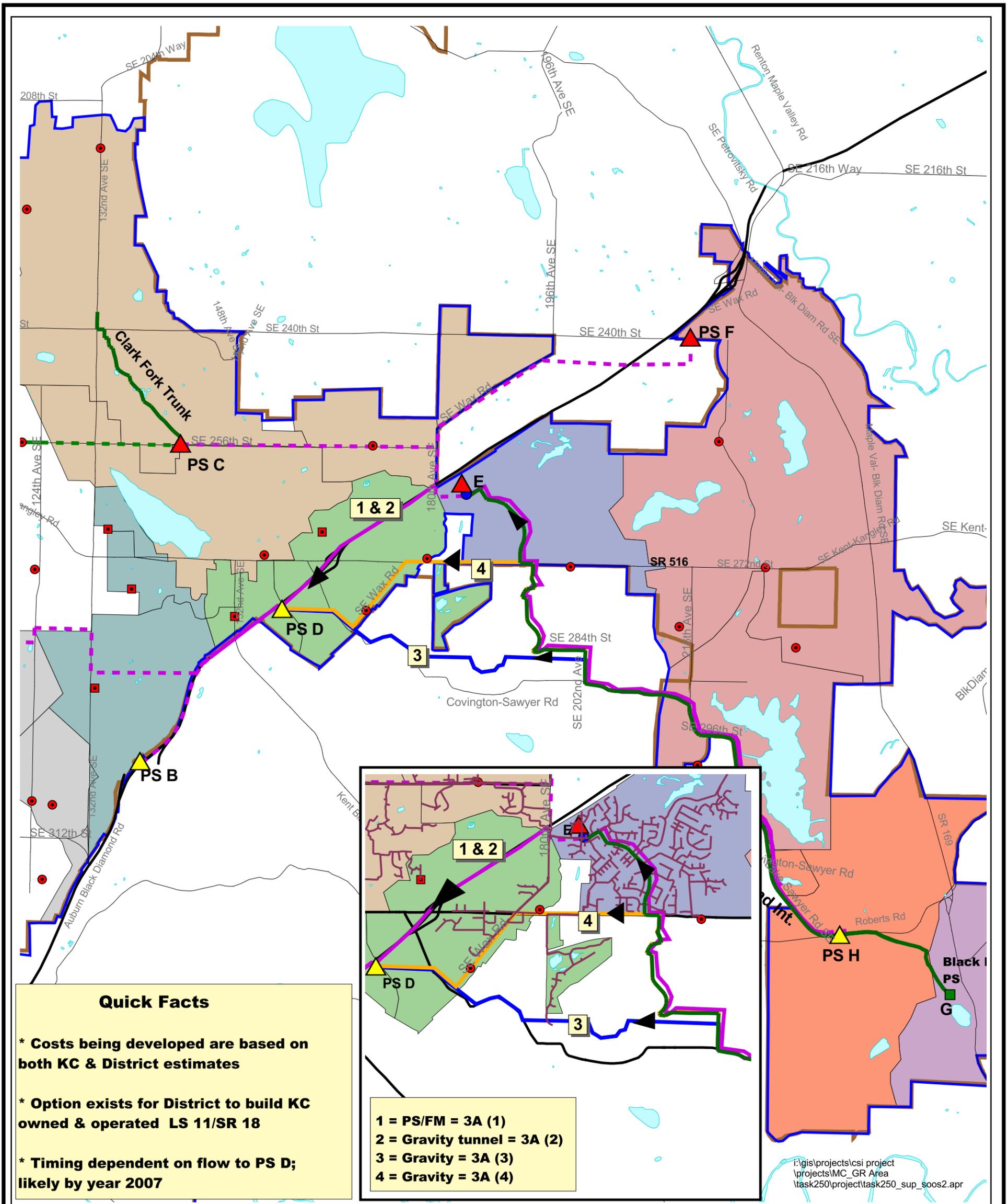


Figure 250 S - 3A : Soos Planning Zone
Mill Creek / Green River Subregional Planning Area
Working Alternative 3A

Table 250S-1. Cost Summary for Soos Working Alternative 3, 3A(1-4).

Summary Working Alternatives 3, 3A(1-4)			
Summary	Construction (\$)	Total Project ^a (\$)	Total Project ^b (\$)
Working Alternative 3^c			
County Ownership	\$78,150,000	\$132,654,000	\$125,040,000
District Ownership	—	—	—
Total	\$78,150,000	\$132,654,000	\$125,040,000
Working Alternative 3A(1)^d			
County Ownership	\$56,842,000	\$ 96,455,000	\$ 90,949,000
District Ownership	\$ 6,689,000	\$ 10,702,000	\$ 10,702,000
Total	\$63,531,000	\$107,157,000	\$101,651,000
Working Alternative 3A(1A)^e			
County Ownership	\$45,602,000	\$ 77,380,000	\$ 72,965,000
Lift Station 11 & SR18 Interceptor	\$11,240,000	\$ 17,984,000	\$ 17,984,000
District Ownership	\$ 6,689,000	\$ 10,702,000	\$ 10,702,000
Total	\$63,531,000	\$106,066,000	\$101,651,000
Working Alternative 3A(2)^f			
County Ownership	\$56,715,000	\$ 96,259,000	\$ 90,746,000
District Ownership	\$ 6,689,000	\$ 10,702,000	\$ 10,702,000
Total	\$63,404,000	\$106,961,000	\$101,448,000
Working Alternative 3A(3)^g			
County Ownership	\$47,023,000	\$ 81,645,000	\$ 75,239,000
District Ownership	\$11,197,000	\$ 17,912,000	\$ 17,912,000
Total	\$58,220,000	\$ 99,557,000	\$ 93,151,000
Working Alternative 3A(4)^h			
County Ownership	\$51,323,000	\$ 89,213,000	\$ 82,119,000
District Ownership	\$11,197,000	\$ 17,912,000	\$ 17,912,000
Total	\$62,520,000	\$107,125,000	\$100,031,000

^a District allied cost (60%) for District facilities or County 2003 budget model allied cost for County facilities except in Alt 3A(1A) where District allied cost is applied to County construction cost indicating County ownership/District construction for LS 11 and the SR18 Interceptor.

^b District allied cost (60%) for all facilities.

^c All facilities owned by the County/PS H routed to Point E.

^d PS C and F owned by District/PS B, D, and H owned by County/SR18 and LS11 - owned by County and County Construction/PS H routed to Point E.

^e PS C and F owned by District/PS B, D, and H owned by County/SR18 and LS11 - owned by County and District Construction/PS H routed to Point E.

^f PS C and F owned by District/PS B, D, H, SR18 owned by County/PS H routed to Point E.

^g PS C, F, LS11, and SR18 owned by District/PS B, D, and H owned by County/PS H routed to PS D via Power Line.

^h PS C, F, LS11, and SR18 owned by District/PS B, D, and H owned by County/PS H routed to PS D via 272nd.

Appendix A includes cost summaries for working alternatives 3 and 3A(1-4). Cost summaries in working alternative project discussions include construction costs only. The tables included in Appendix A compare different allied cost applications with each working alternative project. More detailed discussions of working alternative project costs will be included in the final version of this report.

Final predesign studies may determine that the budgeting level estimates of cost for certain components contained herein are over-estimated while others are under-estimated. The estimates

presented may be reduced by refinement during design. Estimated construction costs are presented in year 2002 dollars.

COUNTY COSTING METHODOLOGY

Construction cost estimates were prepared for the general alternatives developed in the MC/GR Task 250 report using details presented in *King County Conveyance System Improvement Project Conveyance System Cost Estimates Task 250 Final Report* dated September 21, 2001.

Construction cost estimates are presented in Appendix B. The cost tables presented were based on a fixed average condition for varying pipe diameter and are derived from an extensive County cost model that develops cost for a variety of construction scenarios. The cost model allows site-specific conditions including depth and unit material prices to be factored into a specific unit price for a constructed facility. Pipeline cost has been assumed to include import fill of trenches, relocation of existing utilities, dewatering, and pavement restoration throughout the project length.

Pump station estimates include assumptions for site/civil, electrical/instrumentation, architectural/structural, and mechanical components based on a fixed cost per mgd of flow pumped. The estimates are conservative and will be refined during predesign.

The cost model developed by the County has been refined and released as the CSI cost model Tabula Version 1.0, and is available for download at <http://dnr.metrokc.gov/WTD/CSI/planning/htm>.

The County's method for determining total project costs involves a separate budget model that allocates a range of element costs to the construction estimates generated by the County's Tabula Version 1.0. These project costs involve such factors as engineering costs, contingencies, and permitting, and are based on details from over \$1.1 billion dollars of County wastewater projects.

DISTRICT COSTING METHODOLOGY

Costs for District facilities in this report were provided directly by the District, with less detailed information on assumptions and methodologies provided. Generally, District costs are based on unit costs determined from District bid tabs. The District uses a standard 60 percent multiplier for allied costs; 20 percent contingency and 40 percent for other costs. The cost tables in this report do not include unit information such as pump station capacity for District facilities, as the District-supplied costs reflect different capacity and specification assumptions. This information was provided in a Roth Hill memo to the County dated January 25, 2002.

