



TOWN OF  
**COMOX**

## **Anderton Corridor Servicing Study**

### **Summary Report**

**Town of Comox**

Presented to:

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# 1. INTRODUCTION

The Town of Comox is experiencing growth and there is a need to provide additional lands for development within the Town. The Anderton Corridor has been identified as an area that will be annexed into the Town of Comox as demand for new homes and development land occurs. There has already been an extension of the Town boundary to include the southernmost portions of the study area. Further extension of the Town boundary requires a servicing plan that identifies aspects of the future development in terms of the engineering and infrastructure necessary for future growth, the phasing of the growth, and an estimate of the costs attributable to the provision of the infrastructure.

The Anderton Corridor which is shown on **Figure S1-1** is described as future annexation Area B in the Town of Comox Official Community Plan, Bylaw 1685 (OCP).

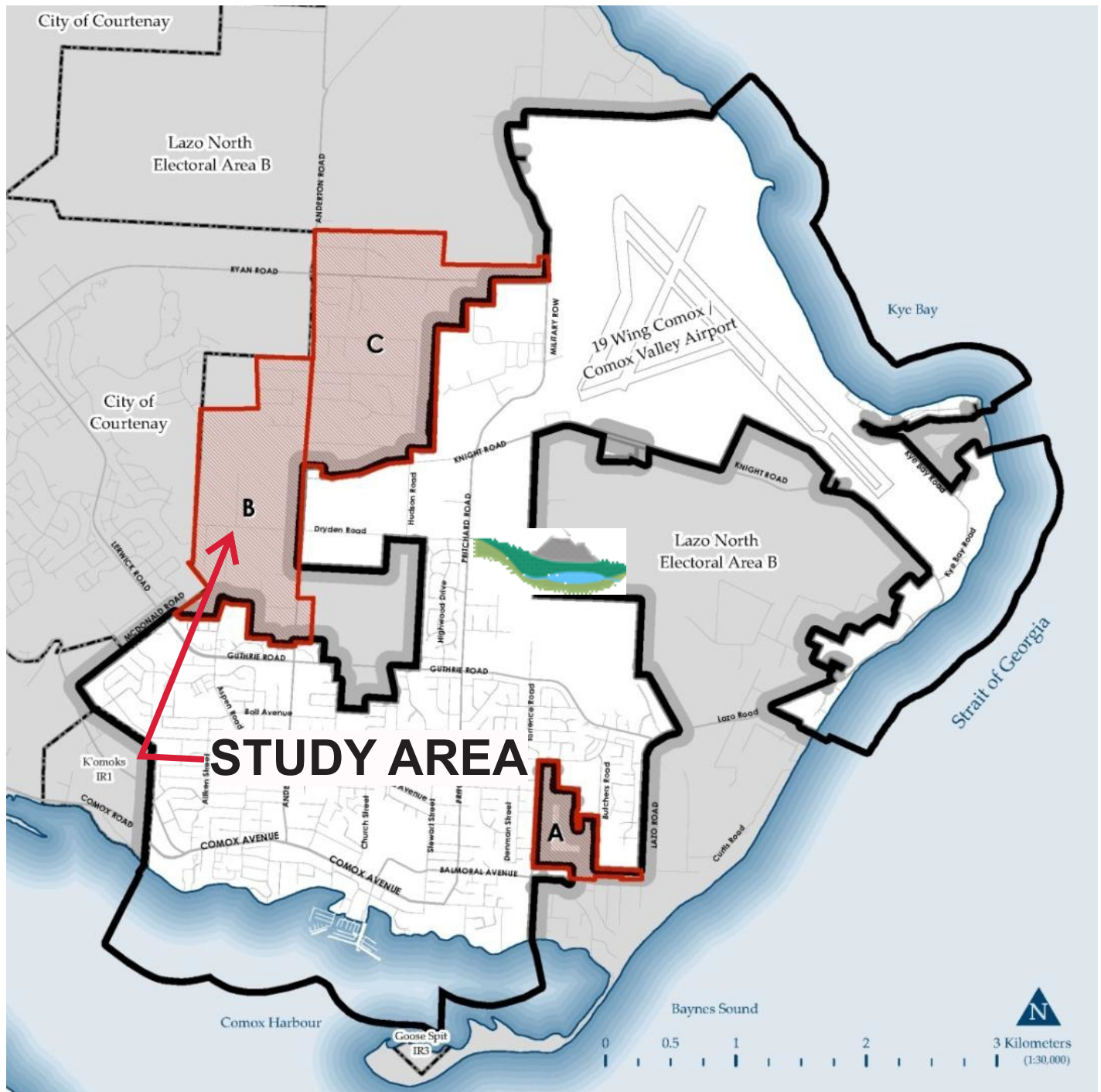
The future municipal infrastructure servicing systems within the Anderton Corridor are interconnected with that in the Comox Valley Regional District (CVRD), the Town of Comox, and the City of Courtenay. The operation, planning, and upgrading of different components of the systems vary depending upon ownership and the responsibility held by the owner. The future scheduling of development and will affect infrastructure extension for the Town and the CVRD within the Anderton Corridor annexation area.

Mr. Jim Dumont has been retained by the Town of Comox to undertake a study of servicing requirements of the Anderton Corridor.

The servicing study focused primarily on the aspect of stormwater management while providing a review of the sanitary sewer and the water requirements in the study area. The study findings are provided in separate volumes, including:

- Summary Report, this volume
- Volume 1 Stormwater Management Plan
- Volume 2 Sanitary Servicing Plan
- Volume 3 Water Servicing Plan.





Source: Town of Comox Official Community Plan, 12 May, 2011, Page 104,  
Figure 9 - Town of Comox Potential Boundary Expansion Areas



## 2. ANDERTON CORRIDOR AREA

The study area is designated to be annexed into the Town as local property owners proceed with development using the standards and planning available within the Town. Accommodation has been made within the Official Community Plans (OCP) of both the Town of Comox and the CVRD.

The OCP of the CVRD identifies the study area as a part of the designated Settlement Expansion Areas. The policies of the CVRD govern development within the study area by limiting developments so that the rural character of servicing with low density.

The future direction of land use and development is discussed within sections 35 and 36 of the CVRD OCP governs development while the lands are a part of the CVRD. The OCP states "*significant change to the existing land use or further subdivision that increases the density, impact or intensity of use of land is not envisioned until these areas have been amalgamated with the adjacent municipality requires a minimum parcel size of four (4) hectares until the lands within the adjacent municipality*". Any development with greater density will require annexation into the Town of Comox. Upon annexation "*any land use application for subdivision, or rezoning will be reviewed in light of the planning direction in the adjacent municipality in order to ensure that consideration is given to compatible planning and zoning requirements of that municipality.*"

In accordance with Comox Valley Regional Growth Strategy Bylaw No. 120, 2010, MG Policy 1E-5 as properties are annexed into the Town, new development must be "*phased in an orderly manner in order to ensure that appropriate infrastructure capacity is available, that new development does not detract from compact growth options within . . . [the Town] and that the financial stability of . . . [the Town] is not affected.*" Therefore, it can be anticipated that new development will have a greater density than existing surrounding municipal single-family development.

The potential land uses for the study area have been provided by the Town of Comox and are shown on **Figure S2-1**. The Town estimates that the ultimate housing density for the study area is approximately 38 units per ha with a total population of 8,910 persons.

