Arrowsmith Water Service Englishman River Water Intake, Treatment Facilities and Supply Mains

Phase 1 Conceptual Planning, Budgeting and Scheduling

AWS Board Meeting

April 26, 2011

Associated Engineering

KOERS & ASSOCIATES ENGINEERING LTD. Consulting Engineers

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Presentation Outline

- The Study
- What conclusions can we draw?
- Intake and WTP siting – selection process
- Water supply program – What will it look like?
- 2011 activities
- 2012 to 2016 activities

The Study Objectives

- Review prior work and determine future water supply needs for the AWS communities
- Determine the site and development concept for a new intake and water treatment plant on the Englishman River
- Determine how the surface water (also termed bulk water) and groundwater resources can best be managed over the next 40 years

The Study Activities

- Population Growth Trends
- Water Demands
- Groundwater Management
- Water Intake and Treatment Plant Locations
- Water Supply Infrastructure
- Water Supply Strategic Plan

Fourteen discussion papers. Draft Summary Report was issued December 2010. Final report issued April 26, 2011

What Conclusions Can We Draw?

Conclusion 1:

Climate changes will lead to more extreme events – both drought conditions and flood events.

During extreme drought conditions, there may be insufficient water in the Englishman River to meet current fisheries release and domestic water license extraction quantities.

What Conclusions Can We Draw?

Conclusion 2:

Water supply over the next 40 years will be a combination of groundwater supply and surface water supply from the Englishman River.

- Existing groundwater wells will continue to be operated. Any increased usage will be managed to not exceed sustainable aquifer yield
- By 2050, about 50% of the overall annual water supply will come from the Englishman River

What Conclusions Can We Draw?

Conclusion 3:

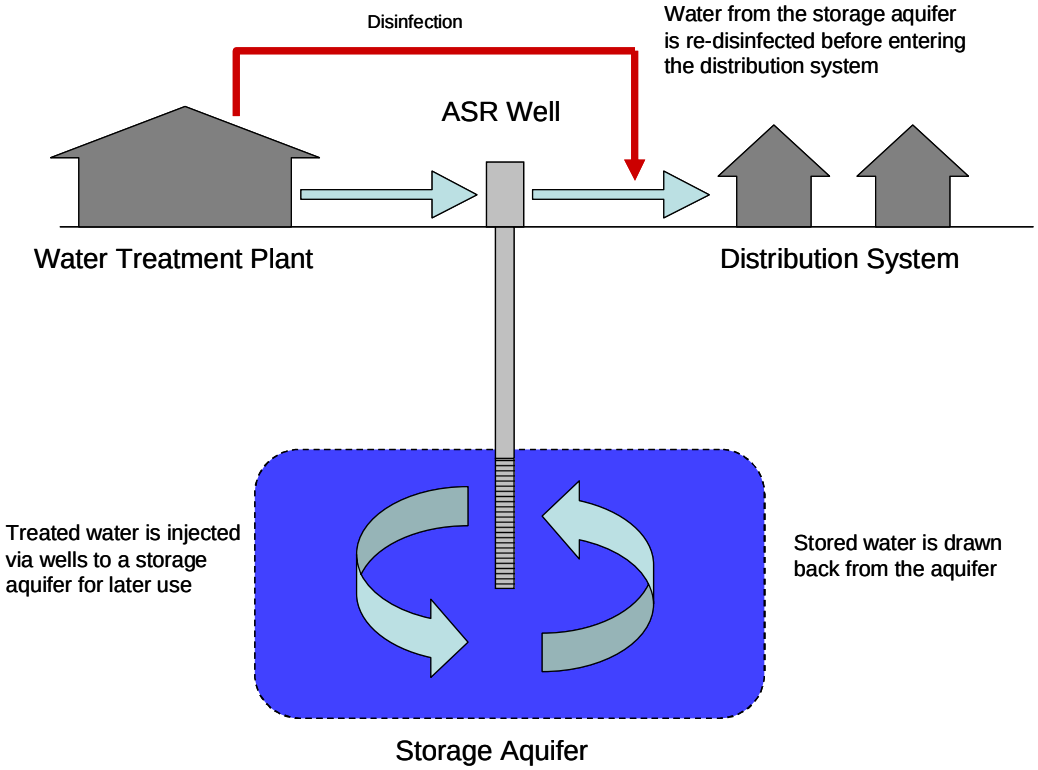
Service areas will require differing quantities of bulk water at different times over the 40 years.

