



REGIONAL DISTRICT OF CENTRAL OKANAGAN

ELECTORAL AREA: *CENTRAL OKANAGAN EAST*

LIQUID WASTE MANAGEMENT PLAN

STAGE 3 REPORT

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Executive Summary

A Liquid Waste Management Plan (LWMP) has been developed for the Regional District of Central Okanagan (RDCO) Electoral Area “Central Okanagan East” (formerly known as Electoral Area “Joe Rich / Ellison”). The area covered by the LWMP includes: Ellison, Joe Rich, the Southern tip of Lakeshore Road, June Springs, McCulloch, Chute Lake and Okanagan Mountain Park and all the land in between.

Stage 1 involved identifying the areas covered by the plan, collecting pertinent data and determining all the potential options for the management of wastewater for each sub-area of the plan. A single Advisory Committee, (AC) was formed to provide input and advice from a local perspective and to assist in ensuring that the information developed was relevant to the residents of the plan area. The comprehensive public information program included a newsletter mailed to each home and business, advertising, media releases, poster distribution and regular updates on the RDCO website. The Stage 1 public consultation program culminated in two Public Information Meetings that were held in the Ellison and Joe Rich areas to advise the public about the options that had been identified for the management of wastewater in the plan area. The public were asked to provide comments on the various options being presented and to provide any additional options for consideration. This information was compiled in an exit survey and was included in the Stage 1 report in Appendix D, which contained the detailed Public Consultation report in its entirety. A total of 24 options were identified in Stage 1. These options were developed from input from the AC, various government agencies, the public and by the consultant.

During Stage 2, the Advisory Committee (AC), acting on behalf of the area residents, selected the “**Preferred Solutions**” for each specific area and also for the entire plan area after all the options had been developed and costed. No additional options were suggested during the development of Stage 2. The “**Preferred Solutions**”, selected by the AC, were presented to the public for confirmation and acceptance, and again reconfirmed with the AC.

This Stage 3 report outlines each of the options that were identified during the Stage 1 process that were not selected as well as the Preferred Solutions that were selected for implementation by the advisory committee and the public. Detailed information about each option may be found in the Stage 2 report. The Options and the “**Preferred Solutions**” are tabulated in Appendix C for quick reference.

In general there does not appear to be any urgency to provide sewer service to any areas that do not already have such service. However, given the current and projected growth in some areas, as well as the potential for septic system failure as tile fields age, in the future, if and when the need should arise, the “**Preferred Solution**” to resolve failures in each one of the specific areas was determined.

The options that were eliminated as impractical, unacceptable to residents or unworkable are also outlined in this report, with an explanation of the reasoning behind each of the options lack of success. In the Stage 1 report several of the options had alternatives that had the potential for joining with the City and receiving sewer service or petitioning to stay in the RDCO and receiving sewer service, however the City has indicated that an area **must** petition to join the City in order to receive sewer service and therefore the alternative to receive City sewer service and remain in the RDCO was eliminated from further consideration in this report. Councils and attitudes do change with time and it would be appropriate to reconfirm with Kelowna City Council that the policy is still in effect if and when sewer service is deemed necessary for any of the specific areas discussed in this plan.

There are a great many options that were considered during the development of this LWMP and the information required in support of the Preferred Solutions and for the elimination of the options that were not selected has resulted in a somewhat lengthier Stage 3 report than is normally the case.

Considerable effort was expended by the public consultation firm, Jan Enns Communications, to keep the public informed throughout the LWMP process and several information circulars were sent to all the residents of the LWMP area outlining the options and the preferred solutions identified by the Advisory Committee. Although the public attendance at the second round of Public Information Meetings was somewhat sparser than anticipated, likely due to the noncontroversial nature of this LWMP, there was support for the Advisory Committee's "Preferred Solutions" by the public that did attend both sets of public information meetings. Support for the preferred solutions was also reconfirmed with the Advisory Committee. The detailed Public Consultation report is contained in its entirety in Appendix D of the Stage 2 report.

All costing information is in 2007 dollars.

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GLOSSARY OF TERMS AND ACRONYMS

<u>Term or Acronym</u>	<u>Definition</u>
Biosolids	The solids waste, or sludge, from a sewage treatment plant that has received treatment to remove pathogens and is of a quality that it is suitable for use as a soil amendment or soil conditioner (See OMRR)
BAMP	Best Agricultural Management Plan. A plan developed for agricultural operations for controlling their wastewaters
BOD	Biochemical Oxygen Demand. The amount of oxygen needed to breakdown the organic matter in the wastewater. (Also referred to as “Biological Oxygen Demand”)
BNR	Biological Nutrient Removal. An advanced tertiary sewage treatment process that removes nutrients biologically from sewage wastes and can produce an effluent that may be discharged to surface waters without negative impact
COP	Code of Practice. Refers to a code which defines acceptable practices, developed under the Municipal Sewage Regulation. An example is the <i>Code of Practice for the Use of Reclaimed Water</i> which is a key reference and guidance document for implementing reclaimed water use and complying with the MSR
Disinfection	A treatment process used to kill or deactivate pathogenic material. Chlorination and UV are processes commonly used for disinfecting effluent before discharge to the environment
Effluent	The treated liquid discharge from a sewage treatment plant
LWMP	Liquid Waste Management Plan
MCD	Ministry of Community Development previously known as the Ministry of Community Services (MCS). Formerly known as MCAWS, Ministry of Corporate, Aboriginal and Women’s Services and prior to that as Ministry of Municipal Affairs (MA)
MOE	Ministry of Environment. Formerly known as MWLAP or the Ministry of Water, Land and Air Protection
MSR	<i>Municipal Sewage Regulation</i> . A regulation that prescribes the treatment requirements for the authorized discharge of municipal wastes to the environment. The MSR supersedes the old Permit system and provides an “ <i>Authorization to discharge</i> ” as long as ALL proscribed requirements are met
OC	Operational Certificate. The OC provides the <u>conditions</u> under which a discharge, authorized by the Minister when a LWMP was approved, must occur
OCP	Official Community Plan. There is only one OCP in the LWMP area and that is the Ellison OCP
OMRR	<i>Organic Matter Recycling Regulation</i> . OMRR provides the criteria for the production of biosolids and the restrictions for the use of Biosolids
Pathogen	Bacteria, viruses or cysts (oocysts) that may affect the health of humans or animals
Permit	Authorization for the discharge of a waste to the environment. Includes specific treatment, quality and monitoring requirements. Existing permits remain in force until cancelled. New Permits are no longer being issued and discharge authorizations are being provided under the MSR or by an approved LWMP
Primary	Primary treatment is essentially the removal of solids from wastewater

RLUB	Rural Land Use Bylaw. There is only one RLUB in the LWMP area, the RLUB for the Joe Rich Area
Reclaimed Water	The effluent from a sewage treatment plant that has undergone sufficient treatment that it may be used for golf course or crop irrigation or for stream flow augmentation in the summer when stream flows drop to levels that endanger aquatic life
Secondary	Secondary treatment consists of primary treatment plus the removal of BOD from wastewater
Sewage	Also known as raw sewage, municipal wastewater, liquid waste or wastewater
Sludge	The solid or semi-solid waste from a sewage treatment plant. Sludge may be processed into useful biosolids in accord with the requirement of the OMRR
Stormwater	Water that is generated as a result of precipitation - including snowmelt. May contain solids, oils and other contaminants
Tertiary	Tertiary treatment consists of secondary treatment with nutrient removal processes added. The City of Kelowna operates an advanced tertiary treatment plant utilizing BNR technology to produce effluent of such high quality that it can be discharged directly to Okanagan Lake with no adverse affect
Treatment	The removal of contaminants from wastewater
UV	Ultra Violet. UV is a form of disinfection where high intensity ultraviolet light is used to kill or deactivate pathogenic material
Wastewater	Often meant as a short form for Municipal Wastewater in the LWMP context, one portion of which is raw sewage. Stormwater runoff is another municipal wastewater

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STAGE 3 Report

1 INTRODUCTION

A Liquid Waste Management Plan (LWMP) has been developed for the Regional District of Central Okanagan (RDCO) Electoral Area “Central Okanagan East” (formerly known as Electoral Area “Joe Rich/Ellison”). The Stage 1 LWMP report provided an insight into existing conditions and identified a number of options for the management of liquid wastes, such as sewage and stormwater in the plan area. The advisory committee met several times to provide local input and ideas and the Stage 1 report culminated in two Public Information Meetings at which all the identified options were presented. The Stage 1 Public Meetings were well attended, due in part to the informational circulars that were developed and sent to all residents in the plan area. The complete details of the extent of the public consultation during Stage 1 may be found in the Stage 1 Report in Appendix D.

The Stage 2 report provides technical and financial details for each of the options identified in Stage 1. Each option was carefully scrutinized by the Advisory Committee, whose members identified the options that were best suited for both the entire plan area and the specific options for the management of liquid wastes for each of the areas of higher density development. These “Preferred solutions” were presented to the public during the two Stage 2 Public Information Meetings and in an informational circular that was prepared and was mailed out to all residents in the plan area. The complete details of the extent of the Stage 2 public consultation may be found in the Stage 2 Report in Appendix D.

The LWMP is intended to complement the other two major plans for the area. An Official Community Plan (OCP) exists for the Ellison Area and a Rural Land Use Bylaw (RLUB) that is currently under amendment for the Joe Rich Area. It is anticipated that the LWMP will be concluded some time after the completion of the amendment to the RLUB for the Joe Rich Area. As a result during the development of the LWMP, it will be necessary to remain cognizant of any changes to the RLUB that might affect the LWMP. The RDCO has produced a Growth Management Strategy Bylaw, agreed to by the Regional Board and all member municipalities, that generally supports development decisions that are, on a local basis, sustainable and environmentally responsible.

2 LWMP DEVELOPMENT

Liquid Waste Management Plans were introduced to British Columbia in the mid-1980s as a way of directly involving the people of a community in the process of selecting their preferred long term solution for managing liquid wastes in their community. The process involves ensuring all reasonable options are considered, and it culminates in the selection of a preferred solution or mix of solutions. The preferred solution is detailed in the LWMP documents, as are the opportunities for public involvement and details of the public consultation program. After the Minister of Environment provides formal approval the community may request grant monies for the implementation of the LWMP. Communities with an approved LWMP for the handling of their liquid wastes normally have a greater chance of success with their grant applications than those who do not. Once the LWMP is finalized Ministry staff may issue an Operational Certificate which provides the technical quality and environmental requirements for the discharge of liquid wastes that were identified in the approved LWMP.