As the future detailed planning, rezoning, and subsequent subdivision design occurs the information in this report may be updated to represent a more accurate view of the study area. The preliminary information provided herein may be superseded for few reasons that may include:

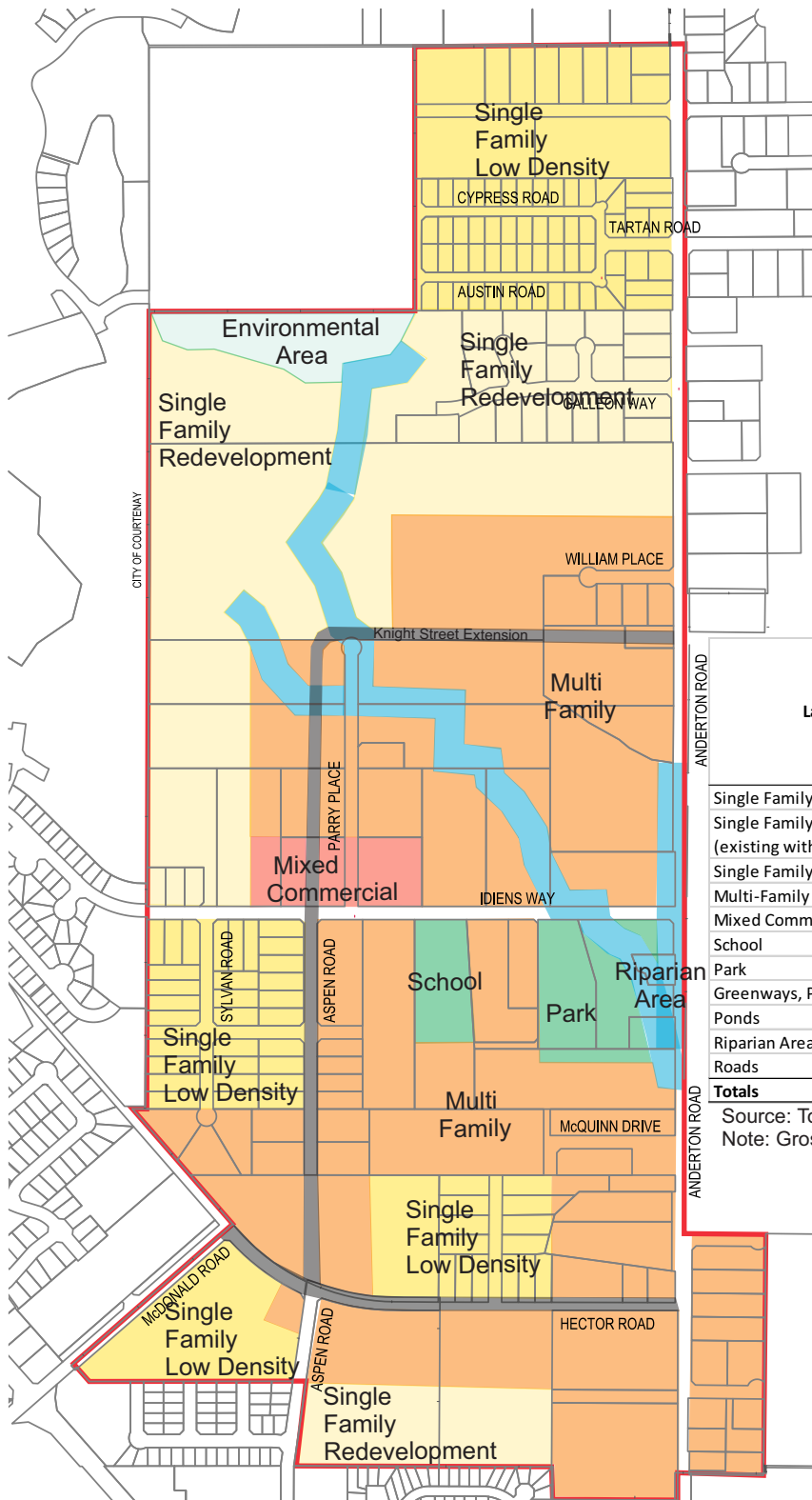
- Accuracy of the topographic mapping, and
- Market conditions that result in different land use requirements.

At this time, the Town has indicated that majority of the land is within "blanket" 9.0 m height limit for construction near the Comox Airport. Ongoing discussions between the Town of Comox, City of Courtenay and DND are occurring to clarify



future requirements. Some creative designs may be required to achieve the target 38 uph density. Given the potential height restrictions, the mid-density areas may need to be expanded. Single-family would remain on Acacia Rd block, east of Aspen Rd and north of (extension) Knight Road, but “Single-Family Redevelopment” labelled lands may need higher density than SF.





Land Use	Area		Density		Population		Totals	
	Gross (ha)	Net (ha)	Net	UPHa	People/ha	Units	People	
Single Family East of Anderton	4.5	4.5	38.0	20	68	135	304	
Single Family Low Density (existing with infill)	16.0	13.6		14	31	186	419	
Single Family Redevelopment	65.3	38.7		24	54	959	2,158	
Multi-Family	61.4	52.7		46	104	2,680	6,030	
Mixed Commercial - Residential	2.0	2.0						
School	2.0	2.0						
Park	2.0	2.0						
Greenways, Pocket Parks		4.1						
Ponds	7.5	7.5						
Riparian Areas		9.0						
Roads		24.6						
<b>Totals</b>	<b>160.7</b>	<b>160.7</b>	<b>38.0</b>			<b>3,960</b>	<b>8,910</b>	

Source: Town of Comox

Note: Gross development areas include parks riparian ways and parks.

Anderton Corridor Servicing Study  
Volume 2 Sanitary Sewer Plan  
Potential Land Use  
Figure S2 - 1





## 3. FUNDING MECHANISMS

### 3.1 New Infrastructure Financing

The financial plan for the Anderton Corridor is based on a series of fundamental assumptions that progress the need to provide the Town of Comox with investment in municipal infrastructure for new developments while utilizing a process that is equitable to both the municipality and developers. The investment is balanced so that neither the taxpayer nor the developer is penalized, or provides subsidies to support the other.

The subdivision process requires installation of infrastructure needed by the individual properties within that subdivision. In the Town of Comox, development and sale of new neighbourhoods funds the construction of new infrastructure that taxpayers will own, operate and maintain. As costs paid by developers are reflected in the price of housing, the cost of new development is ultimately borne by new homeowners.

A very simplistic view is that the infrastructure within any subdivision will be designed, constructed, and funded by the developer. As there is a need to connect the subdivision to existing Town infrastructure some off-site, external to the subdivision, works will need to be constructed. This leads to the possibility that other developments may benefit from the initial infrastructure construction. Where the infrastructure constructed by one developer will benefit other developer then a cost sharing mechanism is required.

One common method of funding the infrastructure that would be shared by more than one subdivision is through Development Cost Charges (DCC) levied on new subdivisions. DCC's are collected and accumulated in the DCC Fund and are used to cover the cost of oversizing the capital works required to provide municipal services to new developments. Inclusion of the Anderton Corridor infrastructure into the DCC Cost recovery system will necessitate an update to the current DCC Bylaw.

The principles that will be followed in funding projects in Anderton Corridor are as follows:

- The Town of Comox will not provide financing to developers wishing to provide servicing within the study area.
- The Town of Comox will not assume financial risk for providing services to the neighbourhood.

A successful DCC funding system requires an ongoing subdivision development process and relatively large area available for subdivision within the Town. At this time there is very little available undeveloped land within the Town and development within the study area is expected to proceed as lands are annexed by the Town. Without a large land bank, a limited amount of DCC funds is foreseeable leading to insufficient funds being available to cover the entire cost of the new infrastructure. This may lead an expectation





that the Town would cover any shortfall. An alternative funding mechanism may be required to achieve the above principles.

A commonly used alternative funding mechanism is the “Front-end”, or “Late Comer’s” financing arrangement which could be used instead of the DCC process, or to make up any shortfall from the DCC funds. The financing would be carried by the initial developer with subsequent developers repaying the initial developer. The “Front-end” agreements would protect the Town of Comox and early subdivision developers through an agreement where any future developments would pay a share of the costs prior to approval of the subsequent development. Thus, all developments relying upon the infrastructure would be responsible for the funding of the infrastructure.