Service Area	When is Bulk Water Needed?	Projected Need in 2050
City of Parksville	2016	54%
RDN Nanoose	2016	22%
RDN French Ck	Timing is to be determined	18%
Town Qualicum Beach	About 2040	6%

What Conclusions Can We Draw?

Conclusion 4:

Aquifer Storage and Recovery (ASR) could play a major role as a “third water source”.



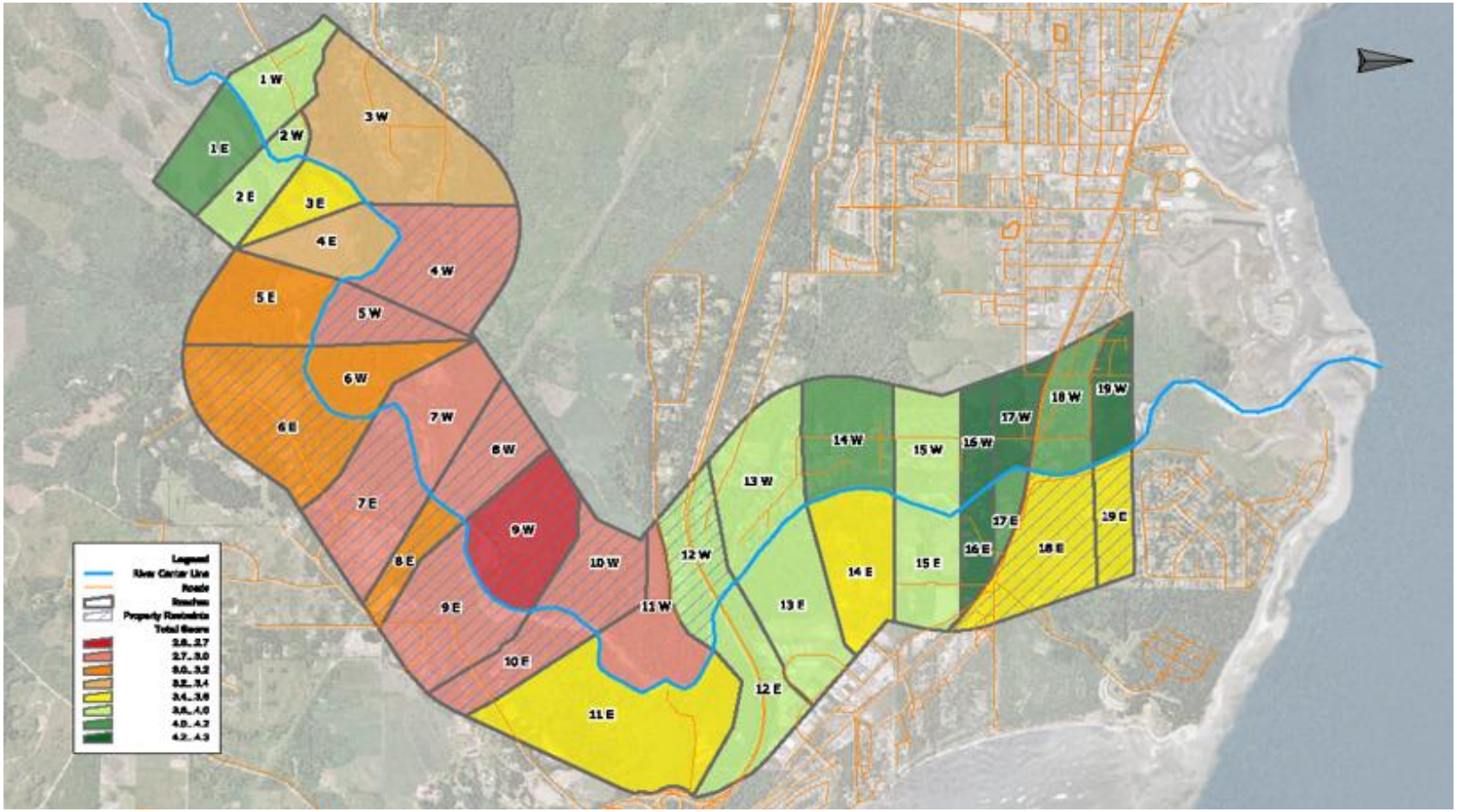
What Conclusions Can We Draw?

