Regional District of Okanagan-Similkameen
Liquid Waste Management Plan *Update*
Gallagher Lake & Vaseux Lake Area

Public Information Meeting

John Van Andel, P.Eng.

Tim Forty, P.Eng.

September 13, 2011

Public Information Meeting – September 13, 2011

Agenda & Meeting Objectives

- Welcome & Introductions
- Provide an overview of the options identified for the management of liquid wastes for the Gallagher Lake and Vaseux Lake areas
  - Present the ***Preferred Solutions*** for the management of liquid wastes that were selected by the Wastewater Advisory Committee, and
  - Explain why other competing options were not selected

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Wastewater Advisory Committee (WAC) Members

Active Members

ORGANIZATION	TITLE	FIRST NAME	LAST NAME
RDOS - Director Area C	Mr.	Allan	Patton
RDOS - Director Area D	Mr.	Tom	Styffe
RDOS	Ms.	Liisa	Bloomfield
RDOS	Mr.	Doug	French
RDOS	Mr.	Alf	Hartviksen
RDOS	Ms.	Evelyn	Riechert
AECOM	Mr.	Tim	Forty
AECOM	Mr.	John	Van Andel
Interior Health	Mr.	John	Beaupre
Ministry of Transportation and Infrastructure	Mr.	Rob	Bitte
Ministry of Environment	Mr.	Mike	Sokal
Ministry of Environment	Mr.	Bill	Michael
Local Citizen	Mr.	Barry	Barisoff
Local Citizen	Mr.	Gordon	Bonnett
Local Citizen	Mr.	Swaranjit	Chahal
Local Citizen	Mr.	Hugh	Chown
Local Citizen	Mr.	Lawrence	Green
Local Citizen	Mr.	Dale	Hyworon
Local Citizen	Ms.	Karen	Kari
Local Citizen	Ms.	Arlene	Loverin
Local Citizen	Mr.	Ray	Moon
Local Citizen	Mr.	Bill	Morey
Local Citizen	Mr.	David	Nason
Local Citizen	Ms.	Joy	Nobel
Local Citizen	Ms.	Dot	Ryrie
Local Citizen	Mr.	Mike	Sarell
Local Citizen	Ms.	Madelon	Stevens
Local Citizen	Mr.	Ronald	Worth

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Option review

…But first a quick LWMP process overview




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What is a LWMP?

A LWMP is a tool used to develop *cost-effective* solutions to address local liquid waste issues, it allows a community to:

- Protect human health and the environment
- Develop strategies to minimize wastewater generation
- Meet water conservation goals
- Maximize use of reclaimed water, and (for this LWMP)
- Provide a stormwater management overview

Why develop a LWMP?

A LWMP provides an opportunity for ratepayers to assist in the process of selecting the best option(s) for the management of liquid wastes for their community and can increase local support for current and future implementations

How do you develop a LWMP?

Ground Rules:

- RDOS Board makes a decision on the "Preferred Solution(s)" at the end of the combined Stage 1 / 2 **only** after carefully considering all information
  - This includes feedback from the Wastewater Advisory Committee and from an **informed** public

How do you develop a LWMP?

Stage I: Data Gathering

- Background on current status
  - Environmental or Health issues
  - Status of the existing systems
- List and Outline of potential options

Completed!

How do you develop a LWMP?

Stage II: Option Development, Cost Analysis & Option Selection

- Provide details for each identified option
  - Develop options in sufficient detail to permit comparison
    - Pros and cons of each option presented
    - Staging and phasing of upgrades shown
    - Cost Analysis developed to permit Order of Magnitude cost comparisons of options - including costs on a per household basis*
    - Environmental and health pros and cons outlined
- WAC selects their “Preferred Solution(s)”
- “Preferred Solutions” presented to public at PIM

We are here!

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Any questions before we move on?

What are the Wastewater Issues?




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What are the Wastewater Issues?

- Need to review & update Wastewater Management practices for Gallagher & Vaseux Lake areas

  – Environmental impact on Okanagan lake system
    - Potential for adverse impact downstream, coarse soils

  – Gallagher Lake water quality is deteriorating
    - Algae blooms, need to reduce nutrient load

  – Gallagher Lake water level dropped alarmingly
    - Water use exceeds recharge (Not wastewater issue)

  – Impact on Vaseux Lake water quality
    - Concern regarding septic system impact

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Any questions before we move on?

Discussion of the Options

(For Managing Wastewater)

WAC selected their Preferred Solution(s) we now need YOUR feedback




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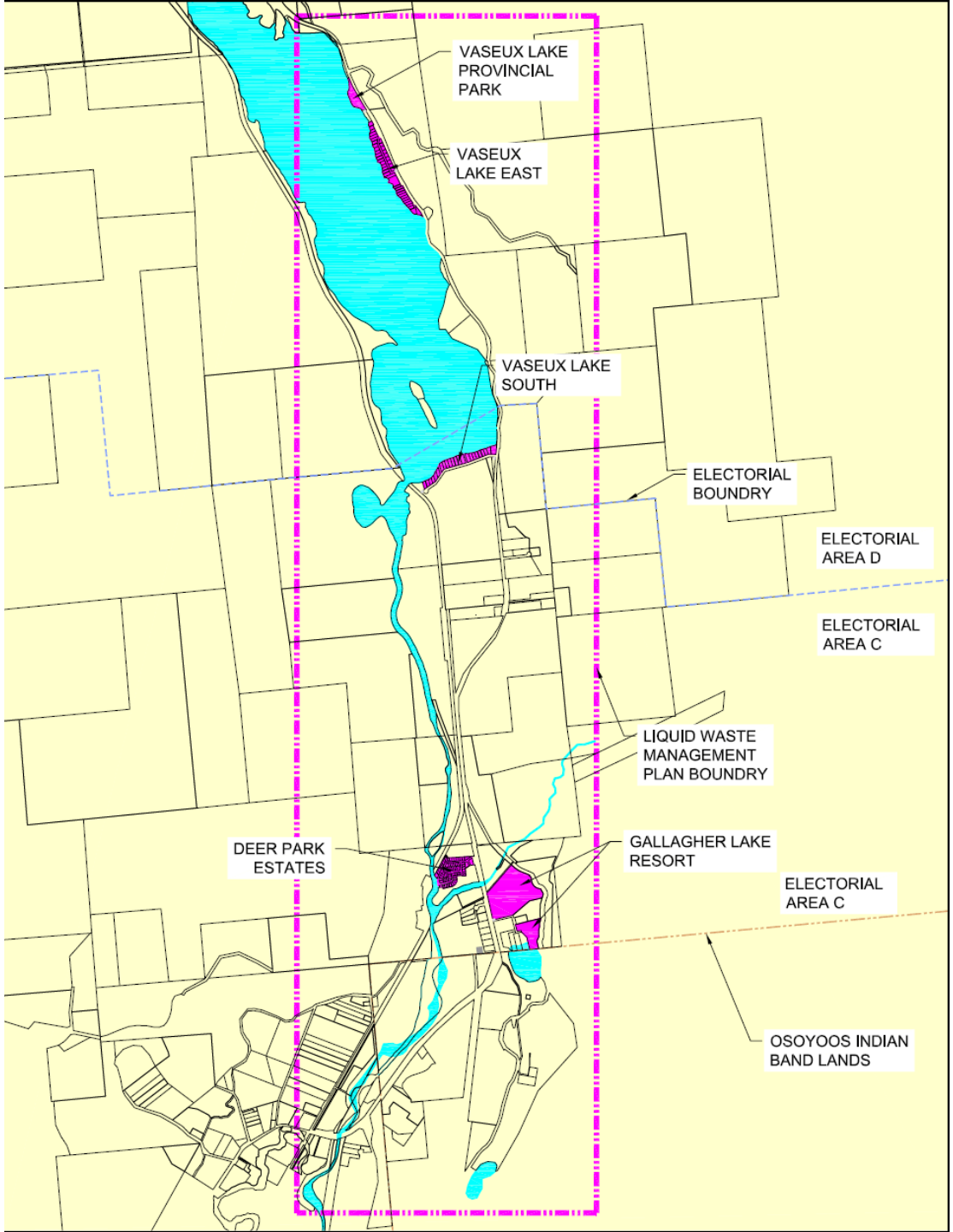
LWMP Area



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Gallagher Lake Area

Wastewater Management Options

Options Discussion

Gallagher Lake area wastewater management

Option 1:

- Gallagher Lake Wastewater to Osoyoos Indian Band Treatment Facility
  - OIB WWTP is relatively close
  - A lift station has been installed for a 90 lot development that will pump wastewater to the OIB treatment plant
  - The conveyance system is almost complete
    - There is an opportunity to utilize this line