WORKING ALTERNATIVE 3A(1-4) PROJECTS

The Soos Planning Zone working alternatives 3A(1-4) include five projects: Pump station H and conveyance to pump station D or point E; pump station F (lift station 15B) and conveyance to point E or lift station 11; conveyance from point E (lift station 11) to pump station D - SR18 Interceptor; pump station B and conveyance to pump station D; and pump station D and conveyance to point A. Pump station C (lift station 10B) is owned by the County in working alternative 3 and by the District in working alternatives 3A(1-4) and is not included as a project in this report. Pump station C (lift station 10B) has no conveyance component required for future flow if existing forcemains are used.

Several differences exist between working alternatives 3 and 3A(1-4). All project components in working alternative 3 were assumed to be County facilities. In working alternatives 3A(1-4), the County owns some components, and the District owns and retains responsibility for some components. The component ownership is shown in Table 250S-2.

Table 250S-2. Working Alternative Ownership/Responsibility.

Facility	Alternative					
	3	3A(1)	3A(1A)	3A(2)	3A(3)	3A(4)
Pump Station H and Conveyance to Pump Station D or Point E	County	County	County	County	County	County
Pump Station F (Lift Station 15B) and Conveyance to Point E (Lift Station 11)	County	District	District	District	District	District
Conveyance from Point E/Lift Station 11 to Pump Station D - SR18 Interceptor	County	County	County ^a	County	District	District
Pump Station B and Conveyance to Pump Station D	County	County	County	County	County	County
Pump Station D and Conveyance to Point A	County	County	County	County	County	County

^a District Builds to County Specifications

Project components and specific differences between the subalternatives are discussed in detail in subsequent sections, in addition to issues and constraints that may impact project implementation. Project components presented are planning level and are subject to further revisions as project implementation proceeds.

Generally, working alternatives 3A(1), 3A(1A), and 3A(2) are all similar to the original working alternative 3. The primary differences between these and the original working alternative 3 involve ownership of pump station C (lift station 10B) and pump station F (lift station 15B), and the design of conveyance from point E to pump station D along SR18 (deep tunnel gravity versus open cut with pump station). Working alternatives 3A(3) and 3A(4) both divert flows from point E, and present two different alignments from pump station H to pump station D.

All pump stations are proposed facilities, except for pump station G which currently serves the City of Black Diamond. In some of the working alternatives, lift station 11 would be expanded or would be a new facility.

PUMP STATION H AND CONVEYANCE TO PUMP STATION D OR POINT E

A regional pump station (pump station H), forcemain H, and a gravity sewer (Black Diamond Parallel Interceptor) convey flow to pump station D or point E as shown in Figure 250S-4. Depending on the construction methods (tunnel or open cut) used for the SR18 Interceptor, lift station 11 located near point E may be required. Pump station H operates at about 51 feet of total dynamic head. The conveyance to pump station D includes approximately 1,000 feet of forcemain and 35,000 feet of gravity sewer to point E; or 1,000 feet of forcemain and 35,300 feet or 49,500 feet of gravity sewer to pump station D, depending on the alignment selected.

Three configurations for the gravity sewer portion of conveyance to pump station D or point E have been developed. In working alternatives 3A(1, 1A, and 2) the gravity sewer portion of the conveyance parallels the existing gravity sewer to point E and includes about 35,000 feet of gravity sewer. In working alternatives 3A(3 and 4), the gravity sewer parallels the existing gravity sewer to an overhead power line corridor near SE 284th Street. The gravity sewer either turns west along the power line corridor, or continues to parallel the existing interceptor to SE 272nd Street, where it turns west. The gravity sewer terminates at pump station D in both the power line and SE 272nd Street alignments. The total length for the power line corridor alignment and the SE 272nd Street alignment from pump station H to pump station D is 35,300 feet and 49,500 feet respectively.

The existing Black Diamond Pump station (pump station G) currently conveys flow to the Black Diamond Interceptor, which discharges to lift station 11. In working alternative 3A(1), lift station 11 is a new County pump station and conveys flow to the SR18 Interceptor. In working alternative 3A(1A), lift station 11 is a County facility, possibly constructed by the District, and conveys flow to the SR18 Interceptor. In working alternative 3A(2), lift station 11 is decommissioned and flow is conveyed from point E to pump station D through a microtunneled SR18 Interceptor. In working alternatives 3A(3 and 4), flow from the Black Diamond Parallel Interceptor is re-routed to pump station D and lift station 11 is a District facility converted to low-head service, and conveys flow to the SR18 Interceptor as needed in the future.

Pump station G conveys flow to pump station H and will remain in service to its current service area through the planning period. The combined capacity of pump station G and pump station H would be adequate for the County's projected flows through year 2050.

The following photographs depict existing conditions along forcemain H and the Black Diamond Parallel Interceptor alignments. The approximate location of each photograph is indicated in Figure 250S-4. A brief description of access concerns for each representative section of the proposed alignment is included.

P1: Roberts Drive – Rock Creek to Lake Sawyer Road SE

Vehicular access along Roberts Drive must be maintained. Impacts to Rock Creek should be minimized.



P2: Lake Sawyer Road SE – Roberts Drive to 224th Avenue SE

Access to homes, businesses, and roadways must be maintained.



P3: 224th Avenue SE – Lake Sawyer Road SE to SE 296th Street

Access to homes, businesses, and roadways must be maintained.



P4: 296th Street – 224th Avenue SE to 216th Avenue SE

Access to homes, businesses, and roadways must be maintained.



P5: Covington-Sawyer Road – 216th Avenue SE to 202nd Avenue SE

Access to roadways and homes must be maintained.



P6: 202nd Avenue SE – Covington-Sawyer Road to SE 284th Street:

Access to roadways and homes must be maintained.



P7: 193rd Avenue SE – SE 284th Street to 192nd Place SE:

Access to roadways and homes must be maintained.



P8: 192nd Place SE – 193rd Place SE to SE 272nd Street (SE 272nd Street Alignment):

Access to roadways and homes must be maintained.



P9: SE 272nd Street – 192nd Avenue SE to SE Wax Road (SE 272nd Street Alignment):

Access to roadways, homes, and businesses must be maintained.



P10: SE Wax Road – SR 516 to Covington-Sawyer Road (SE 272nd Street Alignment):

Access to roadways, homes, and businesses must be maintained.



P11: Covington-Sawyer Rd. – SE Wax Road to Gravel Quarry (SE 272nd Street and Power Line Alignment):

Access to roadways, homes, and businesses must be maintained.



P12: Gravel Quarry – Gravel Quarry to PS D (SE 272nd Street and Power Line Alignment):

Access to the gravel quarry must be maintained.



P13: Power Line – 202nd Avenue SE to SE 287th Street (Power Line Alignment):

Access to roadways, homes, and businesses must be maintained.



P14: SE 287th Street – Power Line to Power Line:

Access to roadways and homes must be maintained.



P15: Covington-Sawyer Rd. – Power Line to Gravel Quarry:

Access to roadways, homes, and businesses must be maintained.



PROJECT IMPACTS

Typical temporary construction related impacts may include increased noise, dust and construction vehicle traffic. Temporary partial road closures may be required. Trees and other vegetation may be impacted by pipeline and pump station excavation.

Impacts to citizens, businesses, and the environment are of concern with all alignments. Access to neighboring residences and businesses must be maintained throughout construction. Impacts to traffic are expected.

Streams should not be impacted by construction. Jacking or tunneling pipeline construction methods would eliminate impacts to streams. A minimum separation of five feet is recommended between streambed and pipe crown in order to allow for natural streambed movement. Jacking and receiving pits should be located away from the streambank to avoid erosion.

Table 250S-3 lists existing utilities and roadway characteristics observed during planning level field inspection along pump station H's conveyance alignments.

PERMIT REQUIREMENTS

A right of way (ROW) use permit from the King County Roads Department is required for construction within the right of way. City of Black Diamond construction permits will be required for pump station and pipeline construction. The discharge from dewatering operations may require a section 401 water quality certificate from the Washington Department of Ecology or a King County Industrial Waste Discharge Permit. A State Environmental Policy Act (SEPA) checklist is required. Documentation associated with the Endangered Species Act may be required. A building permit will be required for the pump station. A Hydraulic Project Approval would be required at non-tunneled stream crossings; however, the County generally, as a matter of course, does not cut through streams, creeks, or rivers.

EASEMENT AND PROPERTY ACQUISITION

Construction within this area may require other easements and consultation with the City of Black Diamond and the power utility. Acquiring property for the pump station should not be difficult because most of the area surrounding pump station H is undeveloped. Further investigation to identify suitable pump station sites should be conducted during project predesign.

OPERATION AND MAINTENANCE

Pump station H's conveyance system includes a gravity sewer and forcemain. No routine or scheduled maintenance is anticipated for either type of pipeline.

Pump stations have specific operations and maintenance (O&M) requirements depending on configuration, frequency of use, and other factors. In general, design considerations to reduce labor, parts replacement and downtime should be considered during predesign.

Table 250S-3. Existing Conditions - Pump Station H and Conveyance to Pump Station D or Point E.