Details of the LWMP process are included in the Stage 1 and 2 reports.

3 THE PREFERRED SOLUTIONS

A total of 24 options were identified during Stage 1. These options were developed from input from the Advisory Committee, various government agencies, the public and the consultant. No additional options were suggested during the development of Stage 2. The Advisory Committee's "*Preferred Solution*" for the entire plan area and for each specific area in the LWMP are outlined below. The Advisory Committee carefully reviewed all the options and identified both their preferences and the unacceptable options for each particular area. The "*Preferred Solutions*" and eliminated options numbered from 0 to 24, were discussed at some length in the Stage 2 report and are outlined below.

In general there does not appear to be any urgency to provide sewer service to areas that do not already have such service. However, as that situation may change at some time in the future, it is prudent to identify and examine the options available for each area. The options that could be utilized if the need should arise have been identified by the Advisory Committee, presented to the public for feedback and reconfirmed with the Advisory Committee. The other options were eliminated from consideration as being unacceptable to the residents, too expensive, or unworkable for a particular area. The eliminated options and the reasons they were eliminated are outlined in section 4, Discarded Options.

The Advisory Committee's "Preferred Solutions" retain their Stage 1 report "Option" number to aid in cross referencing between the Stage 1, Stage 2 and Stage 3 reports.

3.1 LWMP Area Wide "Preferred Solutions"

The first three Preferred Solutions (formerly Options) apply to all areas of the LWMP. They will be implemented to extend the useful service life of existing systems, to improve the management of septic systems and treatment systems and delay the need to implement costly remedial action. The fourth option would permit the identification of problems that may be developing and could serve as a "trigger" that would initiate the chosen remedial action(s) identified in this LWMP.

The first set of Preferred Solutions apply to the entire Liquid Waste Management Plan area and the cost of their implementation would be borne by all residents of the plan area - except where otherwise noted. *Preferred Solution 0*, (formerly Option 0), is the "Do nothing" option whereby the status quo is maintained. *Preferred Solutions 1 and 2* (formerly Options 1 and 2) are "Enhanced status quo" options that are to be implemented to improve the management of septic systems and so extend their useful life and delay the need to implement costly remedial action. *Preferred Solution 3* (formerly Option 3) involves monitoring of ground and surface waters to determine if there are any environmental or health concerns that are developing that may need to be addressed. These Area Wide *Preferred Solutions* will be implemented upon approval of the LWMP except as specifically noted in part of *Preferred Solution 2*.

3.1.01 "Preferred Solution 0", formerly "Option 0" – Maintain the status quo, leave everything as it is particularly for the lower density areas of the Ellison and Joe Rich areas

Maintain the status quo with on-site septic tank tile field sewage disposal systems being used throughout the LWMP area. Those high density areas with either an existing agreement with the City of Kelowna to handle the collected sewage wastes or for which sewage treatment systems exist will continue to be serviced in this manner. This is in accord with the existing OCP for the Ellison area and the RLUB for the Joe Rich area. New homes would be serviced by an on-site system or would connect to a sewer system - if in a serviced area. Any newly created lots using on-site disposal would need to be 1 hectare or larger in area in

accord with the requirements of the Okanagan Basin Water Board (OBWB) and the Ministry of Community Development (MCD).

This *Preferred Solution 0* approach will be used for both the short and long term for all of the plan area, with the other *Preferred Solutions* applying to specific areas on an as noted and as needed basis. *Preferred Solution 0* will form the first part of the solution for most of the LWMP area. It will apply for the foreseeable future to larger lots throughout the plan area which will continue utilize on-site sewage disposal.

Status quo, no change therefore no additional cost for this option.

3.1.02 “Preferred Solution 1”, formerly “Option 1” – Maintain status quo but reduce health and environmental impacts by developing public education initiatives

Develop a series of educational initiatives to assist the residents in water conservation, septic tank operation and maintenance, septic tank recommended pumpout frequency and information on materials that are unsuitable for disposal in a septic tank (Source control). The water conservation initiative will be valuable for everyone not just the septic tank users. Compostable organic wastes, such as food scraps, that should be kept out of a septic tank should also be kept out of a sewage collection system as they will use up valuable biological treatment capacity, in both types of systems (Also known as source control). Education programs will include:

- Water conservation
- Septic tank operation and maintenance. Includes pump out frequency.
- Source control (What should and what should not go into a septic tank or sewage collection system)

This option is applicable to both the short and long term for the entire plan area as the initiatives in this option are applicable to the existing sewerred areas as well as to the on-site septic system areas.

The education program cost is estimated at \$26,000 per year or about \$17 / yr per parcel. **This cost applies to everyone in the LWMP area as everyone will benefit.**

Included in this cost would be a yearly mail-out, promotions, web site updating, RDCO staff time, on-site visits and community meetings. This option also includes data collection for the tracking of septic tank pumpouts. The Regional District may even wish to develop education programs that would be relevant to all areas of the RDCO, thus spreading the educational benefits and the costs over a wider population base, potentially reducing the cost per household. It is anticipated that the initial preparation of the educational materials would be performed by a consultant who specializes in public education and public consultation programs. Once the materials have been prepared the annual mailout program would be administered by RDCO staff.

3.1.03 “Preferred *Solution 2*”, formerly “*Option 2*” – Maintain status quo but reduce health and environmental impacts by a series of bylaws

This option would be applicable in the long term and would not be considered for implementation until after the results obtained under *Preferred Solution 1* are evaluated under the monitoring program that forms part of *Preferred Solution 3*. Bylaws may not be necessary if the majority of residents wholeheartedly embrace the proposed educational initiatives.

Develop and implement a series of bylaws:

- **Water conservation bylaw** to regulate the use of water and mandate the use of low flow fixtures, such as toilets and showerheads.
- **Septic tank maintenance and pumpout bylaw** to catch and prevent any damage or failures before they become a problem. Pumpout could be arranged by the Regional District with a contract to one or more septic tank pumpout companies. The costs for the regular septic tank pumpout could be added to the resident’s annual taxation levy. Each resident could be provided a certificate for a “free” septic tank pumpout every 3 to 5 years depending upon the recommended pumpout frequency for each area in the LWMP or arrangements could be made for the septic haulers to bill the Regional District directly.
- **Source control bylaw** to prohibit the discharge of unsuitable materials, such as heavy metals and toxic

material, to a septic tank or sewer system. This would also include prohibiting the use of garburettors. Swimming pool or hot tub drain waters and backwash would also be prohibited from discharge to a sewer system or to a septic tank.

The preparation and enforcement of bylaws plus additional public education and enhanced pumpout tracking is estimated to cost about \$15,000 or about \$10 / parcel per year, in addition to the costs of *Preferred Solution 1*. **This cost applies to everyone in the LWMP area as everyone will benefit, and would be implemented only if the monitoring programs in *Preferred Solution 3* indicate that the education programs recommended under *Preferred Solution 1* were not effective.**

3.1.04 “Preferred Solution 3”, formerly “Option 3” – Establish a monitoring program to determine the health and environmental impacts from development in the LWMP area

Higher density specific areas with existing on-site disposal, identified below, are to have monitoring programs developed to determine the affect of their sewage wastes on nearby creeks and streams as well as the affect on the groundwater quality in local aquifers. Initial monitoring would provide a baseline and the results of subsequent samplings would show any changes in the environment from the impact of the sewage wastes disposal in each area. The monitoring program would indicate when or if specific developments need to be provided with sewer service.

The goal is to establish monitoring programs for stream and groundwater quality and record baseline data for trend determination. The estimated cost is \$10,000 a year which is about \$7 / household per year. **This cost applies to everyone in the LWMP area as everyone will benefit.**

The specifics of the monitoring programs would need to be developed after consultation with environmental specialists such as Ministry staff and hydrologists to determine location and frequency of testing. The monitoring programs will need to be dovetailed into any existing programs conducted by the Ministry of Environment and or the City of Kelowna to preclude unnecessary duplication of effort.

3.2 LWMP Specific Area “Preferred Solutions”

The *Preferred Solutions* noted below were selected by the Advisory Committee and the public from amongst all the potential options that were identified for the management of liquid wastes for each of the higher density development areas. The *Preferred Solution* for any of the specific areas would be implemented **ONLY** if health or environmental issues should develop, and the RDCO is ordered to implement the LWMP for that area by the Medical Health Officer or the Minister of Environment, or by public demand from the residents of the area.

Time has a way of changing attitudes and it would be appropriate to reconfirm with the City their position regarding sewer service being tied to a request for a boundary adjustment if and when one of the areas noted below should need to avail itself of sewer service from the City.

3.2.01 “Preferred Solution 4”, formerly “Option 4”: Sunset Ranch area continues to receive sewer service from the City of Kelowna

This was selected as the Preferred Solution for Sunset Ranch by the Advisory Committee and the public from amongst all the options available for this area. It has the lowest cost and greatest benefit for the residents and the environment.

This is the current situation and is the “Status quo” option for Sunset Ranch and there are no changes proposed for the provision of sewer services. The current agreement with the City provides sewer service while the area remains in the RDCO.

There are no additional costs to continue to receive city sewer service or any additional health or environmental impacts associated with this option.

The current Development Cost Charge (DCC) required by the City of Kelowna is \$4,675 and has already been paid for all the homes currently connected to cover treatment plant and trunk sewer costs in the City. The operating and maintenance cost is currently about \$320 / connection per year.

3.2.02 “Preferred Solution 7”, formerly “Option 7”: Scotty Creek sewer service provided by the City of Kelowna

This was selected as the Preferred Solution for Scotty Creek by the Advisory Committee and the public from amongst all the options available for this area. It has the lowest cost and greatest benefit for the residents and the environment.

The Scotty Creek area is adjacent to the Sunset Ranch area and is located some distance from the City boundary. The original sewer line that was installed to provide sewer service to the Sunset Ranch development was sized to accommodate the sewage wastes from the Scotty Creek area.

The City has advised that, under current City policy, if any new area should desire City sewer service they MUST amalgamate with the City and therefore the Scotty Creek area would need to petition for boundary expansion and request to be serviced by the City of Kelowna, if they wish to receive sewer service.