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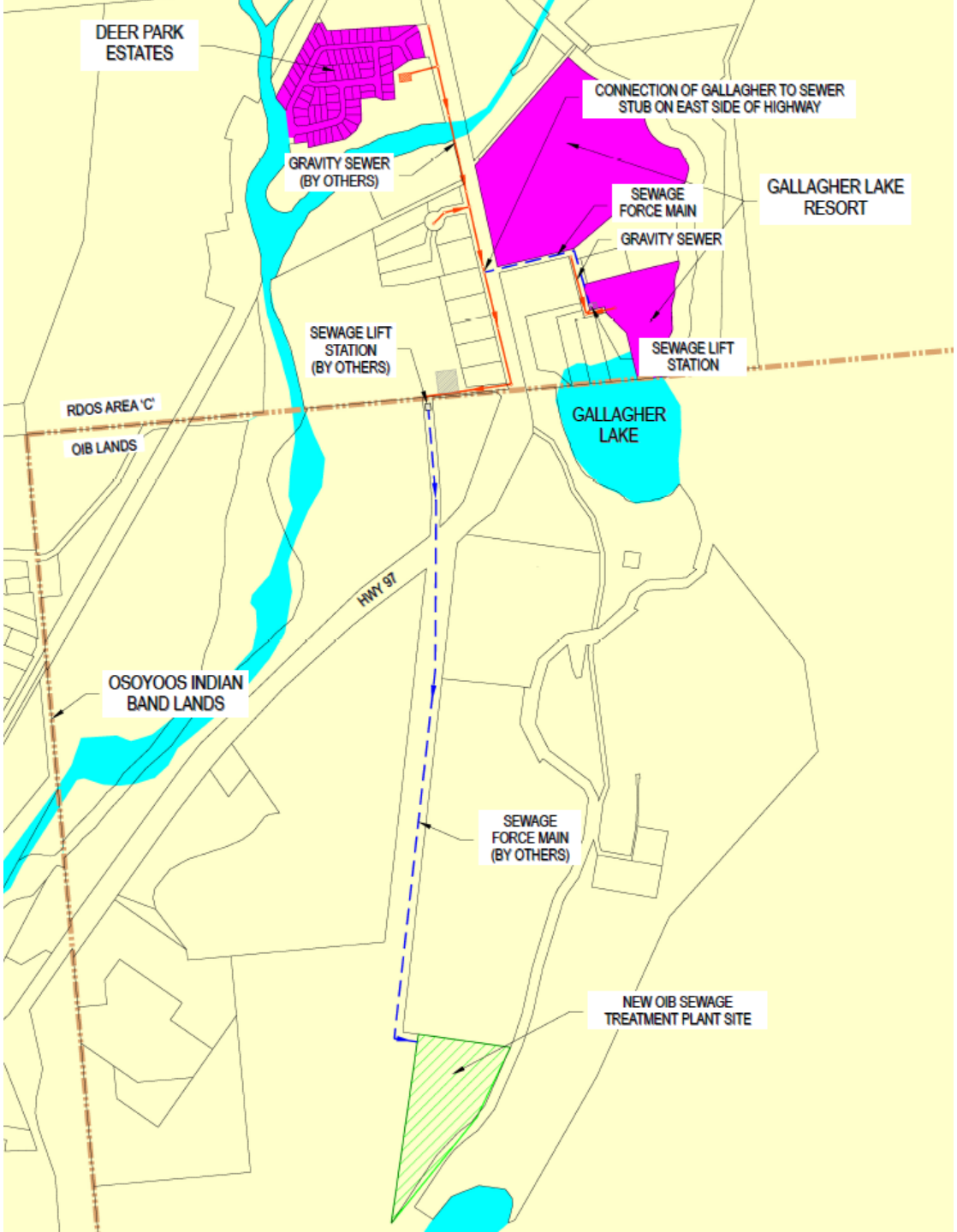

Gallagher Lake area: <u>Option 1</u>

Gallagher Lake Wastewater to Osoyoos Indian Band Treatment Facility

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Conceptual Estimate Gallagher Lake Wastewater to OIB Treatment Facility

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration) to Hwy 97 east side connection	m	200	$300	$60,000
2.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	10	$1,200	$12,000
3.) Gallagher lift station w/o standby	LS	1	$80,000	$80,000
4.) 75 mm sewer forcemain from satellite lift station to OIB treatment facility (includes trenching, backfill, road and landscape restoration)	m	200	$150	$30,000
			Sub-Total	$182,000
			Engineering and Contingency	$55,000
			Total (w/o HST)	$237,000

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Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $20,000/year in conveyance costs and system operation and maintenance (Excludes Deer Park)
- OIB connection fee of $6,000/unit
- $330/SFU for annual OIB operations and maintenance
- 136 SFU for Gallagher Lake
- 42 SFU equivalents for the KOA campground based on a daily flow of 47,250 L/day and 2.5 people/unit as provided by MMM (July 15, 2011)
- Costs exclude private, strata lands and internal campground connections and collections systems
- Cost exclude off-site infrastructure capital contributions along Highway 97 to OIB

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Per Unit Estimate for Gallagher Lake to OIB Treatment Facility

Item	Total Cost
1.) Capital improvements	$444
2.) Per unit OIB connection fee	$6,000
Total Capital Estimate per SFU (w/o HST)	$6,444
Total Annual Operation per SFU	$442year

Options Discussion

Gallagher Lake area wastewater management

<u>Option 2</u>:

- Gallagher Lake Wastewater to OK Falls Treatment Facility
  - The proposed OK Falls AWWTP is about 10 km away and conveyance cost will be large
  - This option would likely include running a line along the KVR to the proposed AWWTP in OK Falls

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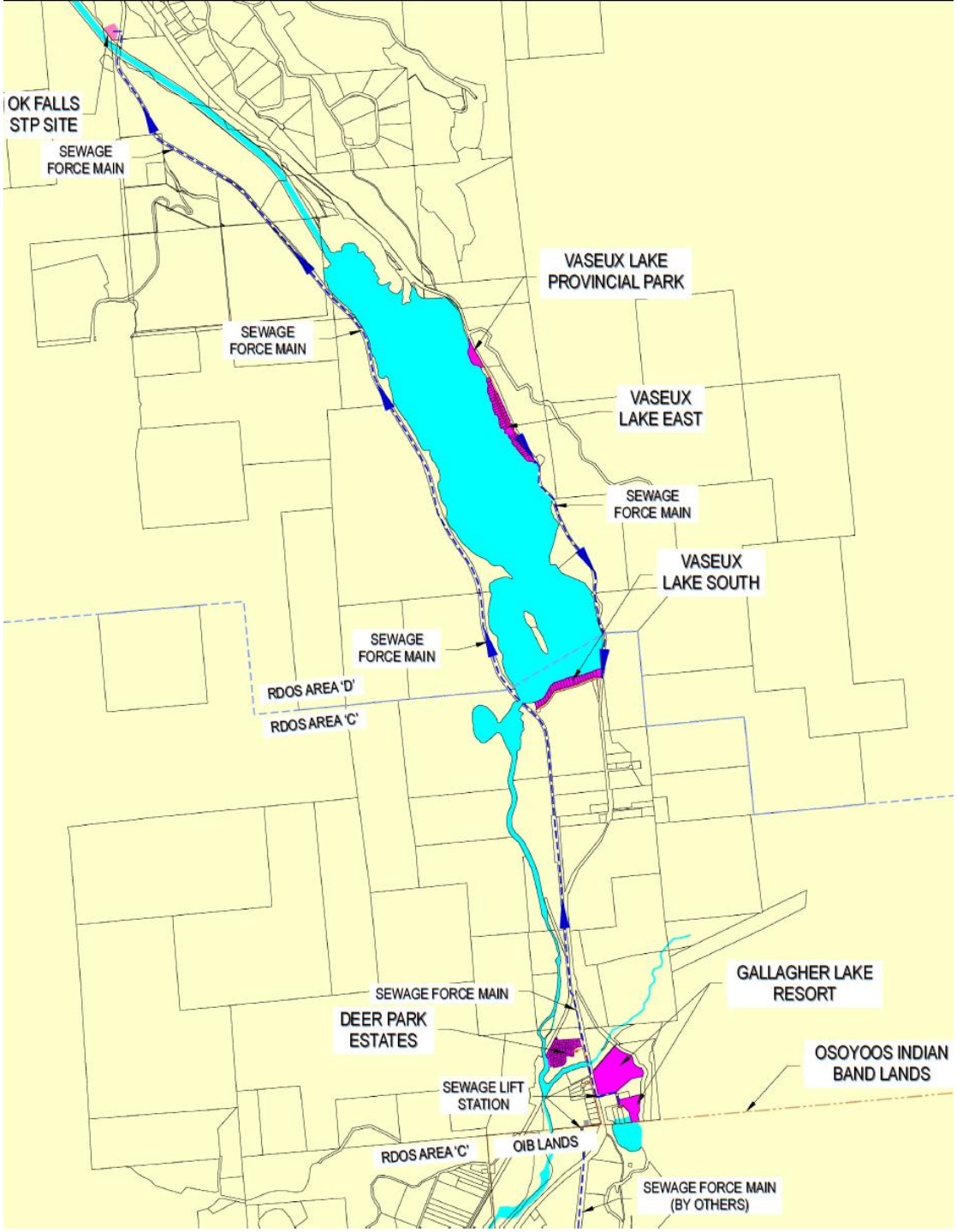