Conveyance Component Alignment		Underground Telephone	Water	Sewer	Storm Drain	Gas	Overhead Power	Underground Power	Bike Lanes	Sidewalk	Stream Crossing	Easement	Street Trees	Roadway Lanes					Traffic Lanes			Parking Lanes			
														Highway	Major Arterial	Secondary Arterial	Collector	Local	1	2	4	1	2		
P1	Roberts Dr – Rock Creek to Lake Sawyer Rd SE		X	X		X	X				X		X							X					
P2	Lake Sawyer Rd SE – Roberts Rd SE to 224th Ave SE		X	X		X	X						X								X				
P3	224 th Ave SE – Lake Sawyer Rd SE to SE 296 th Street		X	X			X						X								X				
P4	296 th St – 224 th Ave SE to 216 th Ave SE		X	X			X						X								X				
P5	Covington-Sawyer Rd – 216 th Ave SE to 202 nd Ave SE		X	X			X						X								X				
P6	202 nd Ave SE – Covington-Sawyer Rd to SE 284 th St		X	X			X						X					X			X				
P7	193 rd Ave SE – SE 284 th St to 192 nd PI SE		X	X				X					X					X			X				
P8	192 nd PI SE – 193 rd PI SE to Kent Langley Rd	X	X	X				X			X	X	X					X			X				
P9	SE 272nd Street – 192nd Ave SE to SE Wax Rd (SE 272nd St):		X	X	X		X				X		X										X		
P10	SE Wax Rd – SR 516 to Covington-Sawyer Rd (SE 272nd St)		X	X	X		X						X					X			X				
P11	Covington-Sawyer Rd – SE Wax Rd to Gravel Quarry (SE 272nd St and Power Line)		X		X		X											X			X				
P12	Gravel Quarry – Gravel Quarry to PS D (SE 272nd St and Power Line):																								
P13	Power Line – 202 nd Ave SE to SE 287 th St (Power Line).			X			X						X												
P14	SE 287 th St – Power Line to Power Line (Power Line)		X										X						X		X				
P15	Covington-Sawyer Rd. – Power Line to Gravel Quarry		X				X						X								X				

DESIGN ISSUES AND CONSTRAINTS

Constraints to be resolved during predesign include location of pump station H, connection to the existing sewer, stream crossings, and avoiding or relocating existing utilities. Provisions must be in place to provide access to homes, businesses, parks, and other facilities along the impacted roadways throughout construction.

A major design constraint is the location of pump station H. The station should be located such that most or all flows from contributing basins can be conveyed to the station by gravity pipelines. The pump station should also have little or no impact on neighboring communities and avoid environmentally sensitive areas.

For planning purposes, the station is currently located at a low point in the service area. This area is heavily wooded, adjacent to Rock Creek and a possible wetland. It is likely not a suitable site for a pump station. Further investigation to identify a suitable pump station site should be conducted during the predesign phase. Acquiring property for the pump station should not be difficult since most of the area surrounding pump station H is undeveloped.

The alignment of the conveyance to pump station D in working alternative 3A(3 and 4) may eliminate the need for lift station 11, depending on the construction method used for the SR18 Interceptor. A gravity connection between point E and pump station D could eliminate lift station 11. Conveying flow from pump station H to pump station D directly would decrease the size of Lift Station 11 when compared to working alternatives 3A(1, and 1A). The power line alignment from pump station H to pump station D eliminates approximately 14,200 feet of pipeline when compared to the SE 272nd Street alignment. It also eliminates a siphon located between SE 277th Street and SE 272nd Street. The availability of the power line utility corridor should be investigated.

The alignment to point E parallels the Black Diamond Interceptor for the entire alignment in working alternatives 3A(1, 1A, and 2). The termination point and connection to either lift station 11 or the SR18 Interceptor requires further analysis during predesign.

CONSTRUCTION COST ESTIMATE

Table 250S-4 shows construction cost estimates for this project component. Quantities for the portion of the gravity sewer paralleling the Black Diamond Interceptor were developed from the contract drawings for the 1991 Water Pumping and Conveyance Facilities project and preliminary profiles generated from existing topography.

PUMP STATION F (LIFT STATION 15B) AND CONVEYANCE TO POINT E (LIFT STATION 11).

Pump station F (lift station 15B) and forcemain F convey flow to pump station C (lift station 10B) or point E in working alternatives 3A(1-4). Pump station F (lift station 15B) would operate at about 200 feet total dynamic head to Point E. The conveyance to point E includes about 14,500 feet of forcemain.

Table 250S-4. Estimated Construction Cost - Pump Station H and Conveyance to Pump Station D or Point E.

Working Alternative Project	Average Depth (ft)	Quantity	Unit	Estimated Construction Cost ^a (million dollars)
Pump Station H				
Pump Station H	–	1	LS	\$ 2,400,000
Forcemain H (open cut construction)				
12 inch	6	1,000	LF	\$ 282,000
Pipeline (open cut construction)				
Power Line	Varies	35,300	LF	\$19,700,000
SE 272 nd Street	Varies	49,500	LF	\$24,000,000
Point E	Varies	35,000	LF	\$18,279,000
				Pump Station H Total (Power Line) \$22,382,000
				Pump Station H Total (SE 272nd Street) \$26,682,000
				Pump Station H Total (Point E) \$20,961,000

^a County Estimate 2002 dollars

A portion of the flow from pump station F (lift station 15B) discharges to point E in working alternatives 3A(1-4). This portion of pump station F’s (lift station 15B’s) flow will discharge to lift station 11 or the SR18 Interceptor, depending on the configuration of the downstream components. Pump station F (lift station 15B) currently conveys flow to lift station 10, which will be replaced by pump station C (lift station 10B).

The following photographs depict existing conditions along forcemain F’s alignment. The approximate location of each photo is indicated in Figure 250S-5. A brief description of access concerns for each representative section of the proposed alignment is included.

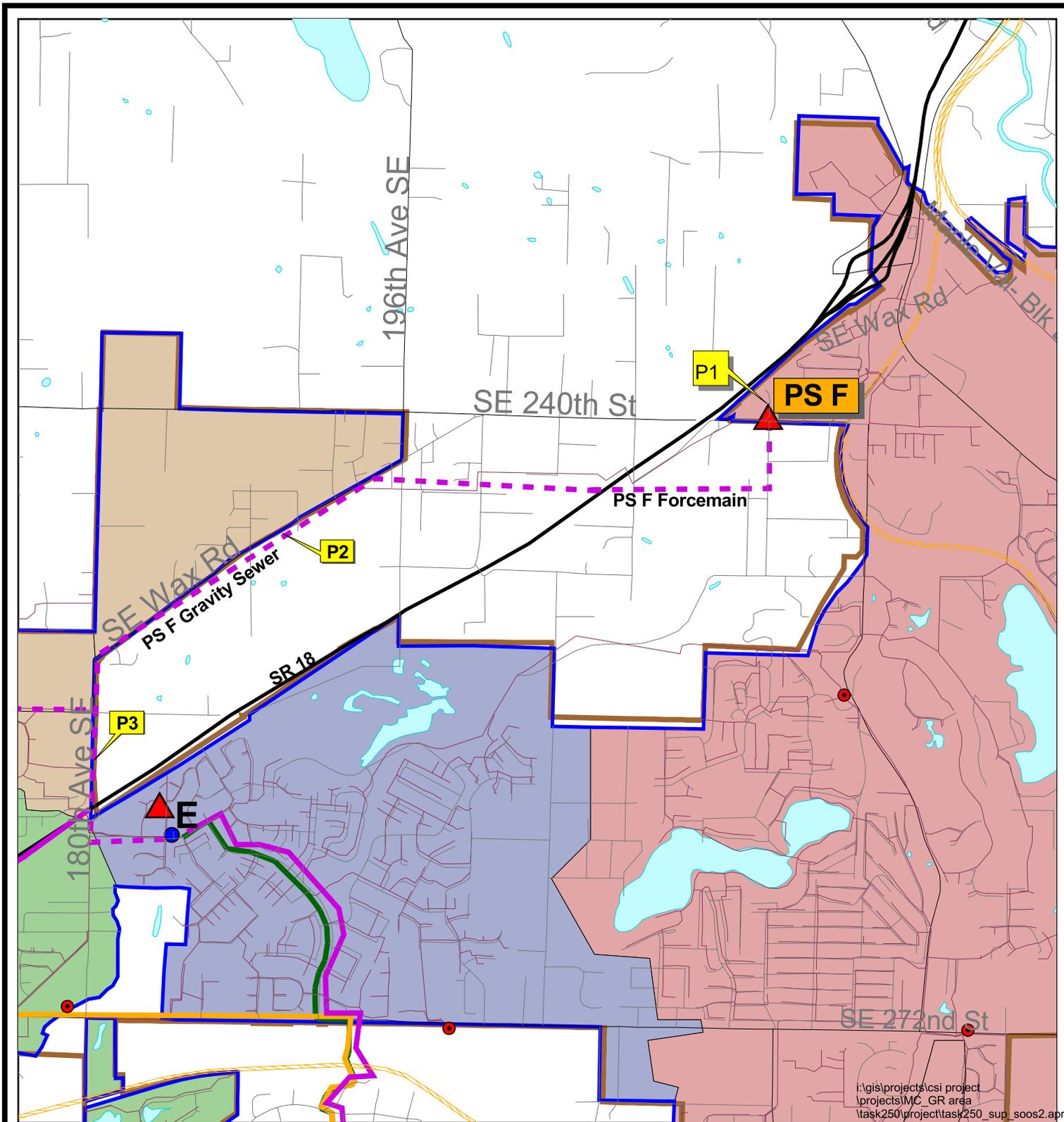
The alignment presented follows an existing easement and developed roadways. Further investigation to determine the status and boundaries of the easement should be conducted during predesign.

The project alignment is not shown in preliminary plan and profile sheets at the end of this project discussion. Preliminary plan and profiles were included in the *Final Task 250 Supplement Report for Soos Creek* dated July 2001. The District may have adequate capacity in existing forcemains from SE 256th Street to pump station C (lift station 10B).