New infrastructure eligible for cost sharing may be financed by one of two sources:

1. The Town can fund new infrastructure through Development Cost Charges (DCC) where developers can pay for new infrastructure directly and have all or part of the cost rebated through a reduction in DCC’s; and/or
2. Utilize a Front-end Financing or Late Comer’s Agreement where the first developer funds and constructs the infrastructure and recovers costs that are in excess of their development need from future benefiting developers.

It is recommended that any future funding and cost sharing system be based on the "oversizing" concept, which has a significant impact on the assumptions in the financial report/analysis. This means that the "base" cost of all works is the responsibility of the developer and it is only the oversizing from base to standards that are covered by funds from either the DCC program or other funding mechanism.

## 3.2 Operation and Maintenance Funding

Any addition of infrastructure to the Town of Comox will result in an increase in the budgets require for the ongoing operation, maintenance, and ultimately the replacement (O&M) of the infrastructure. Three components of the future infrastructure required within the study area is expected to carry increased O&M costs than previously experienced by the Town of Comox. These are:

1. The Brooklyn Pumping station for the sanitary sewerage system,
2. The detention ponds for stormwater, and
3. The infiltration systems for stormwater.

The current practice within the Town is to allocate the O&M costs across the entire Town. In this instance the added O&M costs can be attributed to the future developments within the study area. There is a method with can lead to a “User Pay” alternative that would see the additional O&M costs being assigned to the properties benefiting from the infrastructure. Establish a Local Service Area to fund construction and operations through a parcel tax levee. The Local Service Area could also be used to fund future operation and maintenance costs.



## 4. STORMWATER MANAGEMENT PLAN

The fundamental purpose of stormwater management is to provide drainage for new developments while not increasing the risk of flooding and downstream erosion in the streams, thus protecting people, property, and the environment. Planning of the stormwater management systems within the Anderton Corridor must consider the drainage aspects, protection of environmental and biological aspects of the stream, as well as the protection of downstream agricultural lands. Additional information is provided in Volume 1 Stormwater Management Plan.

The localized development drainage system provides protection from localized and nuisance flooding using a conventional piped and pond system in accordance with the Town's Bylaws. Protection against environmental and agricultural losses plus increases in potential flooding will require additional consideration and enhanced protection works.

The stormwater management systems within the study area will be comprised of several separate and independent components with a set of defined purpose and standards. These include:

1. The piped or **minor system** consists primarily of the storm sewer system comprised of inlets, conduits, manholes and other appurtenances designed to collect and discharge into the stormwater ponds. The piped system will be constructed for each development and will replace the existing system of roadside ditches.
2. The overland or **major system** will come into operation once the minor system's capacity is exceeded. Thus, the streets may act as open channels directing the excess storm water to the stormwater ponds. The major system shall be designed to safely convey a 1 in 100 year return period peak discharge.
3. Stormwater retention or **infiltration systems** consist of underground systems that will temporarily store stormwater while allowing it to infiltrate into the ground. These systems will reduce the total volume of stormwater runoff to predevelopment amounts to reduce the potential erosion in Brooklyn Creek.
4. Stormwater **ponds** will temporarily store stormwater while reducing the discharge rates and preventing increases in downstream flooding.

The minor and major systems will be designed and constructed at the time of subdivision. The operation and sizing of the infiltration and pond systems is described below

The Anderton Corridor lies within the upper reaches of the Brooklyn Creek watershed. The lower reaches of Brooklyn Creek have been impacted by increases in flooding, stream erosion, soil deposition, and reduced summer discharges as a result of past development within the watershed. The Town has undertaken repairs and maintenance along the stream corridor to provide stream bank stability, and to reduce flooding. The need for increased maintenance and expenditures will occur with additional development in the



watershed. Minimizing these expenditures is essential for the future sustainability of development within the Town.

A large portion of the Brooklyn Creek watershed that lies within the City of Courtenay and the CVRD as shown on **Figure S4-1**. Within Courtenay is approximately 196 ha comprised of the entire 186 ha of the Upper Watershed and approximately 10 ha of the Middle Watershed immediately north and west of the study area. Due to the potential impact of the stormwater contributed from outside the future boundary of the Town of Comox the recommendations for the study area should also be applied to future development and redevelopment within the City of Courtenay and within the CVRD. The Town should enter into discussions with the City and the CVRD to apply common standards for development across the Brooklyn Creek watershed.

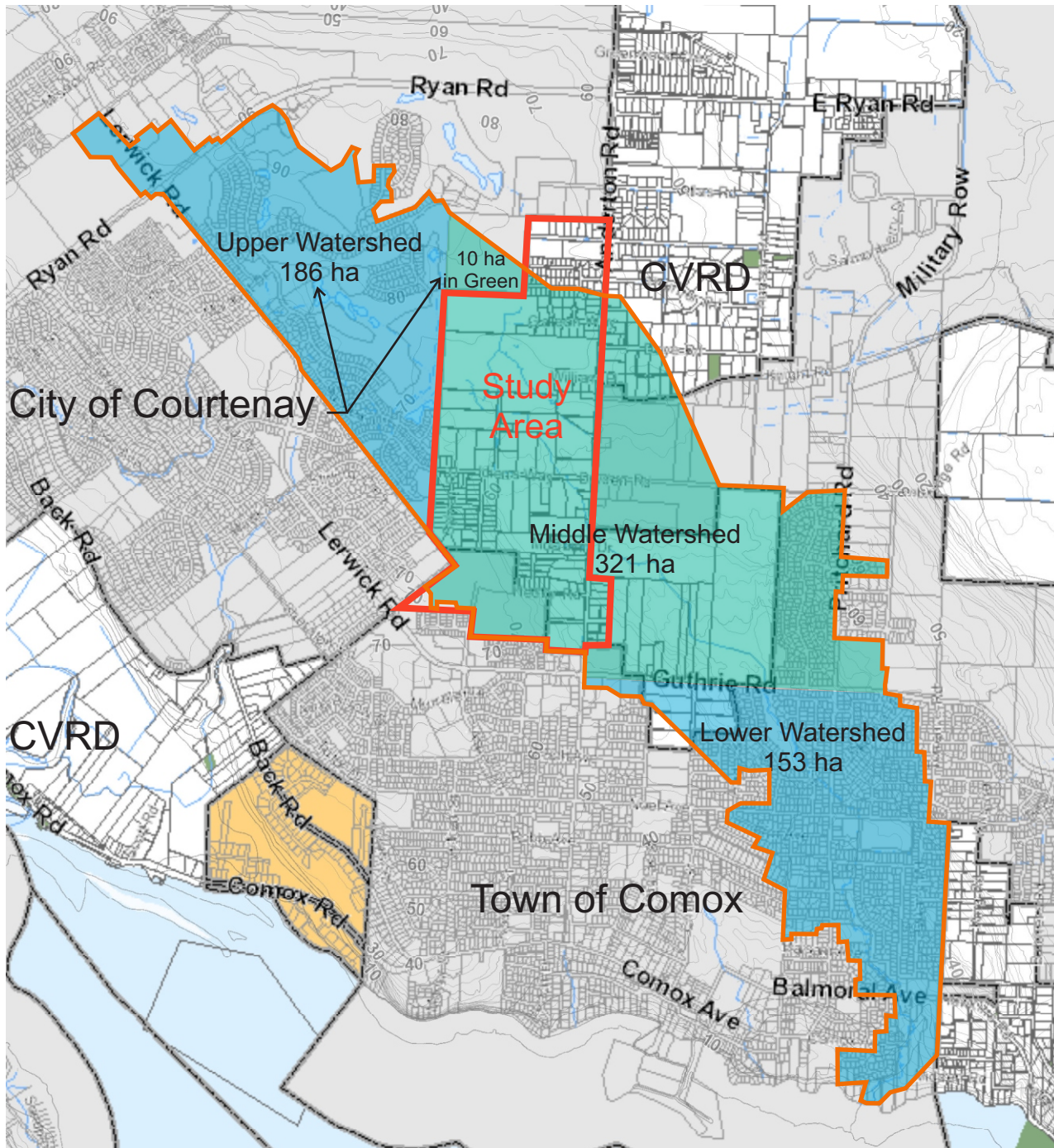
A Water Balance Methodology has been developed and applied in the North East Comox development area. This approach manages the volume of stormwater discharges so that both the downstream flooding and stream degradation are by controlled. The major consideration of this approach is the duration of discharge from future developments. This approach will not solve existing problems in the watershed or along the stream corridor however it will allow development to proceed without increasing the adverse impacts which include the risk of downstream flooding and stream degradation.