Gallagher Lake area:
Option 2

Gallagher Lake Wastewater to OK Falls Treatment Facility

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Conceptual Estimate Gallagher Lake Wastewater to OK Falls Treatment Facility

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration)	m	200	$300	$60,000
2.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	10	$1,200	$12,000
3.) Gallagher lift station	LS	1	$80,000	$80,000
4.) Central lift station	LS	1	$250,000	$250,000
5.) 75 mm sewer forcemain from central lift station to OK Falls treatment facility (includes trenching, backfill, road and landscape restoration)	m	10,000	$150	$1,500,000
6.) Land acquisition allowance	LS	1	$200,000	$200,000
			Sub-Total	$2,102,000
			Engineering and Contingency	$650,000
			Total (w/o HST)	$2,752,000

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Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $60,000/year in conveyance costs to OK Falls
- $639/SFU for annual OK Falls operations and maintenance in addition to connection fee reserve
- 136 SFU for Gallagher Lake
- Costs exclude Vaseux Lake connections and cost sharing
- 42 SFU equivalents for the KOA campground based on a daily flow of 47,250 L/day and 2.5 people/unit
- Costs exclude private, strata lands and internal campground connections and collections system

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Per Unit Estimate for Gallagher Lake to OK Falls Treatment Facility

Item	Total Cost
Total Capital Estimate per SFU (w/o HST)	$5,154
Total Annual Operation per SFU	$976

Options Discussion

Gallagher Lake area wastewater management

Option 3:

- Gallagher Lake Wastewater to Oliver Treatment Facility
  - The Town of Oliver will need to be approached to ensure there is sufficient capacity in their system to accommodate wastewater from the Gallagher Lake area
  - If Vincor should connect to the OIB system there would be an existing unused forcemain from Vincor to the Oliver WWTP that could be utilized for the Gallagher Lake area wastewater
  - Vincor originally covered the cost of this pipeline and there would be a cost to those connecting to the pipeline that would go to Vincor
    - Vincor will need to be approached to ascertain the viability of this concept as they are currently constructing a pretreatment facility for their wastewater and plan to continue to discharge to Oliver

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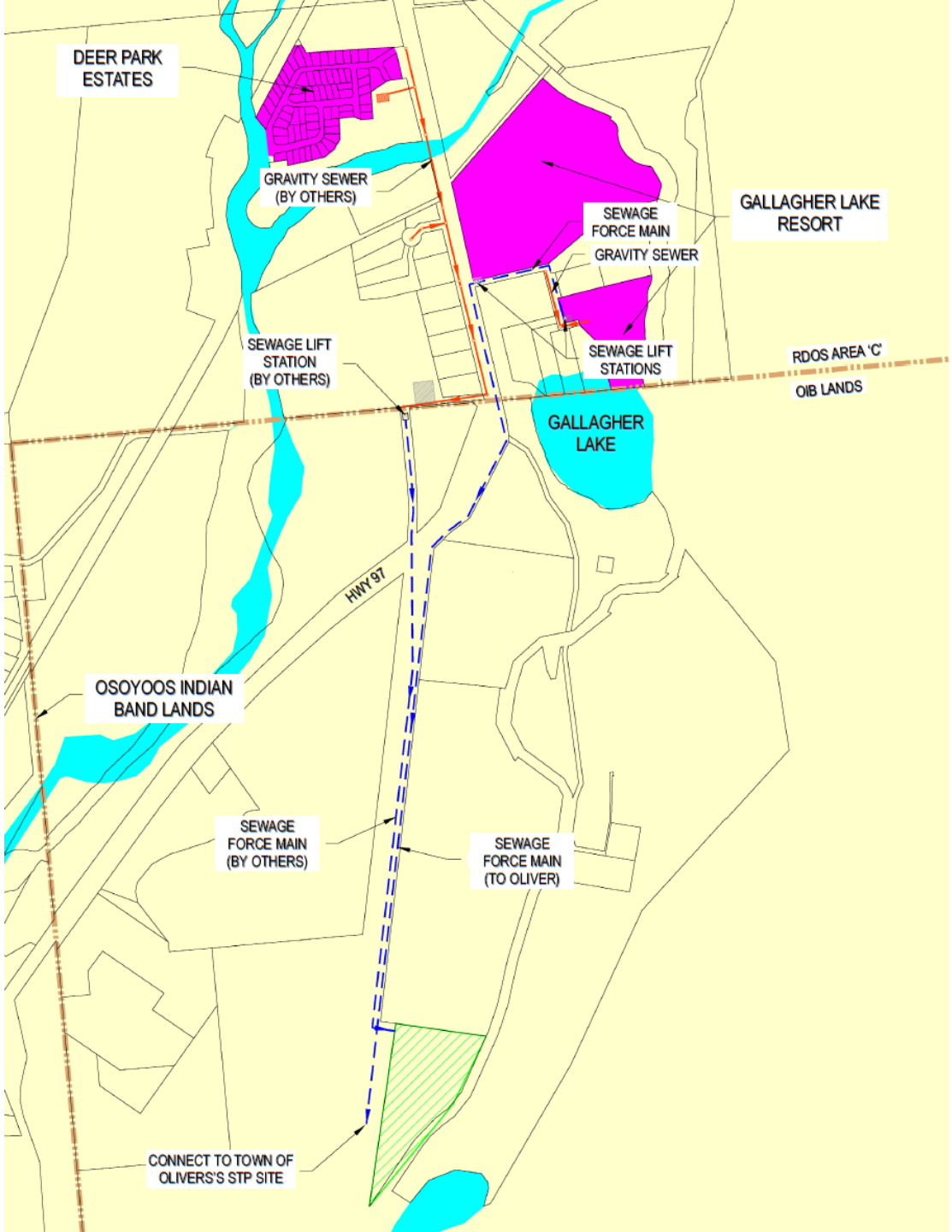

Gallagher Lake area: <u>Option 3</u>

Gallagher Lake Wastewater to Oliver Treatment Facility

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Conceptual Estimate Gallagher Lake Wastewater to Oliver Treatment Facility

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration)	m	200	$300	$60,000
2.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	10	$1,200	$12,000
3.) Gallagher lift station	LS	1	$80,000	$80,000
4.) Central lift station	LS	1	$250,000	$250,000
5.) 75 mm sewer forcemain from central lift station to Oliver treatment facility (includes trenching, backfill, road and landscape restoration)	m	5,580	$150	$837,000
6.) Land acquisition allowance	LS	1	$500,000	$500,000
7.) Upgrades to the Town of Oliver's sewer system allowance	LS	1	$700,000	$700,000
			Sub-Total	$2,439,000
			Engineering and Contingency	$750,000
			Total (w/o HST)	$3,189,000

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Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $50,000/year in conveyance costs to Oliver
- Oliver connection fee of $857/unit
- $225/unit for annual Oliver operations and maintenance
- 136 SFU for Gallagher Lake
- 42 SFU equivalents for the KOA campground based on a daily flow of 47,250 L/day and 2.5 people/unit
- Costs exclude private and strata lands connections and collections systems