PROJECT IMPACTS

Typical temporary construction related impacts may include increased noise, dust and construction vehicle traffic. Temporary partial road closures may be required. Trees and other vegetation may be impacted by pipeline and pump station excavation.

Impacts to citizens, businesses, and the environment are of concern with proposed interceptor alignments. Access to neighboring residences and businesses must be maintained throughout construction. Impacts to traffic are expected.



i:\gis\projects\csi project
 projects\MC_GR area
 task250\project\task250_sup_soos2.apr

Figure 250 S - 5 : Soos Planning Zone

Mill Creek / Green River Subregional Planning Area
Working Alternative Component - PS F and Conveyance to Point E

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KING COUNTY



600 0 600 1200 1800 2400 3000 Feet

March 20, 2002

Legend	
Reference Point	Photo Reference Point
Proposed Regional PS	MC/GR King Co Pump Stations
Existing Local PS	MC/GR Sewerlines
Local PS Continues	Streets - Freeways
Local PS Eliminated	MC/GR Boundary
Railroad	South Interceptor III
Proposed Sewers	Urban Growth Line 2000
Proposed Gravity	Stream
Proposed Forcemain	Flow Projection Area
Existing Local Gravity	A
Existing Local Forcemain	B
County Boundary	C
	D
	E
	F
	G
	H

P1: 215th Avenue SE – Pump Station F (Lift Station 15B) to Easement

Vehicular access will probably be impossible to maintain due to the limited space available for sewer construction. Access to homes and Lift Station 15B must be maintained.



P2: SE Wax Road – SE 240th Street to 180th Avenue SE

Access to businesses, homes, and adjacent roadways must be maintained.



P3: 180th Ave SE – SE Wax Rd to SR18

Access to businesses, homes, and adjacent roadways must be maintained.



Streams should not be impacted by pipeline construction. Eliminating impacts may be accomplished by jacking or tunneling. A minimum separation of five feet is recommended between streambed and pipe crown in order to allow for natural streambed movement. Jacking and receiving pits should be placed away from the streambank to avoid erosion.

Table 250S-5 includes existing utilities and roadway characteristics observed during planning level field inspection along pump station F’s (lift station 15B) conveyance alignment.

Table 250S-5. Existing Conditions - Pump Station F (Lift Station 15B) and Conveyance to Point E (Lift Station 11).

Conveyance Component Alignment		Underground Telephone	Water	Sewer	Storm Drain	Gas	Overhead Power	Underground Power	Bike Lanes	Sidewalk	Stream Crossing	Easement	Street Trees	Airport	Road Way Type				Traffic Lanes			Parking Lanes	
															Major Arterial	Secondary Arterial	Collector	Local	1	2	5	1	2
P1	215th Ave SE – Pump Station F (Lift Station 15B) to Easement	X	X					X					X				X	X					
P2	SE Wax Rd – SE 240th Street to 180th Ave SE	X	X		X		X						X				X			X			
P3	180th Ave SE – SE Wax Rd to SR18	X	X	X	X		X		X	X			X				X			X			

PERMIT REQUIREMENTS

A ROW use permit from King County Roads Department is required for construction within the right of way. The discharge from dewatering operations may require a section 401 water quality certificate from the Washington Department of Ecology or a King County Industrial Waste Discharge Permit. A SEPA checklist is required. Documentation associated with the Endangered Species Act may be required. A building permit will be required for the pump station. A Hydraulic Project Approval will be required at non-tunneled stream crossings; however, the County generally, as a matter of course, does not cut through streams, creeks, or rivers.

EASEMENT AND PROPERTY ACQUISITION

Property acquisitions may be necessary for pump station F (lift station 15B). Further investigation to identify suitable pump station sites should be conducted during project predesign if the existing lift station is not adequate or if lift station 15B must be kept online during construction of an upgraded station.

OPERATION AND MAINTENANCE

Pump station F's (lift station 15B) conveyance is a forcemain. No routine or scheduled maintenance is anticipated for this type of pipeline.

Pump stations have specific O&M requirements depending on configuration, frequency of use, and other factors. In general, design considerations to reduce labor, parts replacement and downtime should be considered during predesign.

DESIGN ISSUES AND CONSTRAINTS

Constraints to be resolved during design include connection to the existing sewer, location of pump station F (lift station 15B), stream crossings, and avoiding or relocating existing utilities. In general, provisions must be in place to provide access to homes, businesses, and pump station F's (lift station 15B's) pipeline alignment throughout construction.

A major design constraint is the location of pump station F (lift station 15B). The station should be located such that most or all flows from contributing basins can be conveyed to the station by gravity pipelines. It should also have little or no impact on neighboring communities and avoid environmentally sensitive areas.

For planning purposes, pump station F (lift station 15B) is located adjacent to lift station 15B. If the station were south of its current location it would have a larger service area. In the current location, conveyance facilities would be required to convey flows from the southern portions of the service area. Suitable pump station sites should be identified during the predesign phase.

Connection to point E and the SE 256th Street forcemain(s) needs to be resolved. Discharging to two systems presents unique hydraulic impacts to pump station F (lift station 15B) and should be considered during design of the facility.

CONSTRUCTION COST ESTIMATE

Table 250S-6 shows construction cost estimates for this project component. Quantities were developed from preliminary profiles generated from existing topography.

Table 250S-6. Estimated Construction Cost - Pump Station F (Lift Station 15B) and Conveyance to Point E (Lift Station 11).

Working Alternative Project	Average Depth (ft)	Quantity	Unit	Estimated Construction Cost ^a (million dollars)
Pump Station F (Lift Station 15B)				
Pump Station F (Lift Station 15B)	—	1	LS	\$1,004,000
Forcemain F (open cut construction)				
18 inch	6	14,500	LF	\$2,466,000
Pump Station F (Lift Station 15B) Total				\$3,470,000

^a District estimate 2002 dollars

CONVEYANCE FROM POINT E/LIFT STATION 11 TO PUMP STATION D - SR18 INTERCEPTOR

The SR18 Interceptor is located along SR18 from point E to pump station D and conveys flow greater than 14.4 mgd from pump station F (lift station 15B), pump station C's (lift station 10B) local service area, and lift station 11's local service area to pump station D in working alternatives 3A(3 and 4). Flow from pump station H is included in the total flow received at point E in working alternatives 3A(1, 1A, and 2).

Lift station 11 conveys flow through a forcemain to the SR18 Interceptor in working alternatives 3A(1, 1A, 3, and 4). Lift station 11 is eliminated in working alternative 3A(2), and flow is conveyed to a microtunneled SR18 Interceptor by gravity. The SR18 Interceptor includes about 10,000 feet of open cut construction or a combination of open cut and microtunneled gravity sewer.

The following photograph depicts existing conditions along the proposed gravity interceptor. Included is a brief description of access concerns for the proposed alignment.

P1: SR18 – Point E to Pump Station D

Access to SR18 must be maintained. Construction along SR18 may require alternate methods of construction such as microtunneling.



PROJECT IMPACTS

Typical temporary construction related impacts may include increased noise, dust and construction vehicle traffic. Temporary partial road closures may be required. Trees or other vegetation may be impacted by excavation.

Impacts to citizens, businesses, and the environment are of concern along interceptor alignments. Access to neighboring residences and businesses must be maintained throughout construction. Impacts to traffic are expected.

Streams should not be impacted by construction. Jacking or tunneling pipeline construction methods would eliminate impacts to streams. A minimum separation of five feet is recommended between streambed and pipe crown in order to allow for natural streambed movement. Jacking and receiving pits should be placed away from the streambank to avoid erosion.

Table 250S-7 lists existing utilities and roadway characteristics observed during planning level field inspection along the SR18 Interceptor alignment.

Table 250S-7. Existing Conditions - Conveyance from Point E/Lift Station 11 to Pump Station D - SR18 Interceptor.

Conveyance Component Alignment		Underground Power	Water	Sewer	Storm Drain	Gas	Overhead Power	Underground Power	Bike Lane	Sidewalk	Stream Crossing	Easement	Street Trees	Roadway Type			Traffic Lanes		Parking Lanes		
														Highway	Major Arterial	Secondary Arterial	Collector	Local	2	4	1
P1	SR18 - Point E to Pump Station D				X						X								X		

PERMIT REQUIREMENTS

Work within SR18’s right of way will require a Franchise from the Washington State Department of Transportation. The discharge from dewatering operations may require a section 401 water quality certificate form the Washington Department of Ecology or a King County Industrial Waste Discharge Permit. A SEPA checklist is required. Documentation associated with the Endangered Species Act may be required. A Hydraulic Project Approval will be required at non-tunneled stream crossings; however, the County generally, as a matter of course, does not cut through streams, creeks, or rivers.

EASEMENT AND PROPERTY ACQUISITION

Easements are not anticipated for the SR18 Interceptor. If open cut methods of installation are used, property acquisitions will likely not be required.

OPERATION AND MAINTENANCE

The SR18 Interceptor includes a gravity sewer. No routine or scheduled maintenance is anticipated for this type of pipeline.

DESIGN ISSUES AND CONSTRAINTS

Constraints to be resolved during design include avoiding or relocating existing utilities, stream crossings, and connection to gravity sewers and pump station D. Provisions must be in place to provide access to impacted roadways throughout construction.