The cost of connecting to the City of Kelowna is estimated to be about \$4,643,000 or about \$720 per parcel per year for 20 years with grant funding and a Municipal Finance Authority low interest loan. Costs include the City’s DCC of \$4,675, and the operating and maintenance costs which are estimated to be about \$320 per year, the same as for homes currently connected to the City system in the Sunset Ranch Area.

3.2.03 “Preferred Solution 10”, formerly “Option 10” Ranch Park Mobile Home Park sewer service provided by the City of Kelowna

This was selected as the Preferred Solution for the Ranch Park Mobile Home Park by the Advisory Committee and the public from amongst all the options available for this area. It has the lowest cost and has the greatest benefit for the park owner, the residents and the environment.

The Ranch Park Mobile Home Park is adjacent to the Sunset Ranch area and is located some distance from the City boundary. The original sewer line that was installed to provide sewer service to the Sunset Ranch development was sized to accommodate the sewage wastes from the

Ranch Park Mobile Home Park as well as the Scotty Creek area. There are currently no known issues in the area with sewage wastes. As a result, the implementation of any other sewage system options, would not be necessary until associated health or environmental issues arise. The Ranch Park Mobile Park is a privately owned system and it would be necessary for the owners to negotiate directly with the City of Kelowna for sewer service.

The City has advised that if any new area should desire City sewer service they MUST amalgamate with the City and therefore the Ranch Park owners could petition for boundary expansion and request to be serviced by the City of Kelowna.

The cost of connecting to the City of Kelowna is estimated to be about \$890,000 or \$620 per unit per year for 20 years with grant funding and a Municipal Finance Authority low interest loan for the off-site costs. Costs include the City's DCC of \$4,675. The costs are similar to those for Scotty Creek but as the property is privately owned the park owners would have to cover the additional internal collection costs. (It is anticipated that these costs would be passed on to the mobile home park residents.) Operating and maintenance costs are estimated to be about \$320 per year per connection, the same as for homes currently connected to the City system in the Sunset Ranch Area.

3.2.04 “Preferred Solution 12a” formerly Option 12a, Country Lane sewer service provided by the City of Kelowna

This was selected as the Preferred Solution for Country Lane by the Advisory Committee and the public from amongst all the options available for this area. It has the lowest cost and has the greatest benefit for the residents and the environment.

The Country Lane strata is adjacent to the Sunset Ranch area and is located some distance from the City boundary. The original sewer line that was installed to provide sewer service to the Sunset Ranch development was sized to accommodate the sewage wastes from the Ranch Park Mobile Home Park, the Scotty Creek area and the Country Lane strata. There are currently no known issues in the area with sewage wastes. As a result, the implementation of any

remedial measures, will not be necessary unless or until sewage waste issues arise. Country Lane is a strata development and it would be necessary for the owners to negotiate directly with the City for sewer service.

The City has advised that if any new area should desire City sewer service they MUST amalgamate with the City and therefore the Country Lane strata would need to petition for boundary expansion and request to be serviced by the City of Kelowna.

The cost of connecting to the City of Kelowna is estimated to be about \$533,750 or about \$930 per home per year for 20 years with grant funding and a Municipal Finance Authority low interest loan for the off-site costs. The costs include the City's DCC of \$4,675. Costs are similar to Scotty creek but as the property is a privately owned strata they will have to cover their own internal collection costs. Operating and maintenance costs are estimated to be about \$320 per year, the same as for homes currently connected to the City system in the Sunset Ranch Area.

3.2.05 “Preferred Solution 13” formerly Option 13, Country View sewer service provided by the City of Kelowna

This is the option that the Advisory Committee selected from amongst all the options available for this area as it has the lowest cost and greatest benefit for the residents and the environment.

The Country View area is adjacent to the City boundary and under current City policy would be required to amalgamate with the City in order to receive sewer service. (Note: The neighboring area Country Rhodes was previously required to amalgamate with the City in order to receive sewer service.)

The cost for Country View to connect to the City was estimated to be \$1,230,000 or \$1,060 per year for 20 years. The off-site costs would be eligible for grant funding assistance and an MFA low cost loan. As the area is a Strata ONLY the connection fee and offsite works could be financed and the Strata would need to finance the internal improvements themselves. . Operating and maintenance costs are estimated to be about \$320 per year, the same as

for homes currently connected to the City system in the Sunset Ranch and Country Rhodes Areas.

3.2.06 “Preferred Solution 16” formerly Option 16, Falconridge sewer service (Collection and septic treatment system) provided by the RDCO

This is the option selected by the Advisory Committee from amongst all the options available for this area. It has the lowest cost of all the Falcon Ridge options and the greatest benefit for the residents and the environment. However it is still very costly and would only be implemented if environmental monitoring indicated that it was absolutely necessary.

Falcon Ridge is a 52 small lot subdivision located in the northern part of the Joe Rich area. There are currently 51 homes constructed, leaving room for only one additional home before the development is at full build-out. There are currently no known issues in the area with sewage wastes so the implementation of remedial measures will not be necessary until issues actually arise. This preferred solution would have the RDCO install a community sewer system utilizing a community septic treatment plant with tile fields for effluent disposal. (The area is currently too far from the existing City of Kelowna boundary for any consideration of connection to City services.)

The necessary works include a sewage trunk main, sewage lift station, a new community septic treatment system, land, and effluent disposal systems the cost of all of which is estimated at \$2,080,000. Residents would be paying about \$1,160 in capital cost per year for 20 years with grant funding and a low interest MFA loan. The operating and maintenance cost would be about at \$120 / connection per year. There is a concern about impact on drinking water wells in the area from existing septic systems and that would also apply to a community septic system so careful review of possible sites prior to purchase is required.

3.2.07 “Preferred Solution 17” formerly Option 17, Greystokes/Dion Road sewer service (Collection and septic treatment system) provided by the RDCO

This is the option that the Advisory Committee selected from amongst all the options available for this area as it has the

lowest cost and greatest benefit for the residents and the environment. However it is still extremely costly and would only be implemented if environmental monitoring indicated that it was absolutely necessary. The cost of this option is so costly using today's technology that it would be appropriate to revisit this option and review the newest technologies available prior to implementation if it should become necessary to provide sewer service to the Greystokes/Dion Road area.

The Greystokes/Dion Road area is a small 22 lot subdivision located in the northern part of the Joe Rich area to the south of the Falcon Ridge area and there are currently 21 homes constructed leaving room for only one additional home before the development is at full build-out. There are currently no known issues in the area with sewage wastes, so the implementation of sewer service, would not be necessary until such issues arise. This preferred solution would have the RDCO install a community sewer system utilizing a community septic treatment plant with tile fields for effluent disposal. (The area is currently too far from the existing City of Kelowna boundary for any consideration of connection to City services.)

The cost of a sewage trunk main, sewage lift station, a new community septic treatment system, land, and effluent disposal system is estimated at \$1,300,000. Residents would be paying about \$1,720 in capital cost per year for 20 years with grant funding and a low interest MFA loan. The operating and maintenance cost would be about at \$120 / connection per year. There is a concern about impact on the drinking water wells in the area from existing septic systems and that concern would also apply to effluent from a community septic system so a careful review of the site would be required prior to purchase.

3.3 LWMP Specific Area “Preferred Solutions” for small subdivisions

There are a number of small subdivisions with smaller lots located throughout the plan area. As the subdivisions are relatively small and with no currently known health or environmental issues “Preferred Solutions 0 through 3” are the most reasonable solution. These options should be re-evaluated when next the LWMP is updated or amended. The enhanced status quo option, Preferred

Solution 1, which provides the residents with the information needed to prolong the life of their existing on-site systems would be beneficial as it is unlikely that sewer service would be available in the foreseeable future for any of these areas. Preferred Solution 2, the development, implementation and enforcement of bylaws would only be necessary if residents fail to heed the information in Preferred Solution 1. Monitoring the environment to ascertain the impacts from the sewage wastes in each area on groundwater and surface water, which is Preferred Solution 3, would show trends and provide an indication when and if remedial measures are needed – specifically the implementation of Preferred Solution 2, the bylaws. Costs, even with RDCO obtained grants and Municipal Finance Authority low interest loans would be so high consideration was not even given for any community treatment system.

3.3.01 “Preferred Solution 18” formerly Option 18, June Springs continues to utilize on-site septic systems

The Preferred Solution for June Springs is to remain on septic systems for the foreseeable future, which means that Preferred Solutions 0 through 3 would be applied to extend the life of all the existing on-site septic systems as long as possible. If a system should fail it would be replaced with a new on-site septic tank tile field system by the homeowner.

The June Springs area is located in the southern part of the plan area and has 14 existing residences with a maximum of 17 residences at full build-out. There are currently no known issues in the area with sewage wastes and consideration of any remedial measures would not appear necessary until such issues arise.

3.3.02 “Preferred Solution 19” formerly Option 19, McCulloch continues to utilize on-site septic systems

The Preferred Solution for this area is to remain on septic systems for the foreseeable future, which means that Preferred Solutions 0 through 3 would be applied to extend the life of all the existing on-site septic systems as long as possible. If a system should fail it would be replaced with a new on-site septic tank tile field system by the homeowner.

The McCulloch area is located in the southern part of the plan area and has 22 existing residences with a maximum of 29 residences at full build-out. There are currently no known issues in the area with sewage wastes and consideration of

any remedial measures would not appear necessary until such issues arise.

3.3.03 “Preferred Solution 20” formerly Option 20, Chute Lake Okanagan Mountain Park continues to utilize on-site septic systems

The Preferred Solution for the Chute Lake Okanagan Mountain Park area is to remain on septic systems for the foreseeable future, which means that Preferred Solutions 0 through 3 would be applied to extend the life of all the existing on-site septic systems as long as possible. If a system should fail it would be replaced with a new on-site septic tank tile field system by the homeowner.

The Chute Lake area is located in the south western part of the plan area adjacent to Okanagan Mountain Park and has 3 existing residences with a maximum of 9 residences at full build-out. Okanagan Mountain Park has no residences. There are currently no known issues in the area with sewage wastes and consideration of any remedial measures would not appear necessary until such issues arise.

