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Osoyoos Irrigation District Water Supply and Treatment Cost/Benefit Review

Public Meeting

October 23, 2008

Objective

- Review Project Requirements
- Review of Options
- Costs
- Recommended Alternative

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Project Requirements

- Identify cost-effective options to improve OID water quality.
  - Feasibility assessment of each design
  - Identify and recommend option with the best cost-benefit.

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Deliverable

- Final Summary Report
  - Tech Memo 1 – System Options Development
  - Tech Memo 2 – Options Assessment

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Existing OID System

- Constructed in 1967
- 140 Domestic Connections
- 40 agricultural connections
- 163 ha of agriculture
- Screen intake - 10.7 m deep
  - 300 m intake to pump house on 45th St.
- Four vertical turbine pumps in wet well (158 Lps @ 110 TDH)
- Gas chlorination system
- A 180,000 litre balancing reservoir,
- Distribution system – pipelines 75 mm to 300 mm
- Currently on a Standing Boil Water Notification.

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Water Demand Design Criteria

Designed to meet maximum day demand (MDD)

- Residential Demand MDD = 180 connections at 900 L/day = 0.175 ML/day.
- Agricultural Demand (163 ha) MDD = 13.1 ML/day.
- Total Combined Demand = 13.3 ML/day

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Assumed Upgrades

- Loop the system
  - Based on TRUE (1988)
  - less water stagnation, improving taste and odour and minimizing corrosion.
- Fire flows through the existing irrigation system.
- New water meters.

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Proposed Servicing Options

- Option 1 – Osoyoos Lake Treated Supply
- Option 2 – Osoyoos Lake Treated Domestic Supply
- Option 3 – Groundwater Domestic Supply
- Option 4 – Osoyoos Lake Supply with Point of Entry Treatment
- Option 5 – Town of Osoyoos Supply

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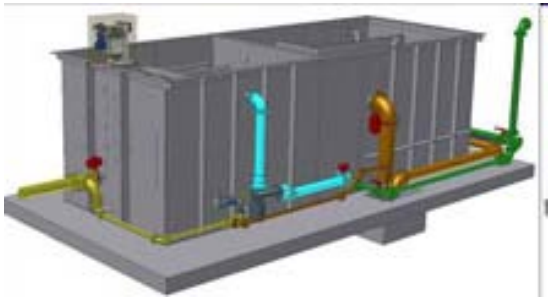
Option 1 – Osoyoos Lake Treated Supply

- Concept
  - All OID water treated to the minimum IHA.
  - New high lift pump station and WTP.
  - Existing station converted to low lift to feed the WTP.
  - WTP to treat 13.3 ML/day.
    - flocculation, clarification, filtration, chlorination and residue management and a building.
- Potential Issues
  - 98 % of capacity is to agriculture.
- Advantages
  - No pipeline twinning costs



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Options 2 and 2a – Osoyoos Lake Treated Domestic Supply

- Concept
  - Twin pipeline strategically
  - Add new WTP and pump house
  - Option 2a – assumes POE to farms
  - New treated water supply main to the new twinned distribution system.
  - The existing intake and pump station would continue to operate for irrigation and fire flow.

- Advantages
  - All domestic users get treated water
  - Fire still on Agr System
- Potential Issues
  - Land ownership and location of WTP

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Options 3 and 3a – Groundwater Domestic Supply

- Concept
  - Golder Associates Ltd. examined using groundwater from a contained aquifer
  - Assumed direct residential consumption only, not GUDI and within boundary
  - Includes
    - well installations, new water supply mains and new chlorination units.
  - Option 3a assumed adds POE instead of twinning to farms no directly in line.
- Advantages
  - Likely no WTP plant
  - Lowest cost
- Issues
  - Quality of groundwater is not currently known
  - Quantity must be verified.
  - Twinning still required.
  - Requires chlorination
  - DBPD required at potential cross connections.

