

APPENDIX A

LOCATION OF STORMWATER DISCHARGES

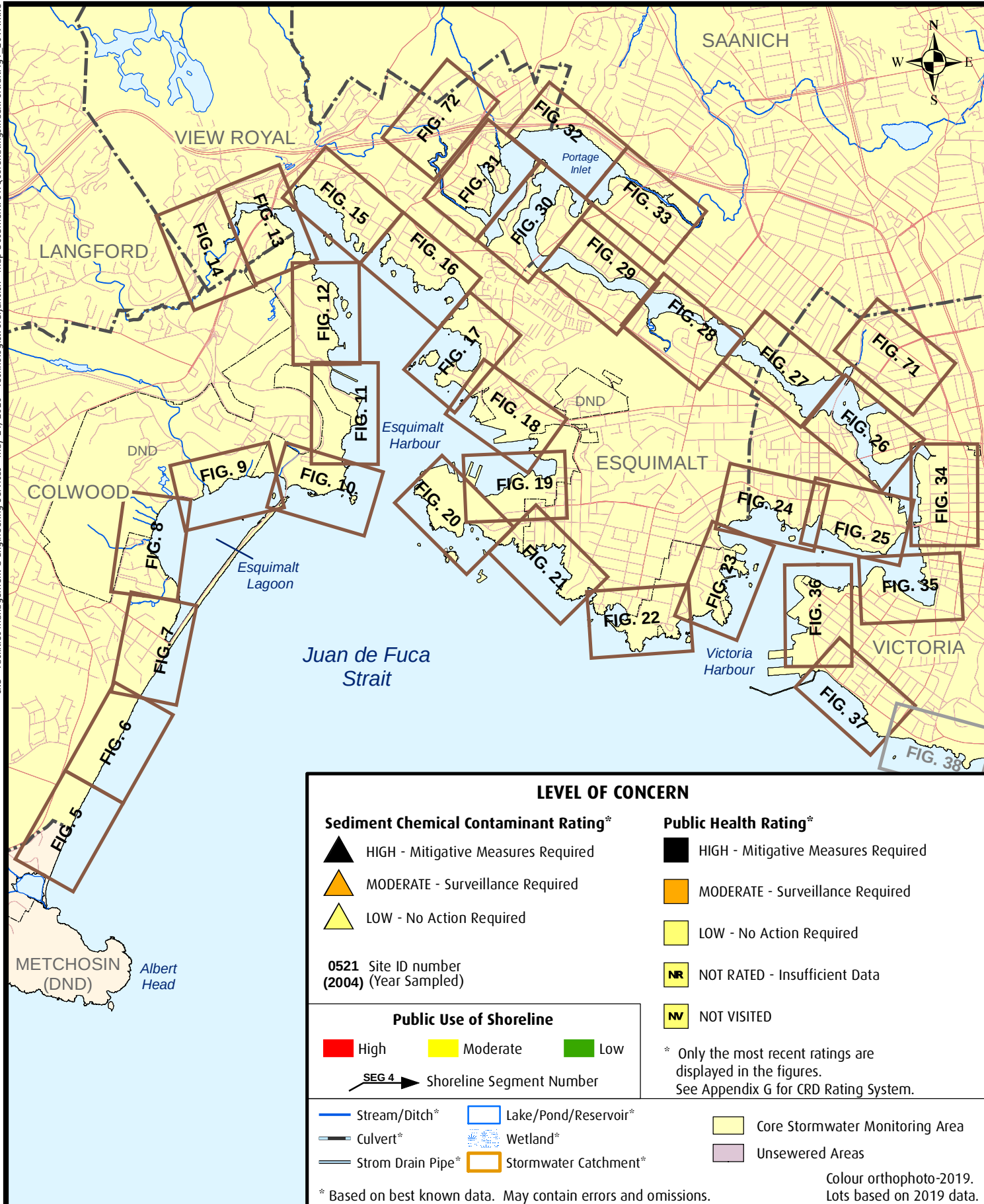


Figure 1 - Core Area 2019

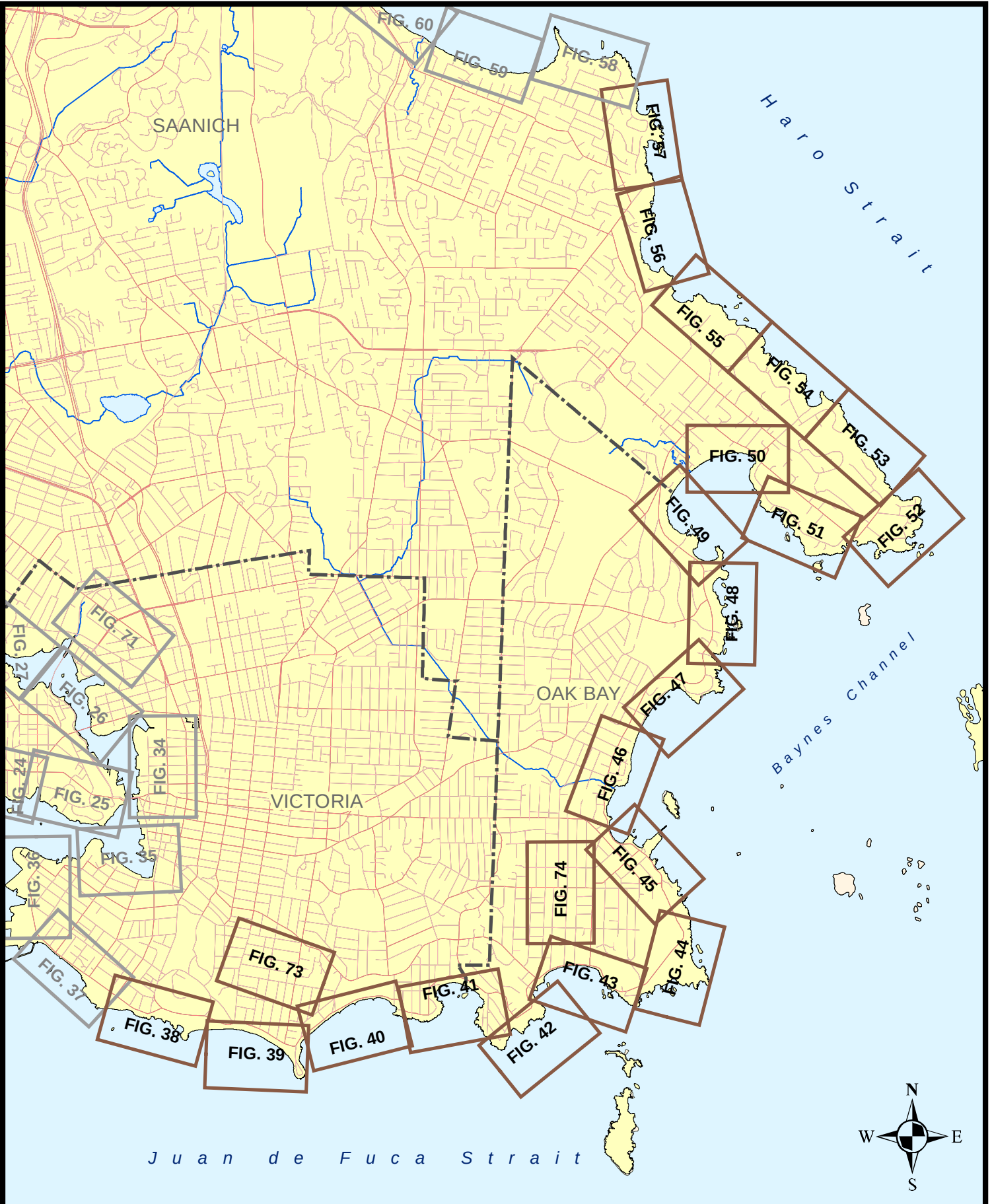
Key Index for Figures 5 - 37, 71, 72 and Legend

Scale: 0 0.5 1 Kilometres

Projection: UTM ZONE 10N NAD 83

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- Municipal Boundaries
- DND Boundaries
- Major Roads
- Minor Roads
- Map Tiles (see adjacent index page)
- Map Tiles (this index page)
- Core Stormwater Monitoring Area

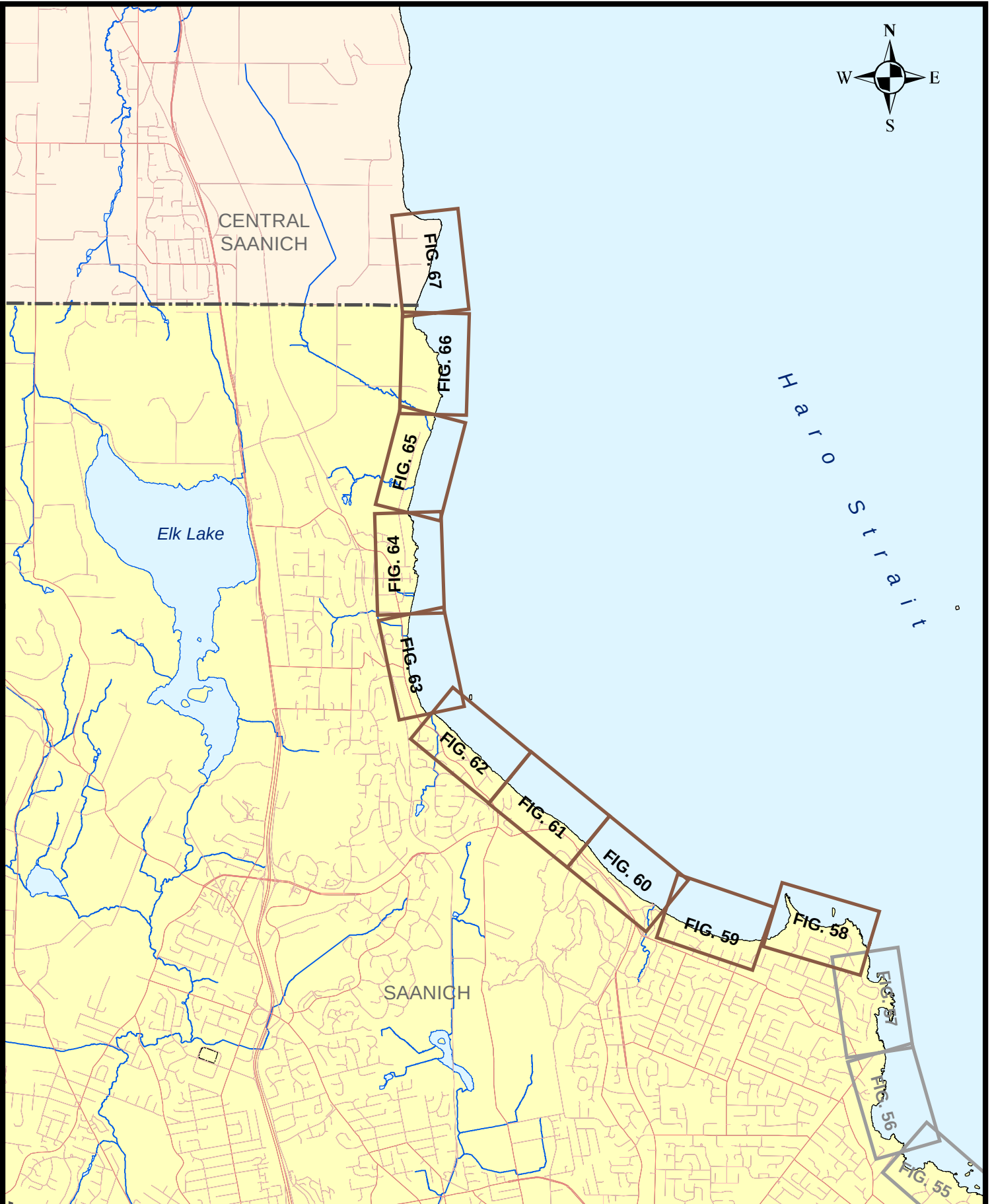


0 0.5 1 Kilometres
Projection: UTM ZONE 10N NAD 83

Figure 2 - Core Area 2019
Key Index for Figures 38 - 57, 73, 74

- | | | |
|--------------------------|---------------|---|
| —•— Municipal Boundaries | — Major Roads | FIG. 25 Map Tiles (see adjacent index page) |
| --- DND Boundaries | — Minor Roads | FIG. 45 Map Tiles (this index page) |
| ~ Streams and Rivers | | Core Stormwater Monitoring Area |

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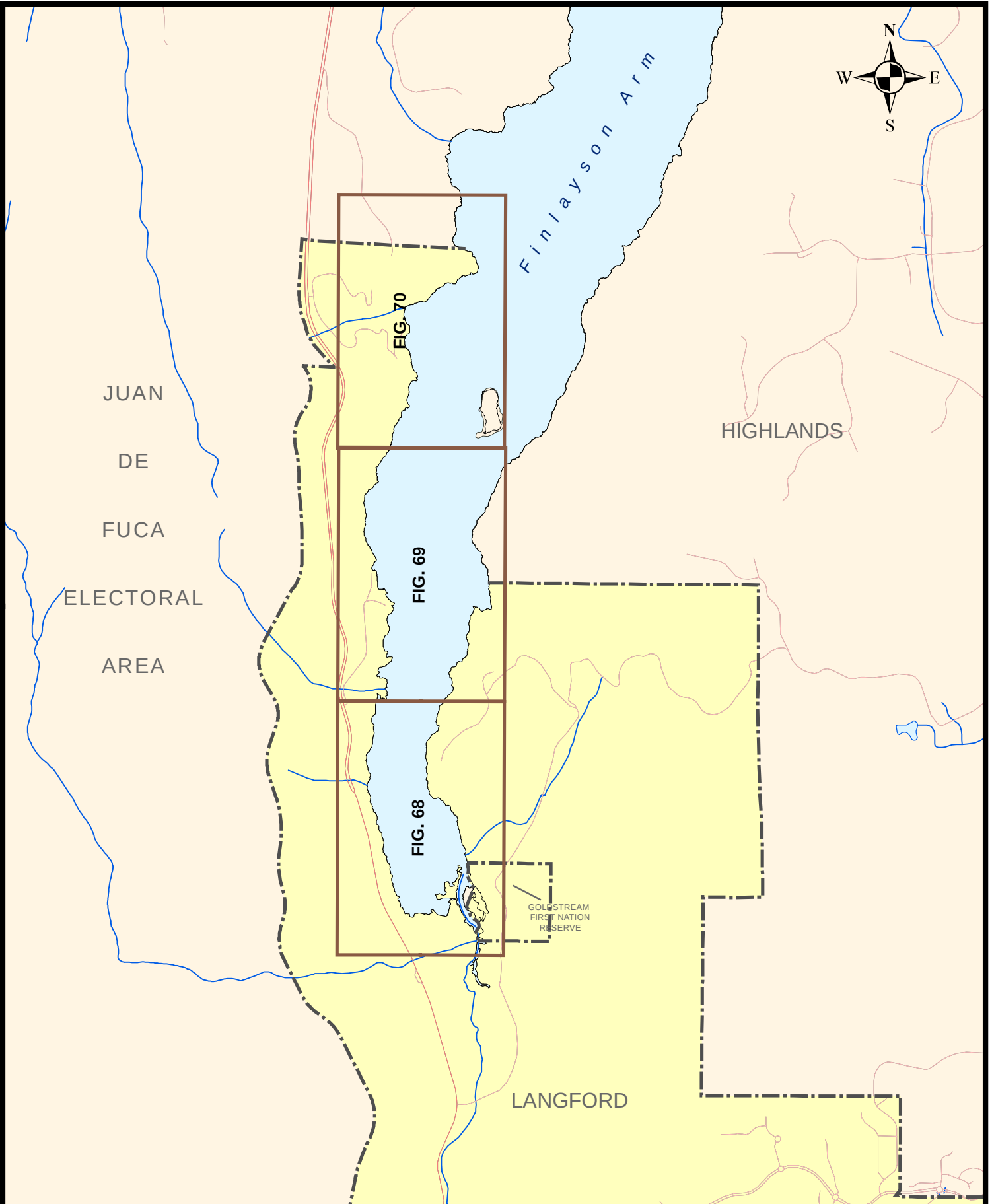


0 0.5 1 Kilometres
Projection: UTM ZONE 10N NAD 83

Figure 3 - Core Area 2019
Key Index for Figures 58 - 67

- | | | |
|--------------------------|---------------|---|
| —•— Municipal Boundaries | — Major Roads | FIG. 58 Map Tiles (see adjacent index page) |
| --- DND Boundaries | — Minor Roads | FIG. 60 Map Tiles (this index page) |
| ~ Streams and Rivers | | Core Stormwater Monitoring Area |

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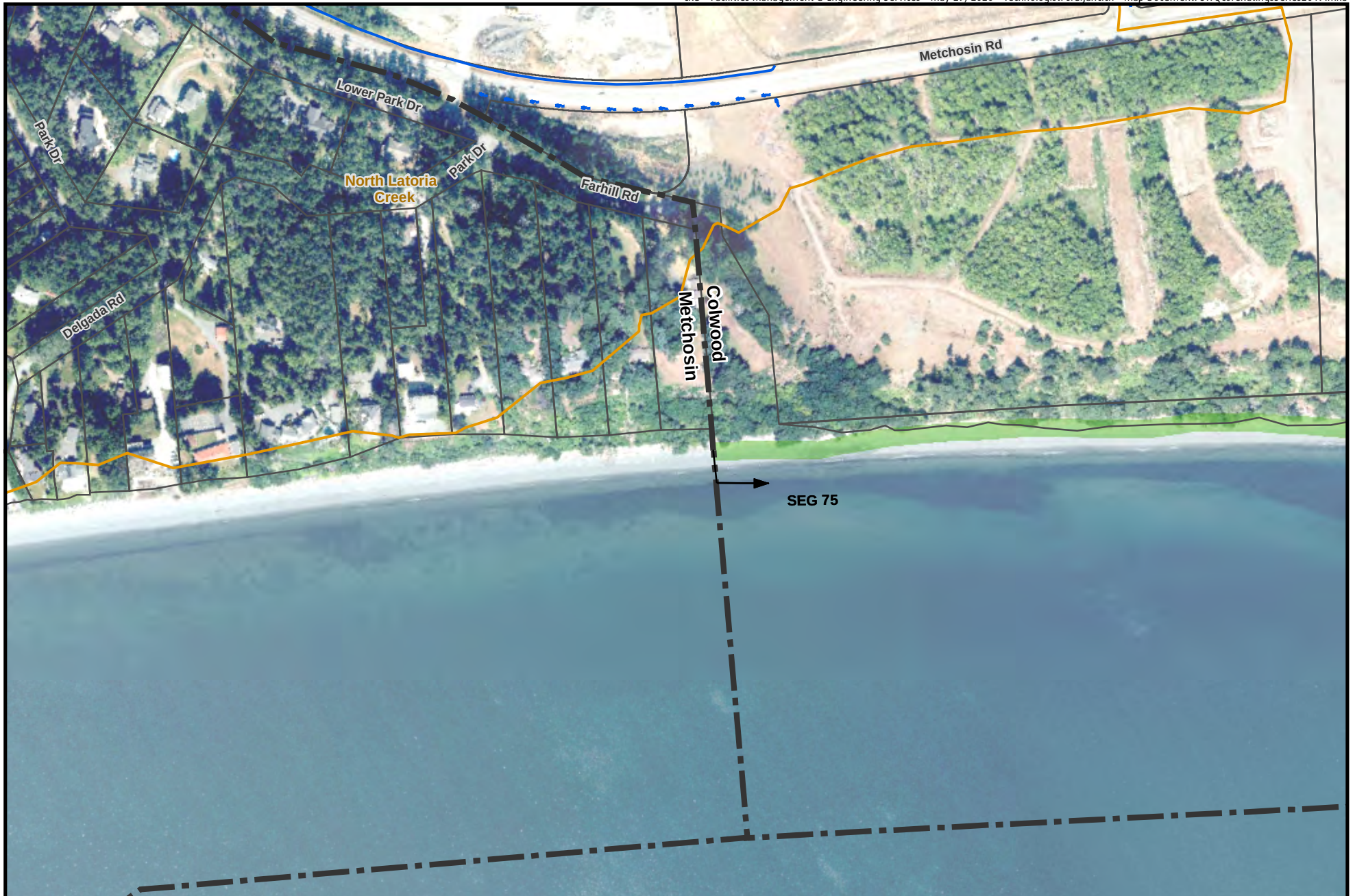


0 0.25 0.5 Kilometres
Projection: UTM ZONE 10N NAD 83

Figure 4 - Core Area 2019
Key Index for Figures 68 - 70

- | | | |
|------------------------|---------------|---------------------------------|
| — Municipal Boundaries | — Major Roads | Map Tiles (this index page) |
| — Streams and Rivers | — Minor Roads | Core Stormwater Monitoring Area |

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 1

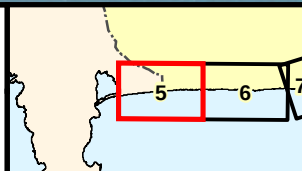
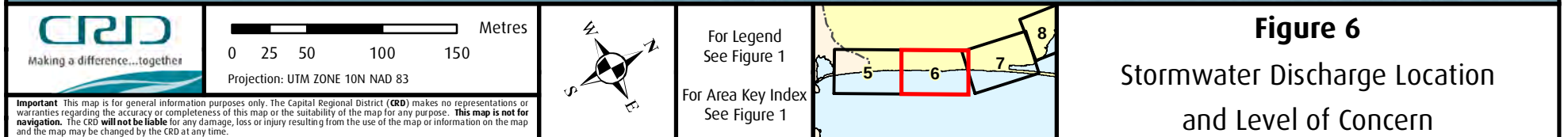


Figure 5
Stormwater Discharge Location
and Level of Concern

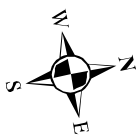
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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 1

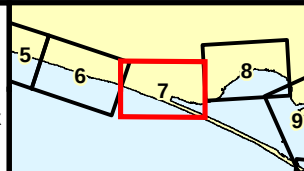
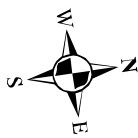


Figure 7
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 1

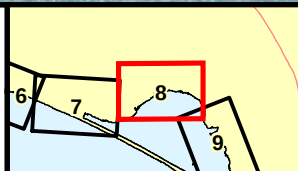


Figure 8

Stormwater Discharge Location
and Level of Concern

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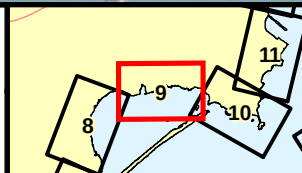
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Projection: UTM ZONE 10N NAD 83