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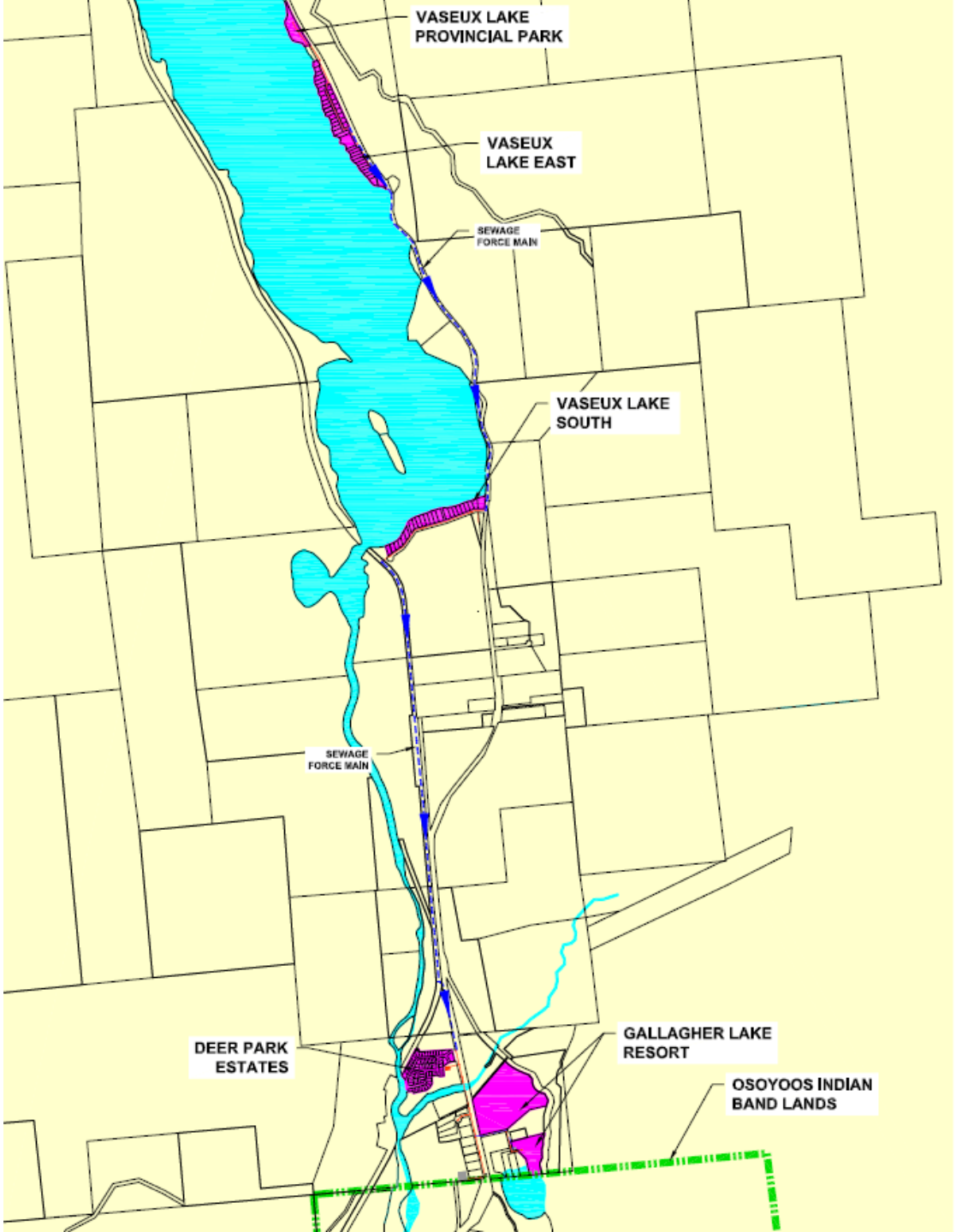
Per Unit Estimate for Gallagher Lake Wastewater to Oliver Treatment Facility

Item	Total Cost
1.) Capital improvements	$5,972
2.) Per unit Oliver connection fee	$857
Total Capital Estimate per SFU (w/o HST)	$6,829
Total Annual Operation per SFU	$506/year



Gallagher Lake area: <u>Option 4</u>

Stand alone local WWTP in Gallagher Lake Area

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Options Discussion

Gallagher Lake area wastewater management

Option 4:

- Stand alone local WWTP in Gallagher Lake Area
  - This plant could accept wastewater from the Gallagher Lake area alone or it could be upsized to also accept wastewater from the Vaseau Lake area
  - The primary issue would be locating a suitable effluent disposal site
    - During a previous LWMP project there were no nearby suitable disposal sites identified
    - A suitable disposal site will be required for this option to be viable
      - Local soils are VERY coarse and have limited effluent renovation capability

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Conceptual Estimate Stand alone local WWTP in Gallagher Lake Area

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration)	m	200	$300	$60,000
2.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	10	$1,200	$12,000
3.) Gallagher lift station	LS	1	$80,000	$80,000
4.) Central lift station	LS	1	$250,000	$250,000
5.) 75 mm sewer forcemain from lift station to treatment facility(includes trenching, backfill, road and landscape restoration)	m	280	$150	$42,000
6.) Tertiary wastewater treatment plant	LS	1	$3,000,000	$3,000,000
7.) Land acquisition allowance	LS	1	$500,000	$500,000
			Sub-Total	$3,944,000
			Engineering and Contingency	$1,200,000
			Total (w/o HST)	$5,144,000

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Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $200,000/year in WWTP operations and maintenance
- 136 SFU for Gallagher Lake
- 42 SFU equivalents for the KOA campground based on a daily flow of 47,250 L/day and 2.5 people/unit
- Costs exclude private and strata lands connections and collections systems

Per Unit Estimate for Stand alone local WWTP in Gallagher Lake Area

Item	Total Cost
Total Capital Estimate per SFU (w/o HST)	$9,633
Total Annual Operation per SFU	$1,124

Options Discussion

Gallagher Lake area wastewater management

Option 5:

- Gallagher Lake Wastewater to new stand alone WWTP in Vaseux Lake area
  - This plant could handle wastewater from both the Vaseau Lake area and the Gallagher Lake area
  - The primary issue would be locating a suitable effluent disposal site
    - A suitable disposal site will be required for this option to be viable

Note: Cost estimates were not prepared for this option as this alternative was deemed to be extremely high in overall capital and operational costs and therefore was not considered a viable alternative as part of the preferred solution evaluations

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Options Discussion

Gallagher Lake area wastewater management

Option 6:

- Gallagher Lake Wastewater to enhanced Deer Park WWTP

Note: Cost estimates were not prepared for this option as this alternative is deemed not viable as the Deer Park owners plan to shut down their existing system and are negotiating with the OIB to send their wastewater to the proposed OIB WWTP

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Gallagher Lake Area Options: Cost Comparison

- Based on 2/3 senior government capital funding
  - comparison of estimated costs is for wastewater servicing to property line and excludes private and strata land connections and collections systems
  - Costs are so high that without grants none of the options is affordable
- Assumes a 20 year amortized period for the capital expenditure and 5% interest rate over the 20-year period
- Excludes costs related to private and strata land connections and collections systems
- Costs in 2011 dollars and excludes any annual sewer rate increases

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Gallagher Lake Area Option Cost Comparison

	Description	Total Capital	Connection Fee/SFU	SFU Cost	Annual SFU Sewer Rate	Total Annual SFU Cost	Total Annual Cost per SFU with 18% OBWB Funding
*	Gallagher Lake to OIB WWTP	$237,000	$6,000	$6,444	$442	$958	$865
	Gallagher Lake to OK Falls WWTP	$2,752,000	N/A	$5,154	$976	$1,388	$1,314
	Gallagher Lake to Oliver WWTP	$3,189,000	$857	$6,829	$506	$1,052	$954
	Gallagher Lake to Satellite WWTP	$5,144,000	N/A	$9,633	$1,124	$1,895	$1,756

*- The WAC's "Preferred Solution"

Note: The actual costs may vary depending on the way that the OBWB calculates their grant