3.3.04 “Preferred Solution 21” formerly Option 21, Southern Tip of Lakeshore Road continues to utilize on-site septic systems

The Preferred Solution for the southern tip of Lakeshore Road area is to remain on septic systems for the foreseeable future, which means that Preferred Solutions 0 through 3 would be applied to extend the life of all the existing on-site septic systems as long as possible. If a system should fail it would be replaced with a new on-site septic tank tile field system by the homeowner.

The Lakeshore area is located in the south western part of the plan area adjacent to Okanagan Lake and abutting Okanagan Mountain Park and the City of Kelowna. There are 8 existing residences with a maximum of 22 residences at full build-out. There are currently no known issues in the area with sewage wastes and consideration of any remedial measures would not appear necessary until such issues arise.

3.4 Stormwater Management, “Preferred Solution 23”

Stormwater management is not under study in this LWMP due to cost considerations but the Advisory Committee recommended that a commitment be made to ensure that stormwater issues are addressed prior to the next update to this LWMP. Specifically, the Advisory Committee recommended that a “needs study” be conducted to identify any storm water issues in the plan area.

The cost of including a Stormwater Management component to this LWMP would be prohibitive within the current budget. Thus it would be prudent to consider the option of conducting a Stormwater study for the entire plan area - perhaps as a single study or perhaps as a series of studies for each of the areas of the LWMP. Existing watershed studies conducted for the City of Kelowna by Dayton & Knight should also be reviewed. This approach has the advantage that funding for these studies would be eligible for Provincial funding assistance. The information from these studies would be available for incorporation into the LWMP process when this LWMP is next amended. If critical issues were identified by the studies they could be addressed much sooner or the information could trigger the LWMP update process.

The RDCO already has a stormwater policy for new subdivisions with any necessary remedial measures being funded by the developer and installed when the basic services are put in prior to the construction of any homes.

The Ministry of Environment has suggested that the RDCO adopt some stormwater best management principles, or the related guidance document entitled “Stormwater Planning: A Guidebook for British Columbia”. This document may be downloaded in pdf (Adobe Acrobat) format from <http://www.env.gov.bc.ca/epd/epdpa/mpp/stormwater/stormwater.html>

3.5 Agricultural Waste Management “Preferred Solution 24”

“Preferred Solution 24” formerly Option 24, identifies the process for the management of agricultural wastes as it currently exists.

The Advisory Committee supported the continuation of the existing system for the management of agricultural wastes. This system includes a reporting / complaint acceptance, a review process and a resolution process. If this process does not resolve the issue and pollution can be shown to be occurring then the Ministry of

Environment may take action to stop the pollution. The process is detailed below.

The Ministry of Agriculture regulations cover the management of liquid wastes on agricultural lands. The Ministry has an established resolutions system in place should any concerns arise.

The FIRB (Farm Industry Review Board) are an independent tribunal and accept "complaints" from individuals with "an interest" directly and adjudicate them directly on their own merits, or lack thereof." According to their website, <http://www.firb.gov.bc.ca> under the FPPA or Farm Practices Protection (Right to Farm) Act. "FIRB is responsible for hearing complaints from persons aggrieved by odour, noise, dust or other disturbances arising from agriculture or aquaculture operations, and may also study and report generally on farm practices."

Thus, agricultural wastewater issues or complaints should first be brought to the attention of the Ministry of Agriculture and if a satisfactory resolution is not identified the matter can be referred to the FIRB by the original complainant.

If the issue remains unresolved and pollution can be shown to be occurring as a result of the operation then the Ministry of Environment may take action to stop the pollution.

Agricultural wastewater issue management is ongoing and current.

4 OPTIONS THAT WERE NOT SELECTED AND WHY

4.01 Option 5, Sunset Ranch sewer service provided by the RDCO

The additional cost required to implement this option would not produce extra benefits for the residents or the environment; **this option was not recommended** for consideration or implementation by the Advisory Committee. Grant funding for the implementation of this option would be exceedingly unlikely as an affordable, functional sewer service is already in place.

If this option had been selected, a new collection system would not be needed as residents are currently provided with sewer service, however a new sewage treatment and effluent disposal system would have to be designed and constructed. The residents of the

area would need to completely fund the new sewage treatment and effluent disposal facilities as grants would be extremely unlikely.

Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent discharge was within acceptable limits.

The cost of a sewage trunk main, sewage lift station, a new sewage treatment plant, land, and effluent disposal systems was estimated at \$5.72 million. Residents would be paying about \$1,110 per year for 20 years in additional capital costs plus a higher than present operating cost as the plant would be fairly small. The cost increase will be about \$1,150 a year more than they are paying now AND residents would lose the money that they already invested in the City's system when they connected (The DCC). The operating and maintenance cost would be about \$360 / connection per year, as opposed to the current \$320 / connection / year for the larger City of Kelowna plant O&M cost due to economy of scale for the bigger plant.

4.02 Option 6, Sunset Ranch sewer service provided by a private sewage system owner operator

The additional cost associated with the implementation of this option would produce no further benefit for the residents or the environment, this option was not recommended for consideration or implementation by the Advisory Committee. Grant funding for the implementation of this option would not be available as it would be a private system. Low interest Municipal Finance Authority loans are also unavailable for private systems. The Municipal Sewage Regulation requires a substantial security deposit with the Ministry of Environment which would further add to the end user cost.

The residents are currently provided with sewer service so a new collection system would not be required however the private system operator would need to design and construct a new sewage treatment and effluent disposal system if this option were selected.

The full costs of facility construction and operation would need to be passed on to the homeowners by the private operator as no provincial grants would be available. Environmental studies and ongoing monitoring would be required to confirm that the environmental impact of the effluent was within acceptable limits.

The cost is essentially the same as for Option 5 but there would be a “Profit” component and a higher financing rate as they do not have access to low interest MFA funding. This choice also requires establishment of a Local Service Area so there would be some additional RDCO involvement in this public private partnership as everyone in the service area would have to participate. The operating and maintenance cost would be about \$360 / connection per year, as opposed to \$320 / connection / year for the larger City of Kelowna plant O&M cost due to economy of scale for the larger plant.

4.03 Option 8, Scotty Creek sewer service provided by the RDCO

The additional cost required for the realization of this option would produce no extra benefit for the residents or the environment; this option was not recommended by the Advisory Committee for consideration or implementation. Grant funding for this option would be exceedingly unlikely as a more affordable, functional sewer service would be available with Preferred Solution 7.

If this option is selected, a new collection system would be required as the residents are currently using on-site sewer systems. This option also would require a new sewage treatment and effluent disposal system.

The residents of the area would need to fund the new sewage collection system, treatment plant and effluent disposal facilities if this option is selected. Scotty Creek residents would be eligible for a Municipal Finance Authority low interest loan but grants are unlikely as there is a less expensive option available. Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent was within acceptable limits.

The cost of a sewage trunk main, sewage lift station, new sewage treatment plant, acquisition of land, and effluent disposal systems is estimated at \$8.606 million. Residents would be paying about \$2,093 in capital cost per year for 20 years. The operating and maintenance cost would be about \$360 / connection per year as the system would be relatively small.

4.04 Option 9, Scotty Creek sewer service provided by a private sewage system owner operator

The additional cost required for the realization of this option would produce no extra benefit for the residents or the environment, this

option was not recommended for consideration or implementation by the Advisory Committee. Grant funding for the implementation of this option would not be available as it is a private system and all costs would be borne by the residents serviced. Low interest Municipal Finance Authority loans are also unavailable for private systems. The Municipal Sewage Regulation requires a substantial security deposit with the Ministry of Environment which would further add to the end user cost.

The residents are currently using on-site sewer systems so a new collection system would be needed, in addition to a new sewage treatment and effluent disposal system. Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent was within acceptable limits.

Cost would essentially be the same as for Option 8 but there would be a "Profit" component and the financing would be substantially higher as they would not have access to MFA funding. The cost of a sewage trunk main, sewage lift station, a new sewage treatment plant, land, and effluent disposal systems is estimated at \$9,896,000. Residents would be paying about \$2,410 per year for 20 years for capital cost. The operating and maintenance cost would be about \$360 / connection per year. In addition the establishment of a Local Service Area will be required so there would be some additional RDCO involvement in this public private partnership as everyone in the service area would have to participate.

4.05 Option 11, Ranch Park Mobile Home Park sewer service provided by the RDCO

The additional cost required for the realization of this option would produce no further benefit for the residents or the environment; this option was not recommended for consideration or implementation by the Advisory Committee. Grant funding for the execution of this option would be exceedingly unlikely as a more affordable, functional sewer service would be available with Preferred Solution 10.

The residents are currently using on-site sewer systems so a new collection system would be needed in addition to a new sewage treatment and effluent disposal system. If selected, the residents of the area would need to fund the new infrastructure. Provincial grants would be unavailable as the park is privately owned and the owners would need to pass the costs along to each household.

Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent was within acceptable limits.

This option of a solely owned RDCO system is not available to this development because it is a privately owned property BUT it could participate in a standalone system if one were to be developed for Scotty Creek. The cost for a solely owned RDCO system is estimated at \$2,785,000 or about \$1,923 per unit per year for 20 years as they are ineligible for grant funding and they would also have to cover the internal collection system costs. The operating and maintenance cost would be about \$360 / connection per year.

4.06 Option 12, Ranch Park Mobile Home Park sewer service provided by a private sewage system owner operator

The additional cost for this option would produce no extra benefit for the residents or the environment; this option was not recommended for consideration or implementation by the Advisory Committee. Grant funding for the implementation of this option is not available as it is a private system and all costs would be borne by the residents serviced. Low interest Municipal Finance Authority loans are also unavailable for private systems. The Municipal Sewage Regulation requires a substantial security deposit with the Ministry of Environment which would further add to the end user cost.

The residents are currently using on-site sewer systems so a new collection system would be needed, as would a new sewage treatment and effluent disposal system with the full costs of facility construction and operation passed on to the owners of the mobile home park.

Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent was within acceptable limits. This monitoring would be paid for by the Owners themselves unless a Public Private Partnership option for Scotty Creek were to proceed in which case they could tie in.

Cost will be essentially the same as for Option 11 but there will be a "Profit" component and higher financing costs as MFA funding is not available. Cost is estimated at \$3,200,000 or about \$2,210 per unit per year for 20 years as they are ineligible for grant funding and they would also have to cover off the internal collection system

costs. The operating and maintenance cost would be about \$360 / connection per year.