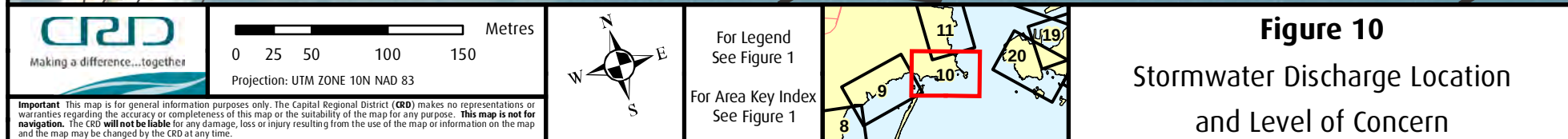
For Legend
See Figure 1

For Area Key Index
See Figure 1



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Figure 9
Stormwater Discharge Location
and Level of Concern

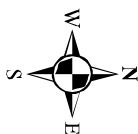


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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 1

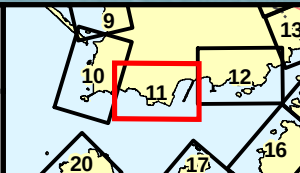
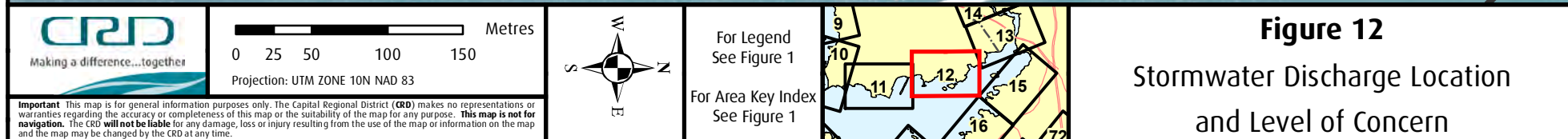
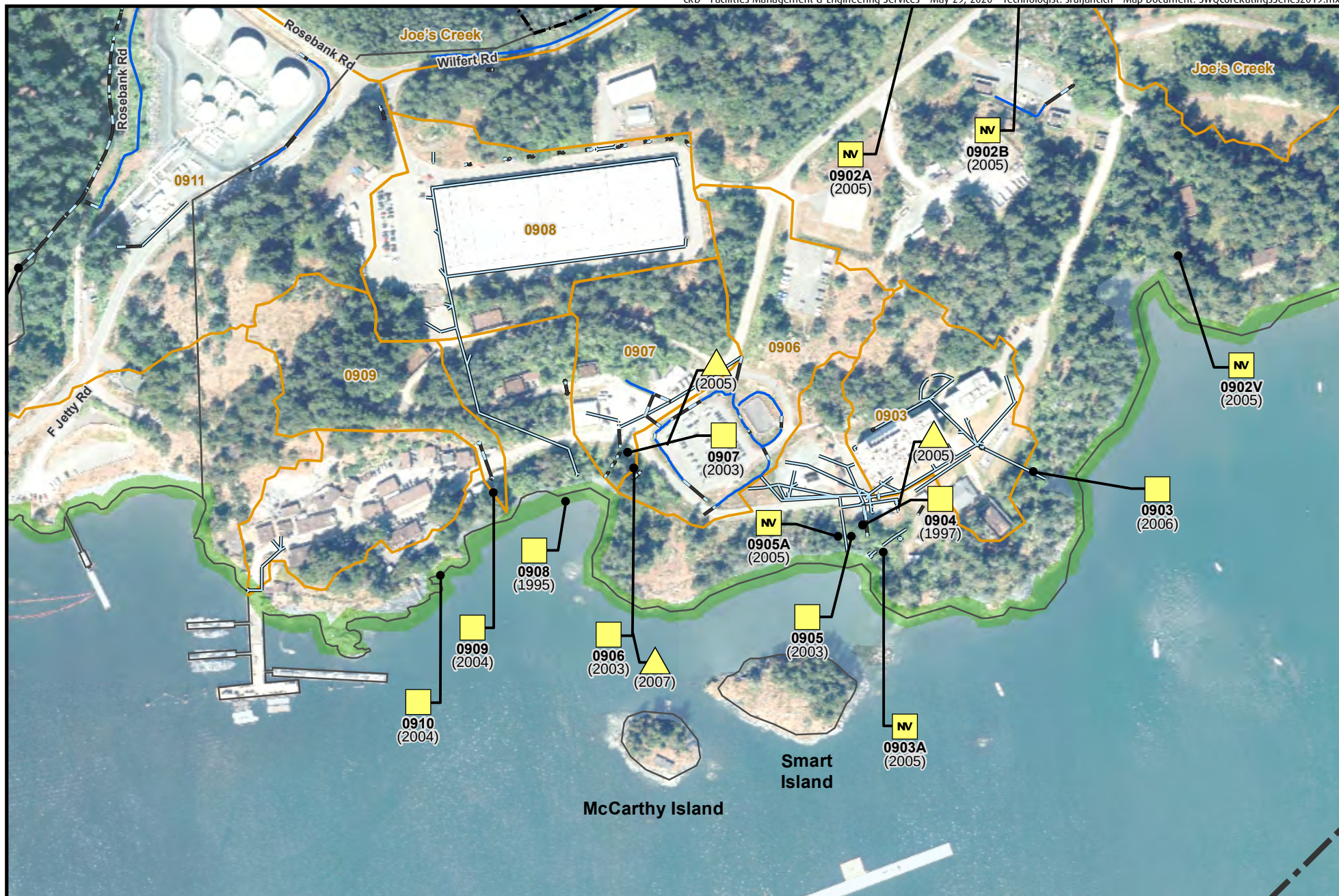
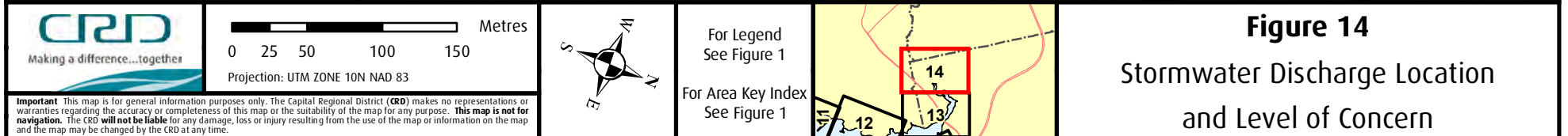
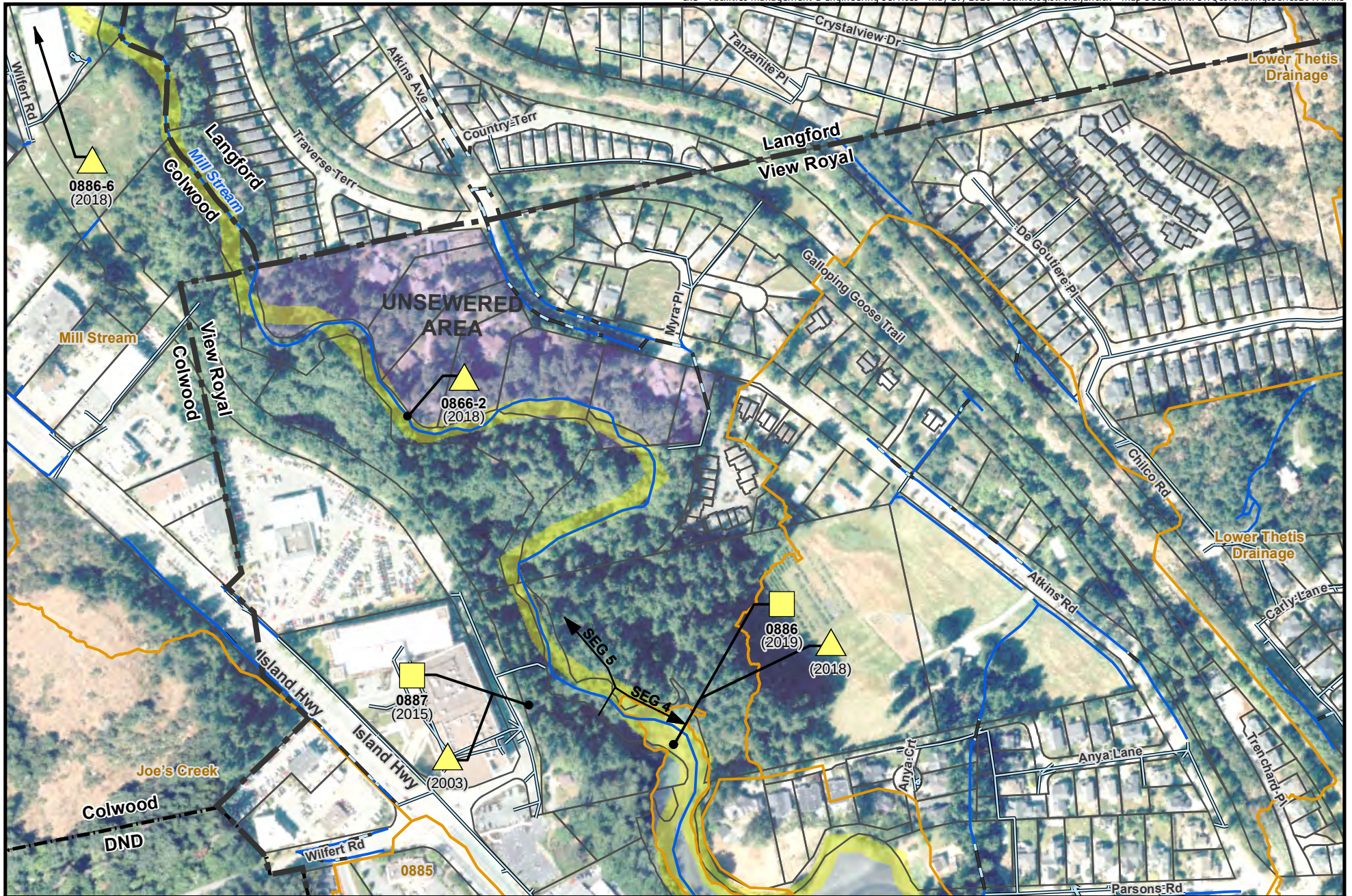


Figure 11
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 1

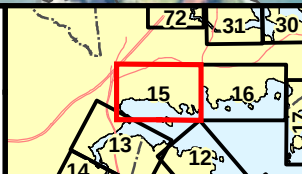
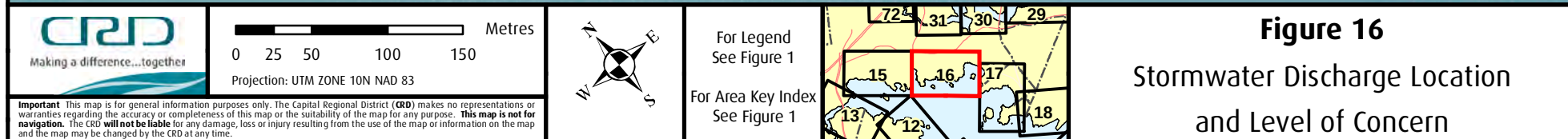
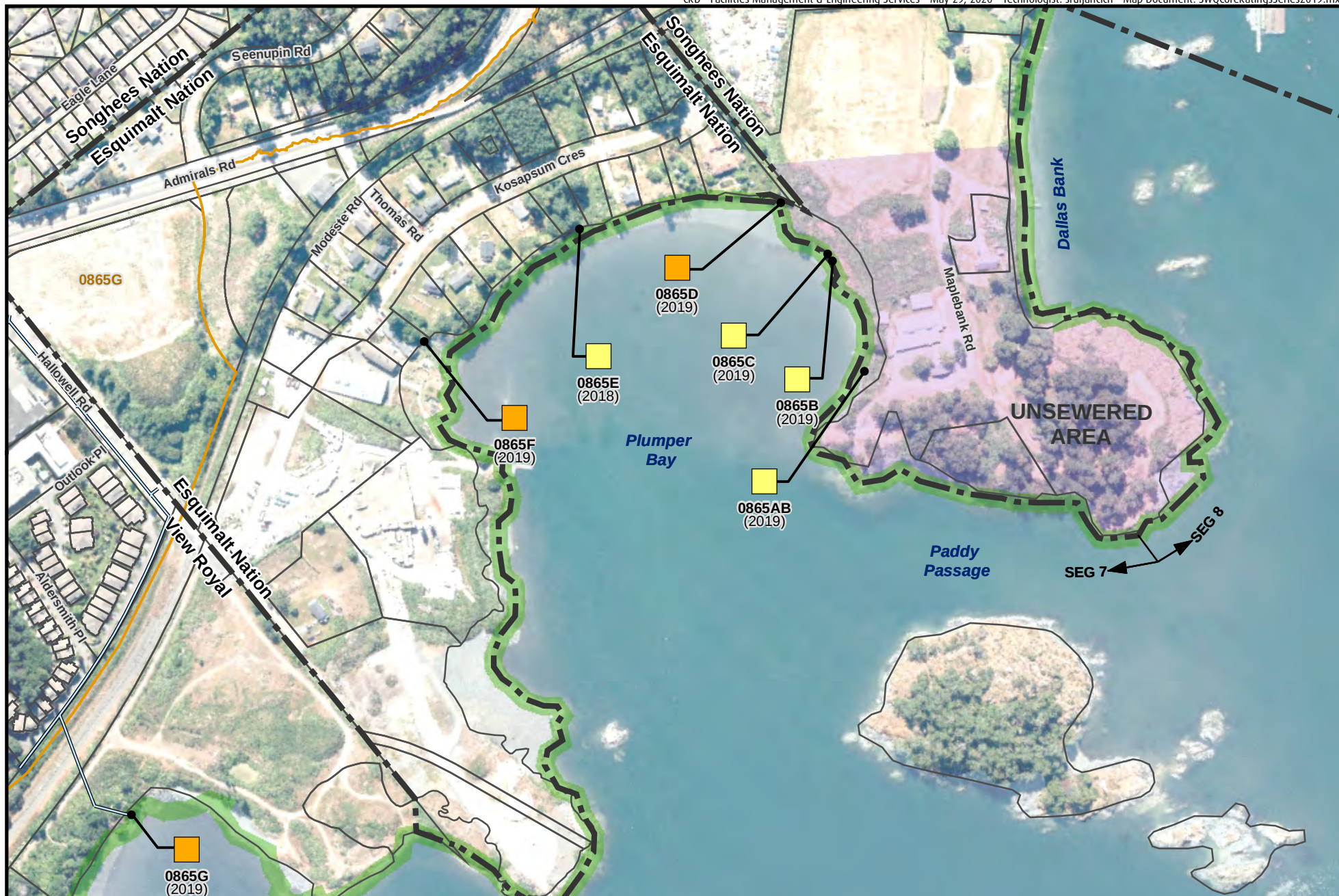


Figure 15
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

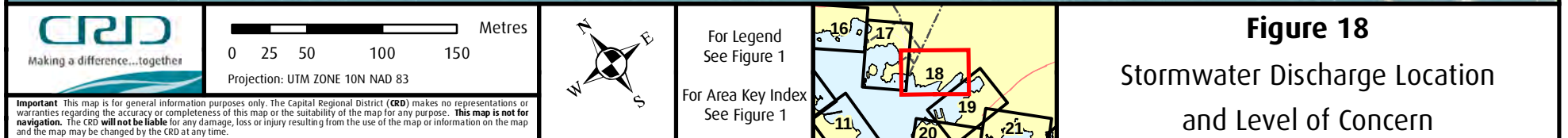
For Area Key Index
See Figure 1



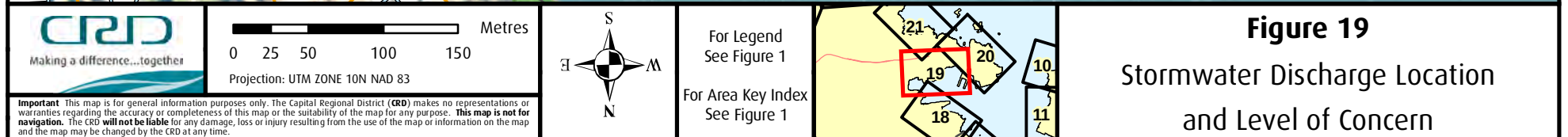
Figure 17

Stormwater Discharge Location
and Level of Concern

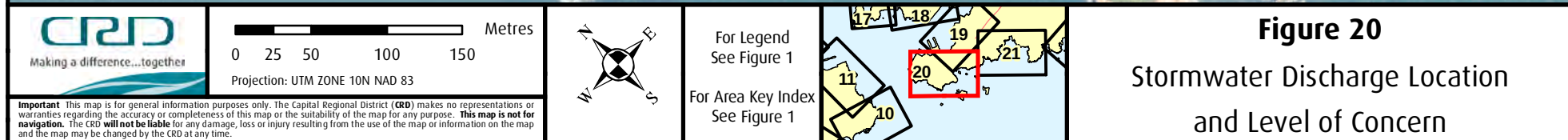
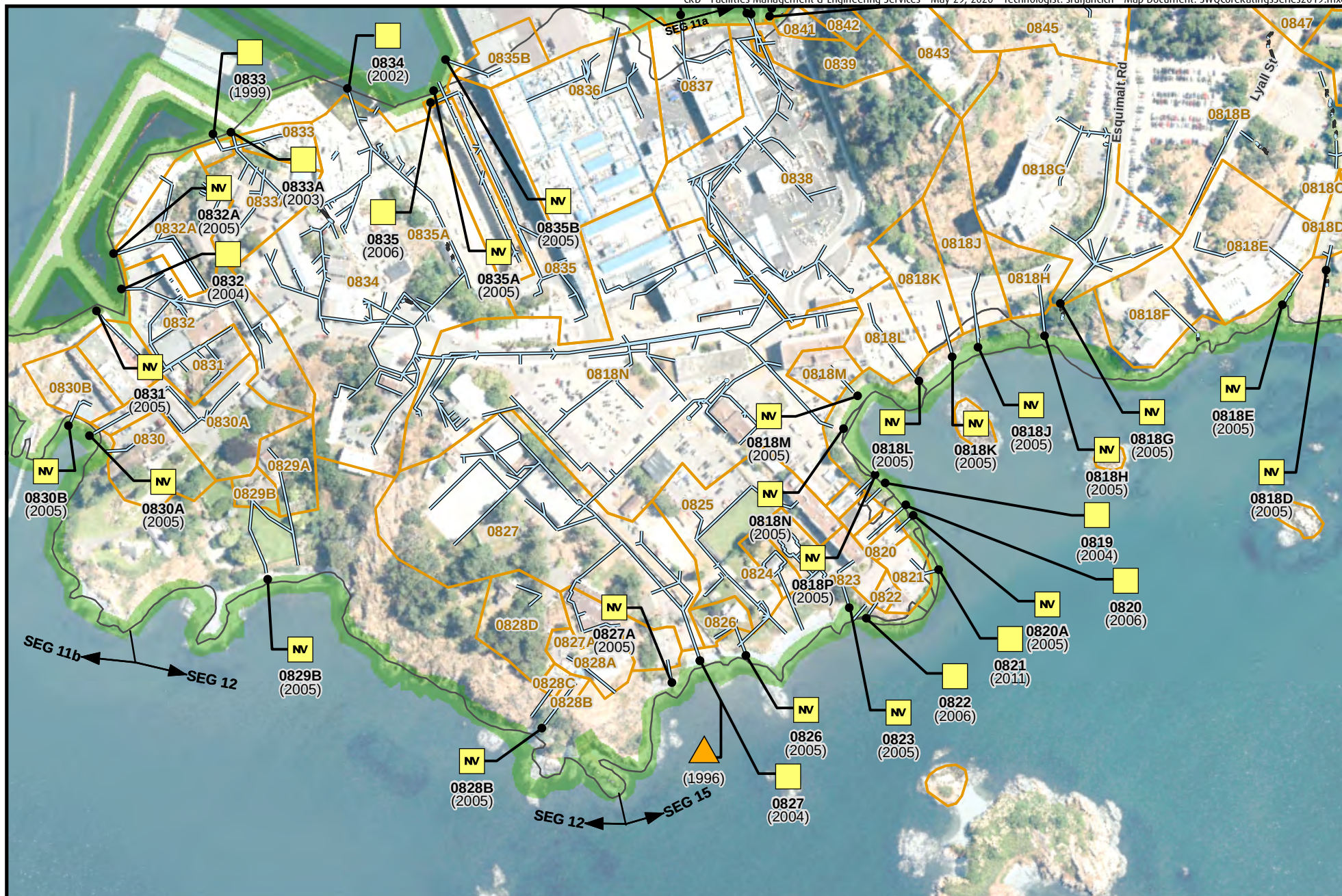
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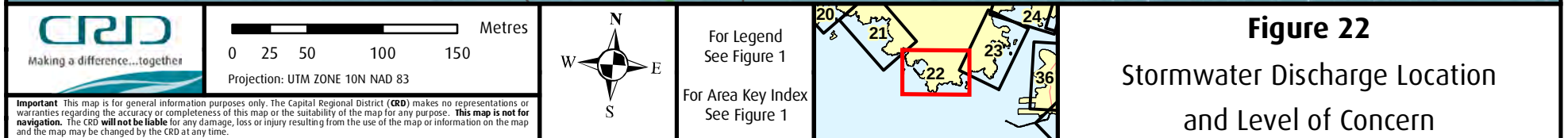
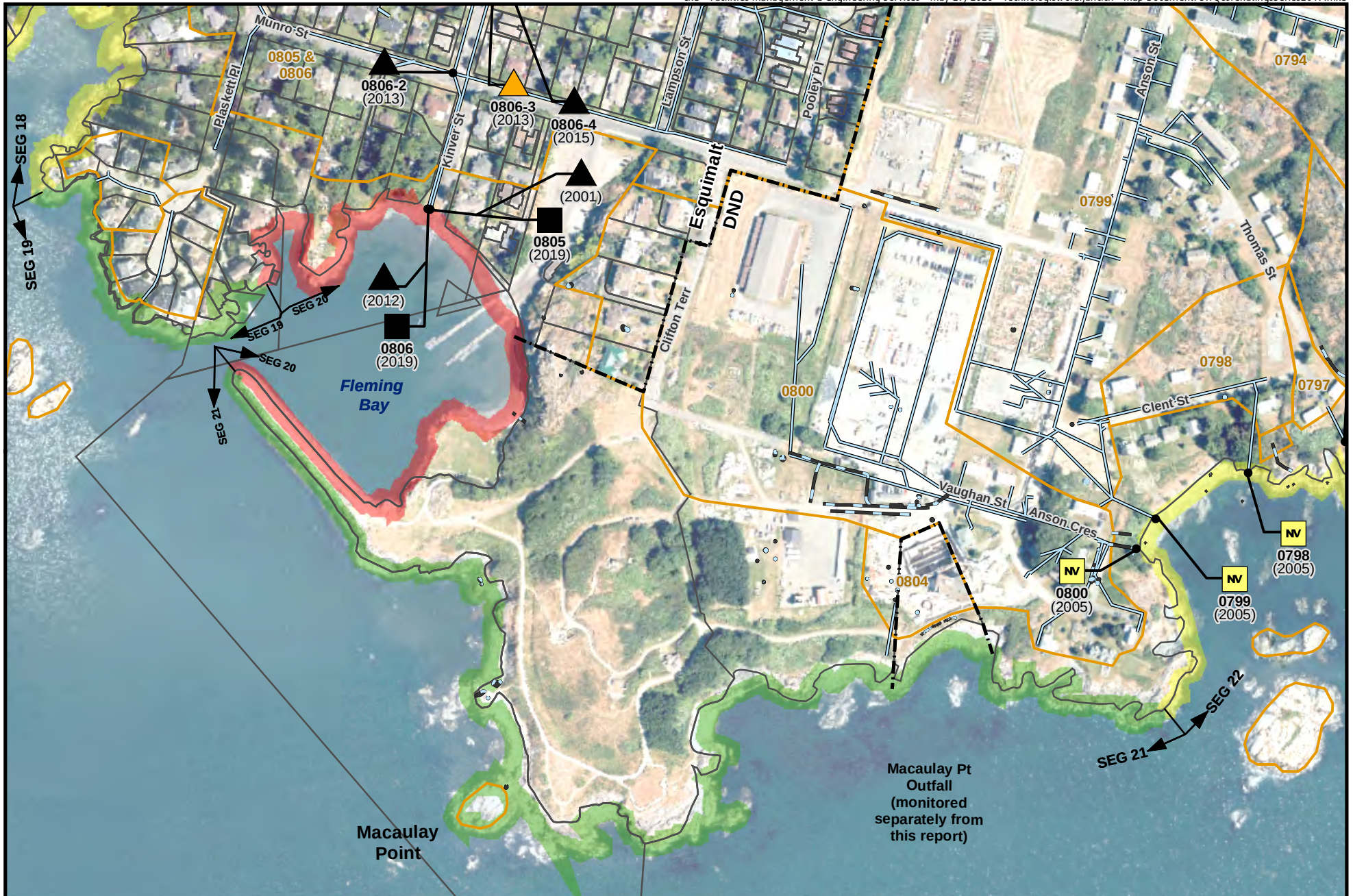