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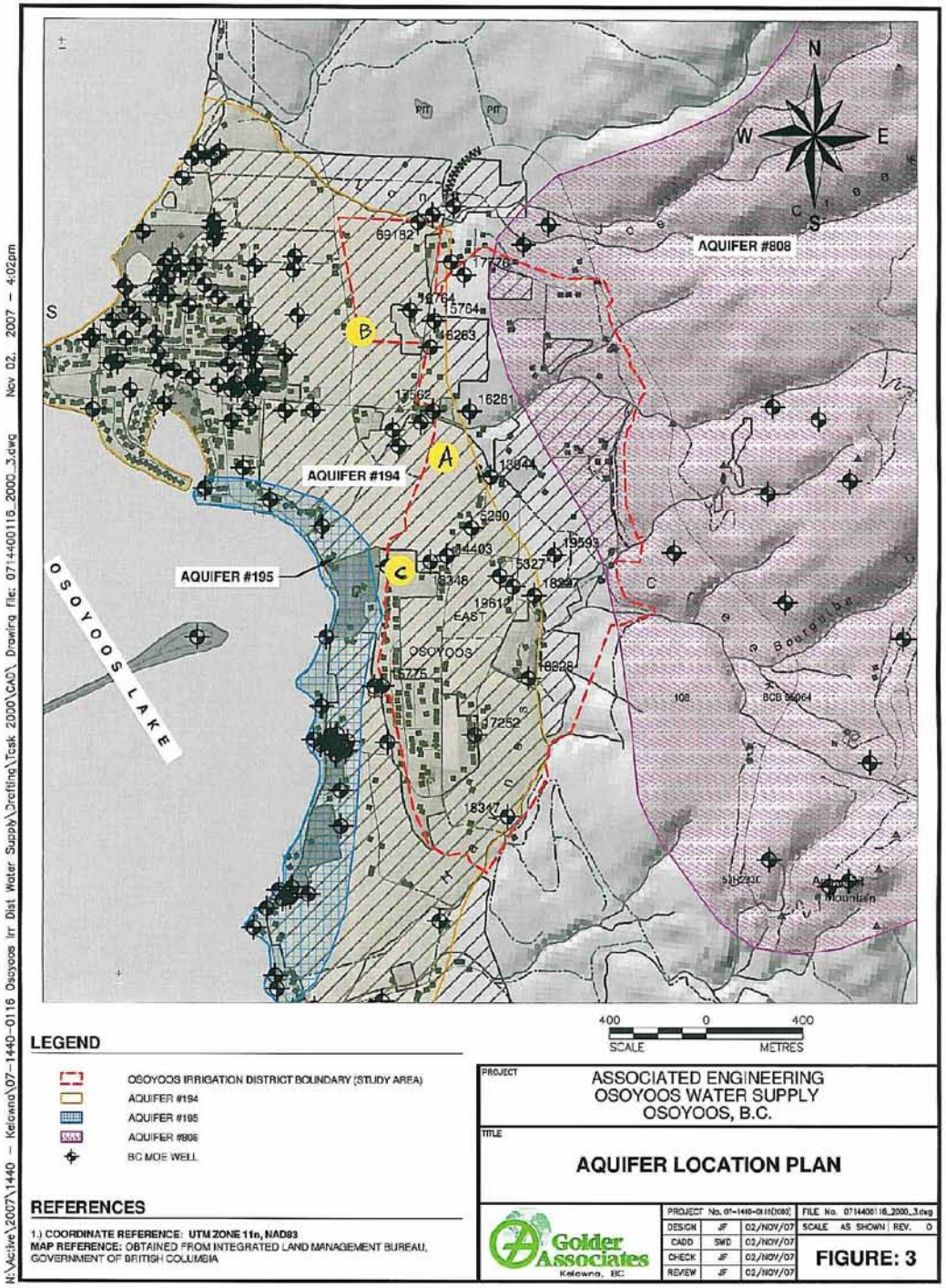

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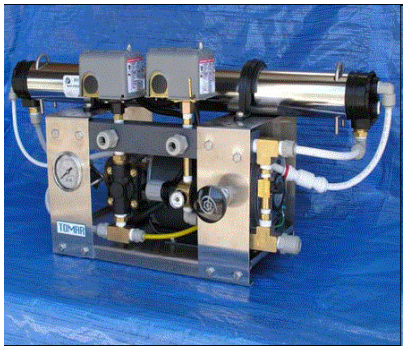
Option 4 – Osoyoos Lake Supply with Point of Entry Treatment



- Concept
  - Keep existing system and add POE.
- Advantages
  - No large initial capital cost
  - Little change to existing infrastructure.
- Potential Issues
  - Pump pressure may need to be increased, or local pressure upgraded.
  - District continues to be at risk.
  - High O&M costs
  - Long term maintenance of irrigation system.