4.07 Option 12b, Country Lane sewer service provided by the RDCO

The additional cost for this option would produce no additional benefit for the residents or the environment and this option was not recommended for consideration or implementation by the Advisory Committee. Grant funding for the implementation of this option would be exceedingly unlikely as lower cost, functional sewer service would be available with Preferred Solution 12a. Low interest Municipal Finance Authority loans would not be available for the same reason.

If this option were selected, a new collection system, sewage treatment plant and effluent disposal system would be needed as the residents are currently using on-site sewage systems.

The residents of the area would need to fund these new facilities if this option were selected as provincial grants would be unavailable as the park is privately owned and the owners would almost certainly need to pass the costs along to each household. Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent was within acceptable limits.

This is not an option available to this development as a standalone RDCO owned system as it is privately owned BUT it could participate in a system if one should be developed for Scotty Creek. The capital cost for a standalone plant was estimated at \$4,800,000 plus \$300,000 for sewer installation or about \$96,000 per lot, which translates to an annual per lot cost of about \$8,400 assuming that they are able to obtain a loan at a 6% rate, equivalent to the MFA rate, which is unlikely, and the borrowing costs would likely be somewhat higher, further adding to the total. This is prohibitively expensive as they are ineligible for grants. They would also have to cover off the internal collection system costs. The operating and maintenance cost would be about \$360 / connection per year.

4.08 Option 12c, Country Lane sewer service provided by a private sewage system owner operator

The additional cost for this option would not produce any additional benefit for the residents or the environment; this option was not recommended for consideration or implementation by the Advisory

committee. Grant funding for the implementation of this option is not available as it is a private system and all costs would be borne by the residents serviced. Low interest Municipal Finance Authority loans are also unavailable for private systems. The Municipal Sewage Regulation requires a substantial security deposit with the Ministry of Environment which would further add to the end user cost.

If selected, a new collection system, sewage treatment plant and effluent disposal system would be needed as the residents are currently using on-site sewer systems. The full costs of facility construction and operation would need to be passed on to the owners of the strata, as there would be no provincial grants available for facility design or construction.

Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent was within acceptable limits. This would be conducted by the Owners themselves at their cost unless the Public Private Partnership option for Scotty Creek were to proceed in which case Country Lane could tie in.

Capital costs would be essentially the same as for Option 12b but there will be a "Profit" component and the financing costs will be higher as they do not have access to MFA funding. This option requires the establishment of a Local Service Area so there would be some additional RDCO involvement in this public private partnership as everyone would have to participate. The capital cost for a standalone plant was estimated at \$4,800,000 plus \$300,000 for sewer installation or about \$96,000 per lot, which translates to an annual per lot cost of about \$8,400 assuming that they are able to obtain a loan at a 6% rate, equivalent to the MFA rate which is unlikely and the borrowing costs would likely be somewhat higher, further adding to the total. This cost does not include the private operators profit component which would add to this cost. The operating and maintenance cost would be about \$360 / connection per year. They would also have to cover off the internal collection system costs.

4.09 Option 14, Country View sewer service provided by the RDCO

The additional cost for this option would not produce any extra benefit for the residents or the environment; this option was not recommended for consideration or implementation by the Advisory Committee. Grant funding for the implementation of this option

would be exceedingly unlikely as more affordable, functional sewer service would be available with Preferred Option 13.

If selected, a new collection system, sewage treatment plant and effluent disposal system would be needed as the residents are currently using on-site sewage disposal systems. The residents of the area would be required to fund these new facilities if this option is selected. Provincial grants may be available to lower the costs to each household.

Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the effluent was within acceptable limits.

The standalone RDCO owned system is not an option available to this development as it is privately owned. Cost for a standalone plant was estimated at \$4,106,000 or \$2,450 per lot for 20 years, which is very costly as they are ineligible for grants. They would also have to cover off the internal collection system costs. The operating and maintenance cost would be about \$360 / connection per year.

4.10 Option 15, Country View sewer service provided by a private sewage system owner operator

The additional cost for this option would not produce any additional benefit for the residents or the environment; this option was not recommended for consideration or implementation by the Advisory Committee. Grant funding for this option is not available as it is a private system and all costs would be passed on to the residents serviced by the private owner. Low interest Municipal Finance Authority loans are also unavailable for private systems. The Municipal Sewage Regulation requires a substantial security deposit with the Ministry of Environment which would further add to the end user cost.

The residents are currently using on-site sewer systems so a collection system, a new sewage treatment plant and effluent disposal system would be required if this option is selected.

Environmental studies and ongoing monitoring would be needed to confirm that the environmental impact of the proposed effluent discharge was within acceptable limits.

Capital costs would be similar to Option 14 but there will be a “Profit” component and the financing will be substantially more as MFA funding would not be available. Requires establishment of a Local Service Area so there will be some additional RDCO involvement in this public/private partnership as everyone would have to participate. The operating and maintenance cost would be about \$360 / connection per year.

4.11 Option 16a, Falconridge sewer service (Secondary treatment system) provided by the RDCO

The additional facilities for this option, whilst it would produce additional environmental benefit as the effluent produced would be secondary effluent rather than septic effluent, makes this option so costly that it was considered to be unaffordable and this option was not recommended for consideration or implementation by the Advisory Committee.

The cost of a sewage trunk main, sewage lift station, a new community secondary treatment system, land, and effluent disposal system is estimated at \$3,770,000. Residents would be paying about \$6,320 in capital cost per year for 20 years without grant funding but with a low interest MFA loan. Grant funding would not be available as there is a lower cost option that could be utilized, however even if grants were available the cost would still be about \$2,470 per connection per year which is considered unaffordable. The operating and maintenance cost would be about \$360 / connection per year. There is a concern about impact on the drinking water wells in the area from existing septic systems and that concern would also apply to effluent from a community sewage treatment system so careful review of possible sites would be required prior to purchase.

4.12 Option 17a, Greystokes/Dion Road sewer service (Secondary treatment system) provided by the RDCO

The additional cost for this option, whilst it would produce additional benefit for the environment as the effluent produced would be secondary effluent rather than septic effluent, makes this option so costly that it was considered to be unaffordable; this option was not recommended for consideration or implementation by the Advisory Committee.

The cost of a sewage trunk main, sewage lift station, a new community secondary treatment system, land, and effluent disposal system is estimated at \$2,080,000. Residents would be paying

about \$8,240 in capital cost per year for 20 years without grant funding but with a low interest MFA loan. Grant funding would not be available as there is a lower cost option that could be utilized, however even if grants were available the cost would still be about \$3,110 per connection per year which is considered unaffordable. The operating and maintenance cost would be about \$360 / connection per year. There is a concern about impact on the drinking water wells in the area from existing septic systems and that concern would also apply to effluent from a community sewage treatment system so a careful review of proposed sites would be required prior to purchase.

4.13 Option 22, Southern Tip of Lakeshore Road sewer service provided by the City of Kelowna

The cost for this option would produce no real benefit for the residents or the environment and would only be of benefit to developer(s) of subdivisions and this option was not recommended for consideration or implementation by the Advisory committee. Grant funding for the execution of this option would not be available as the sewer extension would only be of benefit to the new subdivision and as a policy, grant funding is not available for new development.

The Lakeshore area is located in the south western part of the plan area adjacent to Okanagan Lake and abutting Okanagan Mountain Park and the City of Kelowna. There are 8 existing residences with a maximum of 22 residences at full build-out.

There have been reports of potential subdivision of large lots in the area and as the area is adjacent to the City of Kelowna it was considered that there may be some potential to connect to the City sewer system. However, at this time, the City sewer system terminates several kilometres from the current City boundary and it would be extremely costly to extend the sewer just for the residents of the Southern Tip of Lakeshore Road. Current City policy requires the area to petition for boundary adjustment and become part of the City in order to receive City sewer service. The City also indicated that it was highly unlikely that sewer service would be considered for this end of Lakeshore Road.

There are currently no known issues in the area with sewage wastes, thus the implementation of any measures, such as connecting to sewer service, would not be necessary until such issues arise. It is unlikely that there will be a need to resolve any

sewage issues in the foreseeable future for this area so Preferred Solutions 0 through 3 are applicable at this time as noted in Preferred Solution 21 which covers this area.

5 FINANCIAL CONSIDERATIONS

There are a number of grant programs that are available for studies, for the development of LWMPs and for the construction of needed infrastructure. The currently available grants were discussed at some length in the Stage 2 report BUT as these grant programs change with some regularity it will be necessary to confirm with the Ministry of Community Development and the Okanagan Basin Water Board, the actual grant programs that are active at the time of implementation of any of the Preferred Solutions for the management of liquid wastes specified under this LWMP.

6 PUBLIC CONSULTATION

Considerable effort was expended by the public consultation firm, *Jan Enns Communications*, to keep the public informed throughout the LWMP process and several information circulars were sent to all the residents of the LWMP area outlining the options and the preferred solutions identified by the Advisory Committee. Although the public attendance at the second round of Public Information Meetings was somewhat sparser than anticipated, likely due to the noncontroversial nature of this LWMP, there was support for the Advisory Committee's "Preferred Solutions" by the public that did attend both sets of public information meetings. Support for the preferred solutions was also reconfirmed with the Advisory Committee. The detailed Public Consultation report for Stage 1 is contained in its entirety in Appendix D of the Stage 1 report and that for Stage 2 in Appendix D of the Stage 2 report.

Key elements that were identified throughout the public consultation process were:

- Consistent support for ground watering monitoring to determine the nature of any potential contamination issues;
- Concern among the Ellison area residents about the City's current policy that requires an area to join the City in order to receive sewer service;
- An awareness and comfort level achieved knowing that no action would be taken without further in-depth consultation with residents effected (i.e. petition for sewer service, including the implications of connecting, prior to decision to implement).

7 BYLAWS NEEDED AND WHO SHOULD PREPARE THEM

There will need to be a number of bylaws developed for the implementation of the preferred solutions, and those bylaws and who should prepare them are noted below.