Critical elevations for the proposed alternative are the upstream connection at point E and the connection to pump station D. The SR18 interceptor may require open cut or microtunneled forms of construction depending on the final elevations to be refined in full predesign.

CONSTRUCTION COST ESTIMATE

Table 250S-8 shows construction cost estimates for this project component. Quantities were developed from preliminary profiles generated from existing topography.

Table 250S-8. Estimated Construction Cost - Conveyance from Point E/Lift Station 11 to Pump Station D - SR18 Interceptor.

Working Alternative Project	Average Depth (ft)	Quantity	Unit	Estimated Construction Cost ^a (million dollars)
Lift Station 11				
Lift Station 11 (Alt 3A(1) ^d and 3A(1A) ^e)	-	1	LS	\$ 3,810,000
Lift Station 11 (Alt 3A(3 and 4))	-	1	LS	\$ 1,121,000 ^c
Forcemain Lift Station 11/GS SR18				
Alt 3A(1) ^d and 3A(1A) ^e FM and GS			LS	\$ 7,430,000 ^b
Alt 3A(3 and 4) - FM and GS			LS	\$ 3,387,000 ^c
Alt 3A(2) - GS			LS	\$11,113,000 ^b
SR18 Interceptor & Lift Station 11 (Alt 3A(1) ^d and 3A(1A) ^e) Total				\$11,240,000 ^b
SR18 Interceptor & Lift Station 11 (Alt 3A(3 and 4)) Total				\$ 4,508,000 ^c
SR18 Interceptor & Lift Station 11 (Alt 3A(2)) Total				\$11,113,000 ^b

^a 2002 dollars

^b County estimate

^c District estimate for comparison and reference

^d County-owned/County-built

^e County-owned/District-built

PUMP STATION B AND CONVEYANCE TO PUMP STATION D

This component project includes pump station B, and conveyance to pump station D as shown in Figure 250S-6. Pump station B operates at about 171 feet total dynamic head. Conveyance to Pump station D includes approximately 5,500 feet and 4,300 feet of forcemain and gravity sewer respectively. Conveyance to Pump station D is routed northeast along SR18 to pump station D.

The following photographs depict existing conditions along the proposed forcemain alignment. The approximate location of each photo is indicated in Figure 250S-6. A brief description of access concerns for each representative section of the proposed alignment is included.

P1: SR18 – Pump Station B to Pump Station D

Roadway and shoulder access must be maintained.



The project alignment was shown on preliminary plan and profile sheets in the *Final Task 250 Supplement Report for Soos Creek* and will not be included in this report.

PROJECT IMPACTS

Typical temporary construction related impacts may include increased noise, dust and construction vehicle traffic. Temporary partial road closures may be required. Trees and other vegetation may be impacted by pipeline and pump station excavation.

Impacts to citizens, businesses, and the environment are of concern with interceptor alignments. Access to neighboring residences and businesses must be maintained throughout construction. Impacts to traffic are expected.

Table 250S-9 lists existing utilities and roadway characteristics observed during planning level field inspection along pump station B’s conveyance alignment.

Table 250S-9. Existing Conditions - Pump Station B and Conveyance to Pump Station D.

Conveyance Component Alignment		Underground telephone	Water	Sewer	Storm Drain	Gas	Overhead Power	Underground Power	Bike Lanes	Sidewalk	Stream crossing	Easement	Street Trees	Highway	Major Arterial	Secondary Arterial	Collector	Local	Traffic Lanes	Parking Lanes			
																				2	4	1	2
P1	SR18 – Pump Station B to Pump Station D				X						X			X							X		

PERMIT REQUIREMENTS

Work within SR18’s right-of-way will require a Franchise from the Washington State Department of Transportation. A ROW Use Permit is required from the King County Roads Departments for construction within the right of way. The discharge from dewatering operations may require a section 401 water quality certificate from the Washington Department of Ecology or a King County Industrial Waste Discharge Permit. A SEPA checklist is required. Documentation associated with the Endangered Species Act may be required. A building permit will be required for the pump station. A Hydraulic Project Approval will be required for any non-tunneled stream crossings; however, the County generally, as a matter of course, does not cut through streams, creeks, or rivers.

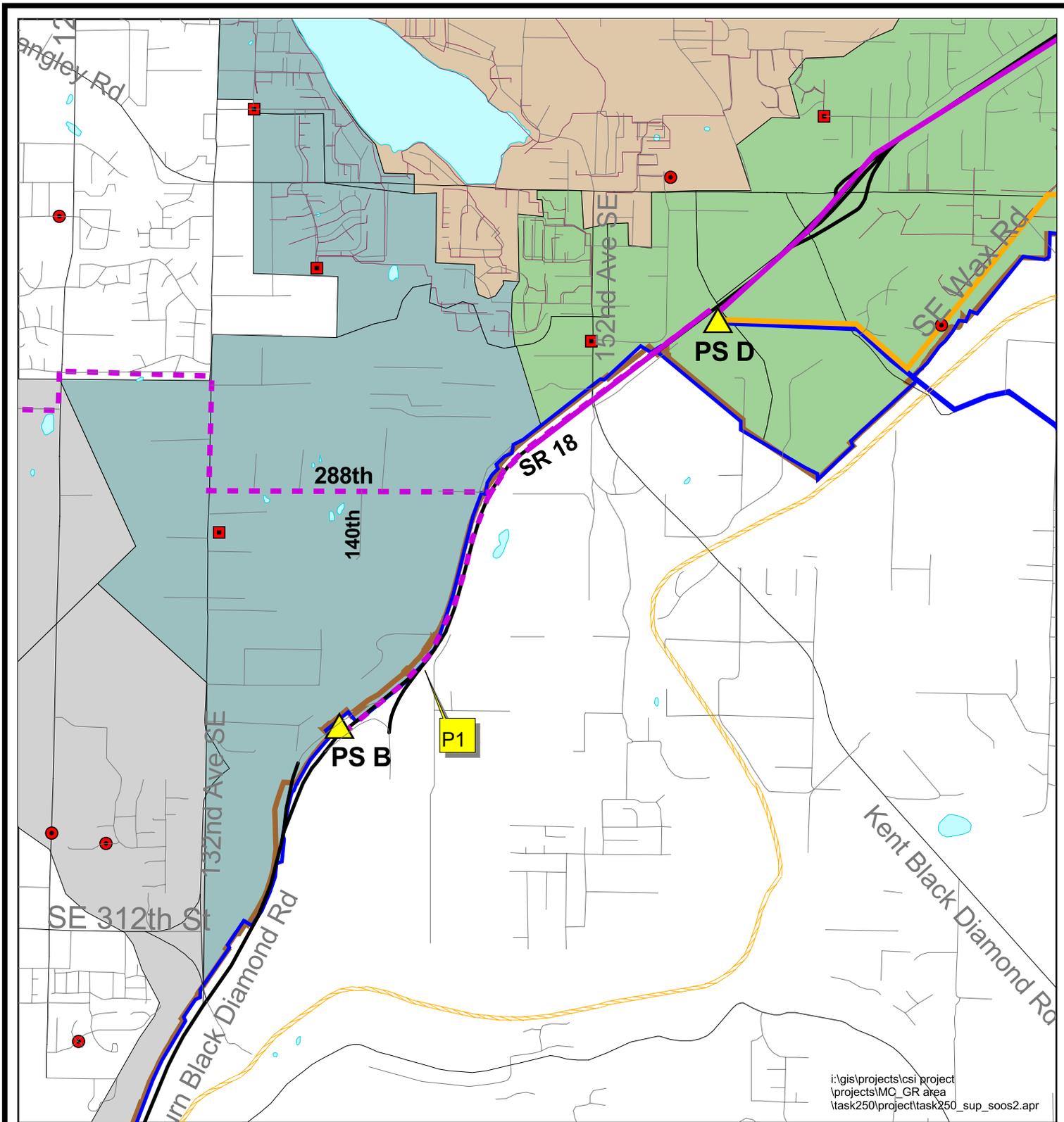
EASEMENT AND PROPERTY REQUIREMENTS

Property acquisitions are anticipated for pump station B. Easements are not anticipated for forcemain B or the gravity sewer. Further investigation into pump station siting should be conducted during the project’s predesign phase.

OPERATION AND MAINTENANCE

Pump station B’s conveyance system includes a gravity sewer and forcemain. No routine or scheduled maintenance is anticipated for either type of pipeline.

Pump stations have specific O&M requirements depending on configuration, frequency of use, and other factors. In general, design considerations to reduce labor, parts replacement and downtime should be considered during predesign.



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Figure 250 S - 6 : Soos Planning Zone
Mill Creek / Green River Subregional Planning Area
Working Alternative Component -PS B and Conveyance to PS D

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600 0 600 1200 1800 2400 3000 Feet



May 6, 2002

Legend

● Reference Point	■ Photo Reference Point
▲ Proposed Regional PS	■ MC/GR King Co Pump Stations
▲ Existing Local PS	■ MC/GR Sewerlines
● MC/GR Local PS	■ Streets - Freeways
● Local PS Continues	■ MC/GR Boundary
■ Local PS Eliminated	■ South Interceptor III
■ Railroad	■ Urban Growth Line 2000
■ Proposed Sewers	■ Stream
■ Proposed Gravity	■ Flow Projection Area
■ Proposed Forcemain	■ A
■ Existing Local Gravity	■ B
■ Existing Local Forcemain	■ C
■ County Boundary	■ D
	■ E
	■ F
	■ G
	■ H

DESIGN ISSUES AND CONSTRAINTS

Constraints to be resolved during design include connection to the existing sewer, location of pump station B, stream crossings, and avoiding or relocating existing utilities. In general, provisions must be in place to provide access to homes and businesses along the alignment throughout construction. The operation of SR18 must be maintained throughout construction.