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Figure 21
Stormwater Discharge Location
and Level of Concern



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Figure 23
Stormwater Discharge Location
and Level of Concern

Figure 24
Stormwater Discharge Location
and Level of Concern



0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 1

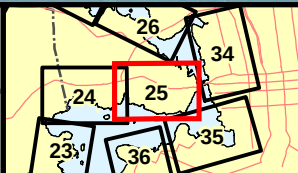


Figure 25
Stormwater Discharge Location
and Level of Concern

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Figure 26

Stormwater Discharge Location
and Level of Concern

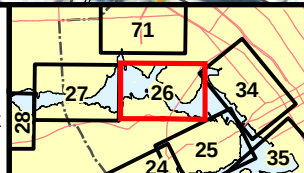


0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83

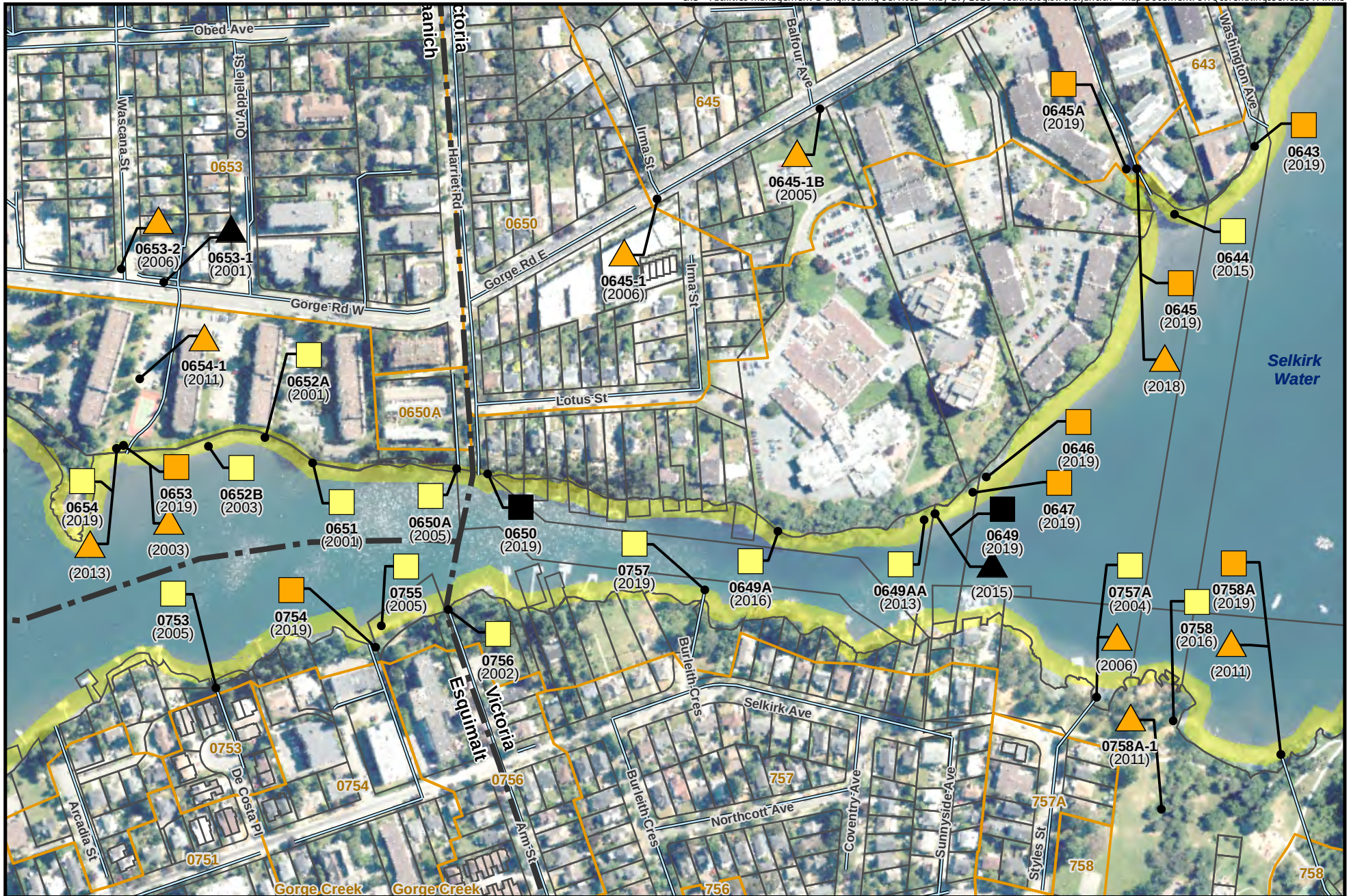


For Legend
See Figure 1

For Area Key Index
See Figure 1

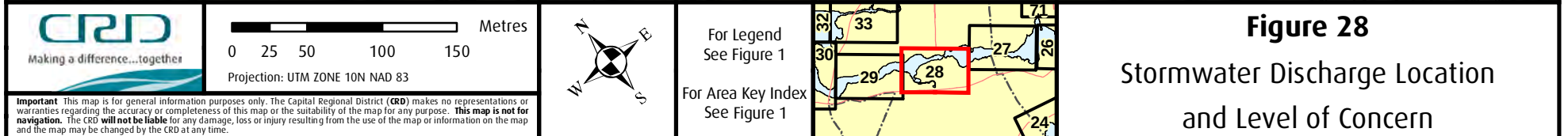
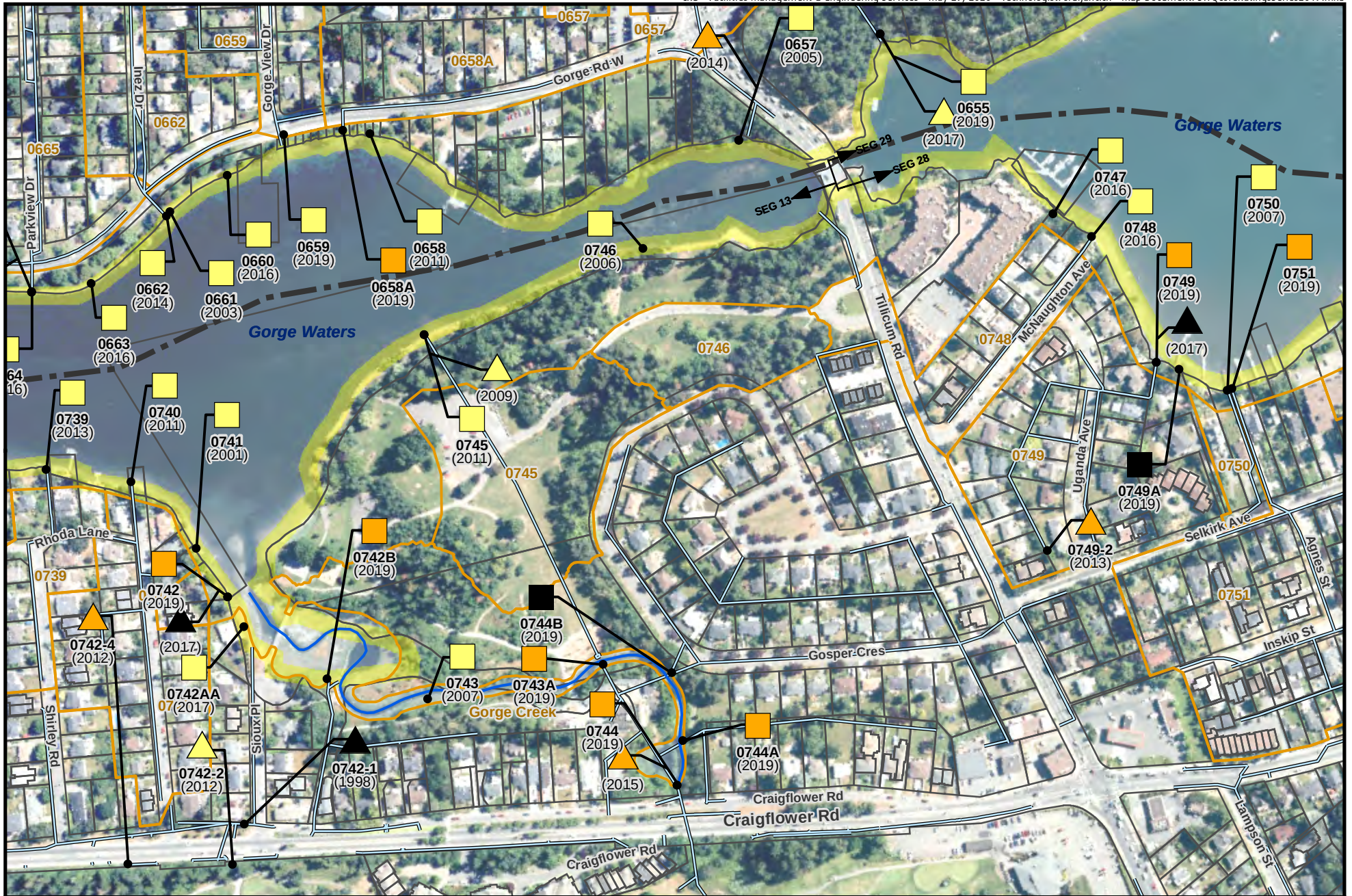


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	0 25 50 100 150 Metres Projection: UTM ZONE 10N NAD 83		For Legend See Figure 1 For Area Key Index See Figure 1		Figure 27 Stormwater Discharge Location and Level of Concern
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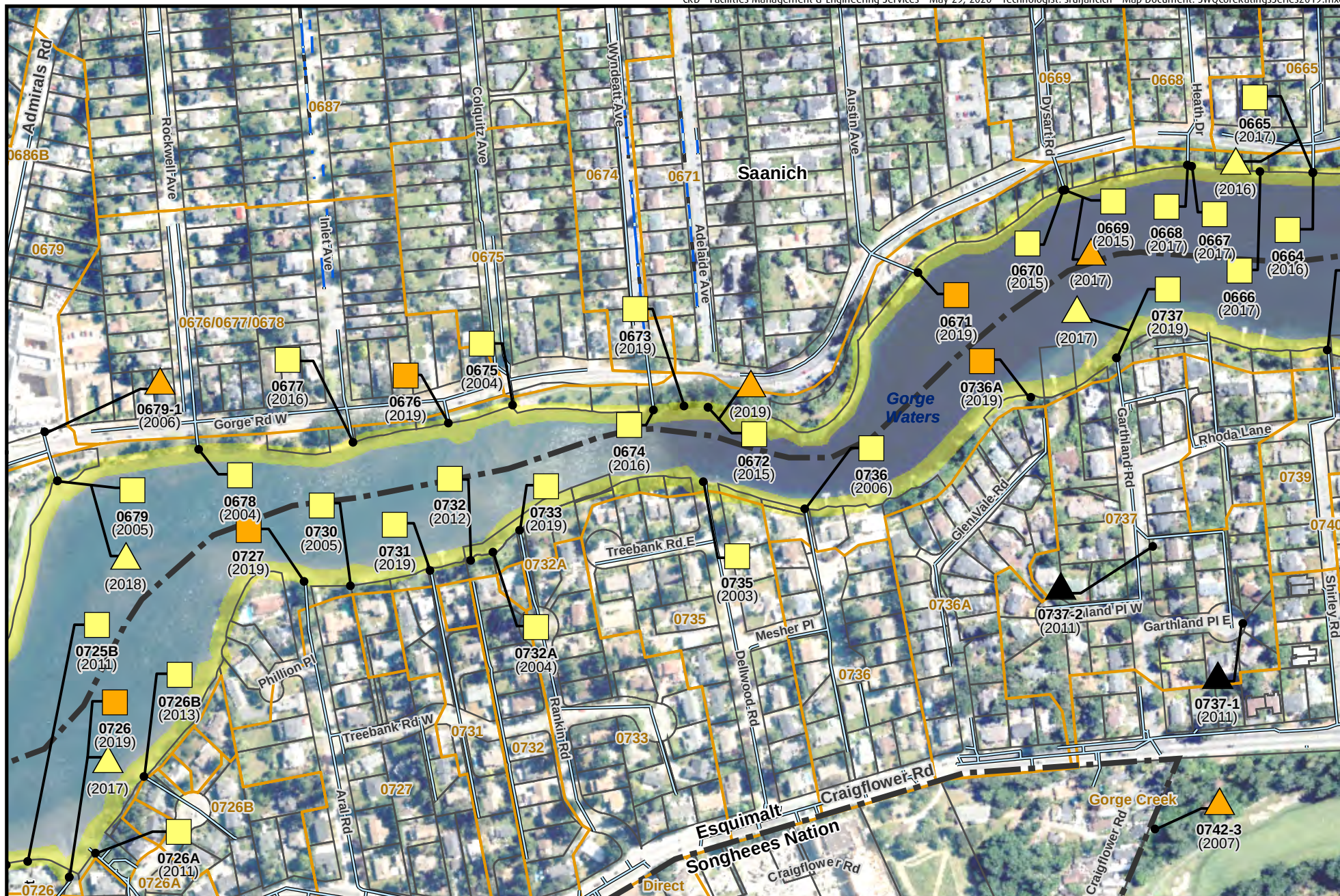


Figure 29

Stormwater Discharge Location
and Level of Concern

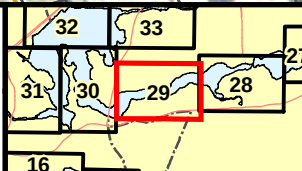


0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 1



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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

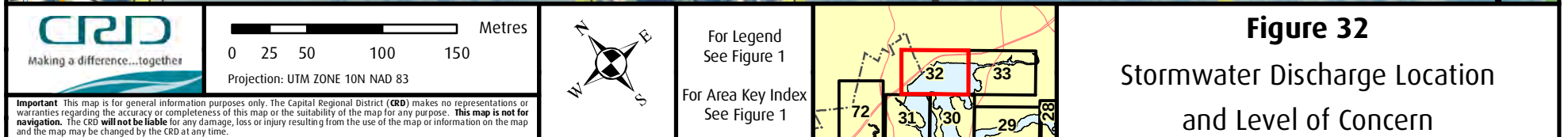
For Legend
See Figure 1

For Area Key Index
See Figure 1

Figure 31

Stormwater Discharge Location and Level of Concern

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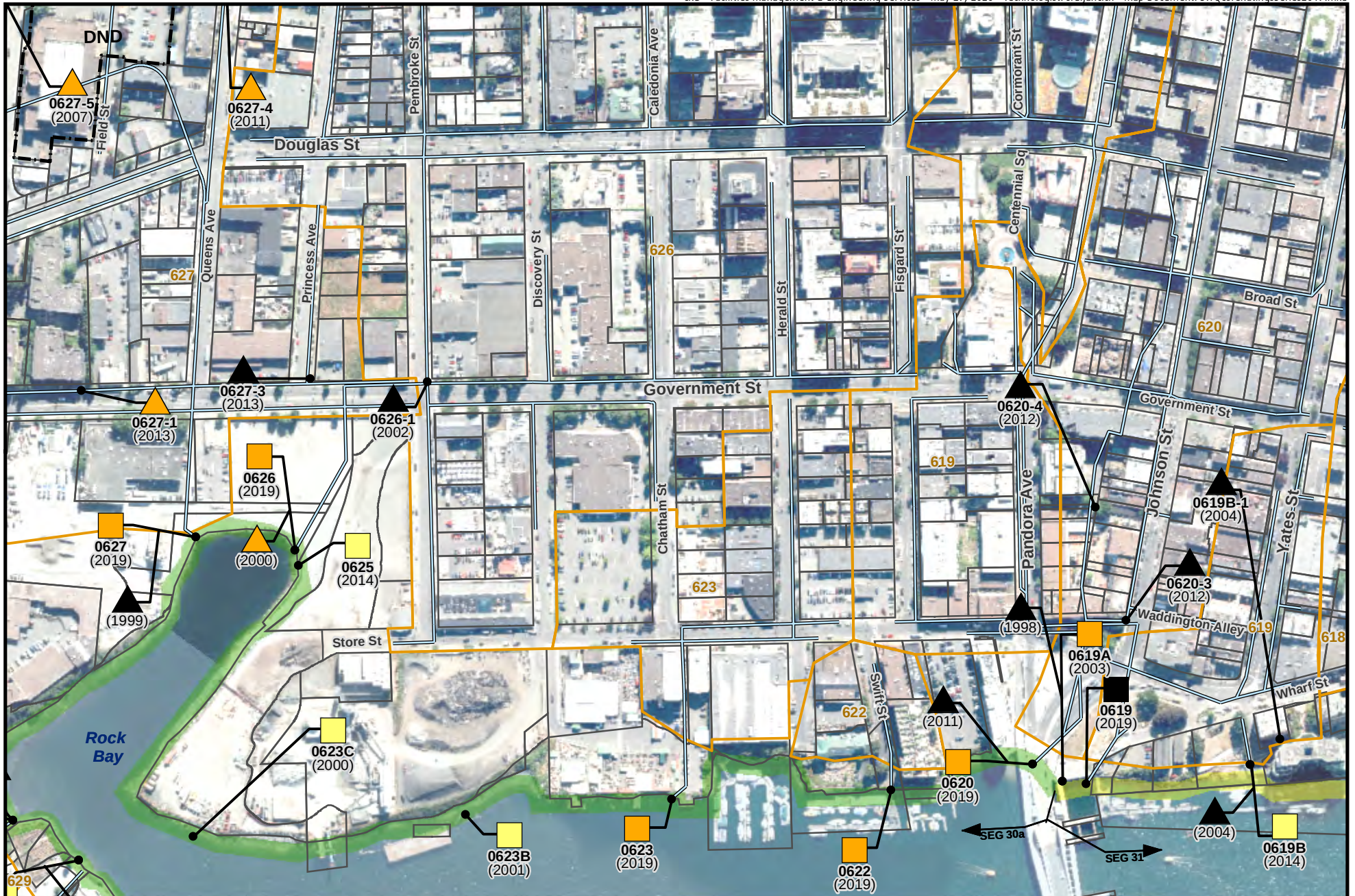


Figure 34

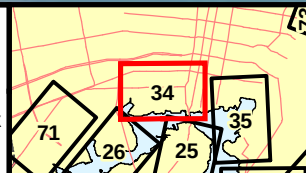
Stormwater Discharge Location
and Level of Concern