Conclusion 5:

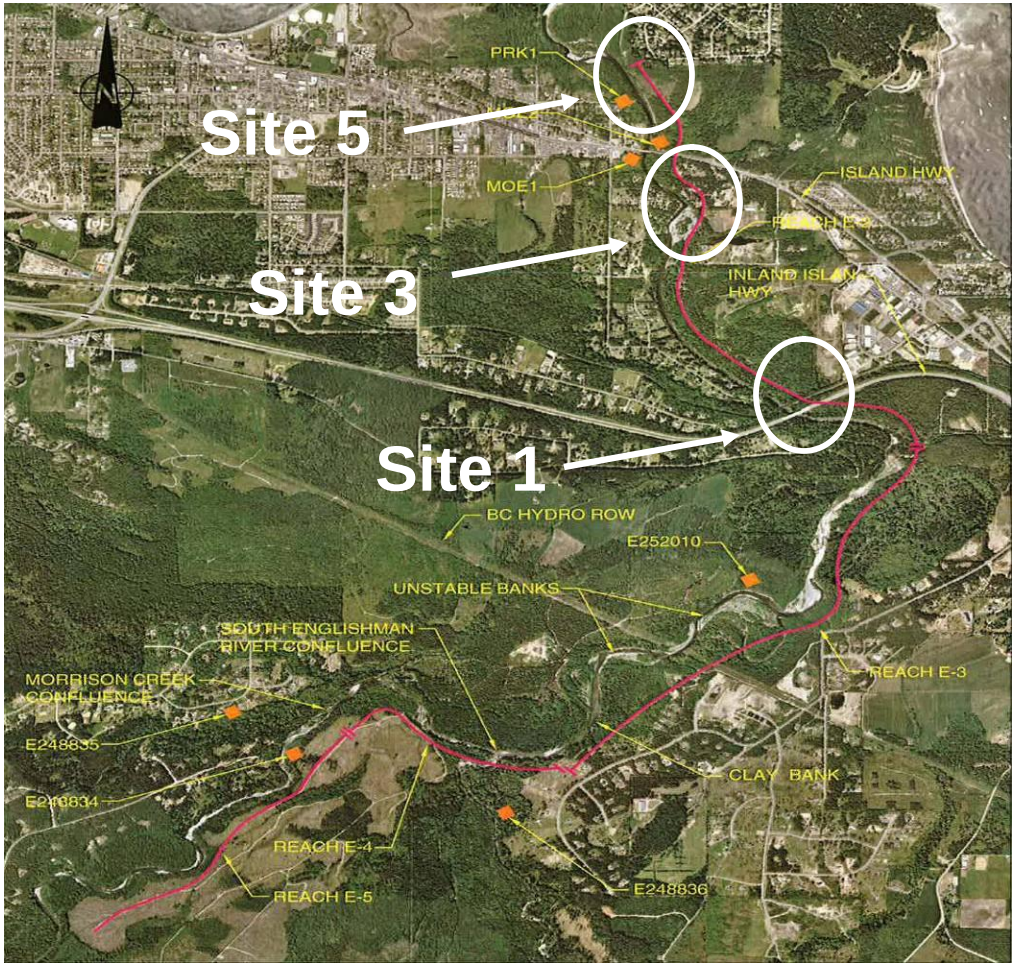
Based on a broad review of sites along the lower Englishman River:

- The best location for the water treatment plant is in the industrial area adjacent to the Parksville Works Yard.
- The best location for the water intake location is upstream of Hwy 19