There are several potential adverse impacts that result from development within the study area, and within the upper watershed area of the City of Courtenay and the CVRD which include:

1. Increases of flood discharge and the risk of flood damage in both the developed and agricultural areas;
2. Increased channel erosion resulting from a range of discharges associated with larger volumes of stream discharge, or put another way an alteration of the Water Balance of the watershed.
3. Alteration of, and damage to, the aquatic environment and its value as a result of alteration of the Water Balance of the Watershed.
4. Long term reduction of the water table and aquifer storage that may impact agricultural production in the nearby areas.

Implementing the volume reduction systems, and the retention ponds as described would not increase the flood risks within the Brooklyn Creek watershed. The systems envisioned would provide a developed study area with a hydrologic response that would be equal to those if no development had occurred within the study area. The study addressed the potential to increase the flood risks associated with further development and redevelopment within the study area and the mitigation works to prevent further increases in flood discharges and flooding. However, the study did not estimate the impacts that have occurred, or may occur in future, as a result of development within the City of Courtenay.





Anderton Corridor Servicing Study  
Volume 1 Stormwater Management Plan  
Brooklyn Creek Watershed  
Figure S4-1





This study did not delineate the floodplain of Brooklyn Creek within the study area, or in downstream reaches of Brooklyn Creek. Delineation of the floodplain will be required as development occurs to safeguard future developments, properties, and people along Brooklyn Creek. Floodplain delineation will establish flood construction levels (FCL) along Brooklyn Creek and the flood setback from the stream necessary to provide flood conveyance. It is important to note that the flood setback is separate and distinctly different than the riparian setbacks established for the RAR environmental requirements.

The key to successfully incorporating the detention systems into the study area would be to mandating the provision of the three target values within each development within the study area. The three targets include:

1. **Retention Volume** for infiltration systems and neighbourhood detention facilities having a 1 in 100 year volume as measured in m<sup>3</sup>/ha of both subdivided properties and road ROWs;
2. **Base Flow Release Rate** defined as the mean predevelopment discharge rate as measured in L/s/ha; and
3. **Infiltration Area** for the infiltration systems for all parts of the subdivision including road ROWs and serviced lots on a m<sup>2</sup>/ha basis.

A summary of the required stormwater sizing, or watershed targets are shown in **Table S4.1**.

Table S4.1 – Watershed Targets for Mitigation		
Target	Impervious Values (%)	
	60	90
<b>Infiltration System Area</b> (m <sup>2</sup> /ha)	200	400
<b>Base Flow Release</b> (L/s/ha)	1.0	1.0
<b>Infiltration System Volume</b> (m <sup>3</sup> /ha)	60	120
<b>Neighbourhood Detention Volume</b> (m <sup>3</sup> /ha)	475	475

**The Town of Comox has established a preference for direct control over the infiltration system and the subsequent responsibility for operation and maintenance of constructed works. As a result, these constructed systems will be located within land and Rights-Of-Ways owned by the Town.**

The standard design details and specification for the infiltration system have been previously established in the North East Comox Stormwater Management Plan. Use of these previously established details are recommended for the study area.

The neighbourhood stormwater ponds will be constructed as development occurs within the study area. The size, number, and location of neighbourhood ponds will be determined as development planning progresses. Two distinctly different options were considered that include



distributed ponds and minimum ponds. Details of these options are as follows:

**Option 1 Distributed Ponds** would see ponds being constructed as development occurs. This approach can be seen as following the current practices followed by the Town and the development community. It should be noted that this practice will result in many of new facilities that will require ongoing maintenance. Following this option has the potential to ignore the impacts caused by the road network. As development occurs the control of stormwater from the existing road network must be considered during the subdivision and development process.

**Option 2 Minimum Number** would see a minimum number of ponds to reduce increased level of resources and costs associated with the ongoing maintenance of each pond along with all the required infiltration systems. To this end a plan has been created to reflect a series of seven ponds that would correspond to the future development phasing and annexation of lands into the Town. A series of seven development phases is foreseen, each with a single stormwater pond. The development phasing and ponds are shown on **Figure S4.2**.

**It is recommended that the Town of Comox consider establishing a minimum pond catchment area to provide a balance between future maintenance costs and ease of development. A minimum pond catchment of 10 ha would result in a total of sixteen ponds. This may provide an acceptable balance between Option 1 and Option 2 to manage future maintenance costs and potential difficulties in planning and implementing the detention ponds.**

**The ponds will be designed to contain the 1:100 year return period volume with a maximum discharge rate of 16.1 L/s/ha of contributing area.** During the detailed design of each pond the contributing area will be confirmed along with the ultimate catchment characteristics.

The costs for the stormwater drainage system can be attributed to pond catchment areas as shown on **Figure S4.2** and costs of the minimum number of pond option are listed in **Table S4.2**. The cost estimates are generally representative of the detention ponds for each of the catchment areas as shown and may increase if the number of ponds is increased. The costs can be updated should the number of ponds be increased.

Examination of the estimated costs leads to the observation that the off-site storm sewer cost required to drain the pond for Catchment 7 is large. This is due to the uncertainty of the ultimate discharge point which could be either a local roadside ditch, or an extension to the Queen's Ditch. Ultimately the development and redevelopment within the CVRD combined with annexation into the Town of Comox will lead to conversion of the ditches to storm sewers.



If we exclude the pipe for Catchment 7 from the costs the average cost of providing the stormwater detention system for the projected 3825 units on a per unit basis will be approximately \$1,591 plus taxes, engineering and administrative costs.

The cost estimates will be revised as new developments and subdivisions occur and will become more accurate as more detail is acquired.

The option to have more numerous ponds can be considered as it is likely to facilitate development where the acquisition of property for a pond may be located on adjacent or nearby property. While this may facilitate development there will be a long-term effect on the O&M costs for the Town. The O&M costs will increase as the number of ponds increase, even if the total detention volumes are equal.

The Town of Comox should investigate the pond configuration(s) including wet and/or dry ponds, and the minimum contributing area that would be allowed while considering future O&M costs. This can then lead to a Town Policy regarding the future number of ponds.