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Option 5 – Town of Osoyoos Supply

- Concept
  - Construct twinned pipeline to domestic services,
  - Connect to Town Pipeline on Lakeshore.
- Advantages
  - Separates irrigation and domestic use.
  - Risk taken out of hands
- Potential Issues
  - Farms serviced by POE's or twinned pipe (OID responsibility?)
  - Town system is groundwater.
  - Rates not in control of OID users.
  - Cost of twinning pipeline may be higher due to fire flow.
  - Town currently not interested in absorbing District.

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Evaluation of Options (TM-2)

- Cost and Cost Risk
  - capital cost, life-cycle cost per lot, government funding dependency, constructability, potential political implementation risk, direct ability to control future costs, and facilities site availability.
- Source Capacity/Quality
  - available source capacity, raw water quality, and source resilience to water quality deterioration.
- Treated Water Quality
  - treatment conformance with IHA, risk of human consumption of lower quality water, and flexibility for phasing filtration.
- Operation and Security
  - operational robustness, operational flexibility, and security.
- Environmental Impact
  - construction impacts and operational impacts.

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Option	Name	Supply and Distribution System Capital Cost	Water Treatment Capital Cost	Capital Cost	Initial Annual O&M Cost
1	Osoyoos Lake Treated Supply	$2,283,000	$7,968,350	$10,251,350	$528,026
2	Osoyoos Lake Treated Domestic Supply	$3,420,000	$358,800	$3,778,800	$35,896
2a	Osoyoos Lake Treated Domestic Supply (POE in Rural Residences)	$2,125,000	$622,800	$2,747,800	$58,896
3	Groundwater Domestic Supply	$3,613,000	$23,400	$3,636,400	$20,466
3a	Groundwater Domestic Supply (POE in Rural Residences)	$2,211,000	$221,400	$2,432,400	$43,240
4	Osoyoos Lake Supply with POE Systems	$764,000	$1,188,000	$1,952,000	$138,820

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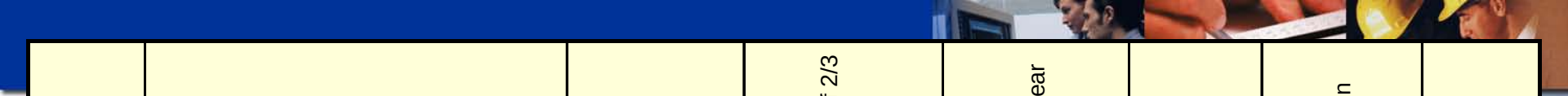

Option	Name	Capital Cost	Capital Cost Based on Gov't Grant of 2/3 of Capital Costs	Inflated O&M Life Cycle Cost – 20 year	No. of Connections	Net Life Cycle Cost Per Connection	Total Annual Cost per Lot
1	Osoyoos Lake Treated Supply	$10,251,350	$3,617,000	$12,829,640	180	$103,524	$5,176
2	Osoyoos Lake Treated Domestic Supply	$3,778,800	$1,460,000	$872,177	180	$17,863	$893
2a	Osoyoos Lake Treated Domestic Supply (POE in Rural Residences)	$2,747,800	$1,116,000	$1,431,017	180	$17,900	$895
3	Groundwater Domestic Supply	$3,636,400	$1,412,000	$497,270	180	$15,352	$768
3a	Groundwater Domestic Supply (POE in Rural Residences)	$2,432,400	$1,011,000	$1,050,607	180	$14,851	$743
4	Osoyoos Lake Supply with POE Systems	$1,952,000	$851,000	$3,372,972	180	$26,326	$1,316

Notes:

1) Assumed Interest Rate 5.00%
2) Assumed Inflation Rate 2.00%
3) Land Acquisition costs are not applicable for grant.

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Recommendations

- The Regional District review this report with the Community at Large to receive feedback on the options presented herein and impacts on taxes.
- As a first step, water quality testing be completed for a full suite of parameters including metals, fertilizers, pesticides and microbiology to confirm the quality of groundwater and its suitability as a drinking water source.
- Confirm with the provincial government the potential for obtaining provincial government funding for the project.
- Assuming water quality meets project requirements, a test well should be drilled to confirm long term production capacity.
- Assuming that ground water quality and quantity meet project requirements, proceed on the basis of Option 3.
- Before proceeding with final design, the OID should further investigate reducing the design residential domestic demands with the implementation of flow metering.