7.1 Sewer Service Area Bylaws:

Bylaws will be required to establish the extent of each of the sewer service areas that wish to take advantage of the implementation of any of the preferred solutions that result in sewer service for an area that does not currently have such service. The areas currently lie within the RDCO, and RDCO staff would need to prepare these bylaws unless the preferred solution for the area in question requires that the area petition the City of Kelowna for a boundary expansion, and in that case the Sewer Service Area bylaw would be prepared by the City. The reason this distinction is noted is that the City should be consulted at the time an area found itself in need of sewer service to confirm that the City policy that requires the area to petition for boundary expansion in order to receive sewer service remains in effect.

7.2 Money Bylaws

In order to take advantage of available grant monies which only cover off part of the cost of a project a borrowing bylaw will need to be prepared for each of the sewer service areas by RDCO staff unless the area is required to petition the City of Kelowna for boundary expansion in order to receive sewer service as noted in the section immediately above that deals with Sewer Service Areas, in which case it would be incumbent upon City staff to prepare the necessary money bylaws.

7.3 Sewer Use Bylaw

The development of a Sewer Use Bylaw may be necessary under Preferred Solution 2 or under any of the preferred solutions that pertain to a sewer system being required for any of the specific areas of the LWMP, to ensure that deleterious substances are not discharged either to existing septic systems or to a sewer system that may result in an upset of the treatment works. It is probable that RDCO or City staff would review their existing sewer use bylaws and modify them as necessary. The development of a bylaw for each of the service areas should be done by staff of the jurisdiction involved. If connection to the City sewer were needed the City would likely ensure that the area was covered under its existing sewer use bylaw.

7.4 Water Conservation Bylaw

A water conservation bylaw to regulate the use of water and mandate the use of low flow fixtures, such as toilets and showerheads may be necessary under preferred solution 2, if the water conservation public education program fails to produce the desired results. RDCO staff would develop the bylaw.

7.5 Septic Tank Maintenance Bylaw


A septic tank maintenance and pumpout bylaw to catch and prevent any damage or failures before they become a problem may be necessary under preferred solution 2, if the septic tank operation and maintenance public education program fails to produce the desired results. RDCO staff would develop the bylaw.. Pumpout could be arranged by the Regional District with a contract to one or more septic tank pumpout companies. The costs for the regular septic tank pumpout could be added to the resident's annual taxation levy. Each resident could be provided a certificate for a "free" septic tank pumpout every 3 to 5 years depending upon the recommended pumpout frequency for each area in the LWMP or arrangements could be made for the septic haulers to bill the Regional District directly.

APPENDIX “A”

CITY OF KELOWNA’S SEWER SERVICE POLICY

APPENDIX A

A copy of the City of Kelowna's Council Policy Manual Resolution R267/06/03/20 in respect to sewer servicing for areas outside the City's boundary.

	<h1>CITY OF KELOWNA</h1>	POLICY: 293 PAGE: 1 of 1
<h2>COUNCIL POLICY MANUAL</h2>		
APPROVAL DATE: 2000/09/11 RESOLUTION #: R267/06/03/20 REPLACING #: R750/00/09/11 DATE OF LAST REVIEW: April 2006		
SUBJECT: SEWER SERVICING - NON-CITY AREA		
<p>There are areas immediately outside the City limits that have been developed with an urban setting that require, or will require, adequate sewage disposal. These include existing neighborhoods that are experiencing septic field or treatment system failure or where an environmental or health need has been identified. There are also potential new developments that, to avoid installing a private sewage collection, treatment, and disposal systems, should be connected to conventional sewer treatment facilities. It is generally recognized that when considering environmental, health, and cost benefits, that a central sewage treatment and disposal solution is the better alternative as compared to a number of small individual treatment facilities. The City of Kelowna will permit the connection of certain Regional District areas to the City sanitary sewer collection and treatment system with specific conditions. This policy identifies the criteria for determining which properties will be considered.</p>		
CRITERIA		
<ol style="list-style-type: none">1) A parcel or area wishing to connect to the City of Kelowna sewer system must support the process required to amalgamate the boundaries of the subject property into the boundaries of the City, and join the City.2) Areas to be considered are only the abutting "Kelowna Fringe Area" within the Regional District where the Regional Directors representing the City of Kelowna have full voting rights. Areas that are remote and do not abut the City boundaries will need special consideration and each case will be brought before City Council and the Regional Board before servicing is permitted.3) There must be no negative cost impact on existing City sewer utility customers or development within the City boundary either in the form of increased operating cost or increased Development Cost Charges.4) Any proposal to amalgamate with the City and connect to City sanitary sewer must be reviewed with the appropriate City and Regional District staff and then be submitted to City Council for consideration.5) The City sewer system intended to be utilized must have adequate capacity to serve all Lands in the City identified in the current OCP, and have additional capacity available for the Lands requesting the connection. If the proposed connection results in the need for improvements/expansion to the City sewer system, the benefiting property owner(s) or the Regional District will be required to finance the initial cost of improvements/expansion.		
REASON FOR POLICY: To establish criteria to require properties within the Central Okanagan Regional District to join the City of Kelowna to allow connection to the City sanitary sewer system.		
LEGISLATIVE AUTHORITY: Council Resolution.		
PROCEDURE FOR IMPLEMENTATION: As outlined in policy.		

APPENDIX “B”

PREFERRED SOLUTIONS AND OPTIONS

Note: The Preferred Solutions and the not recommended Options shown in this Appendix, Appendix C and in the main body of the report retain the numbering sequence utilized in the Stage 1 Report to facilitate cross referencing.

APPENDIX B RECOMMENDED SOLUTIONS AND NOT RECOMMENDED OPTIONS

Area	Maintain Status Quo	Public Education Initiatives	Implement Bylaws	Environmental Monitoring Program	City sewer service & remain in RDCO	City sewer service & join City	RDCO provides sewer service (Secondary Treatment)	RDCO provides sewer service (Septic Treatment)	Privately owned sewer service
All	0	1	2	3					
Sunset Ranch	0	1	2	3	4		5		6
Scotty Creek	0	1	2	3		7	8		9
Ranch Park MHP	0	1	2	3		10	11		12
Country Lane	0	1	2	3		12a	12b		12c
Country View	0	1	2	3		13	14		15
Falconridge	0	1	2	3			16a	16	
Greystokes/Dion Road	0	1	2	3			17a	17	
June Springs	0 (18)	1	2	3					
McCulloch	0 (19)	1	2	3					
Chute Lake / Okanagan Mountain Park	0 (20)	1	2	3					
Southern tip of Lakeshore Road	0 (21)	1	2	3		22			
Stormwater Management			23						
Agricultural Wastewater Management	24								
Key	MHP #	means Mobile Home Park							
	#	The Preferred Solution							
	#	Preferred Solution, implemented if the education in Preferred Solution #1 should fail to produce results							
	#	Option that was not selected							
	#	Option that is not available							

Table B1: LWMP Preferred Solutions and the not recommended Options identified for each Area

APPENDIX “C”

OVERALL SUMMARY AND COST DETAILS FOR EACH PREFERRED SOLUTION AND OPTION

Note: The Preferred Solutions and the not recommended Options shown in this Appendix, Appendix B and in the main body of the report retain the numbering sequence utilized in the Stage 1 Report to facilitate cross referencing.

The information that represents the most likely scenario is shown with a blue background for both the Preferred Solutions and for the Options which were not selected.

The costs utilized in the tables were developed by RDCO staff under the direction of Hilary Hettinga, P.Eng.

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APPENDIX C: Summary Table (Part 1)

Regional District of Central Okanagan LWMP for Electoral Area: Central Okanagan East									
APPENDIX Table C1: Summary of Options and Costs. (The most likely scenarios are shaded blue)									
Preferred Solution or Option	Comments	Area Involved	Number of Parcels Served	Gross cost for option	Cost per parcel	Cost per parcel with 2/3 grant	Annual Payments per parcel (20 yr Loan)	Annual Payments per parcel with 2/3 grant (20 yr Loan)	Total Annual Payments
Preferred Solution 0	Maintain the status quo	All	1522						None
Preferred Solution 1	Maintain status quo but with public education initiatives	All	1522	\$ 26,000	\$ 17	N/A			\$ 17
Preferred Solution 2	Maintain status quo but implement a series of bylaws	All	1522	\$ 15,000	\$ 10	N/A			\$ 10
Preferred Solution 3	Establish a monitoring program	All	1522	\$ 10,000	\$ 7	N/A			\$ 7
Preferred Solution 4	Sunset Ranch area continue to be serviced by the City of Kelowna	Sunset Ranch	450						\$ -
Option 5	Sunset Ranch area could have sewer service provided by the RDCO	Sunset Ranch	450	\$ 5,720,000	\$ 12,711	N/A	\$ 1,108	N/A	\$ 1,108
Option 6	Sunset Ranch area could have sewer service provided by a private sewage system owner operator	Sunset Ranch	450	\$ 6,578,000	\$ 14,618	N/A	\$ 1,274	N/A	\$ 1,274
Preferred Solution 7	Scotty Creek request sewer service from the City of Kelowna - IF ALL COSTS ARE ELIGIBLE FOR GRANT FUNDING EXCEPT CITY CONNECTION CHARGE	Scotty Creek	300	\$ 4,642,500	\$ 15,475	\$ 8,275	\$ 1,349	\$ 721	\$ 721
Option 8	Scotty Creek area could have sewer service provided by the RDCO - With Sunset Ranch	Treatment Plant	750	\$ 8,450,000	\$ 11,270	Cost per Unit for Scotty Creek and Sunset Ranch ONLY			
		Scotty Creek	300	\$ 8,023,500	\$ 26,745	\$ 8,915	\$ 2,332	\$ 777	\$ 2,332
		Treatment Plant	300	\$ 5,135,000	\$ 17,120	Cost per Unit for Scotty Creek ONLY			
		Scotty Creek	300	\$ 9,778,500	\$ 27,920	\$ 9,307	\$ 2,434	\$ 811	\$ 2,434
Option 9	Scotty Creek area could have sewer service provided by a private sewage system owner operator	Scotty Creek	300	\$ 11,245,275	\$ 32,100	N/A	\$ 2,799	N/A	\$ 2,799
Preferred Solution 10	Ranch Park MHP could request sewer service from the City of Kelowna - IF ALL COSTS ARE ELIGIBLE FOR GRANT EXCEPT CITY CONNECTION CHARGE	Ranch Park Mobile Home Park	76	\$ 655,300	\$ 8,622	\$ 5,991	\$ 752	\$ 522	\$ 522
Option 11	Ranch Park Mobile Home Park could have sewer service provided by the RDCO	Ranch Park Mobile Home Park	76	\$ 1,795,300	\$ 23,622	\$ 7,874	\$ 2,060	N/A	\$ 2,060
Option 12	Ranch Park Mobile Home Park could have sewer service provided by a private sewage system owner operator	Ranch Park Mobile Home Park	76	\$ 2,064,920	\$ 27,170	\$ 9,057	\$ 2,369	N/A	\$ 2,369
Preferred Solution 12a	Country Lane could request service from City of Kelowna	Country Lane (K726 Strata)	50	\$ 533,750	\$ 10,675	\$ 3,558	\$ 931	N/A	\$ 931
Option 12b	Ranch Park Mobile Home Park could have sewer service provided by the RDCO	Country Lane (K726 Strata)	50	\$ 1,050,000	\$ 21,000	\$ 7,000	\$ 1,831	N/A	\$ 1,831
Option 12c	Ranch Park Mobile Home Park could have sewer service provided by a private sewage system owner operator	Country Lane (K726 Strata)	50	\$ 1,210,000	\$ 24,200	\$ 8,067	\$ 2,110	N/A	\$ 2,110
Preferred Solution 13	Country View could request service from City of Kelowna	Country View	101	\$ 1,229,675	\$ 12,175	\$ 4,058	\$ 1,061	N/A	\$ 1,061
Option 14	Country View – Serviced by RDCO	Country View	101	\$ 3,232,000	\$ 32,000	\$ 10,667	\$ 2,790	N/A	\$ 2,790
Option 15	Country View – Serviced by private sewage system owner operator	Country View	101	\$ 3,603,175	\$ 35,675	N/A	\$ 3,110	N/A	\$ 3,110