A major design constraint is the location of pump station B. The station should be located such that most or all flows from contributing basins can be conveyed to the station by gravity pipelines. It should also have little or no impact on neighboring communities and avoid environmentally sensitive areas.

Field investigations were performed to determine suitable locations for pump station B. Several siting areas of interest are shown in Figure 250S-7. The general pump station siting area of interest is a low point in the service area along SR18 and SE 304th Street. The area surrounding the area of interest is largely developed. Further investigation into a suitable site should be conducted during the projects predesign phase.

CONSTRUCTION COST ESTIMATE

Table 250S-10 shows construction cost estimates for this project component. Quantities were developed from preliminary profiles generated from existing topography.

Table 250S-10. Estimated Construction Cost - Pump Station B and Conveyance to Pump Station D.

Working Alternative Project	Average Depth (ft)	Quantity	Unit	Estimated Construction Cost ^a (million dollars)
Pump Station B				
Pump Station B	-	1	LS	\$3,030,000
Forcemain B (open cut construction)				
12 inch	6	5,500	LF	\$1,530,000
Gravity Sewer B				
12 inch	7	2,600	LF	\$ 780,000
18 inch	4	1,700	LF	\$ 552,000
			Lift Station B Total	\$5,892,000

^a County estimate in 2002 dollars

PUMP STATION D AND CONVEYANCE TO POINT A

A regional pump station (pump station D), forcemain D, and gravity sewer convey flow to point A as shown in Figure 250S-8. Pump station D operates at about 163 feet total dynamic head. Conveyance to point A includes about 16,200 feet and 5,400 feet of forcemain and gravity sewer respectively. Forcemain D transitions to gravity sewer approximately half way between 118th Avenue SE and 124th Avenue SE. The gravity sewer continues along local roadways to its connection with the 277th Interceptor.

The following photographs depict existing conditions along the proposed forcemain and gravity sewer. The approximate location of each photo is indicated in Figure 250S-8. A brief description of access concerns for each representative section of the proposed alignment is included.

P1: SR18 – Pump Station D to SE 288th Street

Roadway and shoulder access must be maintained. SR18 offers a direct route to Pump Station D.



P2: SE 288th St – SR18 to 132nd Avenue SE

Access to roadways and homes must be maintained.



P3: 132nd Avenue SE - SE 288th St to SE 282nd St

Access to roadways, homes, and businesses must be maintained.



P4: SE 282nd St - 132nd Avenue SE to 124th Avenue SE

Access to roadways and homes must be maintained.





Figure 250 S - 7 : Soos Planning Zone
Mill Creek / Green River Subregional Planning Area
Pump Station B Siting Areas of Interest

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90 0 90 180 270 360 450 Feet



March 20, 2002

Legend

- | | |
|---|---|
| <ul style="list-style-type: none"> Proposed Sewers Proposed Gravity Proposed Forcemain Existing Local Gravity Existing Local Forcemain Urban Growth Line 2000 Stream | <ul style="list-style-type: none"> Streets - Local Pump Station Area of Interest Conveyance Sites Proposed Regional PS Existing Local PS |
|---|---|

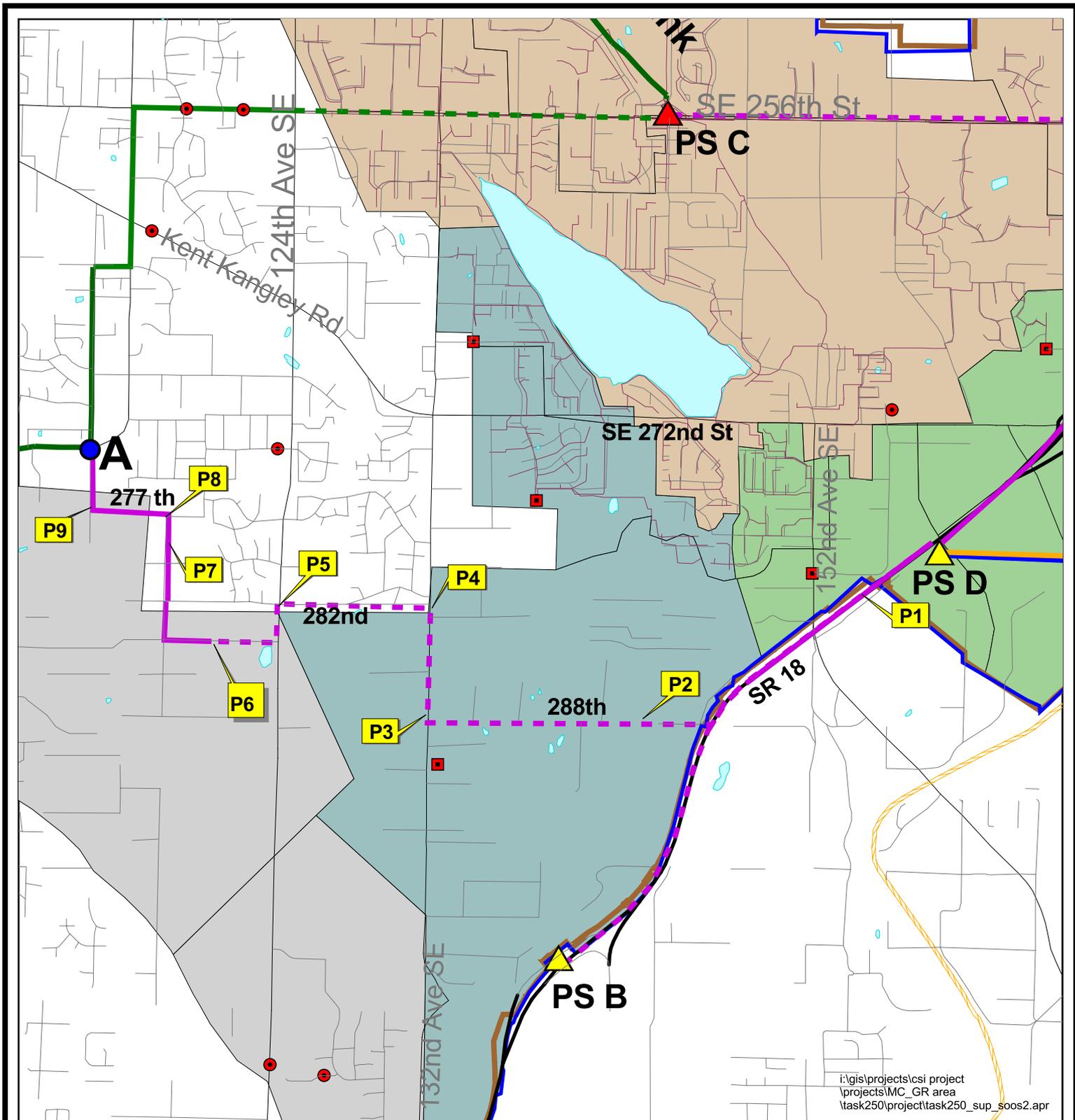
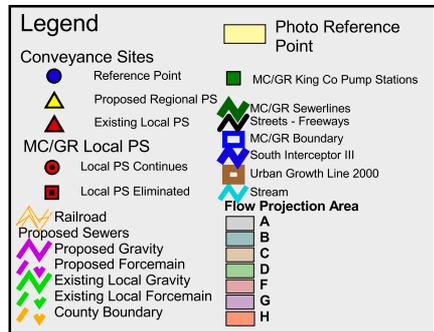
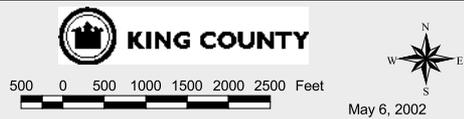


Figure 250 S - 8 : Soos Planning Zone

Mill Creek / Green River Subregional Planning Area
Working Alternative Component - PS D and Conveyance to Point A

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P5: 124th Avenue SE - SE 282nd St to SE 284th St

Access to roadways and homes must be maintained. The pipeline's alignment does not continue along SE 282nd St because there appears to be a wetland area west of 124th Avenue SE.



P6: SE 284th St - 124th Avenue SE to 118th Avenue SE

Access to roadways and homes must be maintained.



P7: 118th Avenue SE - SE 284th St to SE 277th Pl

Access to roadways and homes must be maintained.



P8: SE 277th Pl - 118th Avenue SE to 114th Avenue SE

Access to the elementary school's parking lot and playground must be maintained.



P9: 114th Avenue SE - SE 277th PI to SE 274th St

Access to roadways and homes must be maintained.



The project alignment is not shown in preliminary plan and profile sheets at the end of this project discussion. Preliminary plan and profiles were included in the *Final Task 250 Supplement Report for Soos Creek*.

PROJECT IMPACTS

Typical temporary construction related impacts may include increased noise, dust and construction vehicle traffic. Temporary partial road closures may be required. Trees and other vegetation may be impacted by pipeline and pump station excavation.

Impacts to citizens, businesses, and the environment are of concern with interceptor alignments. Access to neighboring residences and businesses must be maintained throughout construction. Impacts to traffic are expected.