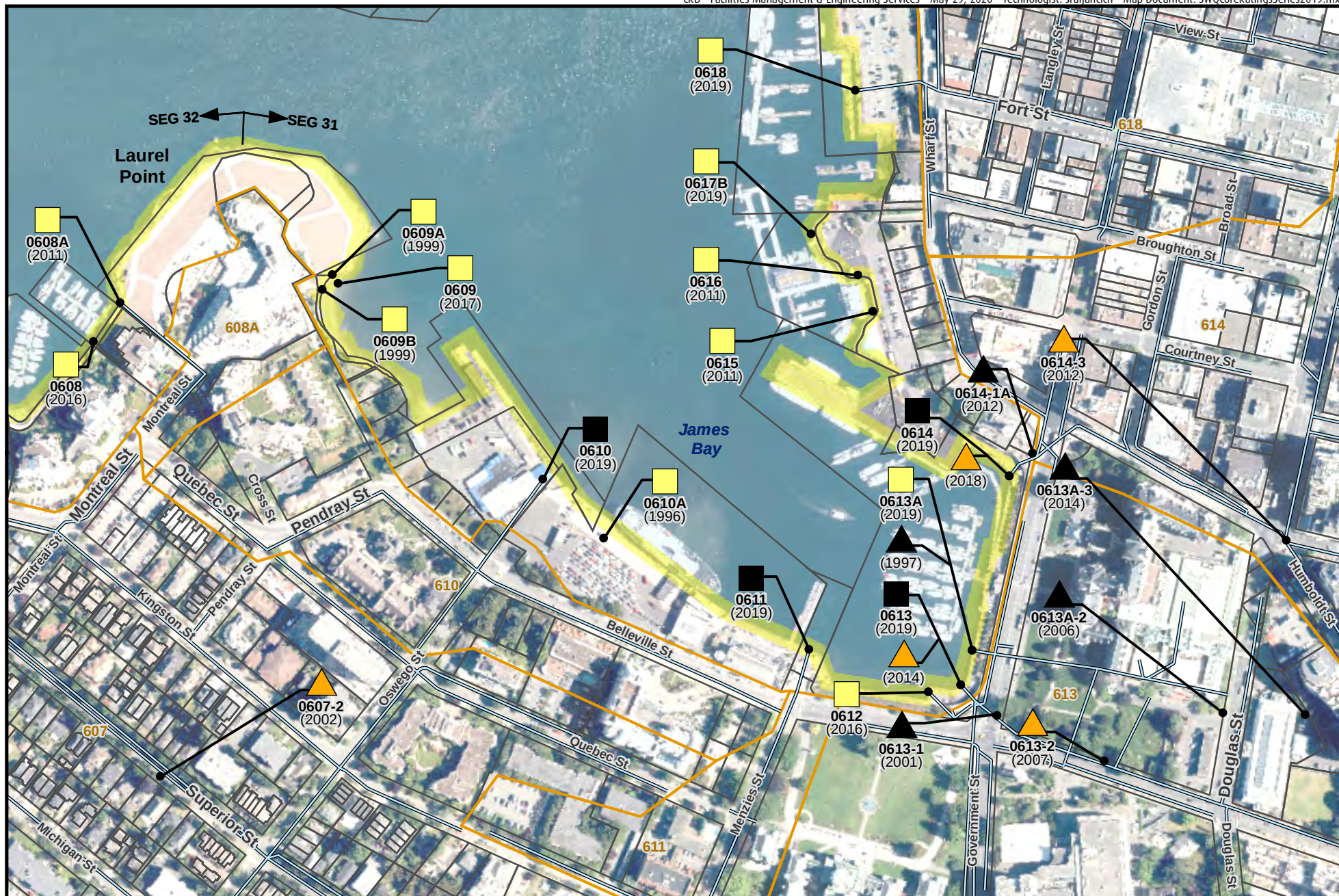
0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 1



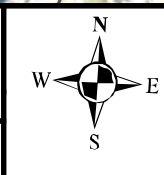
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CRD
Making a difference...together

0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83

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For Legend
See Figure 1

For Area Key Index
See Figure 1

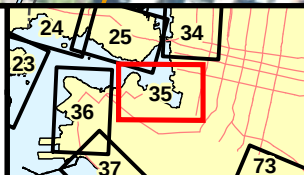
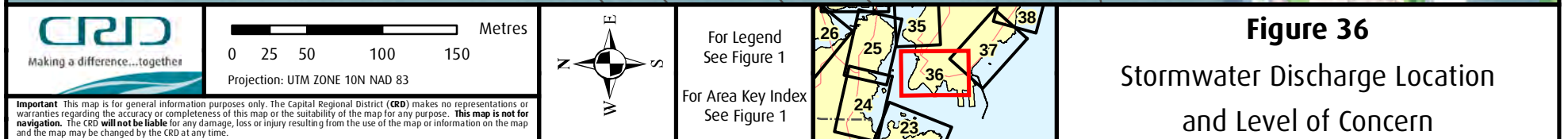


Figure 35
Stormwater Discharge Location
and Level of Concern



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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 1

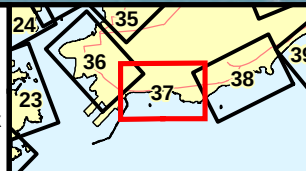


Figure 37
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 2

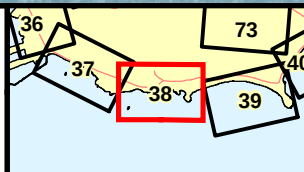


Figure 38
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
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For Area Key Index
See Figure 2

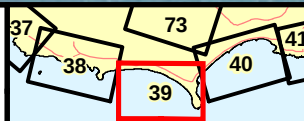
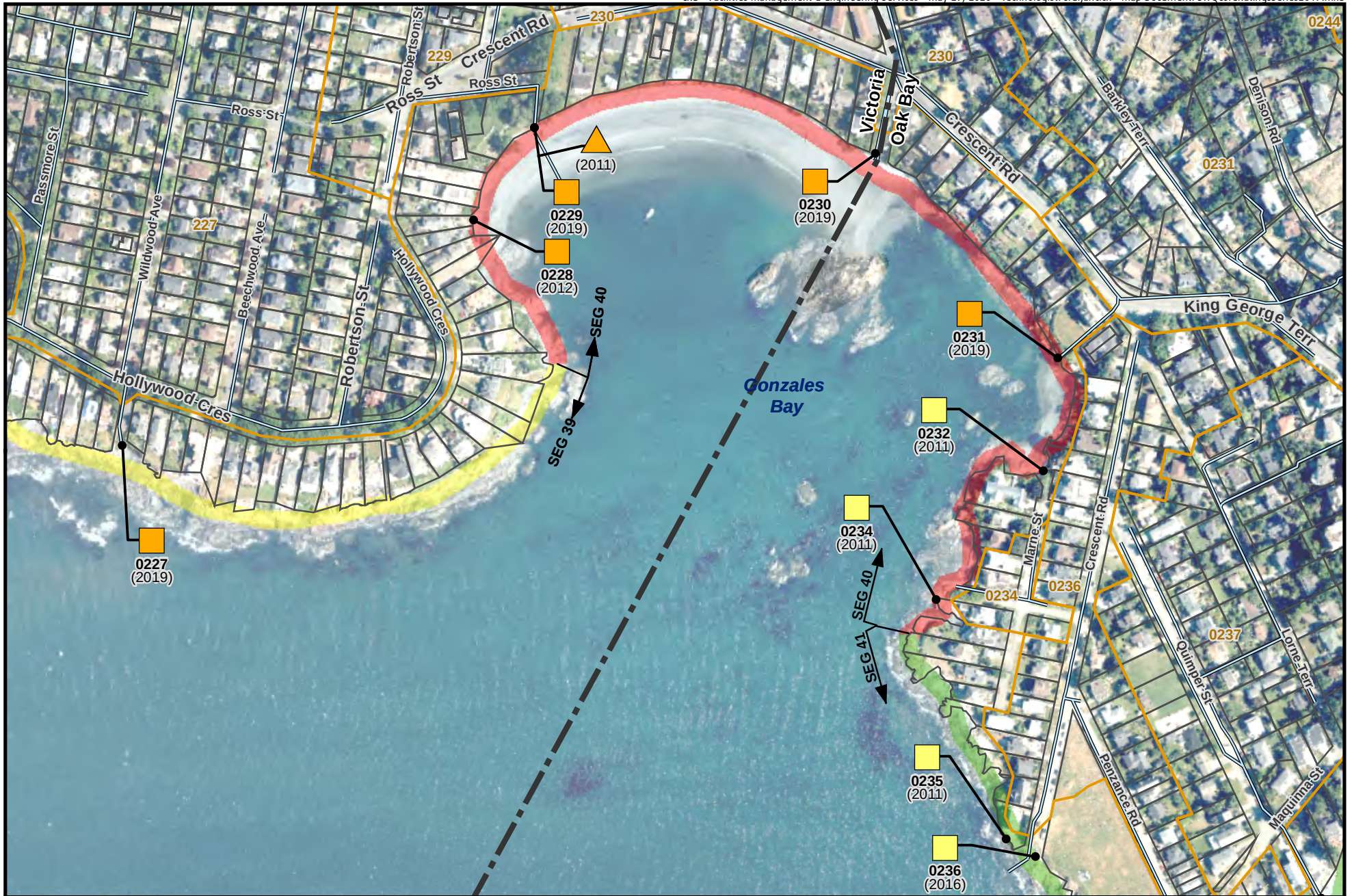


Figure 39
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 2

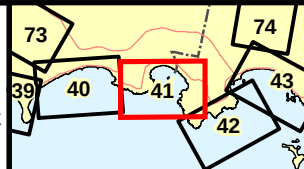
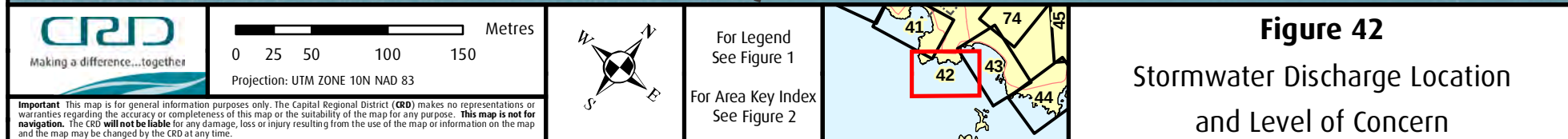
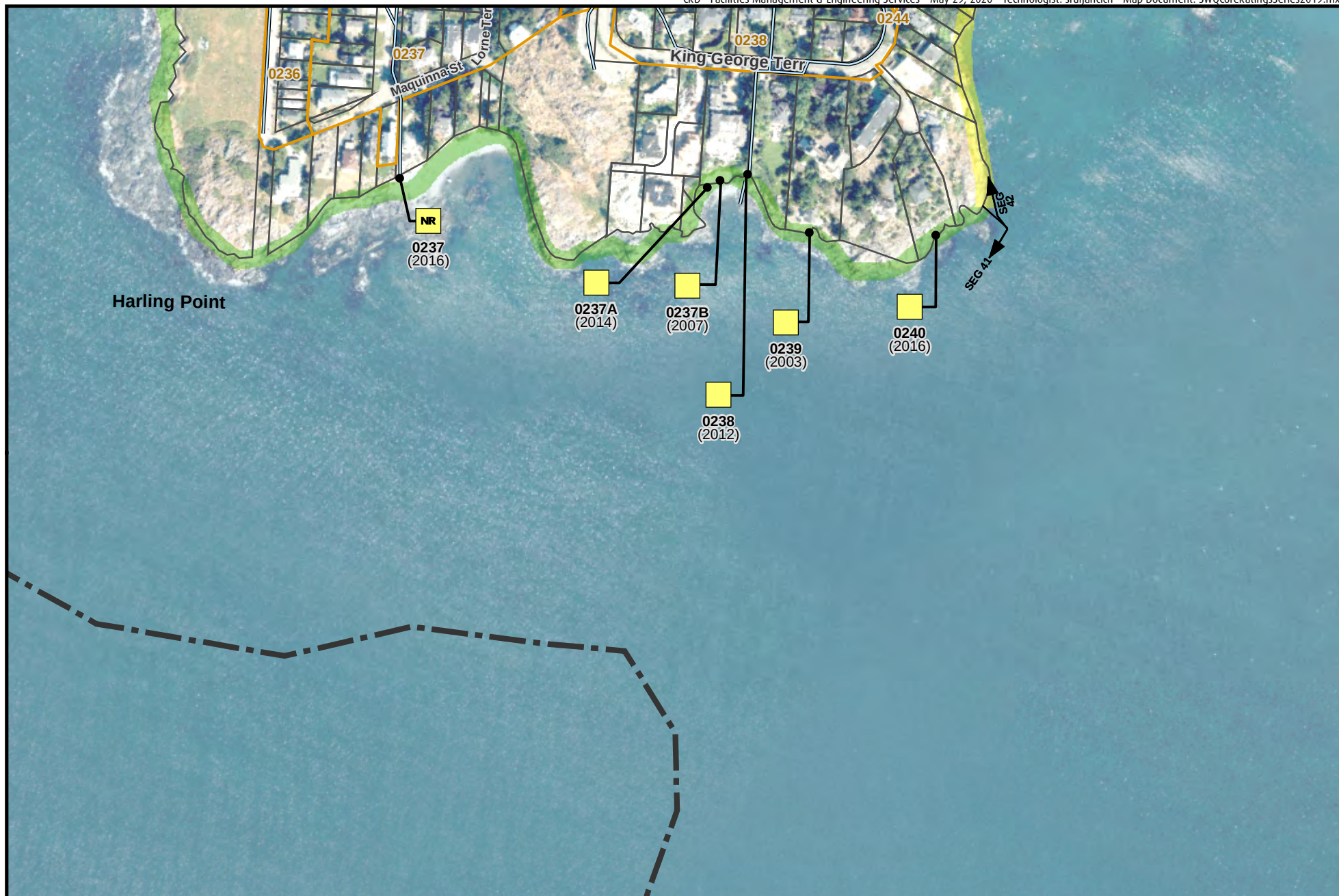


Figure 41

Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 2

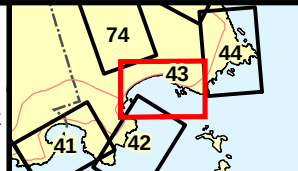
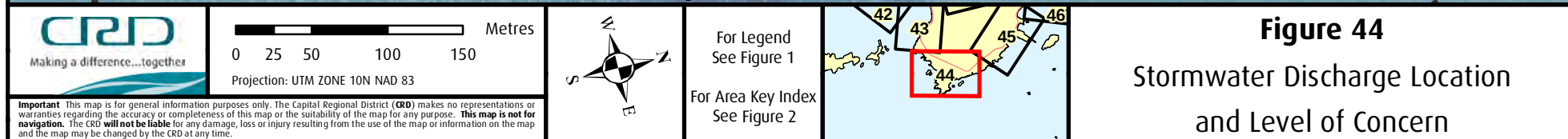


Figure 43

Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 2

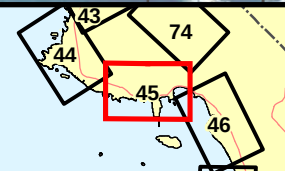
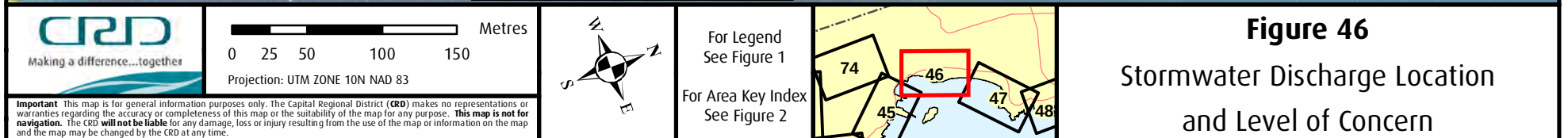
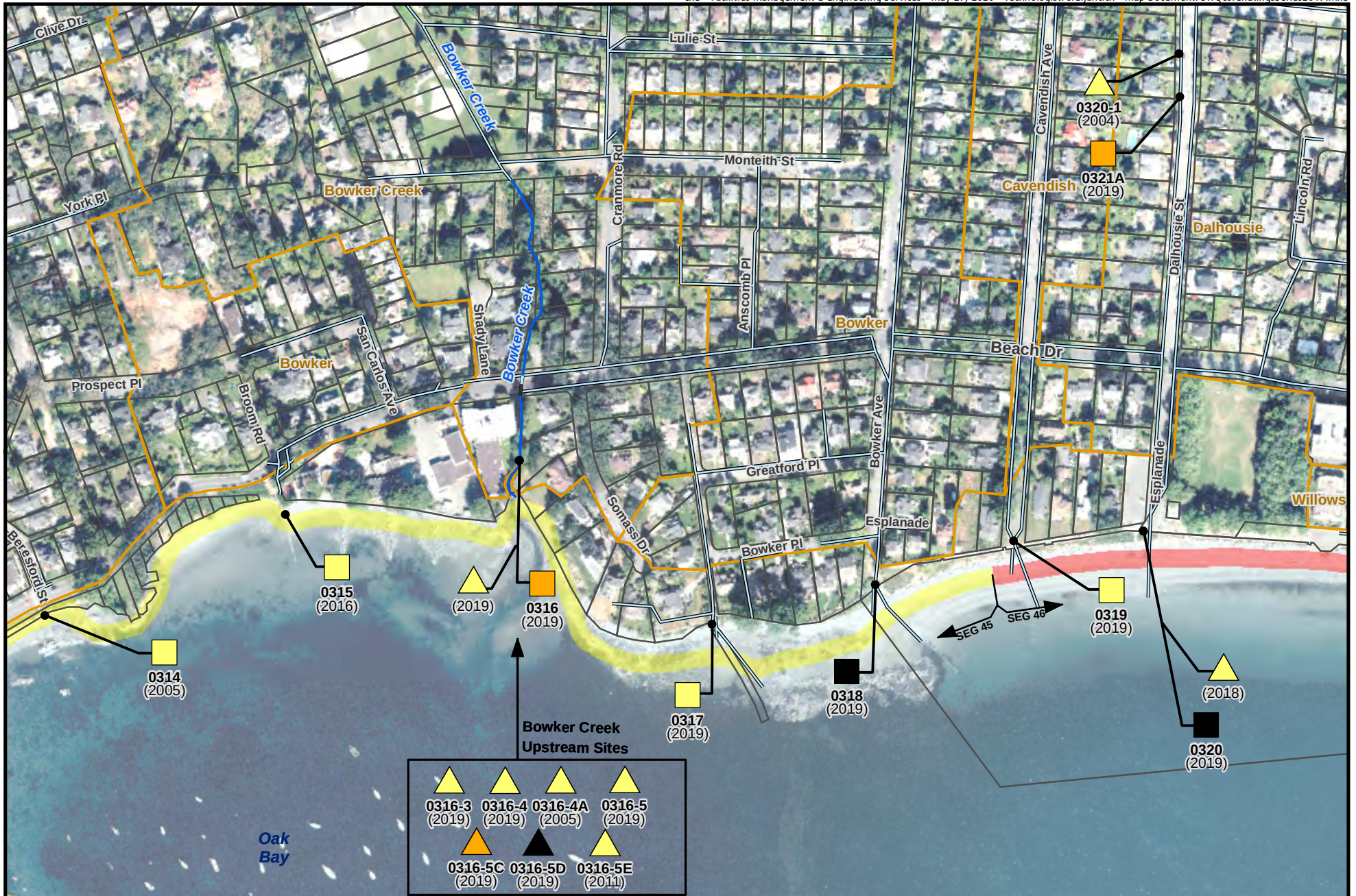
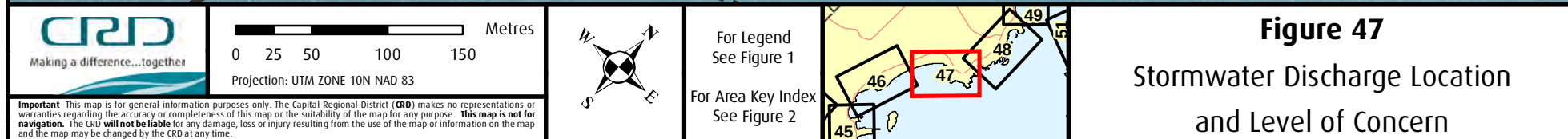


Figure 45
Stormwater Discharge Location
and Level of Concern

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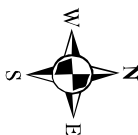
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Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 2

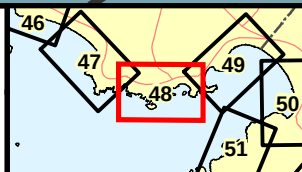


Figure 48
Stormwater Discharge Location
and Level of Concern

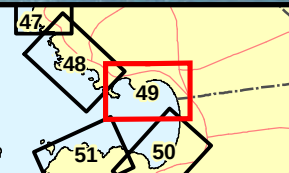
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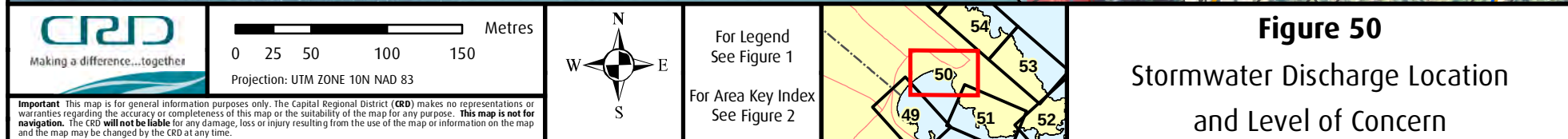
For Legend
See Figure 1
For Area Key Index
See Figure 2



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Figure 49

Stormwater Discharge Location
and Level of Concern



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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 2

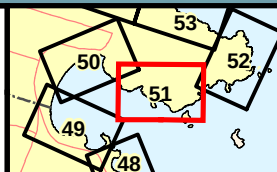
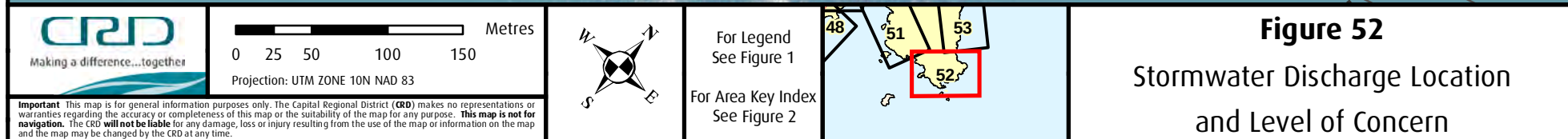
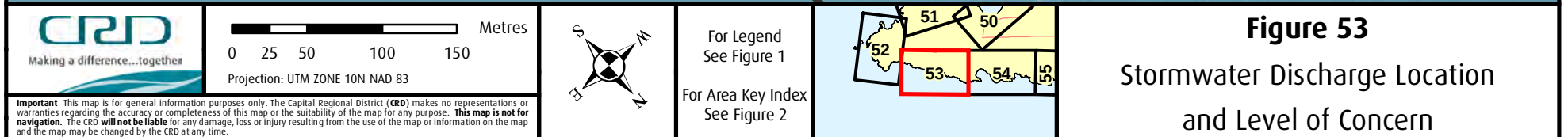