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Vaseux Lake Area

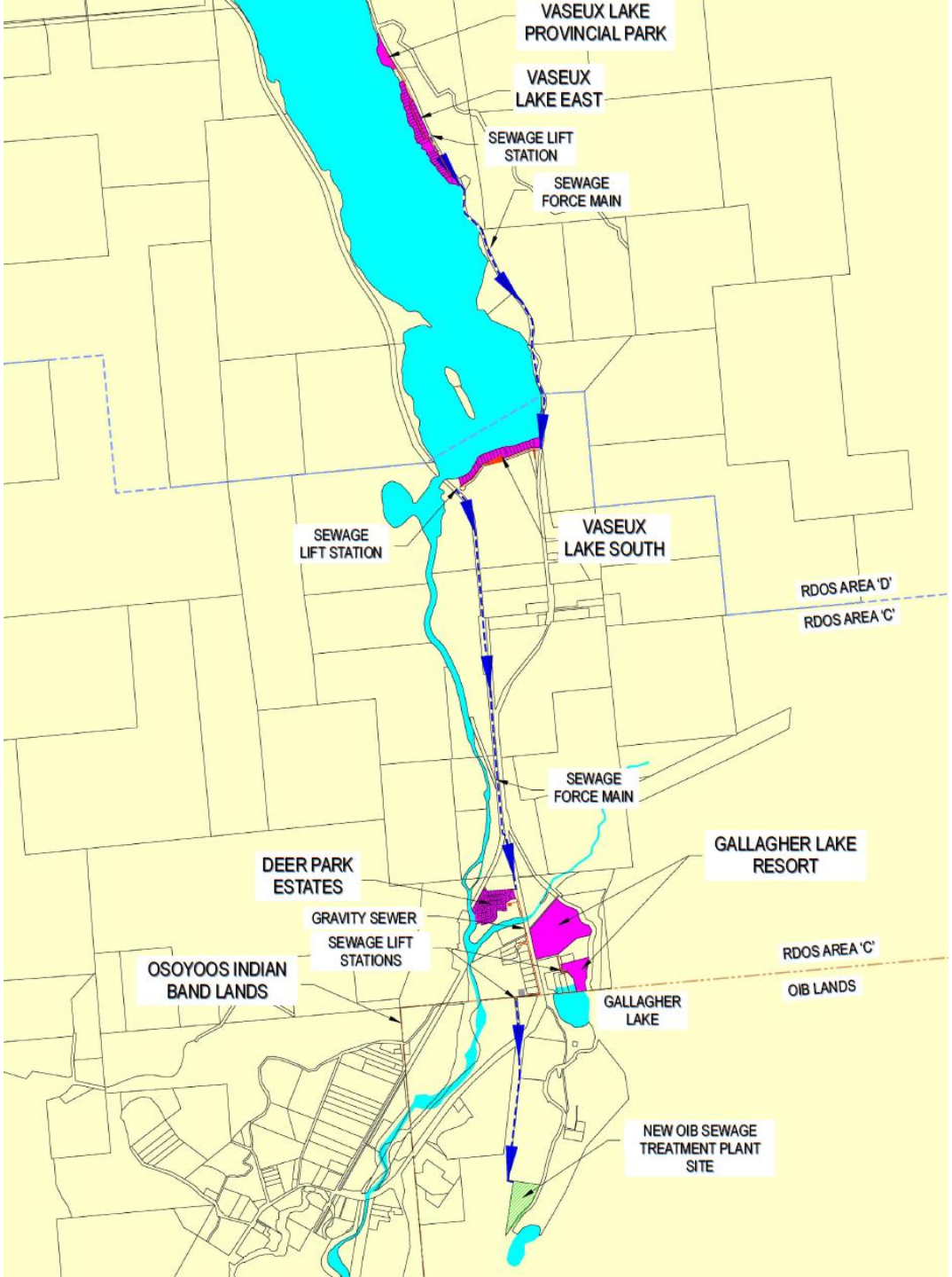
Wastewater Management Options

Options Discussion

Vaseux Lake area wastewater management

Option 1:

- Vaseux Lake Wastewater to OIB
  - The OIB WWTP is relatively close to Gallagher Lake area and the wastewater conveyance system would be sized to accommodate the Vaseux area wastewater in addition to Deer Park Estates and the service area of Gallagher Lake
  - There will also be a lift station for the proposed 90 homes in the nearby new development and a letter of intent and a contract has apparently already been let to put in that pipeline



Vaseux Lake area:
<u>Option 1</u>

Vaseux Lake Wastewater to Osoyoos Indian Band Treatment Facility

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Options Discussion

Vaseux Lake Area Wastewater to OIB WWTP

Pipeline to Gallagher Lake area

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 100mm diameter gravity pipe from main to property line (includes average 1.5m trench depth, bedding and backfill, road and landscape restoration)	m	700	$140	$98,000
2.) Inspection Chamber at Property Line	each	65	$200	$13,000
3.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration)	m	1,500	$300	$450,000
4.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	60	$1,200	$72,000
5.) Vaseux east lift station	LS	1	$150,000	$150,000
6.) Vaseux south lift station	LS	1	$250,000	$250,000
7.) 75 mm sewer forcemain from Vaseux east to Vaseux south (includes trenching, backfill, road and landscape restoration)	m	2,400	$150	$360,000
8.) 100 mm sewer forcemain from Vaseux south to Gallagher (includes trenching, backfill, road and landscape restoration)	m	2,900	$200	$580,000
9.) Land acquisition allowance	LS	1	$500,000	$500,000
			Sub-Total	$2,473,000
			Engineering and Contingency	$750,000
			Total (w/o HST)	$3,223,000

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Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $40,000/year in conveyance costs to OIB
- OIB connection fee of $6,000/unit
- $330/unit for annual OIB operations and maintenance
- 24 SFU for Vaseux South and 41 SFU for Vaseux East
- Costs exclude connections within lots
- Costs relate solely for Vaseux and connection to the Gallagher Lake line to the OIB System

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Vaseux Lake Area Wastewater to OIB WWTP

Item	Total Cost
1.) Capital improvements	$16,528
2.) Per unit OIB connection fee	$6,000
Total Capital Estimate per SFU (w/o HST)	$22,528
Total Annual Operation per SFU	$945/year

Options Discussion

Vaseux Lake area wastewater management

Option 2:

- Vaseux Lake Wastewater to OK Falls AWWT
  - The proposed AWWTP is some distance away but much closer to both Vaseux Lake high density areas than for the Gallagher Lake area and **if** the Gallagher Lake area were to consider this option the costs for the Vaseux area residents would be lower as they would be able to share the pipeline costs
    - If Vaseux Lake areas are unable to share the pipeline costs with the Gallagher Lake area residents this option is rather expensive

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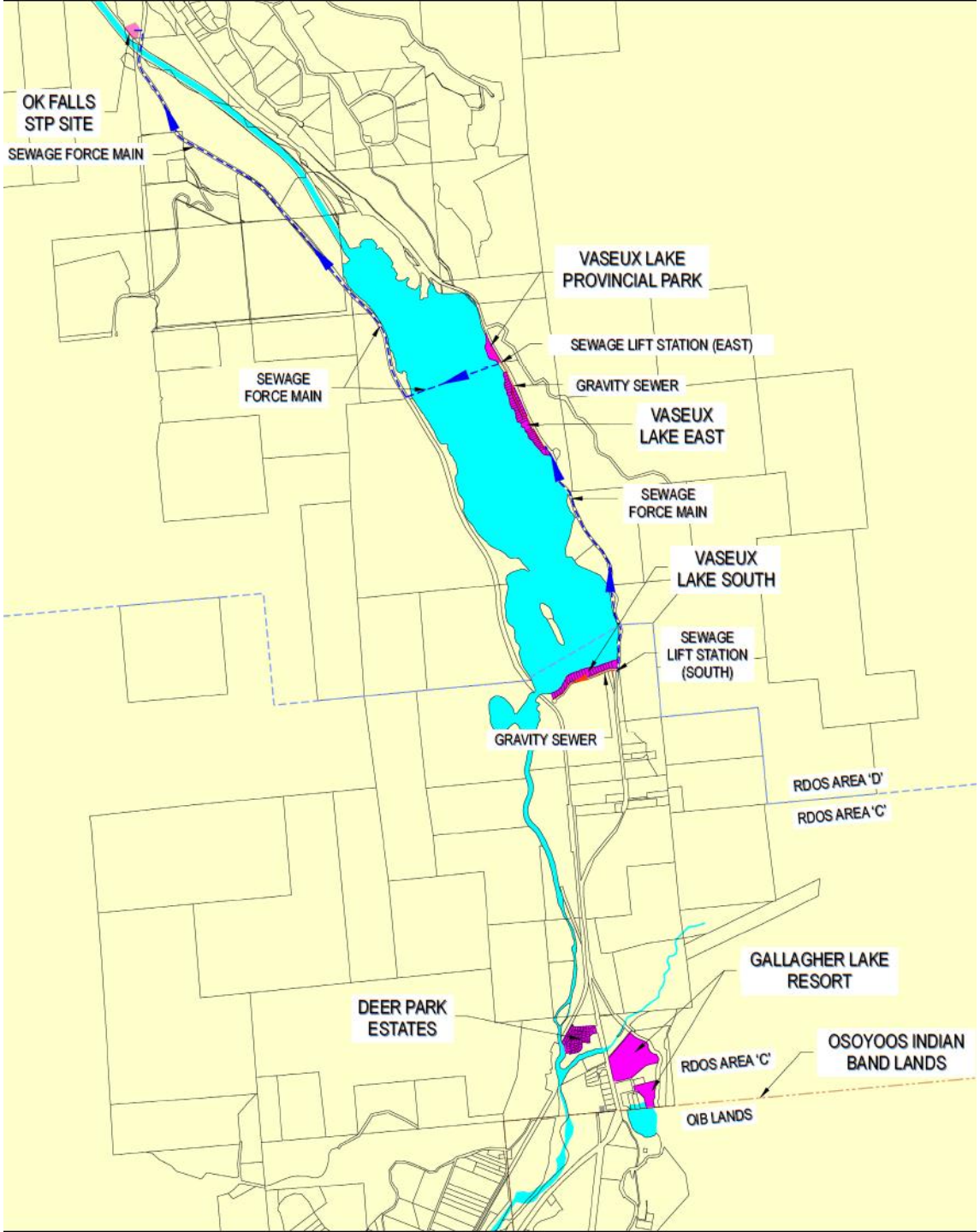