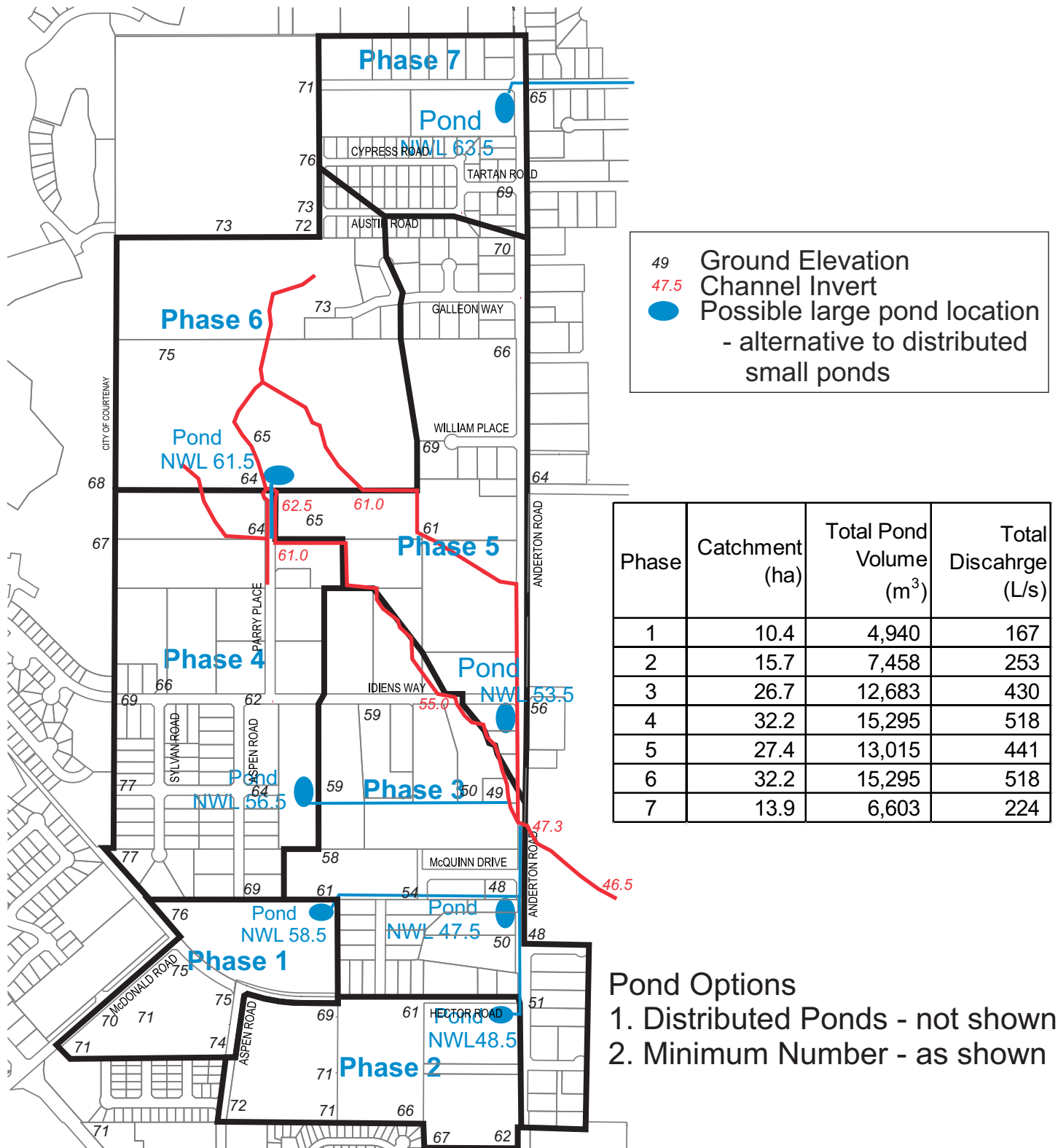
#### **4.1 Funding Stormwater O&M costs**

To fund the operations and maintenance costs of the stormwater infiltration and pond system, the Town can establish a Local Service Area (LSA) for Stormwater to fund the operation and maintenance costs of the infrastructure within the study area beginning with the first subdivision. This Local Service Area can be expanded to include additional subdivisions and developments as they occur and are annexed into the Town of Comox. This process can be used to provide the resources required for O&M while not affecting the General Revenue and budgets already in place. The LSA would be able to minimize the effect of a many ponds by placing the responsibility on the future homeowners in the LSA rather than all the rate payers within the Town.

Estimates of the O&M costs are necessary to set up and to update the cost recovery systems associated with the Local Service Area. As the future stormwater management systems are designed the Town should require an Operation and Maintenance Manual for each facility. The O&M Manual will document the design standards and philosophy, location of the components of the system, the required maintenance and anticipated frequency, the anticipated life of the infrastructure, methods of rehabilitation and replacement as well as estimates of costs for these items. This information can be combined with actual costs and the Local Service Area levies can be adjusted to cover the annual and life cycle costs of the infrastructure.







Elevations are approximate and will be confirmed during design

**Pond Options**  
 1. Distributed Ponds - not shown  
 2. Minimum Number - as shown

Anderton Corridor Servicing Study  
 Volume 1 Stormwater Management Plan  
 Development Phasing and Detention Ponds  
 Figure S4-2



Table S4.2 – Stormwater System Costs					
Phase	Item	Unit	Quantity	Rate	Cost
1	Land Acquisition	ha	0.49	160,000	78,400
	Excavation and finishing	m <sup>3</sup>	9,880	15	148,000
	Discharge works	LS	1	50,000	50,000
	Downstream piping	Lm	530	1,500	795,000
Phase 1 subtotal					1,071,600
2	Land Acquisition	ha	0.75	160,000	120,000
	Excavation	m <sup>3</sup>	14,900	15	223,500
	Discharge works	LS	1	50,000	50,000
	Downstream piping	Lm	370	1,500	555,000
Phase 2 subtotal					948,500
3	Land Acquisition	ha	1.27	160,000	203,200
	Excavation	m <sup>3</sup>	25,000	15	375,000
	Discharge works	LS	1	50,000	50,000
	Downstream piping	Lm	100	1,500	150,000
Phase 3 subtotal					778,200
4	Land Acquisition	ha	1.53	160,000	244,800
	Excavation	m <sup>3</sup>	31,000	15	465,000
	Discharge works	LS	1	50,000	50,000
	Downstream piping	Lm	400	1,500	600,000
Phase 4 subtotal					1,359,800
5	Land Acquisition	ha	1.3	160,000	208,000
	Excavation	m <sup>3</sup>	26,000	155	390,000
	Discharge works	LS	1	50,000	50,000
	Downstream piping	Lm	50	1,500	75,000
Phase 5 subtotal					723,000
6	Land Acquisition	ha	1.53	160,000	244,800
	Excavation	m <sup>3</sup>	30,600	15	459,000
	Discharge works	LS	1	50,000	50,000
	Downstream piping	Lm	50	1,500	100,000
Phase 6 subtotal					823,000
7	Land Acquisition	ha	0.66	160,000	105,600
	Excavation	m <sup>3</sup>	13,000	15	195,000
	Discharge works	LS	1	50,000	50,000
	Downstream piping	Lm	1,600	1,500	2,400,000
Phase 7 subtotal					2,750,000
Total Cost					8,485,500
Contingencies, Engineering, Administrative Costs, and Taxes are not included above					



## 5. SANITARY SEWER PLAN

The future sewer system within the Anderton Corridor is interconnected with that in the Comox Valley Regional District (CVRD), the Town of Comox, and the City of Courtenay. The ownership, operation, planning, and upgrading of different components of the sewage system vary depending upon responsibility. The local sewer collection system constructed as part of subdivision will belong to, and be operated by the Town of Comox. The transmission system from the developments to, and including the sewage treatment facility will continue to be the responsibility of the CVRD. This will affect the future scheduling and budgeting of the Town and the CVRD within the Anderton Corridor annexation area. Additional information can be found in Volume 2 Sanitary Sewer Plan.

The sanitary servicing for the Anderton Corridor Area can be described as falling into four areas shown on **Figure S5-1**:

1. The southern fringe that could contribute to the existing sewerage system within the Town, assuming that there is sufficient downstream system capacity;
2. The area contributing to the future Brooklyn Pump Station (PS),
3. The remainder that is designated to drain by gravity into the Hudson Trunk which excludes a small area in the extreme northeast of the study area; and
4. External areas contributing sanitary flows from Crown Isle.

A small portion of the study area which includes Tartan Road has been excluded from the Hudson Trunk contributing area. At this time the area has not been included in the immediate servicing plan because there are no plans for the provision of sanitary sewer servicing to these properties. As this area nears development a downstream system for both the sanitary and the storm sewer system will be required. At that time the downstream routing of the sewer systems can be finalized.

As the future detailed planning, rezoning, and subsequent subdivision design occurs the information in this report may be updated to represent a more accurate view of the study area. The preliminary information provided herein may be superseded for a few reasons which may include:

- Accuracy of the topographic mapping, and
- Market conditions that result in different land use requirements.