Table C1: Summary table of Preferred Solutions and not recommended Options

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APPENDIX C: Summary Table (Part 2)

Preferred Solution 16	Falconridge area could be serviced by RDCO through a Septic System	Falconridge	52	\$ 2,080,000	\$ 40,000	\$ 13,333	\$ 3,487	\$ 1,162	\$ 1,162
	Falconridge area serviced through a Septic System WITH 75% GRANT		52	\$ 2,080,000	\$ 40,000	\$ 10,000	\$ 3,487	\$ 872	\$ 872
Option 16a	Falconridge area could be serviced by RDCO using a Sewer System	Falconridge	52	\$ 3,770,000	\$ 72,500	\$ 24,167	\$ 6,321	N/A	\$ 6,321
Preferred Solution 17	Greystokes/Dion Road area could be serviced by RDCO using a Septic System	Greystokes/Dion Road	22	\$ 1,300,000	\$ 59,091	\$ 19,697	\$ 5,152	\$ 1,717	\$ 1,717
	Greystokes/Dion Road area serviced through a Septic System WITH 75% GRANT		22	\$ 1,300,000	\$ 59,091	\$ 14,773	\$ 5,152	\$ 1,288	\$ 1,288
Option 17a	Greystokes/Dion Road area could be serviced by RDCO using a Sewer System	Greystokes/Dion Road	22	\$ 2,080,000	\$ 94,545	\$ 31,515	\$ 8,243	N/A	\$ 8,243
Preferred Solution 18	June Springs area	June Springs	Continue to use on-site sewage treatment & disposal systems; Follow Preferred Options 1-3 until issues possibly arise in the future						
Preferred Solution 19	McCulloch area	McCulloch	Continue to use on-site sewage treatment & disposal systems; Follow Preferred Options 1-3 until issues possibly arise in the future						
Preferred Solution 20	Chute Lake Okanagan Mountain Park area	Chute Lake/Okanagan Mountain Park	Continue to use on-site sewage treatment & disposal systems; Follow Preferred Options 1-3 until issues possibly arise in the future						
Preferred Solution 21	Southern Tip of Lakeshore Road area	Southern tip of Lakeshore Road	Continue to use on-site sewage treatment & disposal systems; Follow Preferred Options 1-3 until issues possibly arise in the future						
Option 22	Southern Tip of Lakeshore Road area – Serviced by City of Kelowna	Southern tip of Lakeshore Road	No real benefit to residents; Grant Funding not available as it is only a sewer extension (not new development)						
Preferred Solution 23	All Areas	Stormwater Management	Not included in the scope of this LWMP due to cost constraints, however a study is recommended to identify potential issues with storm water						
Preferred Solution 24	All Areas	Agricultural Wastewater Management	Not included in the scope of this LWMP due to cost constraints, however a study is recommended to identify potential issues with agricultural wastewater						

Table C1: Summary table of Preferred Solutions and not recommended Options (Continued)

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APPENDIX Table C2: Costs for Preferred Solutions 0, 1, 2 and 3

PREFERRED SOLUTION 0: Maintain the Status Quo			
No Additional Cost			

PREFERRED SOLUTION 1: Maintain status quo but with public education initiatives			
Communications Literature Development	240 hr	\$ 80.00 per hr	\$ 19,200
Annual Cost	120 hr/yr	\$ 40.00 per hr	\$ 4,800
Annual Material Mail Out Costs, Advertising			\$ 2,000
Total for Option 1			\$ 26,000
Total Number of Units	1522 units		
Cost per unit per year			\$ 17

PREFERRED SOLUTION 2: Maintain status quo but implement a series of bylaws			
Research, Preparation and Writing Bylaws			\$ 10,000
Annual Bylaw, Education and Enforcement Costs			\$ 5,000
Total for Option 2			\$ 15,000
Total Number of Units	1522 units		
Cost per unit per year			\$ 10

PREFERRED SOLUTION 3: Establish a Monitoring Program for LWMP Area			
Annual Sampling, Analysis and Reporting			\$ 10,000
Total for Option 3			\$ 10,000
Total Number of Units	1522 units		
Cost per unit per year			\$ 7

Table C2: Cost breakdowns for Preferred Solutions 0, 1, 2 and 3

**Regional District of Central Okanagan
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APPENDIX Table C3: Costs for Sunset Ranch for Preferred Solution 4 and Options 5 and 6

PREFERRED SOLUTION 4: Sunset Ranch continues to be serviced by City of Kelowna			
No Additional Cost			
OPTION 5: RDCO provides sewer servicing for Sunset Ranch			
Land Acquisition Cost - (approximately 10 acres)		\$	1,000,000
Treatment Facility Cost	450 units	\$ 3,000.00 per unit	\$ 1,350,000
Foundation & Building		\$	300,000
Pumpstation and Force main		\$	750,000
Disposal Fields		\$	1,000,000
Sub-Total		\$	4,400,000
Engineering & Contingency	30%	\$	1,320,000
Total for Option 5		\$	5,720,000
Total Number of Units in Sunset Ranch	450 units		
Cost per unit		\$	12,711
Total Cost with 2/3 Grant (Unlikely scenario)		\$	1,906,667
Cost per unit with 2/3 Grant (Unlikely scenario)		\$	4,237
		\$	1,108
		\$	369
OPTION 6: Private Developer provides sewer servicing for Sunset Ranch			
Land Acquisition Cost - (approximately 10 acres)		\$	1,000,000
Treatment Facility Cost	450 units	\$ 3,000.00 per unit	\$ 1,350,000
Foundation & Building		\$	300,000
Pumpstation and Force main		\$	750,000
Disposal Fields		\$	1,000,000
Sub-Total		\$	4,400,000
Engineering & Contingency	30%	\$	1,320,000
Markup for Private Developers Profit	15%	\$	858,000
Total for Option 6		\$	6,578,000
Total Number of Units in Sunset Ranch	450 units		
Cost per unit		\$	14,618
		\$	1,274

Table C3: Cost breakdowns for Sunset Ranch for Preferred Solution 4 and Options 5 and 6

**Regional District of Central Okanagan
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APPENDIX Table C4: Costs for Scotty Creek for Preferred Solution 7 and Options 8 and 9

PREFERRED SOLUTION 7: Scotty Creek connects to the City of Kelowna				
Scotty Creek Collection system			Cost per unit per year given 20 yr loan at 6%	
Total Number of Units	300 units			
Collection System Cost per Unit	\$ 10,800 per unit	\$ 3,240,000		
Cost to Connect to City of Kelowna	\$ 4,675 per unit	\$ 1,402,500		
Total for Scotty Creek Collection System		\$ 4,642,500		
Cost per unit		\$ 15,475		\$ 1,349
Cost per unit with 2/3 Grant for all costs		\$ 5,158		\$ 450
Cost per unit with 2/3 Grant for all costs but the City of Kelowna Connection Fee		\$ 8,275	\$ 721	
O&M Costs per unit	\$ 26.52 / month or \$ 318.24 / year			

OPTION 8: Scotty Creek Stand-Alone System, with or without Sunset Ranch			
Scotty Creek	300 units		
Sunset Ranch (full buildout)	450 units		
Treatment Facility Cost - Only Scotty Creek		With Sunset Ranch	Without Sunset Ranch
Land Acquisition Cost - (approximately 15 acres)		\$ 1,500,000	\$ 1,000,000
Treatment Facility Cost	\$ 3,000.00 per unit	\$ 2,250,000	\$ 900,000
Foundation & Building		\$ 500,000	\$ 300,000
Pumpstation and Force main		\$ 750,000	\$ 750,000
Disposal Fields		\$ 1,500,000	\$ 1,000,000
Sub-Total		\$ 6,500,000	\$ 3,950,000
Engineering & Contingency	30%	\$ 1,950,000	\$ 1,185,000
Treatment Plant Total for Option 8		\$ 8,450,000	\$ 5,135,000
Cost per unit		\$ 11,270	\$ 17,120
Cost per unit with 2/3 Grant (Unlikely scenario)		\$ 3,760	\$ 5,710
			\$ 1,493
			\$ 498
Total Capital Costs for Collection System and Treatment Plant		With Sunset Ranch	Without Sunset Ranch
Scotty Creek*			<i>Without Sunset Ranch</i>
Cost per unit - no Grants		\$ 22,070	\$ 27,920
Cost per unit - 2/3 Grant (Unlikely scenario)		\$ 7,360	\$ 9,310
O&M Costs	\$ 40-50 per month		