Constraint Mapping Process

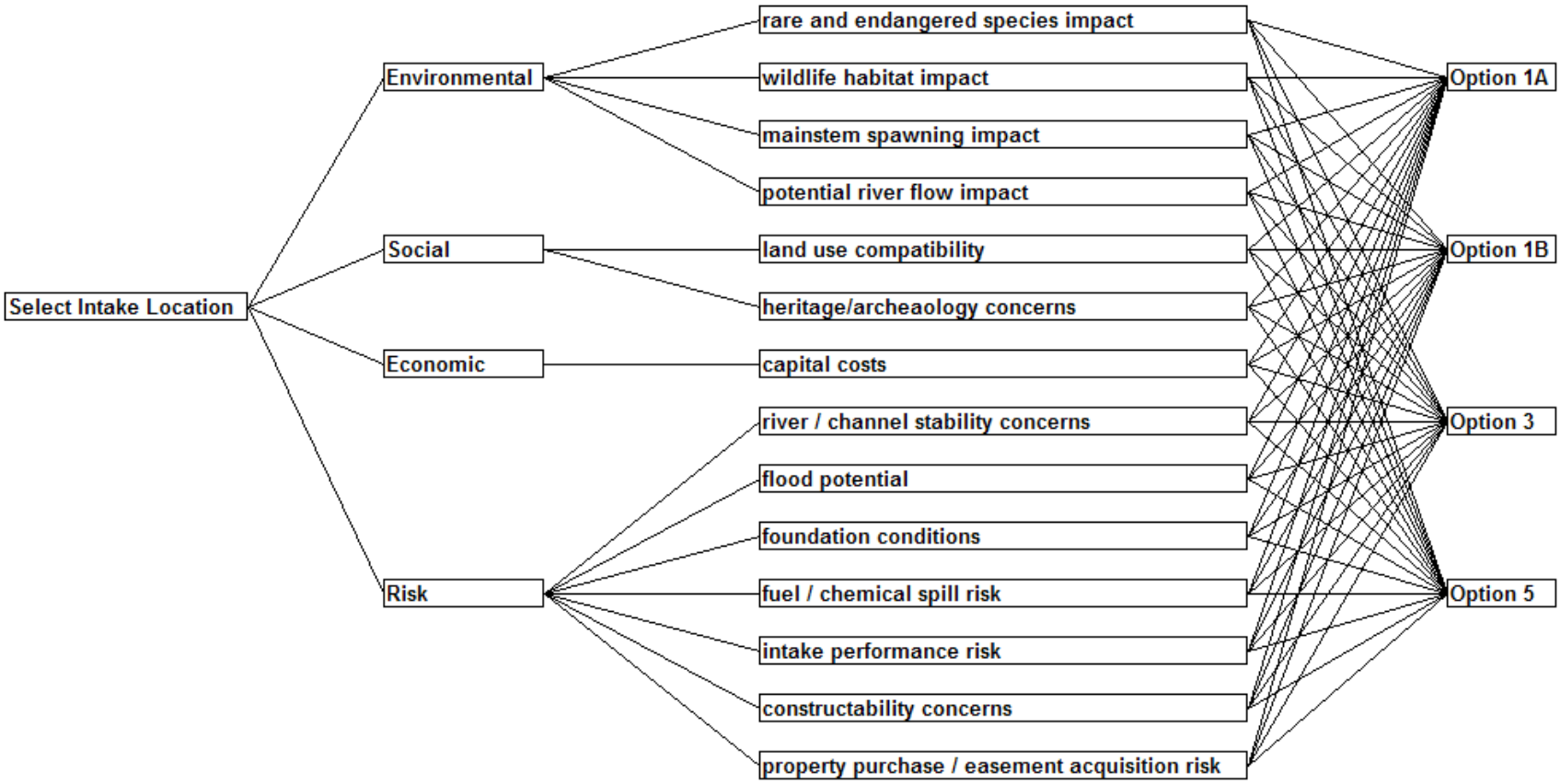


Four Short-Listed Sites