Vaseux Lake area:
Option 2

Vaseux Lake Wastewater to OK Falls AWWTP

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Options Discussion

Vaseux Lake Wastewater to OK Falls AWWT

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 100mm diameter gravity pipe from main to property line (includes average 1.5m trench depth, bedding and backfill, road and landscape restoration)	m	700	$140	$98,000
2.) Inspection Chamber at Property Line	each	65	$200	$13,000
3.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration)	m	1,500	$300	$450,000
4.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	60	$1,200	$72,000
5.) Vaseux east lift station	LS	1	$250,000	$250,000
6.) Vaseux south lift station	LS	1	$150,000	$150,000
7.) 75 mm sewer forcemain from Vaseux south to Vaseux east (includes trenching, backfill, road and landscape restoration)	m	2,400	$200	$360,000
8.) 100 mm sewer forcemain from Vaseux east to OK Falls via KVR ROW and lake forcemain (includes trenching, backfill, road and landscape restoration)	m	5,400	$200	$1,080,000
9.) Land acquisition allowance	LS	1	$500,000	$500,000
			Sub-Total	$2,973,000
			Engineering and Contingency	$900,000
			Total (w/o HST)	$3,873,000

Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $50,000/year in conveyance costs to OK Falls
- $639/SFU for annual OK Falls operations and maintenance in addition to connection fee reserve
- 24 SFU for Vaseux South and 41 SFU for Vaseux East
- Costs exclude connections within lots

Vaseux Lake Wastewater to OK Falls AWWT

Item	Total Cost
Total Capital Estimate per SFU (w/o HST)	$19,862
Total Annual Operation per SFU	$1,408

Options Discussion

Vaseux Lake area wastewater management

Option 3:

- Vaseux Lake Wastewater to Town of Oliver's WWTP
  - The Town of Oliver will need to be approached to ensure there is sufficient capacity in their system to accommodate wastewater from the Gallagher Lake and Vaseux Lake areas
  - The pipeline, as in the option to the OIB is quite expensive on a per connection basis as there are only a few residents in the Vaseux Lake area
    - This pipeline would be more affordable if the Gallagher Lake residents were also participating and assisting with the costs of their portion of the line

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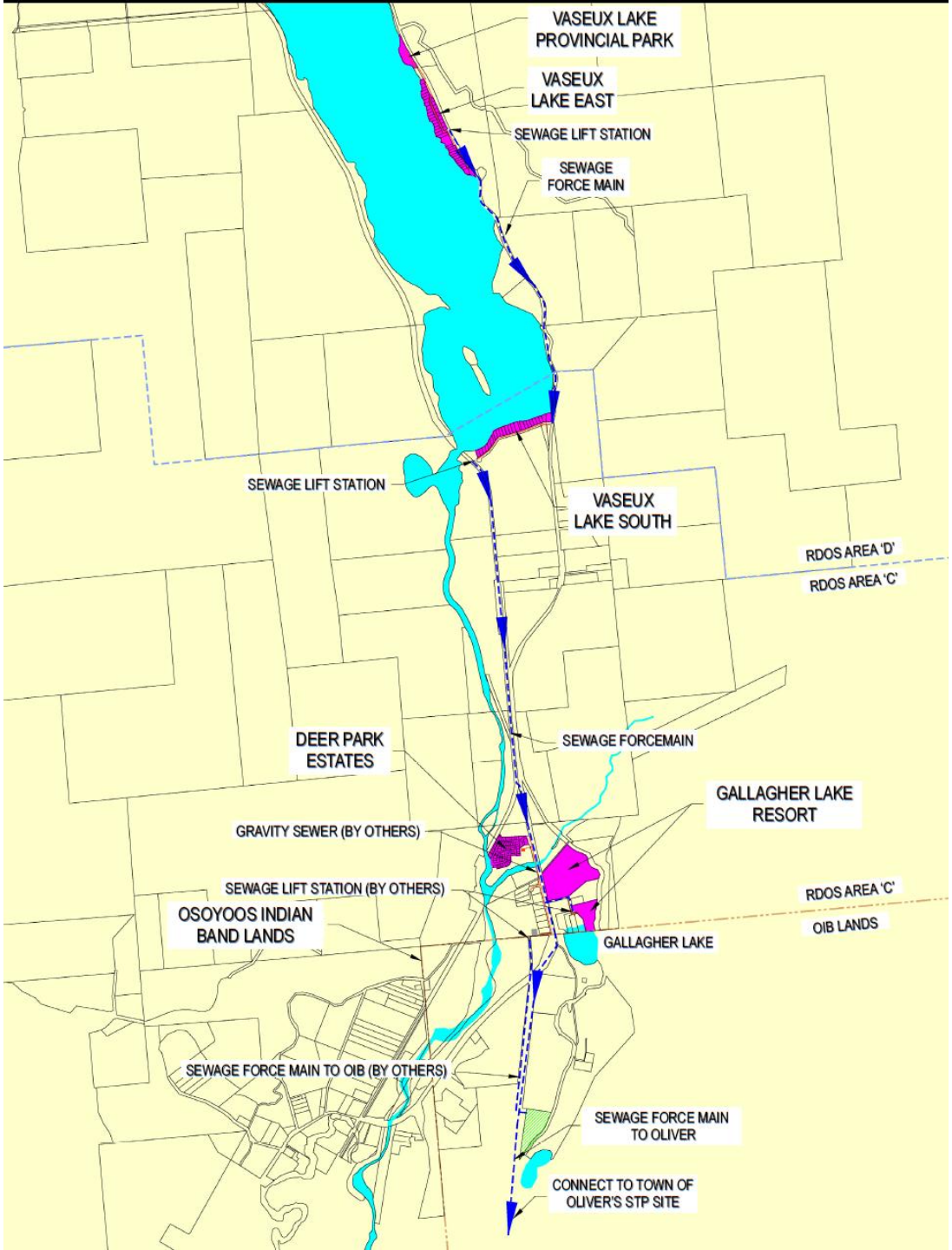

Vaseux Lake area:
<u>Option 3</u>

Vaseux Lake Wastewater to the Town of Oliver's WWTP

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Options Discussion

Vaseux Lake Wastewater to Town of Oliver's WWTP

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 100mm diameter gravity pipe from main to property line (includes average 1.5m trench depth, bedding and backfill, road and landscape restoration)	m	700	$140	$98,000
2.) Inspection Chamber at Property Line	each	65	$200	$13,000
3.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration)	m	1,500	$300	$450,000
4.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	60	$1,200	$72,000
5.) Vaseux east lift station	LS	1	$150,000	$150,000
6.) Vaseux south lift station	LS	1	$250,000	$250,000
7.) 75 mm sewer forcemain from Vaseux east to Vaseux south (includes trenching, backfill, road and landscape restoration)	m	2,400	$150	$360,000
8.) 100 mm sewer forcemain from Vaseux south to Oliver (includes trenching, backfill, road and landscape restoration)	m	8,480	$200	$1,696,000
9.) Land acquisition allowance	LS	1	$500,000	$500,000
10.) Upgrades to the Town of Oliver's sewer system allowance	LS	1	$700,000	$700,000
			Sub-Total	$4,289,000
			Engineering and Contingency	$1,300,000
			Total (w/o HST)	$5,589,000

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Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $60,000/year in conveyance costs to Oliver
- Oliver connection fee of $857/unit
- $225 for annual Oliver operations and maintenance
- 24 SFU for Vaseux South and 41 SFU for Vaseux East
- Costs exclude:
  - connections within lots
  - Gallagher forcemain capital costs from Gallagher to Oliver
    - The residents would share the costs with the Gallagher Lake area residents which would increase the total cost of this option but would reduce the Vaseux Area SFU cost as more connections would be involved

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Vaseux Lake Wastewater to Oliver WWTP