A series of evolving assumptions are used in estimating the design discharges for the Hudson Trunk. An assessment of the system design capacity has been made using the latest information available and the recommended criteria for the future collection system. The contributing areas shown will discharge to the identified nodes or to the pipe upstream of the identified node. The results of the assessment indicate that the capacity of the existing Hudson Trunk downstream from Node 2 is not sufficient to meet the requirements of the projected future developments in the study area plus the designated portions of Crown Isle. Additional capacity will be required to service the projected developments within the City of Courtenay and the Town of Comox.





Excluded From Hudson Trunk Contributing Area

Source: Design Memo, Hudson Trunk Sewer 50% Design Review, MCSL, July 5, 2016

Area of Crown Isle

Source: Design Memo, Hudson Trunk Sewer 50% Design Review, MCSL, July 5, 2016

58 ha Area from Crown Isle

Source: Design Memo, Hudson Trunk Sewer 50% Design Review, MCSL, July 5, 2016

Hudson Trunk

Brooklyn PS Contributing Area

Source: Sanitary Sewer Model Update 2014, MCSL

Boundary Update Valley View Estates - MCSL 2021-07-20

Area which could Contribute to Town system - capacity must be verified



Design and implementation of the sewerage system within the study area will, by necessity, follow the staging of the stormwater sewer system. Two reasons for this include the need to implement stormwater management at the same time the sewer system and the two gravity pipe collection systems are likely to follow the same alignments.

A phasing plan for development of the sanitary sewerage system has been created with consideration being given to the following overall factors:

1. Development progression from the existing Town boundary.
2. The limited capacity of the existing Hudson trunk and the need to provide additional capacity in the future as development occurs.
3. The need to construct the Brooklyn Pumping Station which should be located at the topographic low point within its contributing area, and
4. The need to construct the storm sewer servicing for the area where the sanitary and storm pipes will generally follow the same alignments.

The phasing for the sanitary sewer system can be described to include six phases plus two areas that will ultimately be from the City of Courtenay as shown on **Figure S5-2**.

As indicated previously the Hudson Trunk does not have sufficient capacity to service all of the study area plus the areas in the City of Courtenay. Therefore, an analysis was undertaken to evaluate how much development and which phases can be accommodated before additional capacity will be required to be added to the Hudson Trunk. The contribution from the City of Courtenay and Crown Isle were given priority in the calculations but this may not necessarily be most practical solution. The Town, the City, and the CVRD should discuss and agree upon the staging of the Hudson Trunk upgrades.

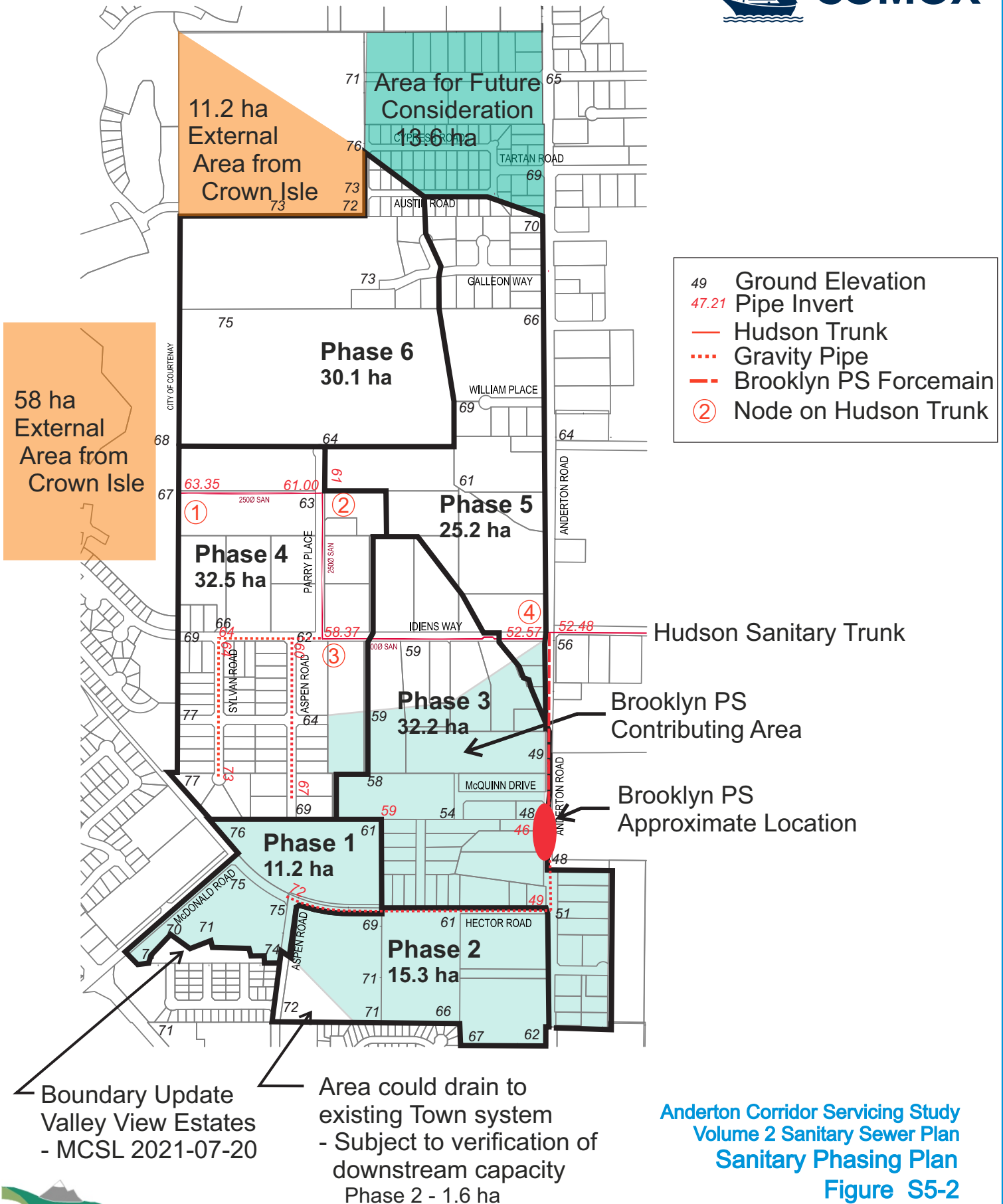
At the time development in the areas north and west of the Brooklyn PS catchment, an evaluation of the options to increase the capacity of the Hudson Trunk will be required.

The other collection system pipes as shown follow the existing roads or anticipated road locations and would be of the minimum 200 mm diameter pipe size as specified in the Town's specifications.

During future development the design of all system components must include verification of discharges, pipe size, and inverts required to convey all flows from development under design and any other upstream developments.

Given the characteristics of the sanitary sewerage system and the preconstruction of the Hudson Trunk the only portions of the system that would qualify for cost sharing are the Brooklyn PS and the associated forcemain. All remaining portions of the collection system will be based upon the minimum pipe size and therefore not eligible to be included in the DCC process. Some of the collection system may qualify for cost sharing between developers using a Later Comer's or Front-End Agreement.





Anderton Corridor Servicing Study  
Volume 2 Sanitary Sewer Plan  
Sanitary Phasing Plan  
Figure S5-2



In this case the first developer would “front end” construction of some portions of the system where a downstream developer would receive a benefit. Essentially, the downstream developer would pay a share of the costs to the first developer for the ability to connect to the constructed systems. In this instance the Town may assist in the negotiations and in establishing the contracts between developers.

The estimated cost of the Brooklyn PS and forcemain included in **Table S5.1**:

Table S5.1 – Brooklyn PS Costs				
Item	Unit	Quantity	Rate	Cost
Pump station supply and install	Each	1	500,000	500,000
Forcemain – 200 mm ductile	Lm	425	900	382,500
Connect to Hudson Trunk	LS	1	5,000	5,000
subtotal				887,500
Land acquisition, Contingencies, Engineering, Administrative Costs, and Taxes are not included in the cost estimates shown above				

One option for funding future operating and maintenance costs would be to establish a Local Service Area for the Brooklyn PS and the forcemain discharging to the Hudson Trunk. This would eliminate the need to increase the budget for operating and maintaining the Town’s infrastructure while placing the burden on the users of the system.