NOTE: * Collection system Costs from previous calculations:
 Scotty Creek Collection Systems \$ 10,800

Table C4.1: Cost breakdowns for Scotty Creek for Preferred Solution 7 and Option 8

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APPENDIX Table C4: Costs for Scotty Creek for Preferred Solution 7 and Options 8 and 9

OPTION 9: Private Developer provides sewer servicing and treatment for Scotty Creek and MHP			
<i>From Option 8:</i>		Cost	Cost per unit per year given a 20 yr loan at 6%
Scotty Creek *			
Cost per unit for collection system and treatment plant		\$ 27,920	
Markup for Private Developers Profit 15%			
Scotty Creek Collection System and Treatment Plant			
Cost per unit		\$ 32,100	\$ 2,799

<i>NOTE: * Collection system Costs from previous calculations:</i>	
<i>Scotty Creek Collection Systems</i>	<i>\$ 10,800</i>

Table C4.2: Cost breakdowns for Scotty Creek (Continued), Option 9

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APPENDIX Table C5: Costs for Ranch Park for Preferred Solution 10 and Options 11 and 12

PREFERRED SOLUTION 10: Ranch Park MHP connects to the City of Kelowna			Cost per unit per year given a 20 yr loan at 6%
Ranch Mobile Home Park Only	76 units		
Sewer Mains (\$ 225,000 + 30% Engineering & Contingency)		\$ 300,000	
Cost to Connect to City of Kelowna	\$ 4,675 per unit	\$ 355,300	
Total for Ranch Mobile Home Park		\$ 655,300	
Cost per unit		\$ 8,622	\$ 752
Cost per unit with 2/3 Grant for all costs		\$ 2,874	\$ 251
Cost per unit with 2/3 Grant for all costs but the City of Kelowna Connection Fee		\$ 5,991	\$ 522
O&M Costs per unit	\$ 26.52 per month per unit		

OPTION 11: Ranch Park MHP serviced by the RDCO			Cost per unit per year given 20 yr loan at 6%
Ranch MHP	76 units		
Estimated cost for treatment system	per unit	\$ 15,000	
Cost of Collection system (from Option 8)	per unit	\$ 8,622	
Total Cost for Service by RDCO	per unit	\$ 23,622	\$ 2,060
Total Cost with 2/3 Grant	per unit	\$ 7,870	\$ 686

OPTION 12: Private Developer provides sewer servicing and treatment for Ranch Park MHP			Cost per unit per year given 20 yr loan at 6%
<i>From Option 11:</i>		Cost	
Cost per Unit for Ranch Park	76 units	\$ 23,622	
Markup for Private Developers Profit	15%		
Cost per unit with Markup		\$ 27,170	\$ 2,369

Table C5: Cost breakdowns for Ranch Park for Preferred Solution 10, and Options 11 & 12

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Regional District of Central Okanagan					
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APPENDIX Table C6: Costs for Country Lane for Preferred Solution 12a and Options 12b and 12c					
OPTION 12a: Country Lane connects to the City of Kelowna					
Country Lane Collection system					Cost per
Total Number of Units	50	units			unit per
Collection System Cost per Unit	\$ 6,000	per unit	\$ 300,000		year given
Cost to Connect to City of Kelowna	\$ 4,675	per unit	\$ 233,750		20 yr loan
Total for Ranch Park Collection System			\$ 533,750		at 6%
Cost per unit			\$ 10,675	\$ 931	
Cost per unit with 2/3 Grant for all costs			\$ 3,558	\$ 310	
Cost per unit with 2/3 Grant for all costs but the City of Kelowna Connection Fee			\$ 6,675	\$ 582	
OPTION 12b: Country Lane serviced by the RDCO					
Country Lane Collection system					Cost per
Total Number of Units	50	units			unit per
Collection System Cost per Unit	\$ 6,000	per unit	\$ 300,000		year given
Estimated cost for treatment system (From Option 11 above)	\$ 15,000	per unit	\$ 750,000		20 yr loan
Total for Ranch Park Collection and treatment System			\$ 1,050,000		at 6%
Cost per unit			\$ 21,000	\$ 1,831	
Cost per unit with 2/3 Grant for all costs			\$ 7,000	\$ 610	
Cost per unit with 2/3 Grant for all costs but the City of Kelowna Connection Fee			\$ 17,000	\$ 1,482	
OPTION 12c: Private Developer provides sewer servicing and treatment for Country Lane					
<i>From Option 12b:</i>				Cost	Cost per
Cost per Unit for Country Lane	50	units	\$ 21,000		unit per
Markup for Private Developers Profit	15%				year given
					20 yr loan
					at 6%
Cost per unit with Markup			\$ 24,200	\$ 2,110	

Table C6: Cost breakdowns for Country Lane Preferred Solution 12a, Options 12b & 12c

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APPENDIX Table C7: Costs for Country View for Preferred Solution 13 and Options 14 and 15

PREFERRED SOLUTION 13: Country View connects to the City of Kelowna			
Country View Collection system			Cost per unit per year given a 20 yr loan at 6%
Total Number of Units	101 units		
Collection System Cost per Unit (estimated)	\$ 7,500 per unit	\$ 757,500	
Cost to Connect to City of Kelowna	\$ 4,675 per unit	\$ 472,175	
Total for Country View Collection System		\$ 1,229,675	
Cost per unit		\$ 12,175	\$ 1,061
Cost per unit with 2/3 Grant for all costs		\$ 4,058	\$ 354
Cost per unit with 2/3 Grant for all costs but the City of Kelowna Connection Fee		\$ 7,175	\$ 626

OPTION 14: Country View Serviced and Treatment by RDCO Facility			
Total Number of Units	101 units	Cost per unit	
From Option 13: Collection System Cost per unit		\$ 7,500	Cost per unit per year given a 20 yr loan at 6%
From Option 8: Cost per unit for treatment plant		\$ 17,120	
Pump Station and Lift Station per unit		\$ 7,426	
Total for Country View Treatment Plant		\$ 24,546	
Cost per unit		\$ 24,500	\$ 2,136
Cost per unit with 2/3 Grant		\$ 8,200	\$ 715
Total Capital Cost for Country View - Treatment Plant and Collection system Costs			
Cost per unit		\$ 32,000	\$ 2,790
Cost per unit with 2/3 Grant		\$ 10,700	\$ 933

OPTION 15: Private Developer provides sewer servicing and treatment for Country View			
<i>From Option 14:</i>		Cost	
Cost per unit for treatment plant		\$ 24,500	Cost per unit per year given a 20 yr loan at 6%
Markup for Private Developers Profit	15%		
Cost per unit for Treatment Plant		\$ 28,175	
Plus Cost per unit for Collection		\$ 7,500	
Total Cost per Unit		\$ 35,675	\$ 3,110

Table C7: Cost breakdowns for Country View Preferred Solution 13, and Options 14 and 15

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APPENDIX Table C8: Costs for Falconridge for Preferred Solution 16 and Option 16a

OPTION 16: Falconridge Area serviced by RDCO using a Septic System			
Land Acquisition		\$ 500,000	Cost per unit per year given a 20 yr loan at 6%
Septic Tank and Distribution Field		\$ 350,000	
Pumpstation and Force main		\$ 250,000	
Collection		\$ 500,000	
Sub-Total		\$ 1,600,000	
Engineering & Contingency	30%	\$ 480,000	
Total for Option 16 - Septic System		\$ 2,080,000	
Total Number of Units	52 units		
Cost per unit		\$ 40,000	\$ 3,487
Total Cost with 2/3 Grant		\$ 693,333	
Cost per unit with 2/3 Grant		\$ 13,333	\$ 1,162
Cost per unit with 75% Hardship Grant		\$ 10,000	\$ 872

OPTION 16a: Falconridge Area serviced by RDCO through sewer system			
Land Acquisition Cost		\$ 750,000	Cost per unit per year given a 20 yr loan at 6%
Treatment Facility Cost		\$ 650,000	
Foundation & Building		\$ 750,000	
Pumpstation and Force main		\$ 250,000	
Disposal Fields		\$ 500,000	
Sub-Total		\$ 2,900,000	
Engineering & Contingency	30%	\$ 870,000	
Total for Option 16a - Sewer System		\$ 3,770,000	
Total Number of Units	52 units		
Cost per unit		\$ 72,500	\$ 6,321
Total Cost with 2/3 Grant		\$ 1,256,667	
Cost per unit with 2/3 Grant		\$ 24,200	\$ 2,110

Table C8: Cost breakdowns for Falconridge Preferred Solution 16, and Option 16a

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**Regional District of Central Okanagan
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APPENDIX Table C9: Costs for Greystokes/Dion Road for Preferred Solution 17 and Option 17a

OPTION 17: Greystokes/Dion Road serviced by RDCO through a Septic System			
Land Acquisition		\$ 400,000	Cost per unit per year given a 20 yr loan at 6%
Septic Tank and Distribution Field		\$ 200,000	
Pumpstation and Force main		\$ 150,000	
Collection		\$ 250,000	
Sub-Total		\$ 1,000,000	
Engineering & Contingency	30%	\$ 300,000	
Total for Option 17 - Sewer System		\$ 1,300,000	
Total Number of Units	22 units		
Cost per unit		\$ 59,091	\$ 5,152
Total Cost with 2/3 Grant		\$ 433,333	
Cost per unit with 2/3 Grant		\$ 19,697	\$ 1,717
Cost per unit with 75% Hardship Grant		\$ 14,773	\$ 1,288

OPTION 17a: Greystokes/Dion Road serviced by RDCO through sewer system			
Land Acquisition		\$ 400,000	Cost per unit per year given a 20 yr loan at 6%
Treatment Facility Cost		\$ 500,000	
Collection System		\$ 250,000	
Pumpstation and Force main		\$ 150,000	
Effluent Disposal		\$ 300,000	
Sub-Total		\$ 1,600,000	
Engineering & Contingency	30%	\$ 480,000	
Total for Option 16 - Sewer System		\$ 2,080,000	
Total Number of Units	22 units		
Cost per unit		\$ 94,500	\$ 8,239
Total Cost with 2/3 Grant		\$ 693,300	
Cost per unit with 2/3 Grant		\$ 31,500	\$ 2,746

Table C9: Cost breakdowns for Greystokes/Dion Road Preferred Solution 17 & Option 17a