Streams should not be impacted by construction. Jacking or tunneling pipeline construction methods would eliminate impacts to streams. A minimum separation of five feet is recommended between streambed and pipe crown in order to allow for natural streambed movement. Jacking and receiving pits should be placed away from the streambank to avoid erosion.

Table 250S-11 lists existing utilities and roadway characteristics observed during planning level field inspection along pump station D's conveyance alignment.

Table 250S-11. Existing Conditions - Pump Station D and Conveyance to Point A.

Conveyance Component Alignment		Underground Telephone	Water	Sewer	Storm Drain	Gas	Overhead Power	Underground Power	Bike Lanes	Sidewalk	Stream Crossing	Easement	Street Trees	Roadway Type					Traffic Lanes		Parking Lanes			
														Highway	Major Arterial	Secondary Arterial	Collector	Local	2	4	1	2		
P1	SR18 – Pump Station D to SE 288th Street				X						X			X							X			
P2	SE 288 th St – SR18 to 132 nd Avenue SE		X			X					X	X					X	X						
P3	132 nd Avenue SE - SE 288 th St to SE 282 nd St		X		X	X					X	X				X		X						
P4	SE 282 nd St - 132 nd Avenue SE to 124 th Avenue SE		X		X	X					X	X				X		X						
P5	124 th Avenue SE - SE 282 nd St to SE 284 th St		X		X	X						X				X		X						
P6	SE 284 th St - 124 th Avenue SE to 118 th Avenue SE		X		X	X						X				X		X						
P7	118 th Avenue SE - SE 284 th St to SE 277 th PI		X		X	X						X				X		X						
P8	SE 277 th PI - 118 th Avenue SE to 114 th Avenue SE											X												
P9	114 th Avenue SE - SE 277 th PI to SE 274 th St		X		X			X				X				X	X							

PERMIT REQUIREMENTS

Work within SR18’s right-of-way will require a Franchise from the Washington State Department of Transportation. A ROW Use Permit from King County Roads Department is required for construction within the right of way. The discharge from dewatering operations may require a section 401 water quality certificate from the Washington Department of Ecology or a King County Industrial Waste Discharge Permit. A SEPA checklist is required. Documentation associated with the Endangered Species Act may be required. A building permit will be required for the pump station. A Hydraulic Project Approval will be required for non-tunneled stream crossings; however, the County generally, as a matter of course, does not cut through streams, creeks, or rivers.

EASEMENT AND PROPERTY ACQUISITION

Property acquisitions are anticipated for pump station D. Easements are not anticipated for the gravity sewer or forcemain D. Further investigation into pump station siting should be conducted during the project’s predesign phase.

OPERATION AND MAINTENANCE

Pump station D’s conveyance system includes a gravity sewer and forcemain. No routine or scheduled maintenance is anticipated for either type of pipeline.

Pump stations have specific O&M requirements depending on configuration, frequency of use, and other factors. In general, design considerations to reduce labor, parts replacement and downtime should be considered during predesign.

DESIGN ISSUES AND CONSTRAINTS

Constraints to be resolved during design include connection to the existing sewer, location of pump station D, stream crossings, and avoiding or relocating existing utilities. In general, provisions must be in place to provide access to homes and businesses along the alignment throughout construction. The operation of SR18 must be maintained throughout construction.

A major design constraint is the location of pump station D. The station should be located such that most or all flows from contributing basins can be conveyed to the station by gravity pipelines. It should also have little or no impact on neighboring communities and avoid environmentally sensitive areas.

Field investigations were performed to determine suitable locations for pump station D. Several siting areas of interest are shown in Figure 250S-9. The general pump station siting area of interest is a low point in the service area on the east side of SR18 at about SE 280th Street. Further investigation into a suitable site should be conducted during the projects predesign phase.

CONSTRUCTION COST ESTIMATE

Table 250S-12 shows construction cost estimates for this project component. Quantities were developed from preliminary profiles generated from existing topography.

Table 250S-12. Estimated Construction Cost-Pump Station D and Conveyance to Point A.

Working Alternative Projects	Average Depth (ft)	Quantity	Unit	Estimated Construction Cost ^a (million dollars)
Pump Station D				
Pump Station D	–	1	LS	\$ 7,140,000
Forcemain D (open cut construction)				
30 inch	6	16,200	LF	\$ 7,850,000
Pipeline (open cut construction)				
24 inch	14	1,200	LF	\$ 699,000
36 inch	13	4,200	LF	\$ 3,060,000
			Pump Station D Total	\$18,749,000

^a County estimate 2002 dollars

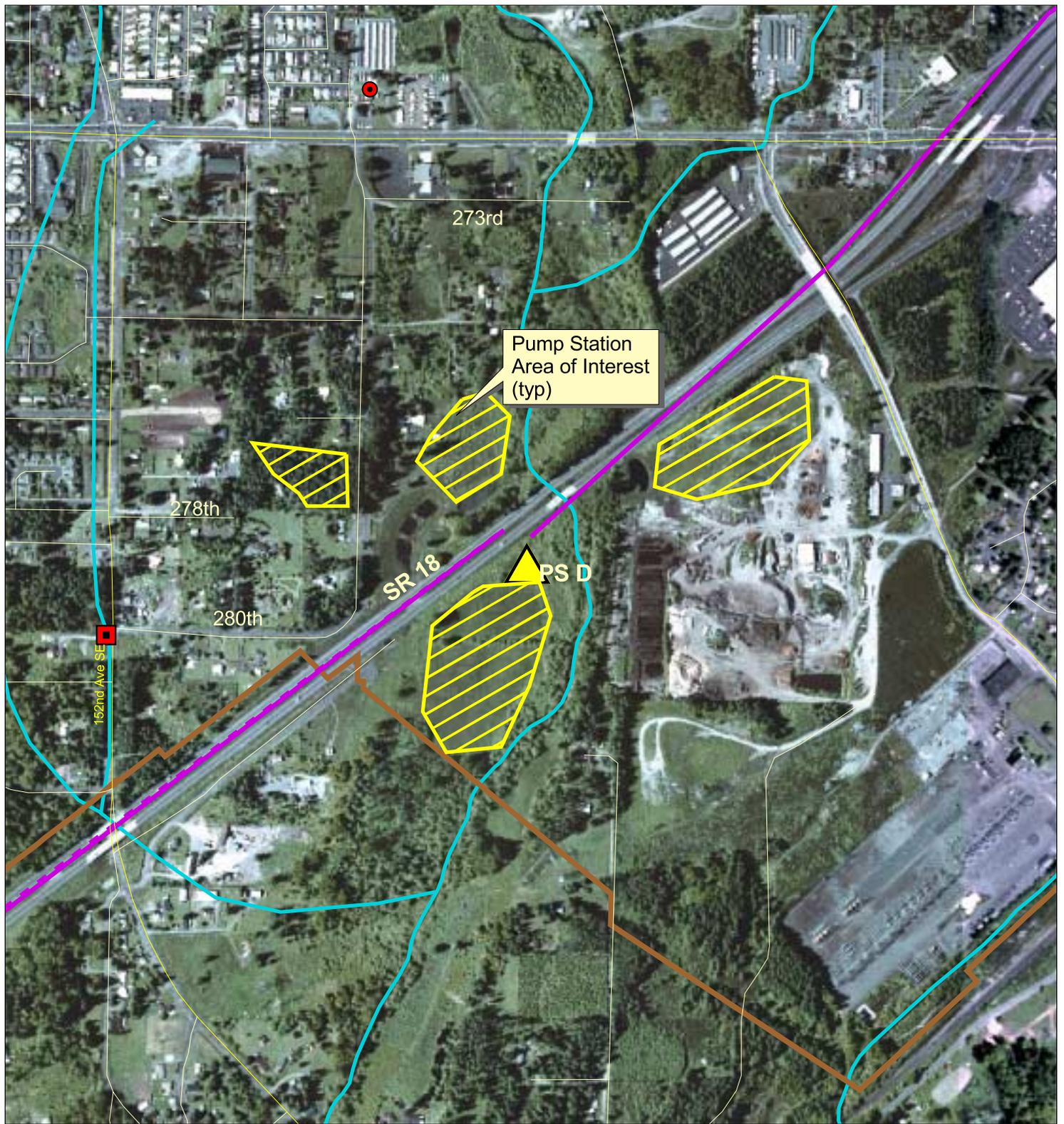


Figure 250 S - 9 : Soos Planning Zone

Mill Creek / Green River Subregional Planning Area Pump Station D Siting Areas of Interest

i:\gis\projects\csi project
 \projects\MC_GR area
 \task250\project\task250_sup_soos2.apr

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200 0 200 400 600 800 1000 Feet

March 20, 2002

Legend

- | | |
|--|--|
| <ul style="list-style-type: none"> Proposed Sewers Proposed Gravity Proposed Forcemain Existing Local Gravity Existing Local Forcemain Urban Growth Line 2000 Stream | <ul style="list-style-type: none"> Streets - Local Pump Station Area of Interest <ul style="list-style-type: none"> Conveyance Sites Proposed Regional PS Existing Local PS |
|--|--|

TIMING

Two scenarios were developed in the *Mill Creek/Green River Final Task 250 Report* to address the Inflow and Infiltration (I/I) effects on the County's system. The first scenario looked at reducing I/I by 20 percent in all Flow Projection Areas (FPAs), in all decades, under all storms. This type of reduction requires the rehabilitation of both existing and future sewers. The second scenario assumed that I/I is limited to 1,100 gallons per acre per day (gpad) for all new construction and avoids rehabilitation of existing sewers. In the 1,100 gpad scenario, the projections for new sewered area are escalated by a 7 percent per decade degradation factor. The result for the Soos Planning Zone was a reduction in peak flow of 17 percent for both of the scenarios. The 20 percent scenario alone may not yield results soon enough to impact the design of facilities required to provide capacity by the year 2010. Subsequent studies should investigate the feasibility of implementing the 1,100 gpad scenario in conjunction with working alternatives 3A(1-4). Direct costs will likely be much higher to implement the 20 percent scenario than the 1,100 gpad scenario. All I/I data and reduction scenarios will be refined and re-evaluated in predesign.