The next step in the planning and design process for the Brooklyn Pump Station will be to undertake a Functional Design that will include establishing the final contributing areas, populations, locations, alignments, staging for construction. More accurate cost estimates will be available for input into the planning and development processes of the Town of Comox.





## 6. WATER SERVICING PLAN

The existing water system within the Anderton Corridor is interconnected with that in the Comox Valley Regional District (CVRD), the City of Courtenay, and the Town of Comox. The ownership, operation, planning, and upgrading of different components of the water system vary depending upon responsibility. The CVRD manages the water transmission system delivering potable water to the Town of Comox. The Town owns and operates the local water distribution system within its boundaries. As the future development areas are annexed into the Town the service area will be enlarged as will the distribution system. The transmission system from the supply to the Town will continue to be the responsibility of the CVRD. This will affect the future scheduling and budgeting of the Town and the CVRD within the Anderton Corridor annexation area. Additional information can be found in Volume 3 Water System Plan.

Moving forward, the OCP land uses, tempered by the latest projections prepared by the Town should form the basis for the future water servicing requirements.

The existing water distribution system within the Anderton Corridor study area is shown on **Figure S6-1**. The water transmission system within the study area is owned and operated by the CVRD. The 200 AC pipe along Idiens Way and the 250 AC pipe along Anderton Road serve dual roles as part of both the transmission and the distribution systems within the CVRD.

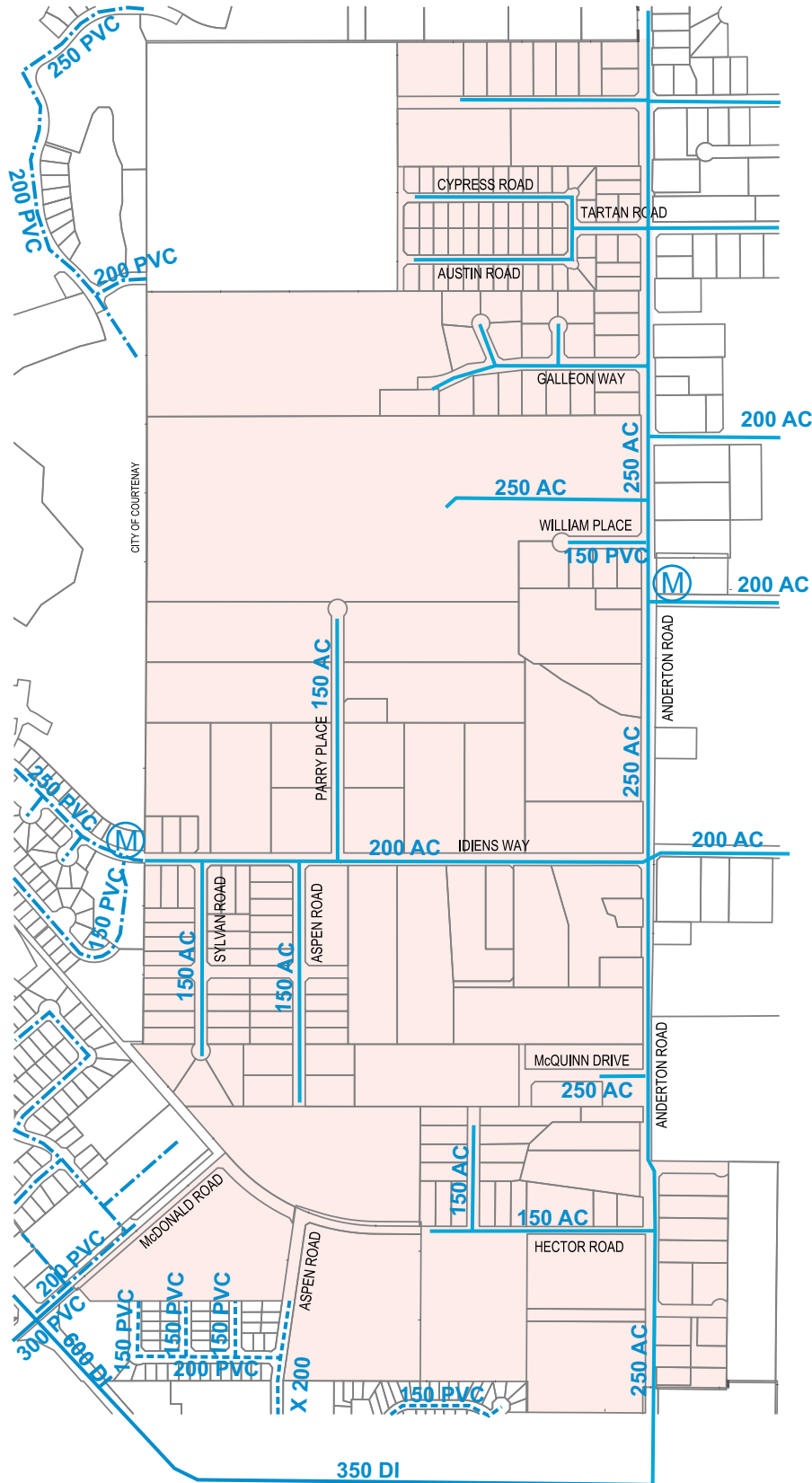
Design and implementation of the water distribution system within the study area will, by necessity, follow the phasing of the stormwater and sewer system. The two reasons for this include the need to implement stormwater management at the same time as the water and sanitary sewer systems and the infrastructure and pipe systems are likely to follow the same alignments within the road dedication and other Statutory Rights-of-Way, or road dedications. The study area has been divided into six phases and one area set aside for future planning.




The area set aside for future planning, which is a small portion of the area that includes Tartan Road has been excluded from the sanitary sewer service area of the Hudson Trunk as there are no plans for the provision of sanitary sewer servicing to these properties.

The CVRD will retain responsibility and ownership of the transmission system delivering water to the Town of Comox, City of Courtenay, and areas within the CVRD.

The Town will own and operate the future water distribution infrastructure which will consist of distribution mains, gate valves, fire hydrants, air release valves, blow-off assemblies, drain assemblies, and individual service connections and individual water meters.





-  CVRD System
-  Town of Comox
-  City of Courtenay
- 200 AC** Size and Material

Anderton Corridor Servicing Study  
Volume 3 Water System Plan  
Existing Water Distribution System  
Figure S6-1



A preliminary layout and phasing of the water transmission system is shown on **Figure S6-2**. Within each of the phases there will be the need to provide both the local distribution system for each development with capacity to service other developments within the Anderton Corridor Area. Care should be taken to provide a looped system with a minimum of single flow direction to dead end pipes. This practice would provide a more secure supply to all locations in the event of failure or closure of any portion of the system, It would allow fire flows to be provided from more than one direction within the system thus reducing the ultimate size of the distribution mains.