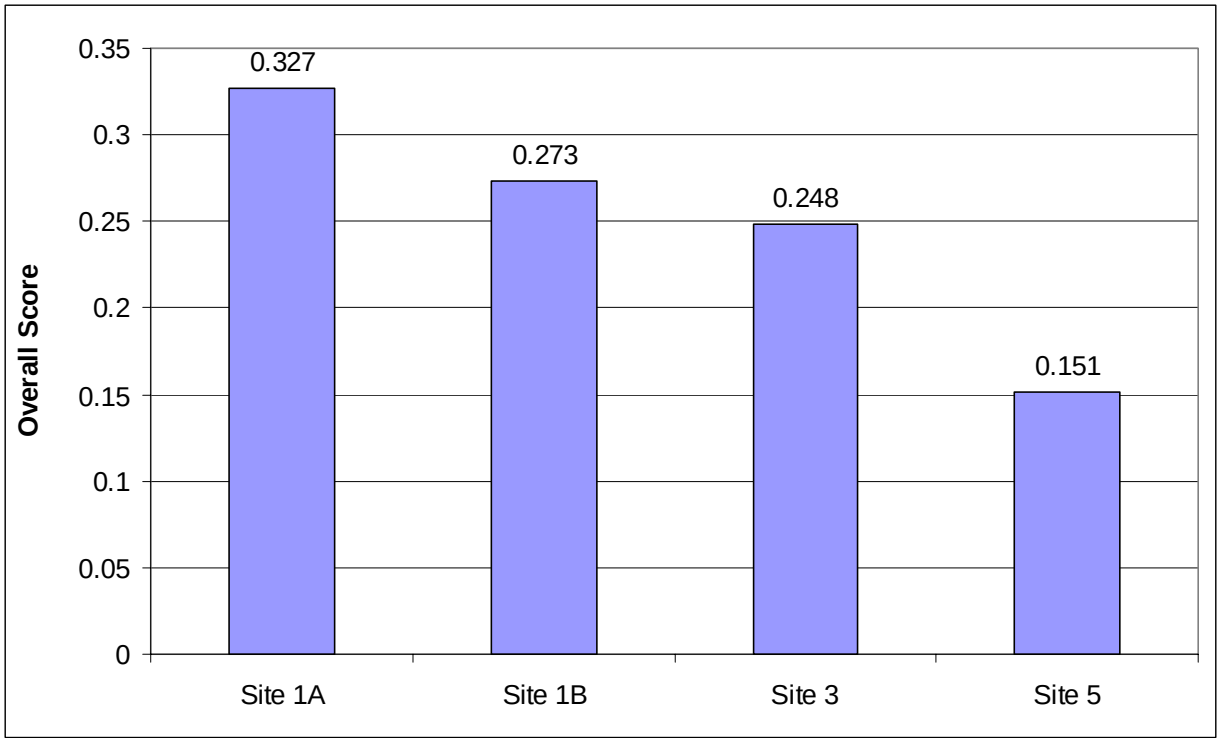


Decision Criteria – Final Site Selection