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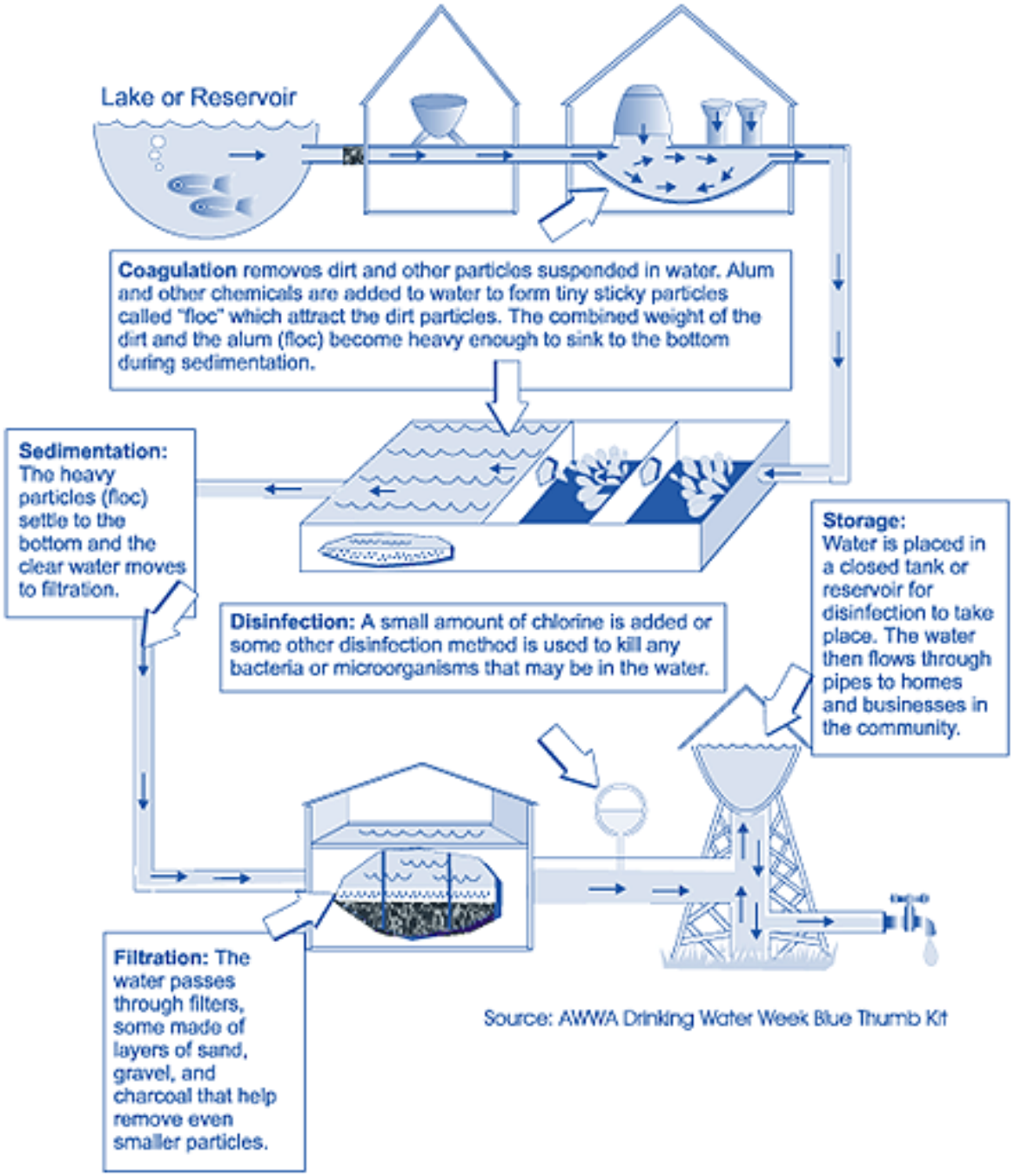

Source: AWWA Drinking Water Week Blue Thumb Kit

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