Figure 51
Stormwater Discharge Location
and Level of Concern

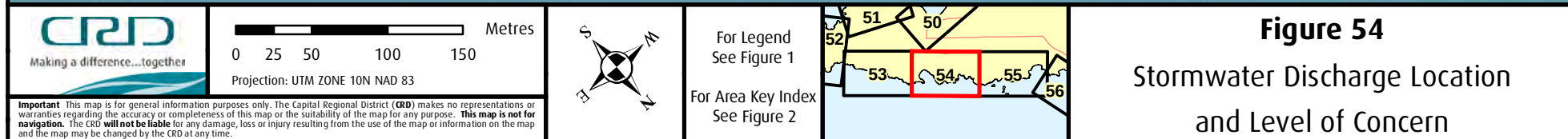
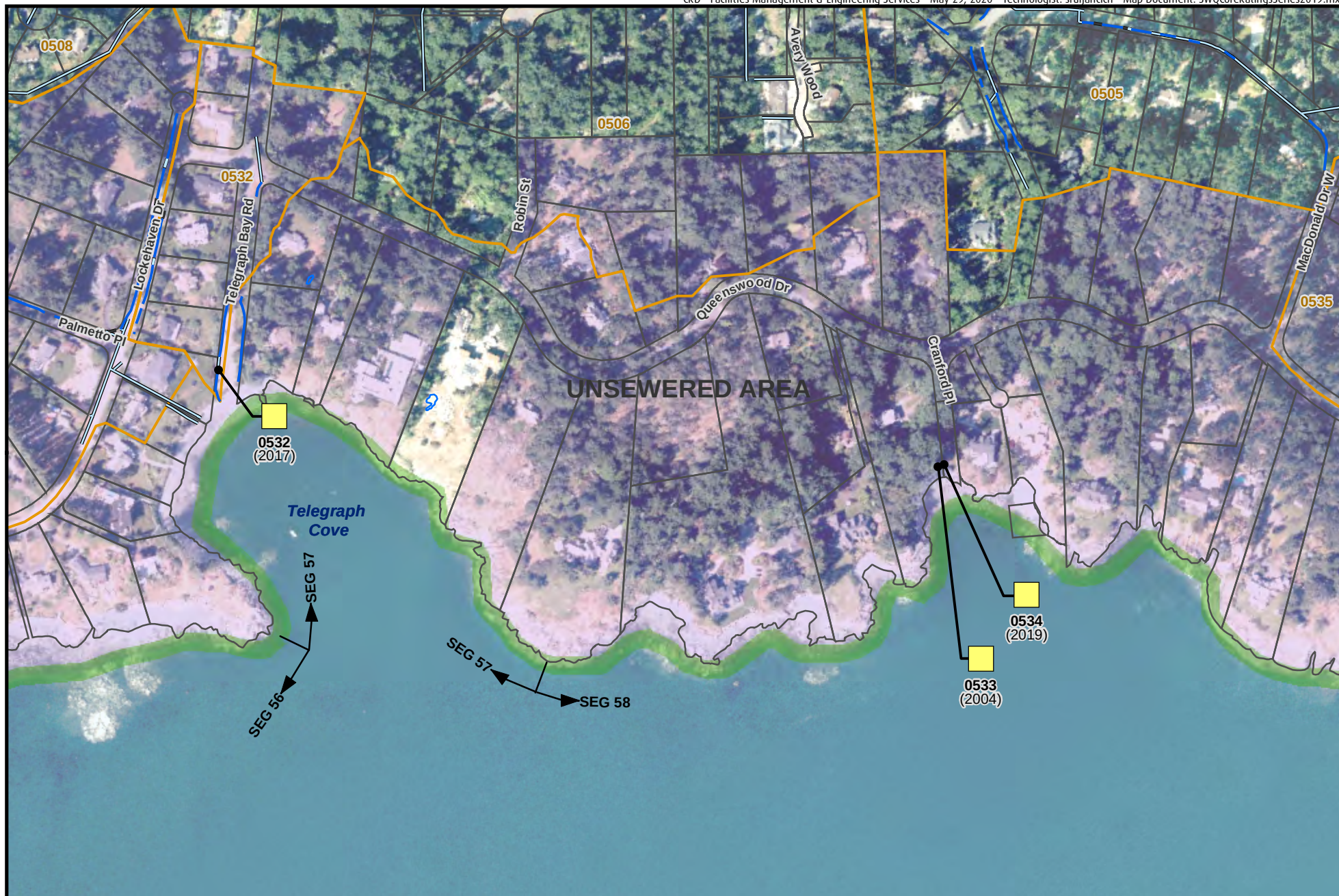
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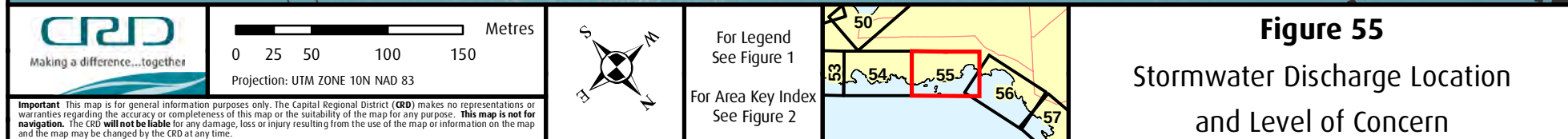
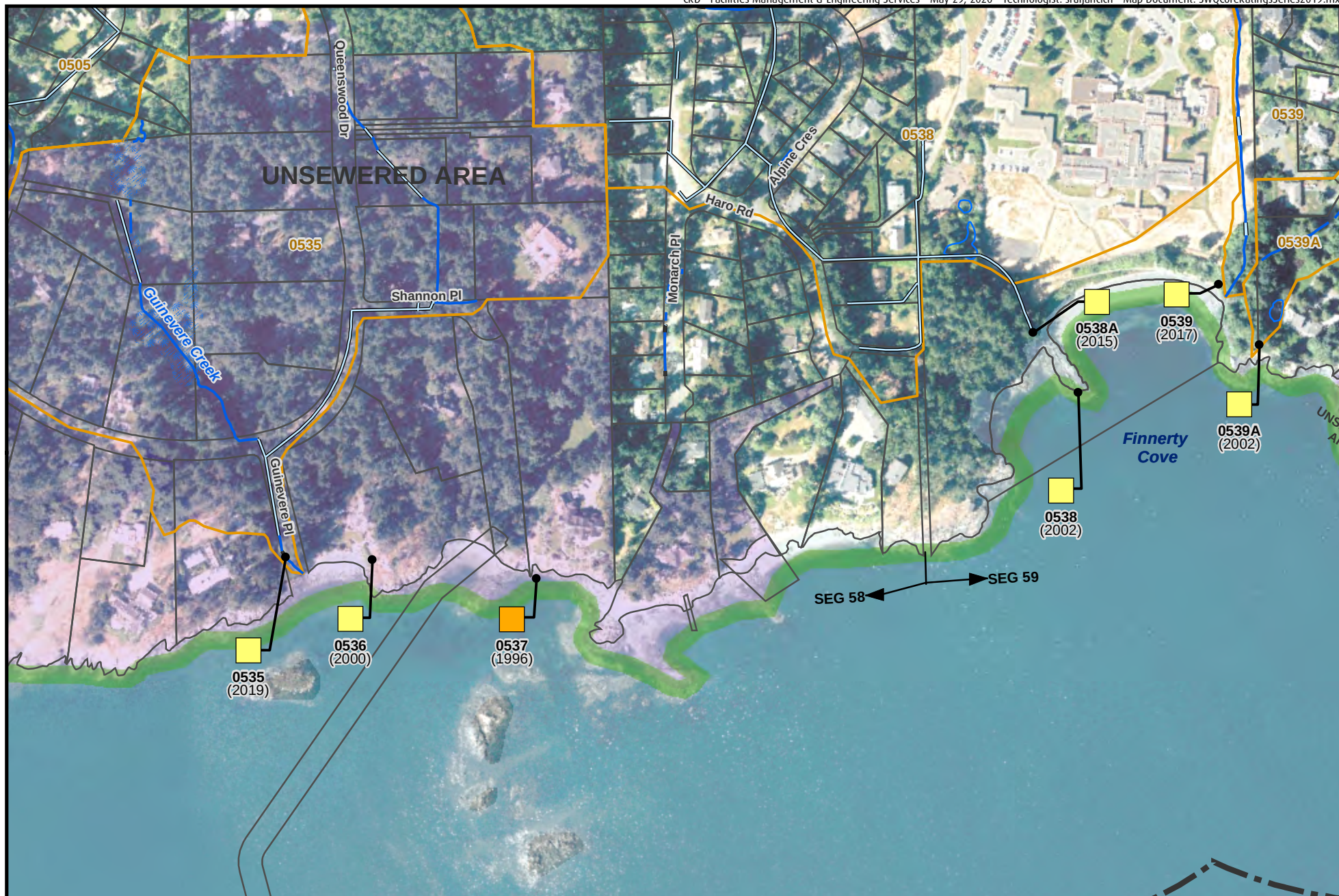
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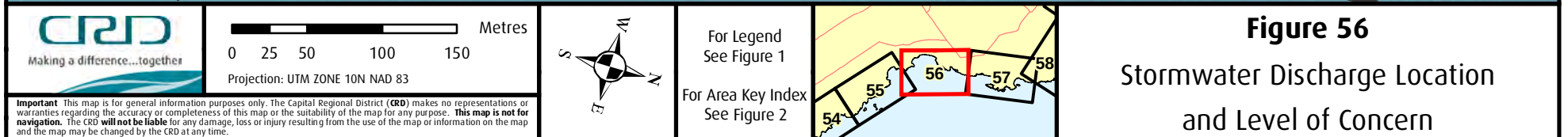
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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 2

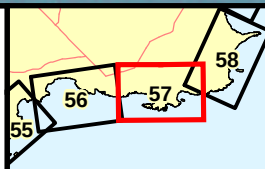


Figure 57
Stormwater Discharge Location
and Level of Concern

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For Legend
See Figure 1
For Area Key Index
See Figure 3

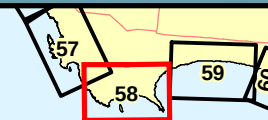
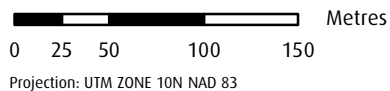


Figure 58
Stormwater Discharge Location
and Level of Concern

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For Legend
See Figure 1

For Area Key Index
See Figure 3

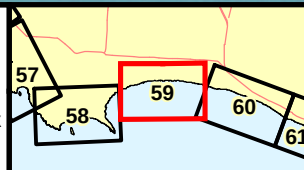
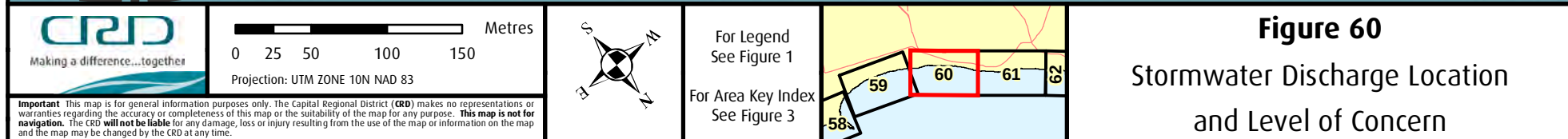
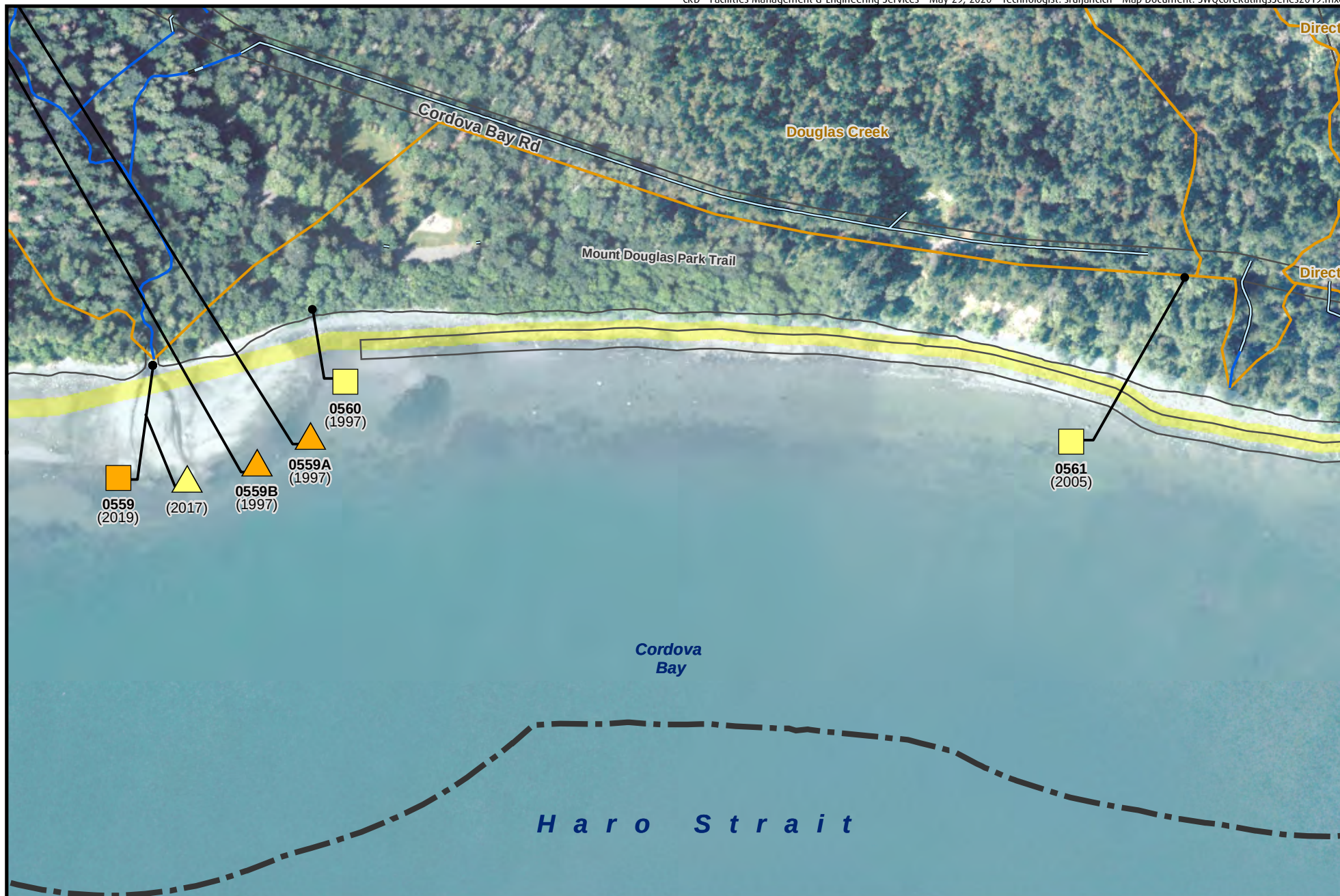
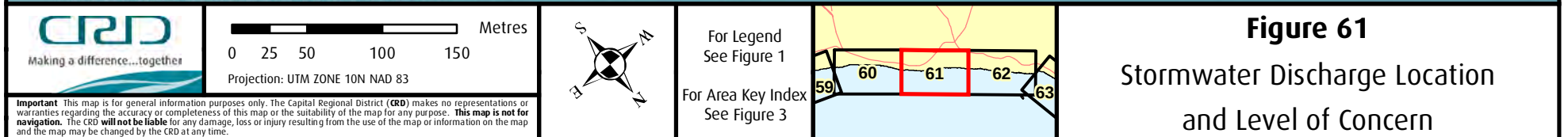


Figure 59
Stormwater Discharge Location
and Level of Concern

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Figure 62

Stormwater Discharge Location
and Level of Concern

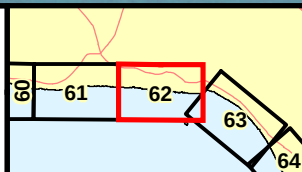


0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 3



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Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See Figure 3

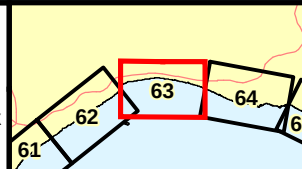
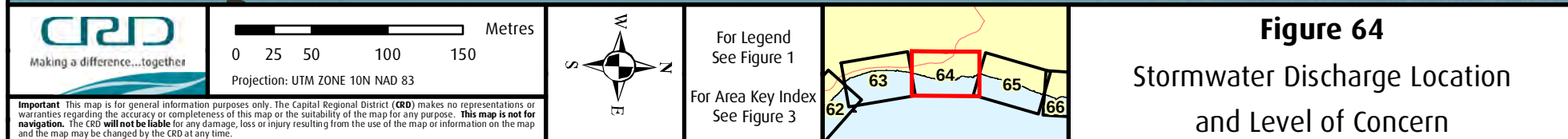
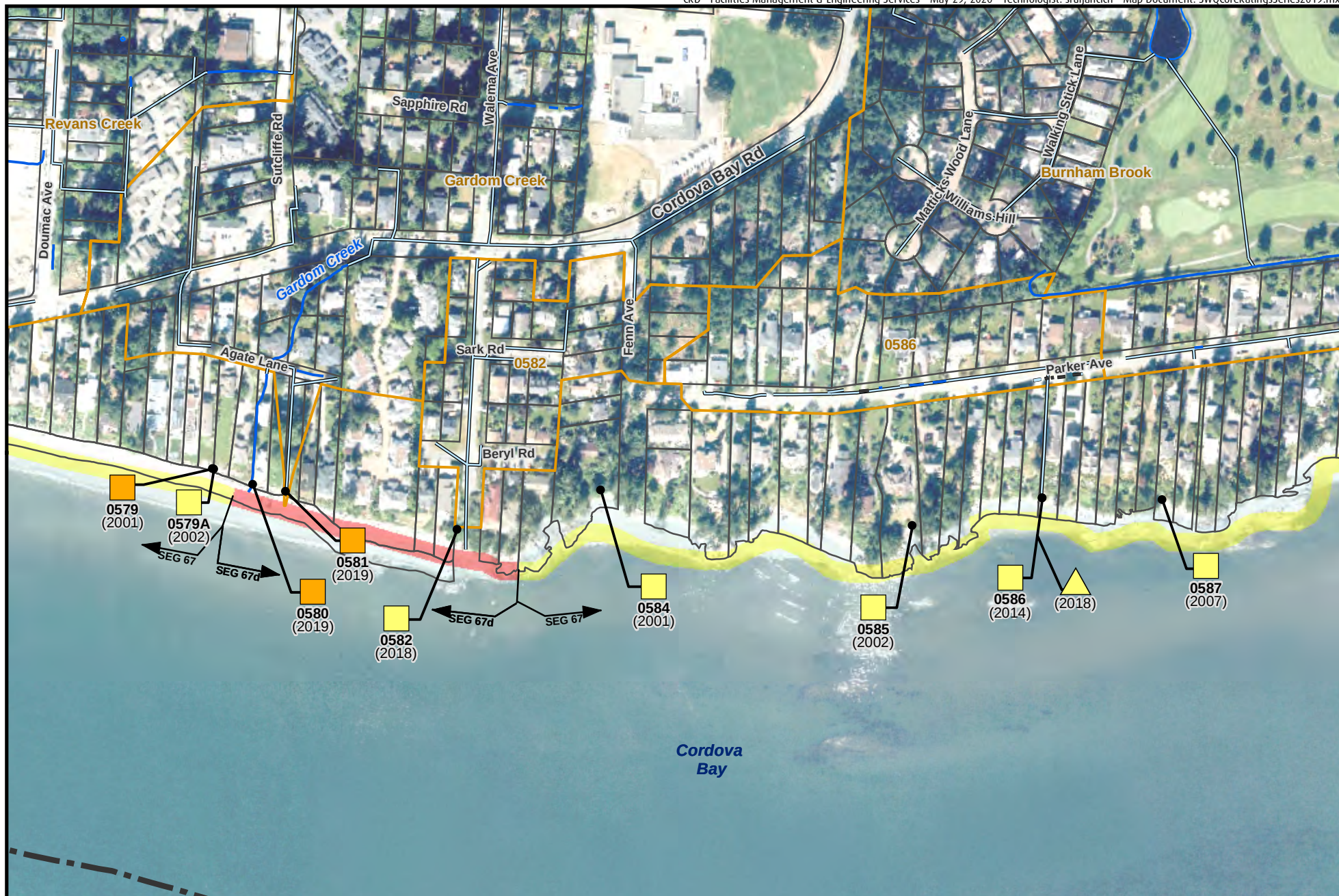


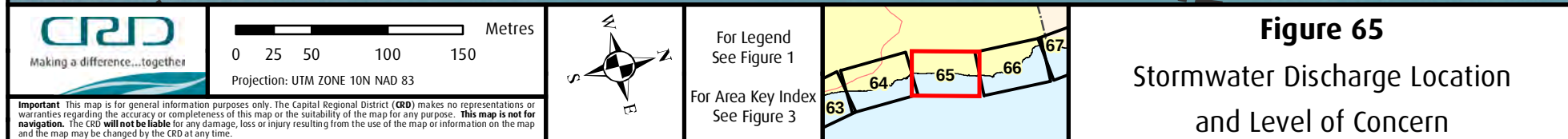
Figure 63

Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 3

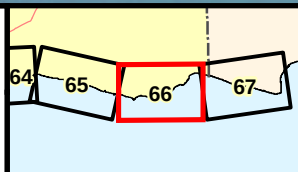
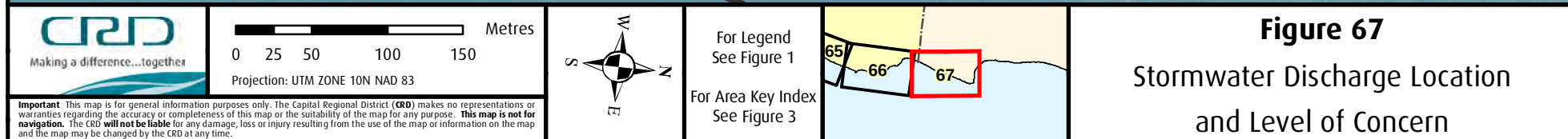