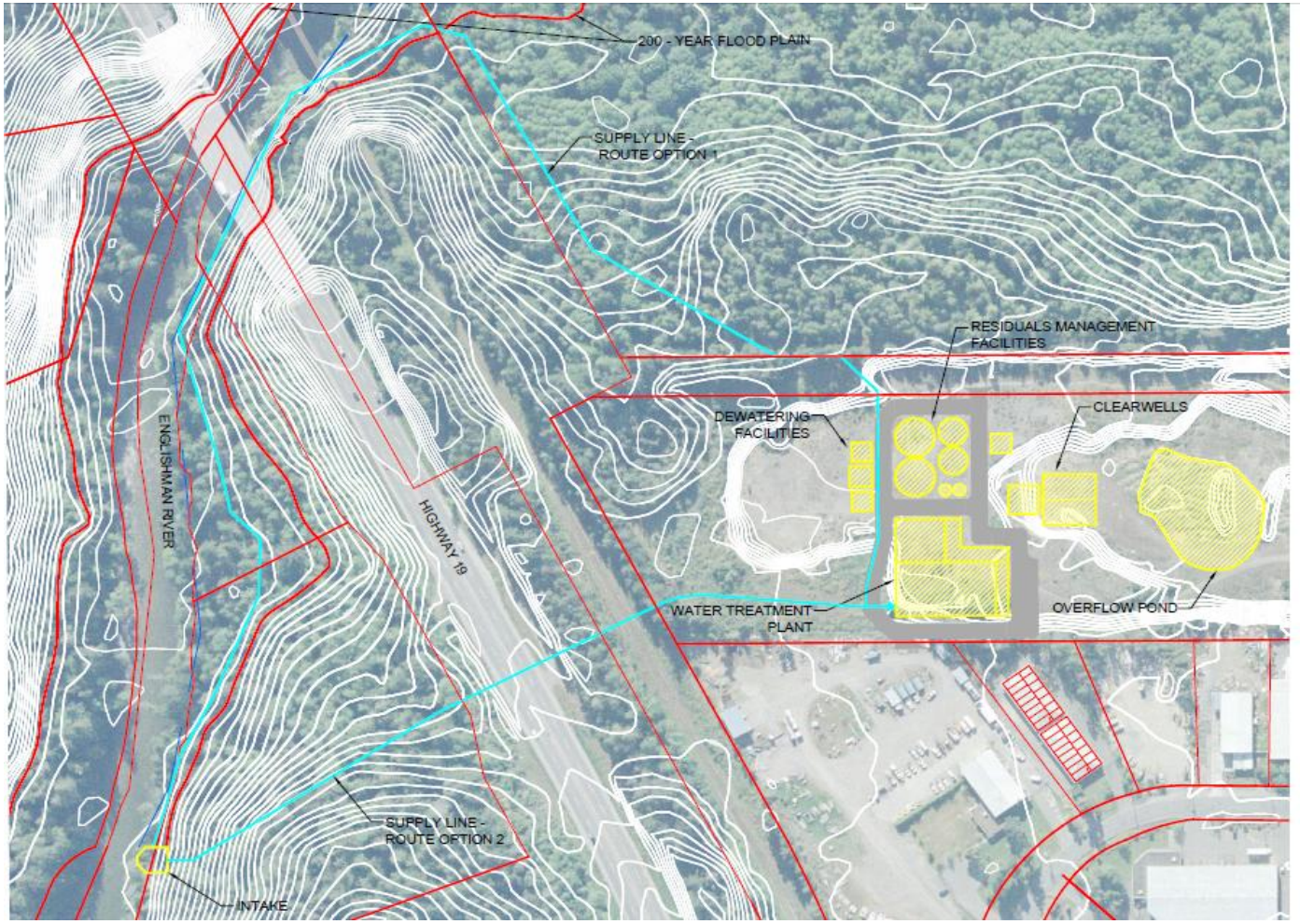
Goal Level	Main Criteria	Sub-Criteria	Options