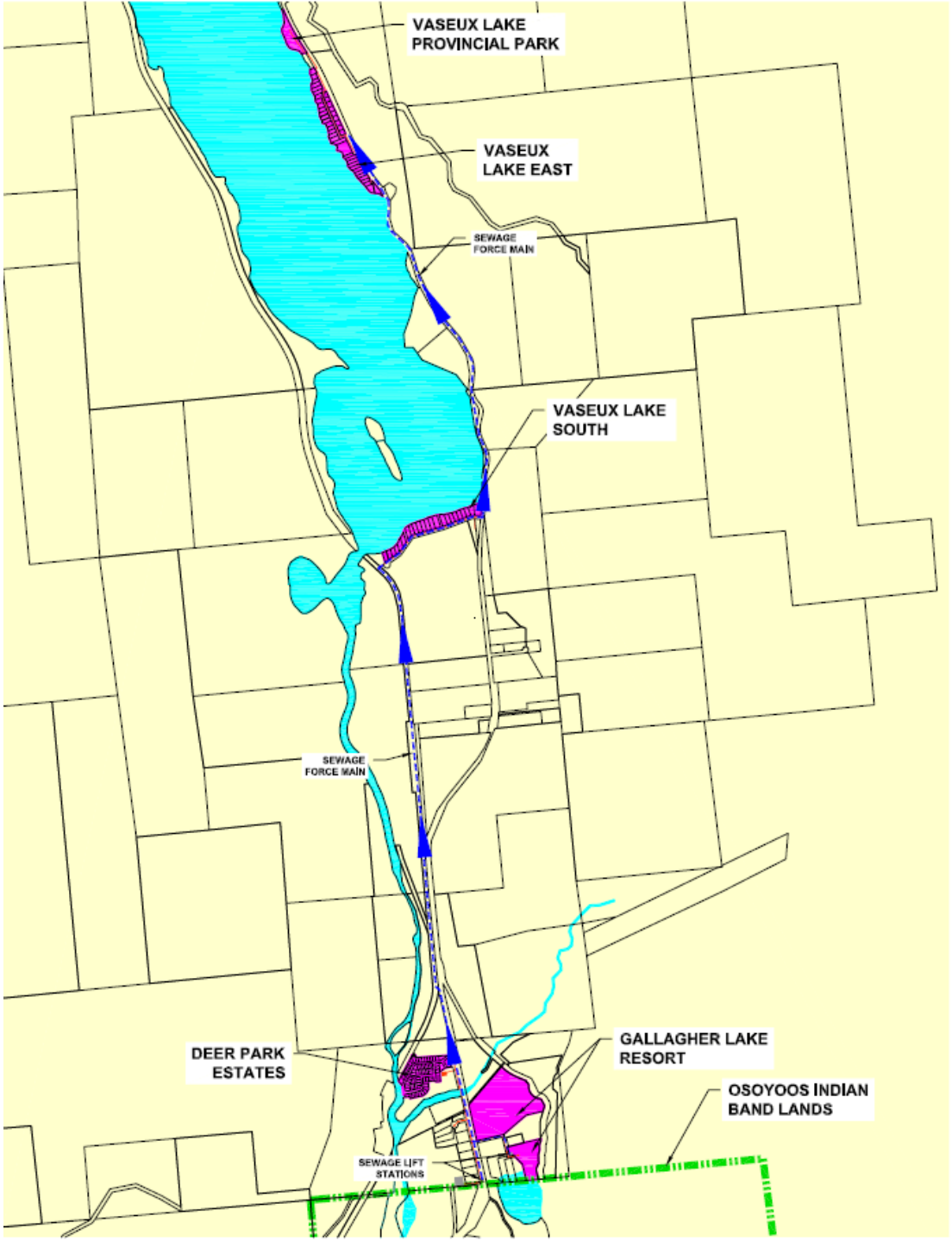
Item	Total Cost
1.) Capital improvements	$28,662
2.) Per unit Oliver connection fee	$857
Total Capital Estimate per SFU (w/o HST)	$29,519
Total Annual Operation per SFU	$1,148/year

Options Discussion

Vaseux Lake area wastewater management

Option 4:

- Vaseux Lake area with its own small WWTP
  - This plant could handle wastewater from the Vaseux Lake area alone or it could be upsized to also handle wastewater from the Gallagher Lake area
  - The primary issue would be locating a suitable effluent disposal site. There will be nutrients in the effluent that need to be removed either in the plant or by the ground



Vaseux Lake area: <u>Option 4</u>

Vaseux Lake area with its own small WWTP

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Options Discussion

Vaseux Lake area with its Own Small WWTP

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 100mm diameter gravity pipe from main to property line (includes average 1.5m trench depth, bedding and backfill, road and landscape restoration)	m	700	$140	$98,000
2.) Inspection Chamber at Property Line	each	65	$200	$13,000
3.) 200 mm diameter gravity sewer main (includes average 3.0m trench depth, bedding, backfill, road and landscape restoration)	m	1,500	$300	$450,000
4.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	60	$1,200	$72,000
5.) Vaseux east lift station	LS	1	$150,000	$150,000
6.) Vaseux south lift station to new AWWTP	LS	1	$250,000	$250,000
7.) 75 mm sewer forcemain from Vaseux east to Vaseux south (includes trenching, backfill, road and landscape restoration)	m	2,400	$150	$360,000
8.) 100 mm sewer forcemain from Vaseux south to Vaseux AWWTP (includes trenching, backfill, road and landscape restoration)	m	500	$200	$100,000
9.) Tertiary wastewater treatment plant	LS	1	$2,500,000	$2,500,000
10.) Land acquisition allowance	LS	1	$500,000	$500,000
			Sub-Total	$4,493,000
			Engineering and Contingency	$1,400,000
			Total (w/o HST)	$5,893,000

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Single Family Unit (SFU) estimated cost is based on:

- 2/3 senior government funding for capital expenditures
- $200,000/year in WWTP operations and maintenance
- 24 SFU for Vaseux South and 41 SFU for Vaseux East
- Costs exclude connections within lots

Vaseux Lake area with its Own Small WWTP

Item	Total Cost
Total Capital Estimate per SFU (w/o HST)	$30,221
Total Annual Operation per SFU	$3,077

Options Discussion

Vaseux Lake area wastewater management

Option 5:

- Vaseux Lake Area Wastewater to Gallagher Lake Area WWTP
  - This plant could be upsized to handle wastewater from the Vaseux Lake area
  - The primary issue would be locating a suitable effluent disposal site
    - There will be nutrients in the effluent that need to be removed either in the plant or by the ground.
  - The “Preferred Solution” for the Gallagher Lake area does not support this option and this plant will not be built, so no further consideration will be given to this option

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Vaseux Lake Area Options: Cost Comparison

- Based on 2/3 senior government capital funding
  - comparison of estimated costs is for wastewater servicing to property line and excludes private and strata land connections and collections systems
- Assumes a 20 year amortized period for the capital expenditure and 5% interest rate over the 20-year period
- Excludes costs related to private and strata land connections and collections systems
- Costs in 2011 dollars and excludes annual sewer rate increases
- Includes 18% Okanagan Basin Water Board (OBWB) funding on remaining capital balance

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Vaseux Lake Area Option Cost Comparison

Description	Total Capital	Connection Fee/SFU	SFU Cost	Annual SFU Sewer Rate	Total Annual SFU Cost	Total Annual Cost per SFU with 18% OBWB Funding
Vaseux Lake to OIB WWTP via Gallagher	$3,223,000	$6,000	$22,528	$945	$2,747	$2,423
Vaseux Lake to OK Falls WWTP	$3,873,000	N/A	$19,862	$1,408	$2,997	$2,711
Vaseux Lake to Oliver WWTP	$5,589,000	$857	$29,519	$1,148	$3,510	$3,084
Vaseux Lake Satellite WWTP	$5,893,000	N/A	$30,221	$3,077	$5,495	$5,059

The WAC was unable to select a "Preferred Solution" from the sewer service options for the Vaseux Lake area, as none were affordable even with 2/3 grants and OBWB funding assistance

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Overall LWMP Area

Wastewater Management Option(s)

Options Discussion

Option: Do nothing

- Do nothing, everything stays as it is
  - **Pros**:
    - No cost
  - **Cons**:
    - The existing issues are not resolved, and will get worse
    - Replacement costs for “On Site” wastewater treatment systems can range from about $15,000 to $50,000 each depending upon local conditions

Note: The pure “Do nothing” option is **not** an option as something needs to be done.

Options Discussion

Option: *Enhanced* "Do nothing"

- *Enhanced* "Do nothing option"
  - To assist the homes that have "On-Site" wastewater management systems to maximize the lifespan of their existing systems in an environmentally sound and affordable manner, additional support effort is needed
    - Educational programs will need to be developed. Including:
      - Optimal septic tank operation and maintenance (A "How to" document)
      - Water conservation, and
      - Source control (What should not be discharged to a septic tank or sewer system)
    - Environmental Monitoring, determine impact of high density development areas and establish baseline and trend information
    - By-laws (needed if the educational programs should fail) Including:
      - Mandatory: septic tank pump-out, water conservation, source control & turn-over of new community WWTP systems to the RDOS

Note: The educational programs will also benefit those who will be connected to wastewater collection systems at a later date by helping them extend the life of their existing systems.

Options Discussion

Option: *Enhanced "Do nothing"*

- *Enhanced "Do nothing option"*
  - The *"Do nothing"* option is not a viable approach, however there are isolated homes to which the *Enhanced "Do nothing"* approach would apply
  - This option would also apply to the higher density development areas near Vaseux Lake, as there were no affordable options identified for providing sewer service to those areas at this time
    - The provision of sewer service for the high density development areas near Vaseux Lake should be reviewed again, when next the LWMP is amended

This is the WAC's "Preferred Solution" for homes with "On Site" wastewater treatment systems and for the high density areas near Vaseux Lake

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Any questions before we move on?