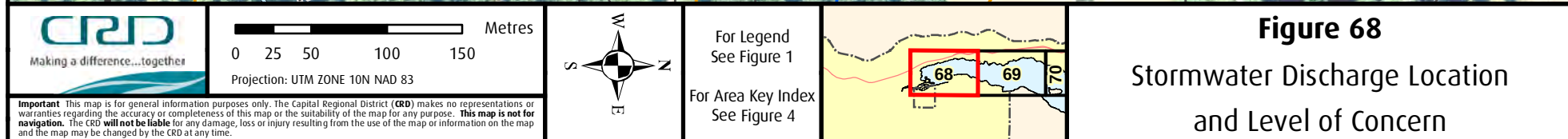
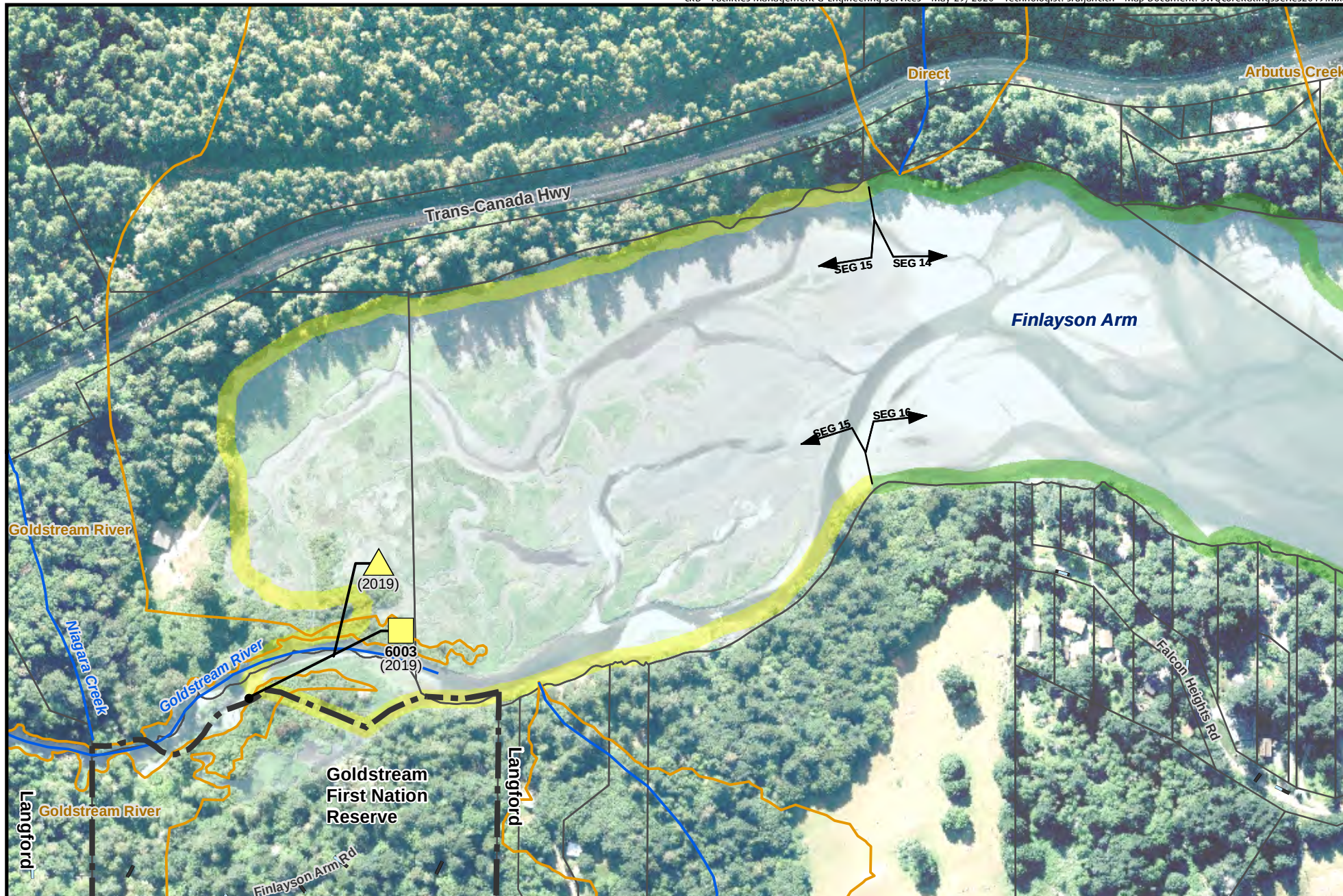
Figure 66

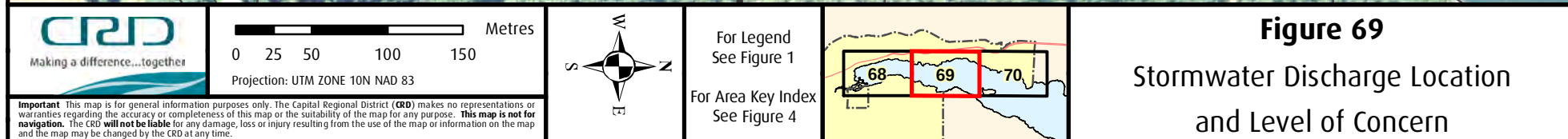
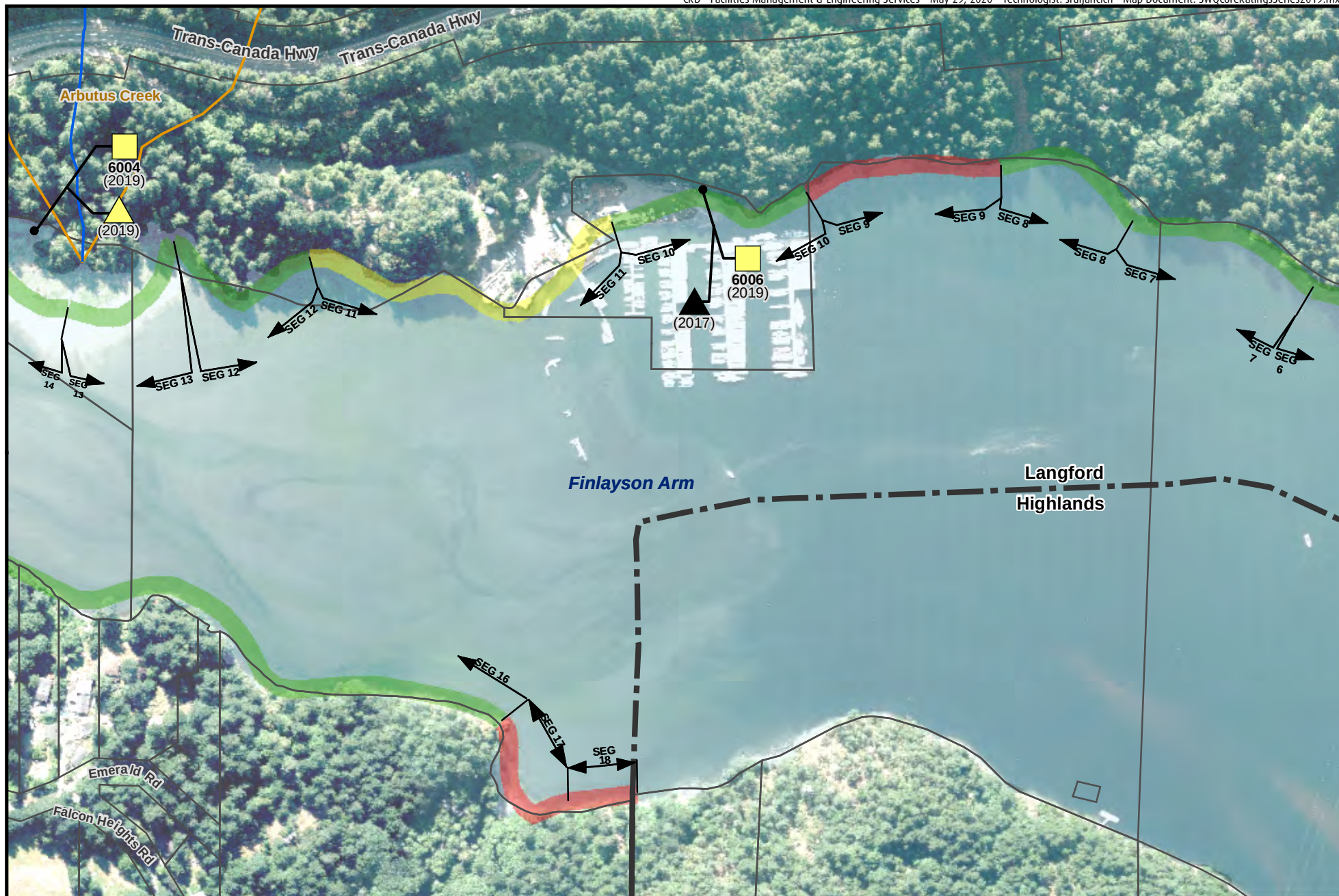
Stormwater Discharge Location
and Level of Concern

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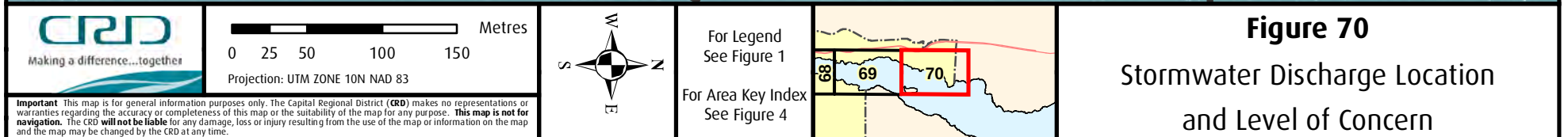
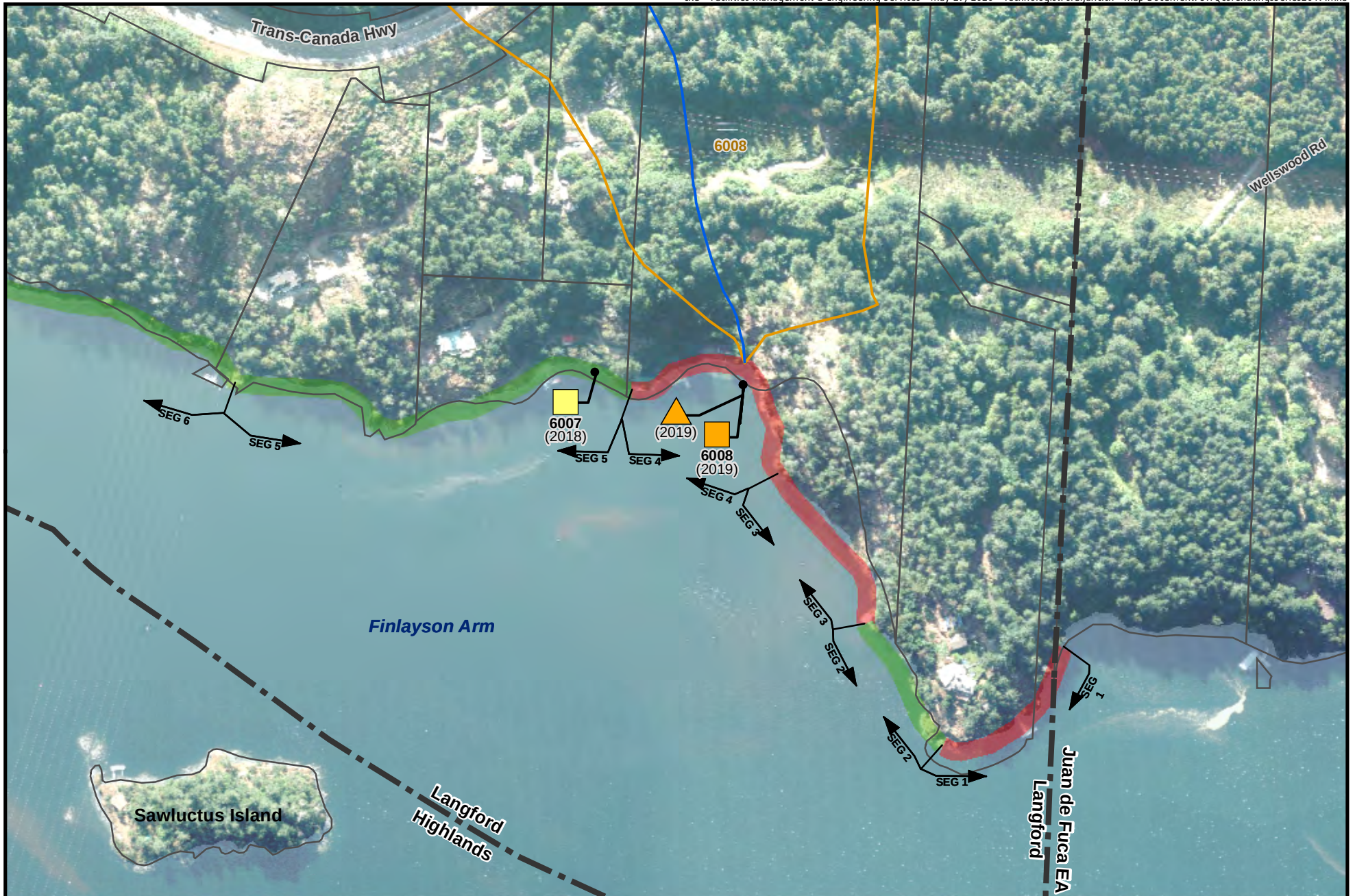


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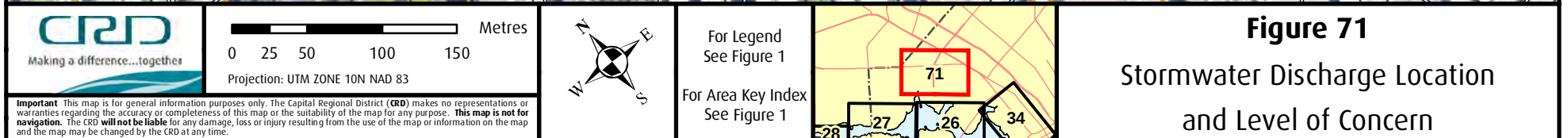
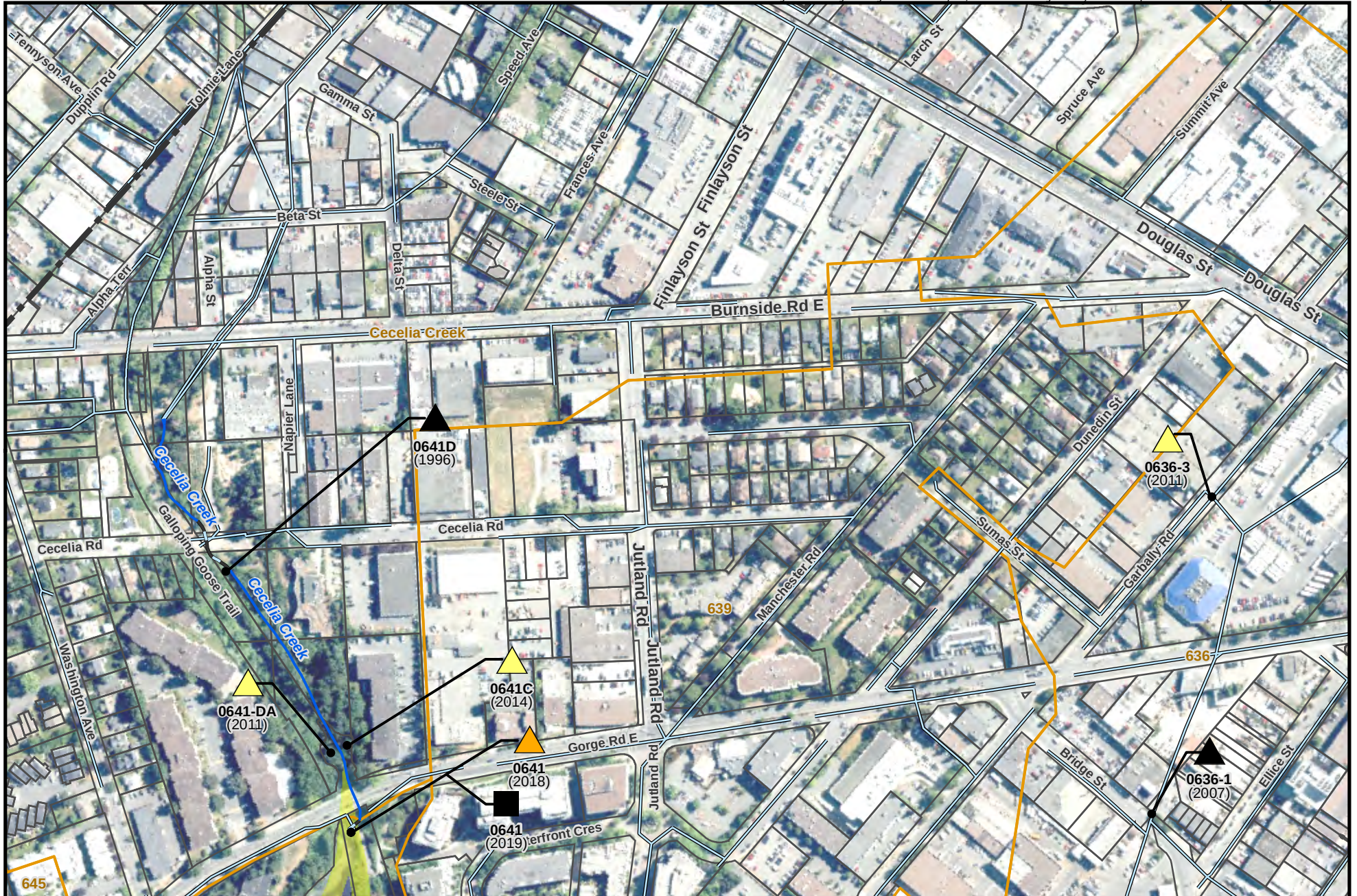




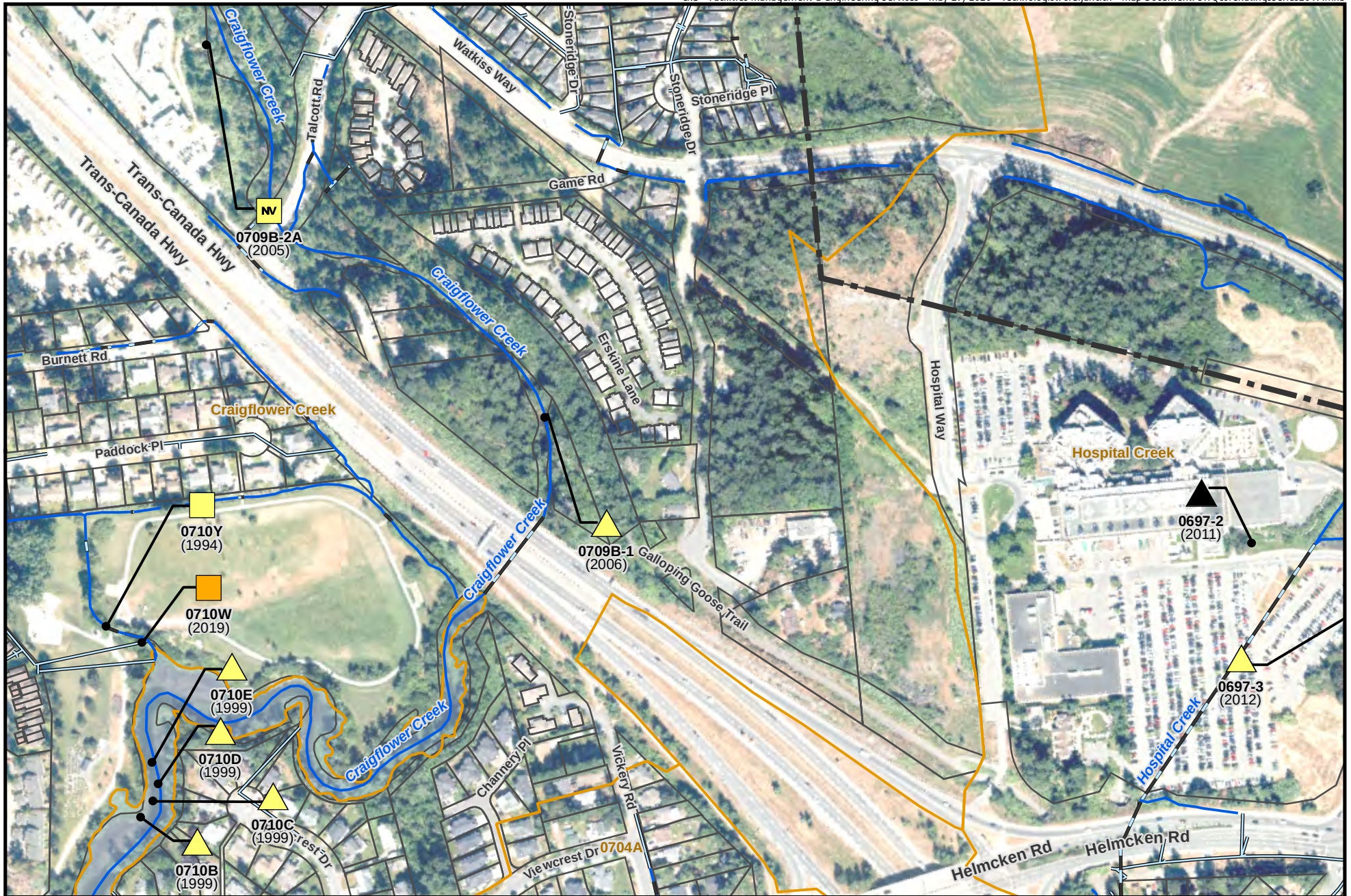
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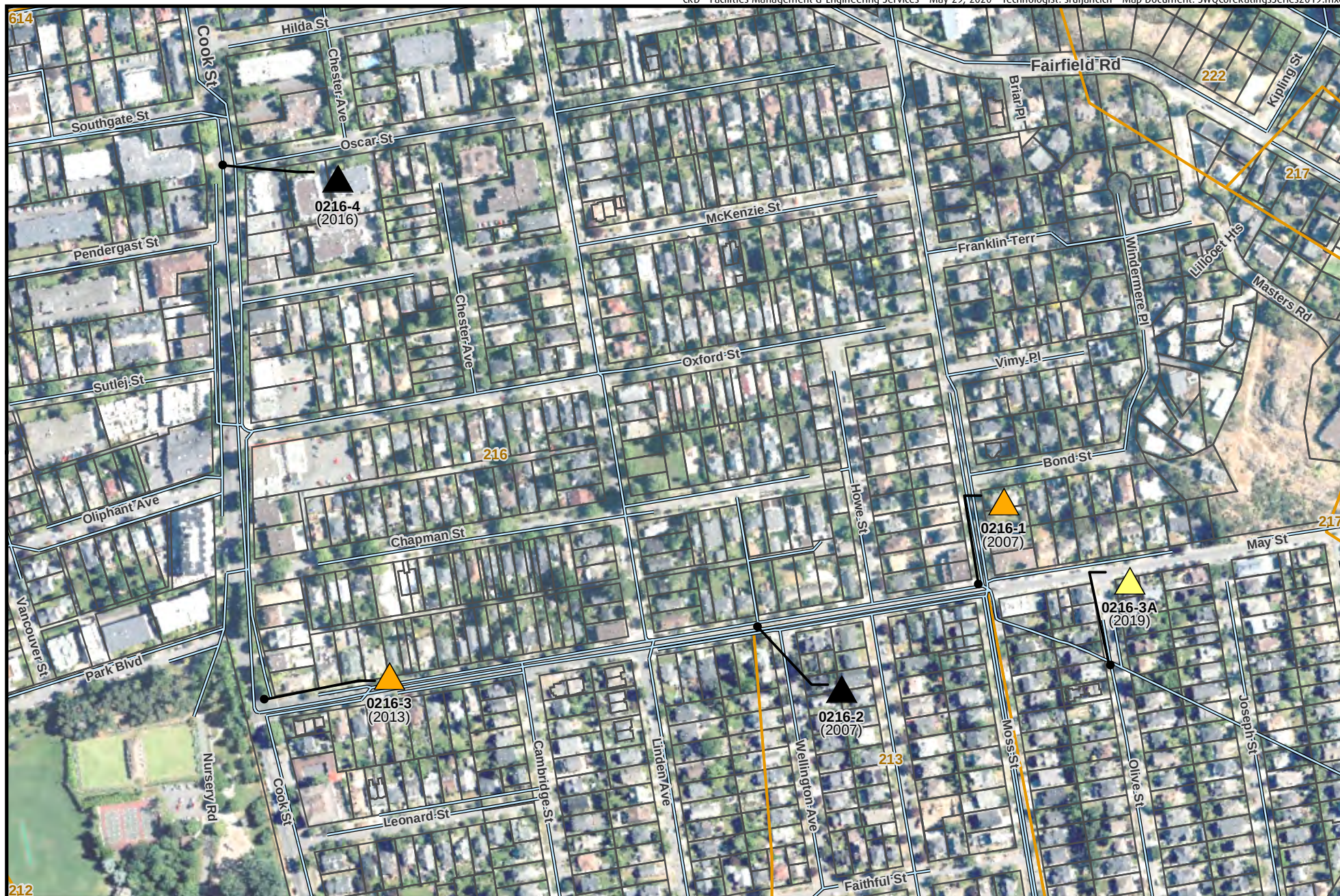