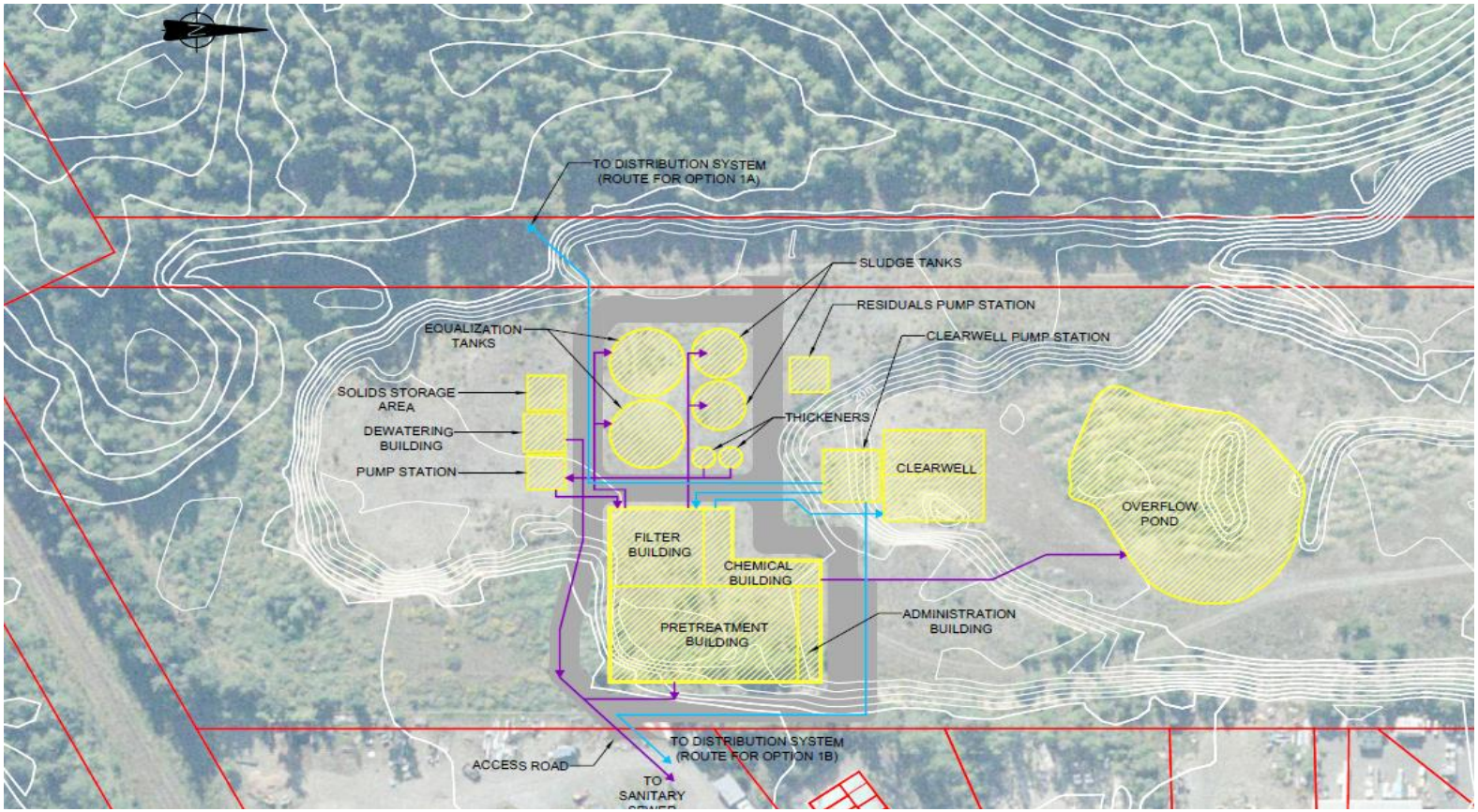
Decision Criteria – Final Site Selection



Site 1 (Intake and WTP Sites)



Conceptual Water Treatment Plant Site Development (Illustrative)



Water Supply Program – What Will it Look Like?

- Conceptual, process, governance and financial planning in 2011
- ASR feasibility confirmation by end of 2013
- Design and construction of the water intake and first stage of the WTP and connecting watermains in 2012 to 2016
- ASR implementation by 2016
- Additional WTP capacity and water distribution capacity constructed in later stage(s)

Estimated Costs

- Conceptual level capital cost of first stage is estimated at $37 million (2010 dollars)
- Conceptual level total capital cost over 40 years is estimated at $52 million (first and subsequent stages, 2010 dollars)
- Program should be attractive for senior government funding given the regional cooperation and ASR elements

2011 AWS Activities

Required Activities

- Continue conceptual level planning
- Discussions with regulators
- Explore senior government funding
- Develop a financial rate structure model
- Secure required properties and easements
- Carry out raw water characterization and bench scale treatment process testing
- Start process pilot testing
- Carry out first phase of ASR feasibility analysis
- Communications Planning

2012 to 2016 AWS Activities

2012 and 2013

- Engage a design consultant
- Complete process selection
- Finalize approvals
- Secure senior government funding
- Detailed design of intake, WTP and water transmission mains
- Complete ASR feasibility analysis
- Borrowing approval

2014 to 2016….. and beyond

- Tender construction contracts
- Construction
- Commissioning
- Operation and maintenance of new facilities

Questions?