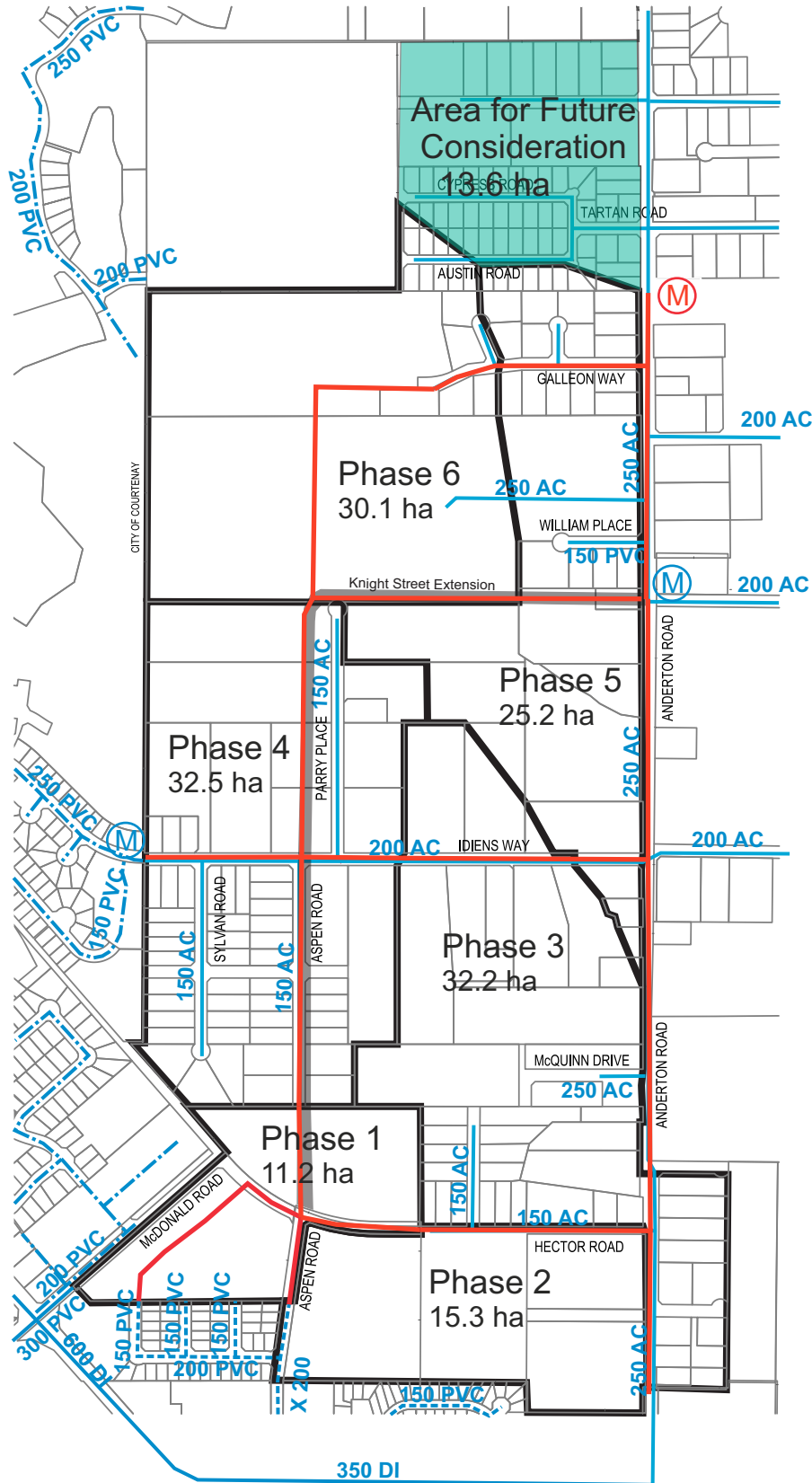
It is recommended that any future funding and cost sharing system be based on the "oversizing" concept, which has a significant impact on the assumptions in the financial report/analysis. This means that the "base" cost of all works is the responsibility of the developer adjacent to the frontage and it is only the oversizing from base to trunk standards that are covered by funds from either the DCC program or other funding mechanism. As an example , for water mains where the minimum pipe system is considered base and the construction cost associated with the development, any additional required capacity would be the responsibility of another other funding mechanism.

A limited amount of the water infrastructure will be larger than that required to provide service to any development. This limits the applicability for DCC funding.

Given the characteristics of the water distribution system the portions of the system that could be larger than the minimum required would be eligible for cost sharing. All portions of the distribution system that are the minimum pipe size would not eligible, except for the potential of "front ending" some portions by developers where a later developer would receive a benefit.

Preliminary estimated sizing of the transmission main would include a 250 mm diameter pipe along Anderton Road and along Idiens Way. The remaining transmission main is estimated to be 200 mm diameter. The distribution pipes are estimated to be 150 mm diameter based upon the existing distribution system in the Town.





**Existing Pipes**

- CVRD System
- Town of Comox
- City of Courtenay
- 200 AC** Size and Material
- Flow Meter

**Future Pipes**

- Town of Comox

Anderton Corridor Servicing Study  
Volume 3 Water System Plan  
Water Phasing Plan  
Figure S6-2



The estimated cost of upsizing the water distribution system within the Anderton Corridor study area which would be eligible for inclusion in the DCC funding process is shown included in **Table S6.1**:

Table S6.1 – Water Distribution Upsizing Costs				
Item	Unit	Quantity	Rate	Cost
250 mm PVC supply and install	Lm	2,600	90	234,000
200 mm PVC supply and install	Lm	3,500	30	105,000
Meter station	LS	1	50,000	50,000
subtotal				389,000
Contingencies, Engineering, Administrative Costs, and Taxes are not included above				

Confirmation of the sizing of the water distribution system will be required through updating the existing water distribution model to test the proposed system to deliver the necessary flows. This would include consideration to the proposed school and mixed commercial development along Idiens Way.



## 7. RECOMMENDATIONS

The Town of Comox adopt the **Stormwater Management Plan** for the Anderton Corridor. The engineering and funding aspects of the Plan will be completed as part of future annexation, subdivision, and development of land within the area. The major components of the plan include:

1. Provision of stormwater management through both rate and volume control to prevent additional damage to downstream properties or place the residents at greater risks associated with potential flooding.
2. Provision of a funding mechanism to facilitate the construction of the required infrastructure.
3. Establish the minimum catchment area for each future stormwater pond.
4. Establish the type of pond, whether dry or one of the wet options that will be used in the study area.
5. Provision of a funding mechanism for the future Operation and Maintenance of the stormwater infrastructure.

The Town of Comox adopt the **Sanitary Sewer Plan** for the Anderton Corridor. The engineering and funding aspects of the Plan will be completed as part of future annexation, subdivision, and development of land within the area. The major components of the plan include:

1. Undertake a functional design of the Brooklyn PS while considering the possibility of staging capacity as development proceeds. This would provide additional time to accumulate DCC funds for upgrades.
2. Provision of a funding mechanism to facilitate the construction of the required infrastructure.
3. Provision of a funding mechanism for the future Operation and Maintenance of the sanitary infrastructure.

The Town of Comox adopt the **Water System Plan** for the Anderton Corridor. The engineering and funding aspects of the Plan will be completed as part of future annexation, subdivision, and development of land within the area. The major components of the plan include:

1. Confirmation of the water transmission and distribution sizing complete with an updated estimate of costs.
2. Provision of a funding mechanism to facilitate the construction of the required infrastructure.



## 8. CORPORATE AUTHORIZATION

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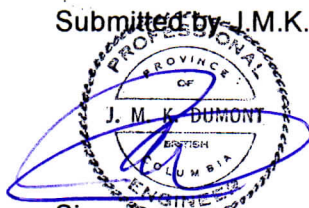
### Anderton Corridor Servicing Study

Client Name:  
**Town of Comox**

This document is intended solely for the use of the Town of Comox, and for the purposes and within the limitations stated in the document. The material in this report reflects the best judgement of J.M.K. (Jim) Dumont, P.Eng. in the light of the information available at the time of preparation. Any use of, or reliance placed upon, the material contained in this report by third parties, or decisions based upon this report are the sole responsibility of those third parties. J.M.K. (Jim) Dumont, P.Eng. accepts no responsibility for damages suffered by any third parties as a result of decisions made, or actions taken, based upon information contained within this report. Duplication or distribution of this report or any portion hereof is forbidden and requires approval from the client and J.M.K. (Jim) Dumont, P.Eng.

I certify this to be a report prepared by: J.M.K. (Jim) Dumont, P.Eng.

Submitted by J.M.K. (Jim) Dumont, P.Eng.



Signature December 7, 2022

Professional Stamp

Permit to Practice 1003061