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	0 25 50 100 150 Metres Projection: UTM ZONE 10N NAD 83		For Legend See Figure 1 For Area Key Index See Figure 1		Figure 72 Stormwater Discharge Location and Level of Concern
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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See Figure 2

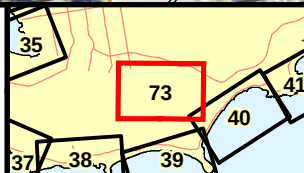
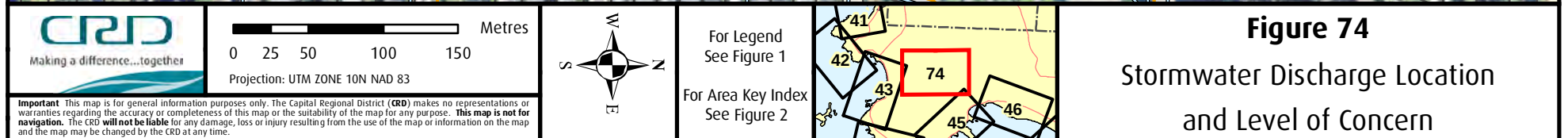
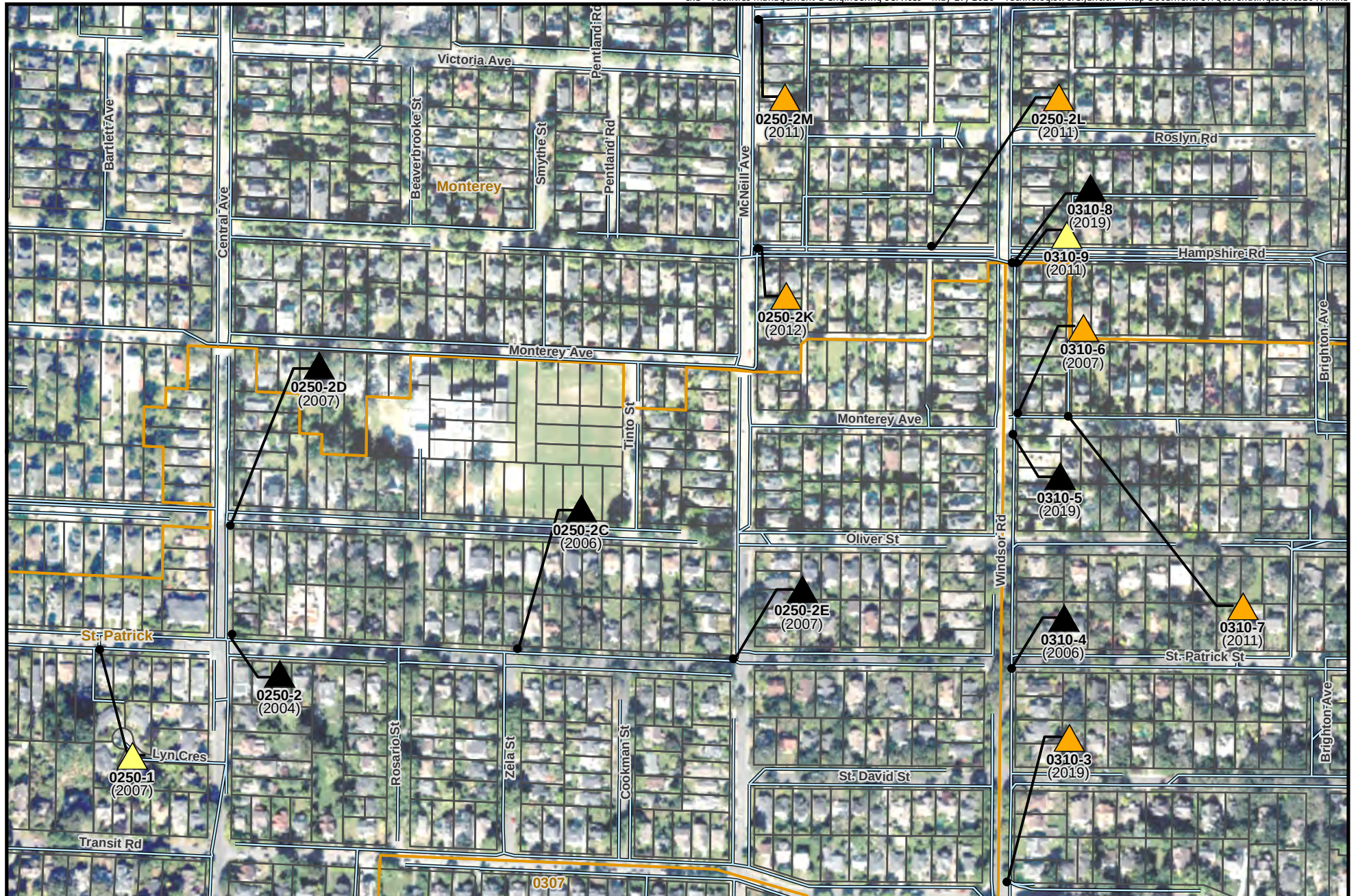


Figure 73

Stormwater Discharge Location
and Level of Concern

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APPENDIX B

CORE STORMWATER PUBLIC HEALTH RATINGS

Table 1 2019 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Figure No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2017	2018	2019	Comments	Recommendations
0912	Colwood/ Parks Canada	9	1	1	2	NA	Low	Low	Dry in summer; discharges into Esquimalt Lagoon	Confirm rating
0913	Colwood/Parks Canada	9	1	1	2	NA	Low	Low	Dry in summer; discharges into Esquimalt Lagoon	Confirm rating
0916	Colwood/DND	9	2	1	3	Moderate	Moderate	Moderate	Colwood Creek; birds present	Continue monitoring
0926	Colwood	8	1	2	3	Moderate	Low	Low	Bee Creek; discharges into Esquimalt Lagoon	Continue monitoring
0928	Colwood	8	1	2	3	Low	Low	Low	Selleck Creek; discharges into Esquimalt Lagoon	Continue monitoring
0930	Colwood	7	1	2	3	Low	Low	Low	Discharges into Esquimalt Lagoon	Continue monitoring
0931	Colwood	7	2	2	4	Low	High	Moderate	Lagoona Brook; discharges into Esquimalt Lagoon	Continue monitoring
0932	Colwood	7	2	2	4	NA	Low	Moderate	Discharges into Esquimalt Lagoon	Confirm rating
0933	Colwood	7	2	2	4	Moderate	Moderate	Moderate	Discharges into Esquimalt Lagoon	Continue monitoring
0935A	Colwood	7	2	2	4	NA	Low	Moderate	Public beach	Confirm rating
0940A	Colwood	6	1	1	2	NA	Low	Low	New pipe; low flow in summer	Resample in 2024
0722AA	Esquimalt	30	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0726	Esquimalt/ Songhees F.N.	29	2	2	4	High	Moderate	Moderate		Continue monitoring
0727	Esquimalt	29	2	2	4	High	Moderate	Moderate	One high result; repeat	Confirm rating
0731	Esquimalt	29	1	2	3	Moderate	Low	Low		Confirm rating
0733	Esquimalt	29	1	2	3	NA	Low	Low		Confirm rating
0736A	Esquimalt private	29	2	2	4	High	Moderate	Moderate	Glen Vale strata	Continue monitoring
0737	Esquimalt	29	2	2	4	Moderate	Low	Low	Lower counts	Continue monitoring; continue investigations
0742	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate	Higher in summer	Continue monitoring
0742B	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0743A	Esquimalt	28	2	2	4	Moderate	Low	Moderate	May be influenced by creek flows	Continue monitoring
0744	Esquimalt	28	2	2	4	Moderate	High	Moderate	Gorge Creek	Continue monitoring
0744A	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate	Low flow	Continue monitoring
0744B	Esquimalt	28	3	2	5	High	High	High	Cross-connection	Continue source investigations
0749	Esquimalt	28	2	2	4	Moderate	High	Moderate		Continue monitoring; elevated upstream
0749A	Esquimalt private	28	3	2	5	High	High	High	Private pipe	Confirm rating
0751	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate	Unusually high count in April	Continue monitoring
0754	Esquimalt	27	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0779	Esquimalt	24	2	2	4	Moderate	Moderate	Moderate		Continue monitoring

Table 1 2019 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Figure No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2017	2018	2019	Comments	Recommendations
0780	Esquimalt	24	3	2	5	High	High	High	Sewer odour	Continue monitoring
0781	Esquimalt	23	3	2	5	Moderate	High	High	Red foam	Continue monitoring
0805	Esquimalt	22	3	3	6	High	High	High	SPSO	Continue monitoring and source investigations
0806	Esquimalt	22	3	3	6	High	High	High		Continue monitoring and source investigations
0813	Esquimalt	21	2	2	4	Moderate	Low	Moderate		Confirm rating
0814	Esquimalt	21	2	2	4	Low	Moderate	Low	SPSO	Continue monitoring
0854	Esquimalt/DND	19	3	1	4	Moderate	Moderate	Moderate	SPSO; very high count in summer	Continue monitoring and investigate
6003	Langford	68	1	2	3	Low	Low	Low	Goldstream River; SPSO	Continue monitoring
6004	Langford	68	1	1	2	NR	NR	Low	Arbutus Creek	Confirm rating
6006	Langford	68	1	1	2	NR	NR	Low		Confirm rating
6008	Langford	70	1	3	4	Low	Low	Moderate	Elevated count in August; lower when resampled in October	Continue monitoring
0231	Oak Bay	41	2	2	4	Low	Moderate	Moderate		Continue monitoring
0244	Oak Bay	43	1	2	3	Moderate	Moderate	Low		Confirm rating
0245	Oak Bay	43	2	3	5	High	High	High	Counts lower	Continue monitoring and source investigations
0249	Oak Bay	43	3	2	5	Moderate	Moderate	High	EC elevated in summer; but low flow	Continue monitoring
0250	Oak Bay	43	2	2	4	Moderate	Moderate	Moderate	Outfall; sampled manhole; water pooled in winter	Continue monitoring
0306	Oak Bay	45	3	2	5	NA	Low	High	Flows in summer; dry in winter	Confirm rating
0307	Oak Bay	45	2	2	4	Moderate	High	Moderate		Confirm rating
0308A	Oak Bay	45	1	2	3	Low	Low	Low	Lower counts in 2016; low flow in summer	Resample in 2024
0309	Oak Bay	45	1	2	3	NA	Low	Low		Resample in 2024
0310	Oak Bay	45	3	2	5	Moderate	Moderate	High	EC counts higher in winter	Continue monitoring
0310A	Oak Bay	45	2	2	4	High	Moderate	Moderate		Continue monitoring
0316	Oak Bay	46	2	2	4	Moderate	Moderate	Moderate	Bowker Creek; high flows; SPSO	Continue monitoring creek
0317	Oak Bay	46	1	2	3	Low	Low	Low	SPSO; manhole; low flow	Continue monitoring
0318	Oak Bay	46	3	3	6	High	High	High	Counts lower	Continue monitoring
0319	Oak Bay	46	1	3	4	High	Low	Low		Confirm rating
0320	Oak Bay	46	2	3	5	High	High	High	Counts lower	Continue monitoring
0321	Oak Bay	47	2	3	5	Moderate	Low	Moderate	Outfall	Continue monitoring
0321A	Oak Bay	47	2	3	5	Moderate	Low	Moderate		Continue monitoring
0322	Oak Bay	47	2	3	5	High	High	Moderate		Continue monitoring
0323	Oak Bay	47	2	3	5	Moderate	Moderate	Moderate	Stream; counts lower	Continue monitoring

Table 1 2019 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Figure No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2017	2018	2019	Comments	Recommendations
0324	Oak Bay	47	1	2	3	Low	Low	Low	Dry or low flows	Resample in 2024
0327	Oak Bay	49	1	3	4	NA	Low	Low		Resample in 2024
0327A	Oak Bay	49	1	3	4	Low	Low	Low	Cadboro Bay; dry	Continue sampling
0501	Saanich	49	2	3	4	Moderate	Low	Low	Cadboro Bay; Saanich fixed a cross-connection	Confirm rating
0503	Saanich	50	2	3	5	High	High	High	Cadboro Bay; duck pond upstream	Continue monitoring
0505	Saanich	50	2	3	5	High	Low	Moderate	EC counts lower; one source found	Continue monitoring
0506	Saanich	50	3	3	6	Moderate	Low	Moderate	One high result; repeat	Continue monitoring
0507	Saanich	50	1	3	4	Low	Low	Low	Low flow	Continue monitoring
0508	Saanich	50	1	3	4	Moderate	Moderate	Low	EC counts lower; a source repaired	Continue monitoring
0511	Saanich	50	1	1	2	NA	Low	Low		Resample in 2024
0512	Saanich	51	2	1	3	NA	NA	Low		Confirm rating
0534	Saanich private	54	1	1	2	NA	NA	Low		Confirm rating
0535	Saanich	55	1	1	2	NA	NA	Low	Guinevere Creek; dry in summer; enterococci was elevated after large rainfall in winter	Confirm rating
0541	Saanich	56	2	2	4	Low	Low	Moderate		Confirm rating
0542	Saanich	56	1	3	4	NA	Low	Low	Dry	Resample in 2024
0542A	Saanich	56	2	3	5	NA	NA	Moderate	Seep in collapsed bank	Confirm rating
0543	Saanich	56	1	3	4	Moderate	Low	Low		Resample in 2024
0543A	Saanich	56	1	3	4	NA	NA	Low		Resample in 2024
0544	Saanich	56	1	3	4	Moderate	Low	Low		Resample in 2024
0545	Saanich	56	1	3	4	NA	Low	Low		Resample in 2024
0545A	Saanich	56	1	1	2	NA	NA	Low		Confirm rating
0558	Saanich	59	2	2	4	Moderate	Moderate	High	Near Mt. Douglas Park access	Continue monitoring
0559	Saanich	60	1	3	4	High	Moderate	Moderate	Mt. Douglas Creek; high flows; SPSO	Continue monitoring creek
0565	Saanich private	61	2	2	4	Low	Low	Moderate	Private pipe	Confirm rating
0567	Saanich	62	2	2	4	Moderate	Moderate	High	Beach access; waterfall	Continue monitoring
0570	Saanich	62		2		NA	NA	NR	Only one sample; dry	Continue monitoring
0574	Saanich	62	1	2	3	Moderate	Low	Low	Galey Brook; laundry soap observed	Continue monitoring
0576A	Saanich	63	2	3	5	Moderate	Moderate	Moderate	High count in winter	Continue monitoring
0578	Saanich	63	1	3	4	Moderate	Moderate	Low		Continue monitoring
0580	Saanich	64	2	3	5	NA	Moderate	Moderate	Gardom Creek	Confirm rating
0581	Saanich	64	2	3	5	Low	Moderate	Moderate		Confirm rating
0589	Saanich	65	1	3	4	Low	Low	Low		Continue monitoring
0592	Saanich	65	2	1	3	Moderate	Moderate	Moderate	Noble Creek; high flow; sewage odour	Continue monitoring creek

Table 1 2019 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Figure No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2017	2018	2019	Comments	Recommendations
0653	Saanich	27	2	2	4	High	Moderate	Moderate	Counts lower	Confirm rating
0654	Saanich	27	1	2	3	Low	Low	Low	Foamy; chlorine odour	Continue monitoring
0655	Saanich	28	1	2	3	Low	Moderate	Low		Confirm rating
0658A	Saanich	28	3	2	5	Low	Moderate	Moderate	High count in summer; flow too low to confirm	Confirm rating
0659	Saanich	28	2	2	4	Low	Low	Low		Confirm rating
0671	Saanich	29	2	2	4	Low	Moderate	Moderate		Confirm rating
0673	Saanich	29	1	2	3	Moderate	Low	Low	Dry	Sample in 2024
0676	Saanich	29	2	2	4	Low	Low	Moderate	SPSO	Confirm rating
0690D	Saanich	33	2	2	4	Low	Moderate	Moderate	Colquitz Creek; high flow	Continue monitoring and start source investigations
0690E	Saanich	33	2	2	4	NR	NR	Moderate		Confirm rating
0691A	Saanich	32	1	2	3	NR	NR	Low		Confirm rating
0692	Saanich	32	1	2	3	Moderate	Moderate	Low		Confirm rating
0208/0209	Victoria	37	3	2	5	Moderate	High	High	0208 is an overflow for 0209 when 209 is blocked	Continue monitoring and source investigations
0210	Victoria	37	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0212	Victoria	39	1	3	4	Moderate	Moderate	Moderate	Counts lower	Continue monitoring
0214	Victoria	39	3	2	5	High	High	High	SPSO; 0213 on Victoria maps	Continue monitoring
0216	Victoria	40	3	2	5	High	High	High	SPSO; high flow; sewage odour	Continue monitoring
0217	Victoria	40	3	2	5	Moderate	Moderate	Moderate	Combined flow with 0218; outfall pipe underwater	Continue monitoring
0222	Victoria	40	3	2	5	High	High	High	Moderate flows	Continue monitoring and source investigations
0227	Victoria	41	2	1	3	Moderate	Low	Moderate	Low flow; SPSO; SS and SD relining completed	Continue monitoring
0229	Victoria	41	1	3	4	High	High	Moderate	Gonzales Bay; flows low	Continue monitoring and source investigations
0230	Victoria	41	2	2	4	High	Moderate	Moderate	Gonzales Bay; pipe buried	Continue monitoring
0603	Victoria	36	3	2	5	Moderate	High	High	High in winter; dry in summer	Continue monitoring
0604	Victoria	36	2	1	3	NA	Moderate	Low	Near boat launch	Confirm rating
0604A	Victoria	36	1	1	2	NA	Low	Low	Dry; private discharge	Resample in 2024
0605	Victoria	36	3	1	4	NA	Low	Moderate		Confirm rating
0606	Victoria	36	1	2	3	NA	Low	Low	Visited in winter only	Confirm rating
0607	Victoria	36	3	2	5	Moderate	High	High	SPSO	Continue monitoring
0610	Victoria	35	3	2	5	Moderate	High	High		Continue monitoring

Table 1 2019 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Figure No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2017	2018	2019	Comments	Recommendations
0611	Victoria	35	3	2	5	High	High	High		Continue monitoring
0613	Victoria	35	3	2	5	High	High	High	Low flow	Continue monitoring and source investigations
0613A	Victoria	35	1	2	3	NA	NR	Low		Resample in 2024
0614	Victoria	35	3	2	5	Moderate	Moderate	High		Continue monitoring
0617B	Victoria	35	1	2	3	NA	Low	Low	Dry; private discharge	Resample in 2024
0618	Victoria	35	1	2	3	Moderate	Moderate	Low		Continue monitoring
0619	Victoria	34	3	2	5	High	High	High	Sewer odour	Sewer cross-connection
0620	Victoria	34	3	1	4	Moderate	Moderate	Moderate	Perfume odour	Continue monitoring
0622	Victoria	34	1	2	3	High	Moderate	Moderate	Near kayak launch; elevated during rainfall	Confirm rating
0623	Victoria	34	3	1	4	Moderate	Moderate	Moderate	Low flow	Continue monitoring
0626	Victoria	34	3	1	4	NR	Moderate	Moderate	Need permission to access; 5 in 30 sampling; high flow	Continue monitoring
0627	Victoria	34	3	1	4	NR	Moderate	Moderate	Need permission to access; 5 in /30 sampling; high flow	Continue monitoring
0629	Victoria	26	3	1	4	Moderate	Moderate	Moderate	High counts; dark discharge; foul odours	Continue monitoring
0634	Victoria	26	3	1	4	Moderate	Moderate	Moderate	Low flow; dry in summer; hydrocarbon and compost odours	Source narrowed; continue monitoring
0636	Victoria	26	3	1	4	Moderate	Moderate	Moderate	High flow; high counts; earthy foul odours; white and coloured discharge	Continue monitoring
0641	Victoria	71	3	2	5	Moderate	High	High	Cecelia Creek; high flow; repaired main; SPSO	Continue monitoring and source investigations
0643	Victoria	27	1	2	3	Low	Moderate	Moderate	Low flow to dry	Confirm rating
0645	Victoria	27	3	2	5	Moderate	Moderate	Moderate	Dry in summer	Continue monitoring
0645A	Victoria private	27	3	2	5	High	Moderate	Moderate	Difficult access; private discharge	Continue monitoring
0646	Victoria	27	2	2	4	NA	NR	Moderate	Dry in summer	
0647	Victoria	27	2	2	4	NA	Low	Moderate	Dry in summer	Confirm rating
0649	Victoria private	27	2	2	4	High	High	High	Gorge Road Hospital; private discharge	Continue monitoring
0650	Victoria	27	3	2	5	Moderate	High	High	Low flow in summer	Continue monitoring
0757	Victoria	27	1	2	3	Moderate	Moderate	Low	Low flow; dry in summer	Confirm rating
0758A	Victoria	27	1	2	3	High	Moderate	Moderate	Low flow in summer	Confirm rating
0759	Victoria	26	2	2	4	Low	Moderate	Moderate		Confirm rating
0768	Victoria	25	2	2	4	Moderate	Moderate	Moderate	SPSO; sewer odour	Continue monitoring
0769	Victoria	25	2	2	4	Moderate	High	Moderate	SPSO?	Continue monitoring
0772	Victoria	25	1	2	3	NA	NR	Low		
0775	Victoria	24	2	2	4	Moderate	Moderate	Moderate	SPSO	Continue monitoring