On-Site Connection Works and Costs




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On-Site Connection Works

On-site works include the piping and pumping located on private property and is required to convey wastewater from the home to the property line

- Facilities located on private property are not eligible for provincial or Federal grant funding
- The full cost of installing these services, and decommissioning the old septic system, is the responsibility of the homeowner
- There are normally two options for connection based on local conditions
  - Gravity connection
  - Pumped connection
- A privately owned property such as a Mobile Home Park would be serviced by the MHP owner, who would need to recoup the cost from his tenants

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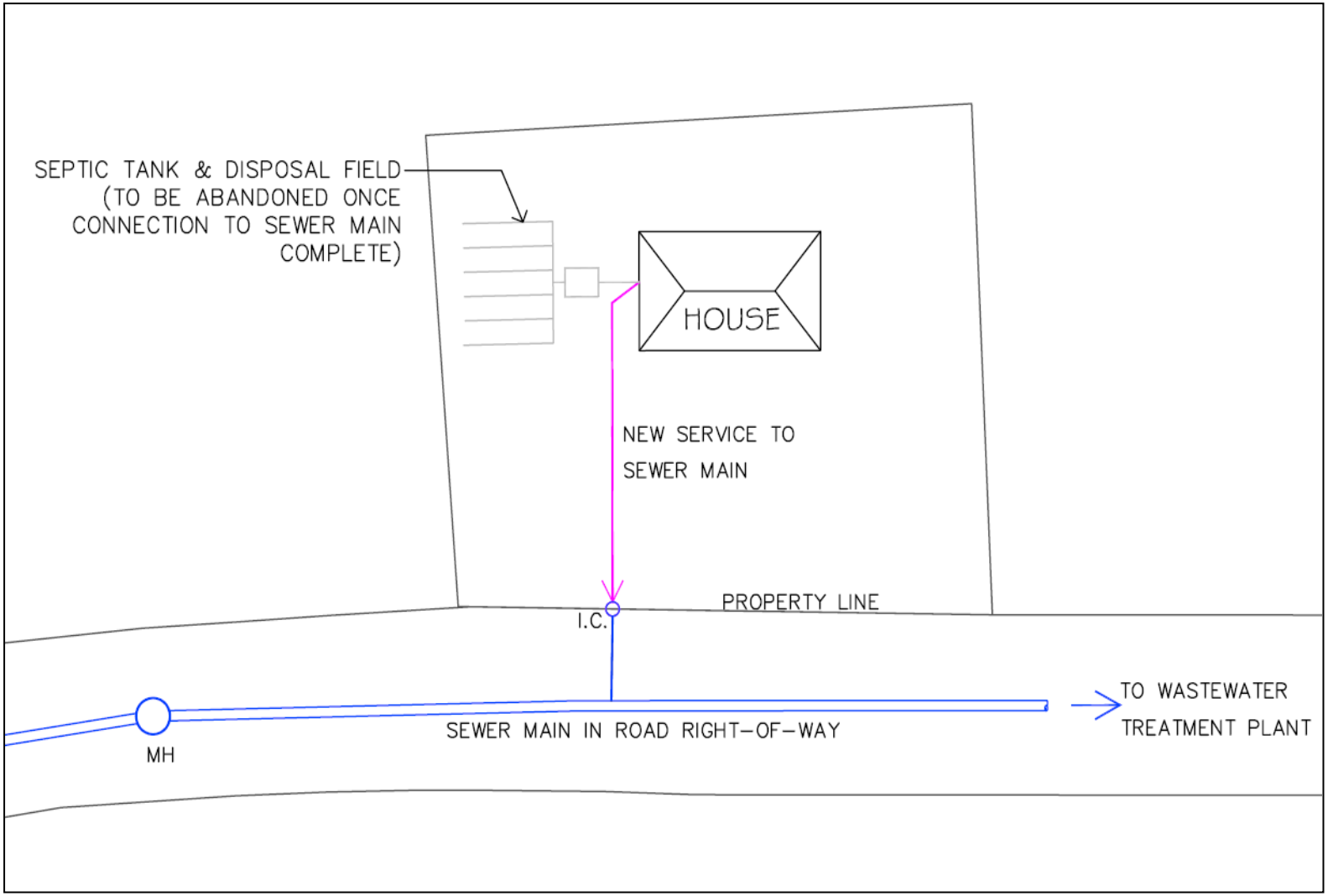
On-Site Works for a Gravity Connection to a Sewer Main



On-Site Works for a Gravity Connection to a Sewer Main

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 100mm diameter gravity pipe from home to inspection chamber at property line (includes average 1.5m trench depth, bedding and backfill)	M	30	$100	$3,000
2.) Fittings	Allowance	1	$200	$200
3.) Landscape restoration (grass sod)	m^2	50	$6	$300
4.) 100mm clean-out	each	1	$250	$250
5.) 100mm flap gate for back flow prevention	each	1	$250	$250
6.) Disconnect and pump-out existing septic tank and back-fill with sand for decommissioning	each	1	$500	$500
			Total (w/o HST)	$4,500

- The estimate is based on a typical 30 metre (100 ft) service
- If the distance should be more the cost will be higher, and
- If the distance should be less the cost will be lower
- Difficult conditions, such as rock, would increase the cost

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On-Site Works for a Pumped Connection to a Sewer Main

Where the home is lower than the sewer main, a small pump must be installed. The pump transfers wastewater from the home to the main and requires an electrical connection.

On-Site Works for a Pumped Connection to a Sewer Main

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) Grinder pump kit (incl. supply & installation)	LS	1	$1,500	$1,500
2.) 50mm diameter forcemain from home to inspection chamber at property line (includes trenching and backfill)	M	30	$70	$2,100
3.) Fittings	Allowance	1	$200	$200
4.) Landscape restoration (grass sod)	m^2	50	$6	$300
3) Disconnect and pump-out existing septic tank and back-fill with sand for decommissioning	each	1	$500	$500
			Total (w/o HST)	$4,600

- The estimate is based on a typical 30 metre (100 ft) service
- If the distance should be more the cost will be higher, and
- If the distance should be less the cost will be lower
- Difficult conditions, such as rock, would increase the cost

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Gallagher Lake Mobile Home Park On-Site Conceptual Estimates

Servicing options for the Gallagher Mobile Home Park are based on costing of facilities for conveying wastewater from each trailer unit to a common gravity sewer main, lift station and forcemain collection system all contained within the private common land parcel.

The full cost of installing these services is the responsibility of the property owner and is assumed to be equally distributed among the number of trailer units within the mobile home park

Gallagher Lake Mobile Home Park On-Site Conceptual Estimates

Item	Unit	Quantity	Cost/Unit	Total Cost
1.) 100mm diameter gravity sewer service from home to common sewer collection main (includes average 1.5m trench depth, bedding and backfill)	m	3,000	$100	$300,000
2.) Fittings	each	136	$200	$27,200
3.) Landscape restoration (grass sod)	m^2	2,500	$6	$15,000
4.) Roadway restoration (granular base course, prime coat and 50 mm depth asphalt)	m^2	4,500	$40	$180,000
4.) 100mm clean-out	each	136	$250	$34,000
5.) 100mm flap gate for back flow prevention	each	136	$250	$34,000
6.) Disconnect and pump-out existing septic tank and back-fill with sand for decommissioning	each	136	$500	$68,000
7.) 200 mm diameter gravity sewer main (includes average 2.5m trench depth, bedding and backfill)	m	1,500	$200	$300,000
8.) 1,200 diameter sewer manhole (includes base, frame and cover)	v.m.	50	$1,200	$60,000
9.) Lift station	LS	1	$150,000	$150,000
10.) 75 mm sewer forcemain from lift station to property line	m	300	$100	$30,000

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Gallagher Lake Mobile Home Park On-Site Conceptual Estimates

Sub-Total	$1,198,200
Engineering and Contingency	$300,000
Total (w/o HST)	$1,498,200
Cost Per Unit	$11,000

This is the estimated cost per unit for the on-site service costs for connecting to the sewage trunk main for the Gallagher Lake Mobile Home Park.

The costs for connection to the treatment facility and the O&M costs is additional to this cost.

- Mobile home users normally pay less per unit for connection as they tend to generate less wastewater than a traditional single family residence

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Any questions before we move on?

LWMP Overview Summary




LWMP Overview Summary

- A LWMP is a tool which allows the citizens of a community to understand the wastewater issues in their community, and assists them in selecting the best option for the management and resolution of those issues
- A LWMP belongs to the community which developed it
- The job of the consultant and Regional District staff is to **ASSIST** in the development of the LWMP, by providing clear, understandable, technical and cost information

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Any questions before we move on?

Next Steps?

Next Steps (We NEED your Feedback!)

- Public feedback regarding the WAC's ***Preferred Solutions***
  - Do you support the WAC's *Preferred Solutions*?
    - If you do not, which option(s) would you prefer?
    - Please fill in the "Exit Survey"
- Meld PIM feedback into combined Stage 1 / 2 report
- Circulate draft final report to the WAC
- Finalize the report and present it to RDOS Board
- Move on to Stage 3

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Thank you!
Please complete the “Exit Survey”
We really do need your feedback