The required timing of County facilities in this report was evaluated based on no I/I reduction and a 17 percent reduction in peak flow.

The construction of pump station H drives the timing for all downstream projects. The timing of pump station H depends on when pump station G's capacity of about 2.0 mgd is exceeded. With no I/I reduction program, this is projected to occur around the summer of 2005. Either the 20 percent or the 1,100 gpad scenario results in about a 17 percent reduction in peak flows. Therefore, implementation of either I/I program results in a need for pump station H in about 2007 as shown in Graph 250S-1.

The timing and sequencing of all other components is dependent on the timing requirements to bring pump station H on line. Therefore, if I/I reduction can be achieved, the need for all other components will be adjusted by a period of time similar to the adjusted time period for pump station H.

Changes in projected development and associated wastewater flows will also impact the required timing for pump station H and downstream facilities. According to the City of Black Diamond's planning department, they currently have a moratorium on new subdivisions based on zoning issues. In addition, they do not currently have adequate water supply to serve new development. They are negotiating with the City of Tacoma to obtain adequate water supply. Both of these issues are expected to be resolved within the next few years, but may impact the speed of development.

The general timing of projects is shown in Figure 250S-10.

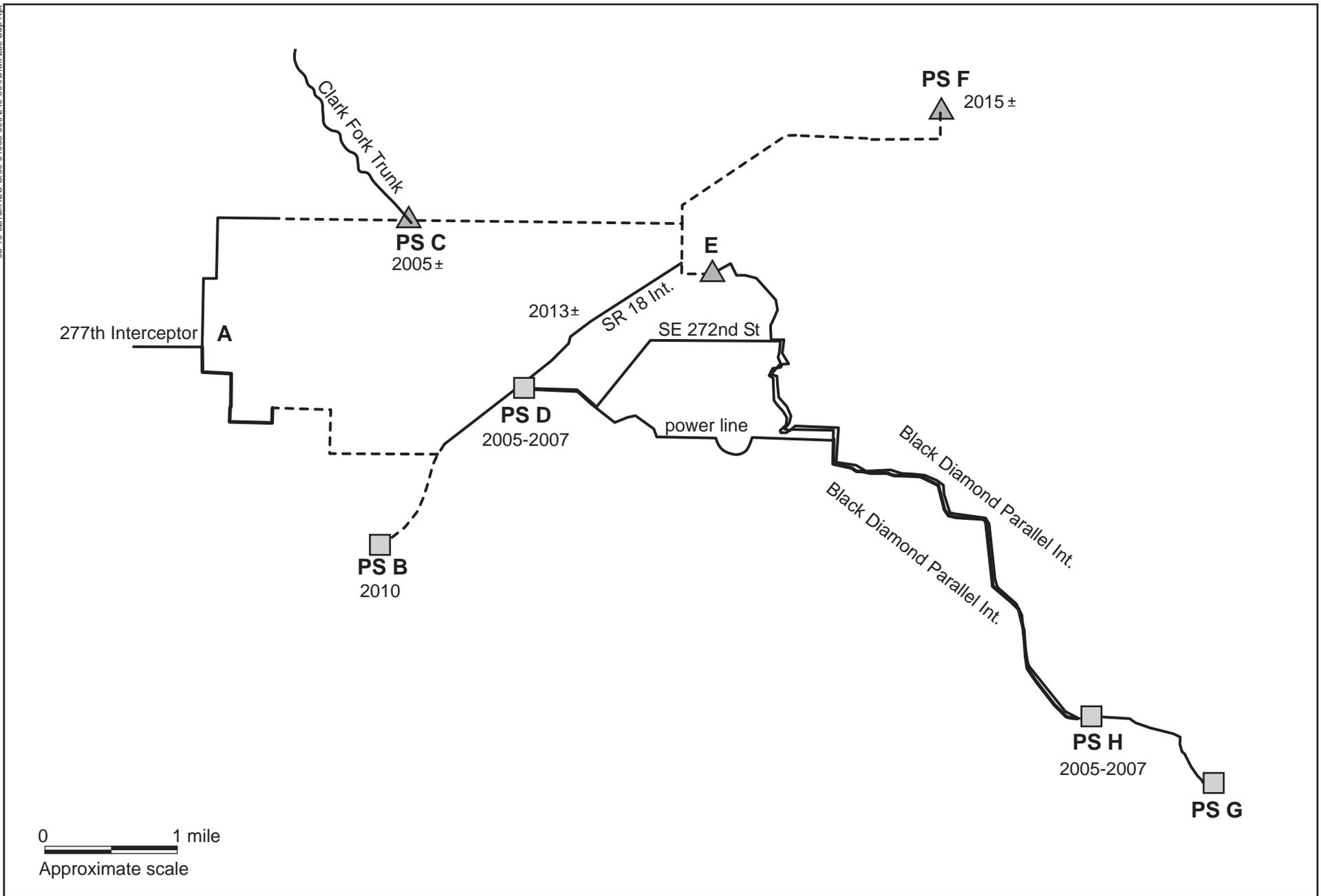
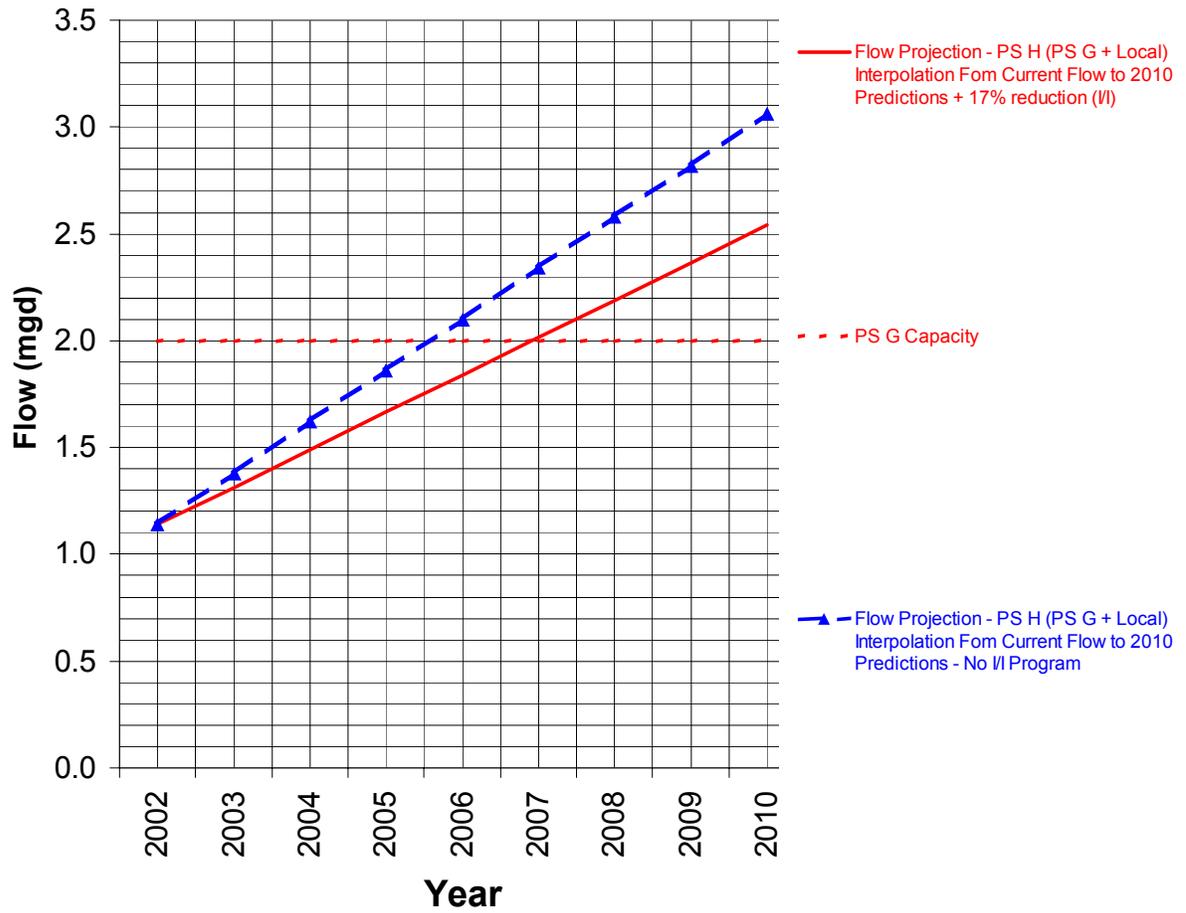


Figure 250 S-10: Soos Planning Zone
Mill Creek/Green River Subregional Planning Area
Approximate Component Timing



Graph 250S-1. Pump Station H Timing (Black Diamond Flow)