Table 1 2019 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Figure No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2017	2018	2019	Comments	Recommendations
0777A	Victoria	24	3	2	5	High	High	High		Continue monitoring
0694	View Royal/MOT	32	1	2	3	NA	NA	Low		Resample in 2024
0695	View Royal/MOT	32	1	2	3	Low	Moderate	Low	Garden waste in discharge	Confirm rating
0697	View Royal	31	2	2	4	Low	Moderate	Moderate	Hospital Creek; SPSO	Continue monitoring
0698	View Royal	31	1	2	3	NA	Low	Low		Confirm rating
0700	View Royal	31	2	2	4	NA	Low	Low		Resample in 2024
0702	View Royal	31	1	2	3	NA	Low	Low	Dry	Resample in 2024
0703	View Royal	31	3	2	5	Moderate	Low	Moderate	One spike; muddy; grey discharge	Confirm rating
0709B	View Royal	31	2	2	4	Low	Moderate	Moderate	Craigflower Creek SPSO	Continue monitoring creek
0710	View Royal	31	2	2	4	NA	Moderate	Moderate		Continue monitoring
0710W	View Royal	31	2	2	4	NA	NA	Moderate		Confirm rating
0711A	View Royal	31	1	2	3	NA	Low	Low		Resample in 2024
0712	View Royal	30	3	2	5	Moderate	Low	High		Confirm rating
0713	View Royal	30	1	2	3	NA	Low	Low		Resample in 2024
0722	View Royal	30	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0865G	View Royal	17	3	1	4	Low	Moderate	Moderate	high counts	Confirm rating; start investigations
0872	View Royal	16	2	2	4	Moderate	Moderate	Moderate	SPSO; low flows	Continue monitoring
0885	View Royal	13	1	2	3	NA	Low	Low		Resample in 2024
0886	View Royal	14	1	2	3	Low	Low	Low	Millstream Creek; 5 in 30 SPSO	Continue monitoring creek
0865AB	Sonhees F.N	17	1	2	3	Moderate	Moderate	Low	New discharge; no flow	Continue monitoring; get wet season sample
0865B	Sonhees F.N	17	1	2	3	Low	Low	Low	No flow	Continue monitoring; get wet season sample
0865C	Sonhees F.N	17	1	2	3	Moderate	Low	Low	Low flow	Continue monitoring; get wet season sample
0865D	Esquimalt F.N.	17	2	2	4	Moderate	Low	Moderate	Iron bacteria present; odour	Continue monitoring
0865F	Esquimalt F.N.	17	2	2	4	Low	Moderate	Moderate		Confirm rating

Notes:
Level of Concern determined by sum of the bacterial and shoreline ratings. Low = sums of 2 and 3, moderate= sum of 4 and high = sums of 5 and 6.
EC = Escherichia coli (E. coli) counts
NR = Not rated due to insufficient data or sample could not be obtained.
NA = Not assessed this year
SPSO = This discharge acts as a sewage pump station overflow
Private discharges are not part of the municipal system

APPENDIX C

CORE AREA STORMWATER DISCHARGE BACTERIAL DATA (2018-2020)

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0209	Foot of San Jose, west of Holland Pt.	2018-02-06	60	110000	No odour, clear
		2018-07-26	1	40000	No odour, slightly murky
		2019-03-12	28	520000	No odour, clear
		2019-07-04	2	29000	Unpleasant odour, clear
SW0210	Foot of Lewis, west of Holland Pt.	2018-02-06	24	570	No odour, clear
		2018-07-25	30	540	No odour, clear
		2019-03-12	44	130000	No odour, clear
		2019-06-17	150	400	No odour, turbid from construction
		2019-07-04	500	740	No odour, clear
SW0212	Foot of Cook Street by circular stairs	2018-02-06	86	70	No odour, clear
		2018-07-25	< 1	210	No odour, clear
		2019-01-07	40	-	No odour, clear, enterococci: 4 CFU/100 mL
		2019-06-17	300	5200	Organic odour, algal green
SW0214	Clover Point	2018-02-06	110	29000	No odour, clear
		2018-07-26	80	990	No odour, clear
		2019-03-12	-	-	Could not sample, due to construction
SW0216	Foot of Eberts, Ross Bay	2018-02-06	< 250	20000	No odour, clear
		2018-07-25	> 100	7400	No odour, murky brown
		2019-06-14	88	40000	No odour, clear
		2019-02-21	60	5900	No odour, clear
SW0218	Foot of Memorial Crescent, eastern pipe, Ross Bay	2018-02-06	46	30	No odour, clear
		2018-07-25	10	5100	No odour, clear
		2019-02-21	12	100	No odour, clear
		2019-06-14	28	510	No odour, clear
SW0222	Middle of Ross Bay Cemetery, Ross Bay	2018-01-17	> 250	2600	Chemical odour, slightly murky
		2018-07-25	140	51000	Slight chemical odour, murky
		2019-02-07	> 200	39000	No odour, murky
		2019-06-14	> 250	220000	Sewer odour, slightly murky
SW0227	Foot of Wildwood Crescent	2018-02-13	6	20	No odour, clear
		2018-07-25	< 1	-	Flow too low to sample
		2019-01-07	12	-	No odour, clear; recent sewage bypass; enterococci: 17 CFU/100 mL
		2019-02-20	36	270	No odour, clear
		2019-06-17	1	320	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0229	Foot of Ross Street, Gonzales Bay	2018-02-13	10	4300	No odour, clear
		2018-07-25	2	8300	No odour, clear
		2019-02-20	6	60	No odour, clear
		2019-06-17	-	-	Dry, not sampled
SW0230	Foot of Foul Bay Road, Gonzales Bay	2018-02-13	12	670	No odour, clear
		2018-07-25	10	3500	Strange odour, clear
		2019-02-20	33	2000	No odour, clear
		2019-06-17	0	-	Dry, not sampled
SW0231	Foot of Marne Street, Gonzales Bay	2018-03-06	15	10	Slight sewage odour, clear
		2018-07-25	15	3200	No odour, clear
		2019-03-11	3	10	No odour, clear
		2019-06-17	5	650	No odour, clear
SW0244	Across from 242 Beach Drive, McNeill Bay	2018-02-14	8	320	No odour, clear
		2018-07-25	5	2800	No odour, clear
		2019-02-20	45	150	No odour, clear
		2019-07-04	8	90	No odour, clear
SW0245	Foot of Monterey Avenue, McNeill Bay	2018-02-05	-	3500	After sewer overflow
		2018-02-14	48	540	No odour, clear
		2018-07-25	240	140	No odour, clear
		2018-11-05	-	590	No odour, clear
		2019-02-20	80	240	No odour, clear
		2019-07-04	35	2000	No odour, clear
SW0249	Foot of Oliver, McNeill Bay	2018-02-05	-	18	After sewer overflow
		2018-07-25	< 1	-	Flow too low to sample
		2018-11-05	-	3000	No odour, clear
		2019-02-20	2	40	No odour, clear
		2019-07-04	2	6000	No odour, amber
SW0250	Foot of St. Patrick, McNeill Bay; outfall	2018-02-14	null	1800	Manhole, pooled; no odour, clear
		2018-07-25	0	23000	Strong unpleasant odour, clear, standing water
		2019-02-20	2	2300	Manhole flooded; no odour, clear
		2019-07-04	null	2800	Manhole; musty odour, clear, no flow estimated
		2019-07-04	10	2800	EOP; musty/sulphur odour, clear
SW0258	Western boundary of Royal Victoria Golf Course	2018-02-14	< 1	10	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0306	South side of Oak Bay Marina	2018-02-14	< 0.1	-	Flow too low to sample
		2018-07-26	40	2000	No odour, clear
		2019-03-11	0	-	Dry, not sampled
		2019-07-04	40	13000	No odour, clear
SW0307	Oak Bay Marina	2018-02-14	2	6700	No odour, clear
		2018-07-25	4	110	No odour, clear
		2019-02-22	12	880	No odour, clear
		2019-07-04	2	4200	No odour, clear, water warm
SW0308A	Foot of Windsor and Goodwin under ramp	2018-02-14	1	20	No odour, clear
		2018-07-25	< 1	-	Flow too low to sample
		2019-03-11	< 1	250	No odour, clear
		2019-07-04	3	170	No odour, clear
SW0309	Upper pipe at the end of Windsor Road	2018-07-25	1	10	No odour, clear
		2018-07-26	1	40	No odour, clear
		2019-07-04	6	200	No odour, clear
SW0310	Lower pipe at the end of Windsor Road	2018-02-14	10	5600	No odour, clear
		2018-07-25	25	190	No odour, clear
		2019-03-11	10	43000	No odour, clear
		2019-07-04	20	3700	No odour, clear
SW0310A	Foot of stairs in seawall; north of Windsor Road	2018-02-14	2	70	No odour, clear
		2018-07-25	2	20	No odour, clear
		2019-03-11	< 1	40	No odour, clear
		2019-07-04	2	7300	No odour, clear
SW0312	Across from 1440 Beach Drive	2018-07-25	28	220	No odour, yellow
SW0316	South of Somass Drive above tidal influence	2018-02-15	> 500	490	No odour, murky
		2018-07-23	150	700	No odour, clear
		2019-03-11	> 500	460	No odour, clear
		2019-07-16	500	530	No odour, clear
		2019-08-15	975	790	No odour, clear, construction upstream
		2019-08-22	975	5000	No odour, clear, construction upstream
		2019-08-29	975	1400	No odour, clear, construction upstream
		2019-09-05	975	1200	No odour, clear, construction upstream
		2019-09-12	975	1300	No odour, clear, construction upstream
		2019-10-07	-	9800	No odour, murky , flow not estimated
		2019-10-16	1500	5600	Sewer odour, clear
		2019-10-21	> 3000	1200	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
		2019-10-31	2000	250	No odour, clear
		2019-11-07	2000	1700	No odour, clear
		2020-01-31	> 2000	600	Slight sewer odour, amber/brown
SW0316-5D	Bowker Creek, forest east of Gordon Head Road	2019-11-29	60	20	No odour, clear
SW0317	End of Bowker Lane	2018-02-15	6	< 10	No odour, clear
		2018-07-23	0	-	Dry, not sampled
		2019-02-22	8	< 10	Slight sewer odour, clear
		2019-07-04	4	20	No odour, clear
SW0318	End of Bowker Avenue	2018-02-15	60	2400	No odour, clear
		2018-07-23	100	32000	Strong sewage odour, clear
		2018-07-30	-	1000	No odour, clear
		2019-02-22	> 200	5600	No odour, slightly murky
		2019-07-04	> 500	330	No odour, clear
SW0319	End of Cavendish Avenue	2018-02-15	3	20	No odour, clear
		2018-07-23	> 1	-	Flow too low to sample
		2019-03-12	2	50	No odour, clear
		2019-07-04	> 0.1	-	Flow too low to sample
SW0320	End of Dalhousie Street	2018-01-17	12	590	No odour, clear
		2018-01-17	12	700	No odour, clear
		2018-07-23	20	1600	No odour, clear
		2018-07-30	-	3700	No odour, clear
		2018-10-22	80	-	No odour, clear
		2019-02-22	40	2100	No odour, clear
		2019-06-06	4	3100	No odour, clear
		2019-06-11	200	2500	No odour, clear
		2019-07-05	45	660	No odour, clear
		2019-12-03	25	8	No odour, clear
SW0321	End of Estevan Avenue	2018-02-15	8	20	No odour, clear
		2018-07-23	< 2	-	Flow too low to sample
		2019-02-22	18	220	No odour, clear
		2019-07-05	20	510	No odour, clear
SW0321A	Foot of Estevan near stairs; buried in sand	2018-02-15	12	90	No odour, clear
		2018-07-23	13	10	No odour, clear
		2019-02-22	20	600	No odour, clear
		2019-07-05	17	370	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0322	End of Thorpe Place beach access	2018-02-15	24	100	No odour, clear
		2018-07-23	50	260	No odour, clear
		2018-07-30	-	420	No odour, clear
		2019-02-22	40	500	No odour, clear
		2019-07-05	80	1200	No odour, clear
SW0323	North end of Esplanade	2018-02-15	86	< 10	No odour, clear
		2018-07-23	50	480	No odour, clear
		2018-07-30	-	70	No odour, clear
		2018-10-19	70	-	No odour, clear
		2019-02-22	200	300	Musty odour, slightly yellow
		2019-06-06	8	560	No odour, clear
		2019-07-05	200	90	No odour, clear
		2019-12-03	> 400	120	No odour, clear
SW0324	Cattle Point	2018-01-15	10	-	After sewer overflow
		2018-02-05	12	10	After sewer overflow
		2019-03-11	6	30	No odour, slight amber
		2019-04-16	7	50	No odour, clear
		2019-05-27	< 0.1	290	No odour, clear
		2019-07-05	< 0.1	-	Flow too low to sample
SW0327	Centre of Cadboro Bay	2018-01-18	8	< 10	No odour, clear
		2018-01-18	8	< 10	No odour, clear
		2018-07-23	25	40	No odour, clear
		2019-03-06	3	< 10	No odour, clear
		2019-05-27	8	40	No odour, clear
		2019-05-29	8	50	No odour, clear
		2019-07-05	25	80	No odour, clear
SW0327A	Foot of Hibbens Close	2018-01-18	5	230	No odour, clear
		2018-07-23	0	-	Dry, not sampled
		2019-03-06	0	-	Dry, not sampled
		2019-07-05	0	-	Dry, not sampled
SW0501	2730 Hibbens Close, Cadboro Bay	2018-01-18	90	10	No odour, clear
		2018-02-05	100	120	After sewer overflow
		2018-07-23	250	34000	No odour, clear
		2018-07-27	120	870	No odour, clear
		2018-08-08	100	990	No odour, clear
		2018-11-05	-	10	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
		2019-03-06	80	10	No odour, clear
		2019-05-07	-	-	No odour, clear
		2019-05-27	120	10	No odour, clear
		2019-05-29	68	< 10	No odour, clear
		2019-07-05	40	10	No odour, clear
SW0503	Hobbs Creek drains duck pond; Cadboro Bay	2018-01-15	100	-	After sewer overflow
		2018-01-18	> 120	290	No odour, clear
		2018-01-18	> 120	310	No odour, clear
		2018-02-05	120	30	After sewer overflow
		2018-07-23	300	530	No odour, clear
		2018-07-27	140	600	No odour, clear
		2018-08-08	110	470	No odour, clear
		2018-11-05	-	1300	No odour, clear
		2019-02-07	100	430	No odour, clear
		2019-02-07	100	400	No odour, clear
		2019-03-06	80	580	No odour, clear
		2019-05-07	-	-	No odour, clear
		2019-05-27	100	1000	No odour, clear, Canada geese in water
		2019-05-29	80	2400	No odour, clear
		2019-07-05	80	1000	No odour, clear
		2019-10-28	130	2800	No odour, murky brown
SW0505	Large diffuser; Gyro Park, Cadboro Bay	2018-02-05	120	30	After sewer overflow
		2018-07-24	80	10	No odour, clear
		2018-07-27	100	70	No odour, clear
		2018-08-08	80	30	No odour, clear
		2019-03-06	80	10	No odour, clear
		2019-05-27	88	40	No odour, clear
		2019-05-29	80	< 10	No odour, clear
		2019-07-05	300	300	No odour, clear
SW0506	30 m west of beach access at Telegraph Bay Road	2018-01-18	50	30	No odour, clear
		2018-07-24	20	40	No odour, clear
		2018-11-05	-	90	No odour, clear
		2019-03-06	60	< 10	No odour, clear
		2019-07-16	15	49000	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0507	2 m south of 508; foot of Telegraph Bay Road	2018-01-18	1	< 10	No odour, clear
		2018-07-24	0	-	Dry, not sampled
		2019-03-06	2	190	No odour, turbid
		2019-07-16	< 0.1	-	Flow too low to sample
SW0508	Diffuser at Telegraph Bay Road, Cadboro Bay	2018-01-15	60	-	After sewer overflow
		2018-01-18	80	70	No odour, clear
		2018-02-05	80	24	After sewer overflow
		2018-07-24	0	120	No odour, clear, standing water
		2018-07-27	0	-	Dry, not sampled
		2018-08-08	0	-	Dry, not sampled
		2018-11-05	-	140	No odour, clear
		2019-03-06	40	440	No odour, clear
		2019-05-27	40	< 10	No odour, clear
		2019-05-29	30	< 10	No odour, clear
		2019-07-16	10	40	No odour, clear
SW0511	Cadboro View Road beach access	2018-01-18	6	10	No odour, clear
		2018-01-18	6	10	No odour, clear
		2018-07-24	0	-	Dry, not sampled
		2019-03-06	0	-	Dry, not sampled
		2019-07-16	0	-	Dry, not sampled
SW0512	With discharge 513, 2825 Sea View Road	2019-03-06	22	10	No odour, clear
		2019-07-16	5	740	No odour, clear
SW0534	East of Cranford Place beach access	2019-03-11	7	20	No odour, clear
		2019-07-16	0	-	Dry, not sampled
SW0535	Edge of road; Guinivere Place beach access	2018-01-15	20	-	After sewer overflow
		2019-01-07	-	-	Enterococci 110 CFU/100 mL; no odour, clear
		2019-03-11	8	20	No odour, slight amber
		2019-07-16	0	-	Dry, not sampled
SW0538A	7.5 m east of 538; Queen Alexandra Hospital	2018-01-15	32	-	After sewer overflow; enterococci was 10 CFU/100 mL
		2019-01-07	-	-	No odour, clear; enterococci was 16 CFU/100 mL
SW0541	Near fence at 4031 Holydene Place, Arbutus Cove	2018-03-06	20	-	Slight sewage odour, clear
		2018-07-24	10	2100	No odour, clear
		2019-03-06	8	3900	No odour, clear
		2019-07-16	8	890	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0542	2296 Arbutus Cove Lane, Arbutus Cove	2018-03-06	0	-	Dry, not sample
		2018-07-24	< 0.1	-	Flow too low to sample
		2019-03-06	0	-	Dry, not sampled
		2019-07-16	< 0.1	-	Flow too low to sample
SW0542A	Between 2254 and 2270 Arbutus Road	2019-03-06	40	60	No odour, clear, new location
		2019-07-16	35	500	No odour, clear
SW0543	140 m south of stairs; Arbutus Cove Lane beach access	2018-03-06	30	< 10	No odour, clear
		2018-07-24	25	< 10	No odour, clear
		2019-03-06	8	< 10	No odour, clear
		2019-07-16	35	40	No odour, clear
SW0543A	Behind wood abutment, 2 m south of discharge 544	2018-03-06	15	20	No odour, clear
		2018-07-24	10	< 100	No odour, clear, lab detection limit raised
		2019-03-06	0	-	No flow observed
		2019-03-11	8	40	No odour, slight amber
		2019-07-16	< 0.1	-	Flow too low to sample
SW0544	55 m south of Arbutus Cove Lane stairs	2018-03-06	10	< 10	No odour, clear
		2018-07-24	< 0.1	-	Flow too low to sample
		2019-03-06	6	10	No odour, clear
		2019-07-16	< 0.1	-	Flow too low to sample
SW0545	Foot of stairs; Arbutus Cove Lane beach access	2018-03-06	15	20	No odour, clear
		2018-07-24	100	< 10	No odour, clear
		2019-03-06	40	10	No odour, clear
		2019-07-16	75	10	No odour, clear
SW0545A	South of fence; Arbutus Cove Lane beach access	2019-03-06	6	< 10	No odour, clear
		2019-07-16	7	110	No odour, clear
SW0558	180 m east of Mt. Douglas Beach access stairs	2018-02-06	22	< 10	No odour, clear
		2018-07-24	5	420	No odour, clear
		2019-03-11	9	20	No odour, clear
		2019-07-16	10	2800	No odour, clear, surge flow
SW0559	Mt. Doug Creek, Cordova Bay	2018-02-06	> 2000	380	No odour, clear
		2018-07-24	150	100	No odour, clear
		2019-03-11	> 400	90	No odour, clear
	Douglas Creek	2019-07-16	-	200	
	Mt. Doug Creek, Cordova Bay	2019-07-16	300	200	No odour, clear
		2020-02-18	> 500	35	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0565	29 m SE of 4755 Carloss Place beach access	2018-03-06	200	< 10	No odour, clear
		2018-07-24	60	110	No odour, clear
		2019-03-12	18	10	No odour, clear
		2019-07-18	30	440	No odour, clear
SW0567	South side of 4771 Timber Place	2018-03-06	120	2000	Strong laundry soap odour, sudsy
		2018-07-24	30	5900	No odour, clear
		2019-03-12	24	650	No odour, clear
		2019-07-18	40	3300	No odour, clear
SW0570	Beach access at 4751 Deloume Lane	2018-03-06	< 0.1	-	Flow too low to sample
SW0574	4915 Cordova Bay Road	2018-02-06	100	50	No odour, clear
		2018-07-26	200	110	No odour, clear
		2019-03-12	86	80	No odour, clear
		2019-07-18	-	180	Laundry soap odour, clear, flow not estimated
SW0576A	South of beach access; 4989 Cordova Bay Road	2018-02-06	80	1000	No odour, clear
		2018-07-26	180	250	Strong disinfectant odour, clear
		2019-03-12	60	< 10	No odour, clear
		2019-07-18	60	200	No odour, clear
SW0578	60 m south of beach access; 5091 Cordova Bay Road	2018-02-06	160	150	No odour, clear
		2018-07-26	800	60	No odour, clear
		2019-03-12	> 500	20	No odour, clear
		2019-07-18	> 600	40	No odour, clear
SW0580	20 m south of park on Agate Lane	2018-02-06	22	90	No odour, clear
		2018-07-26	100	510	No odour, clear
		2019-03-13	6	40	No odour, clear
		2019-07-18	250	1500	No odour, clear
SW0581	5179 Agate Lane	2018-02-06	60	40	No odour, clear
		2018-07-26	60	480	No odour, clear
		2019-03-13	22	20	No odour, clear
		2019-07-18	11	850	No odour, clear
SW0582	Bottom of access stairs; foot of Walema Road	2018-02-06	18	< 10	No odour, clear
SW0589	South of Parker Park beach access, Burnham Brook	2018-02-13	> 350	30	No odour, clear
		2018-07-26	150	150	No odour, clear
		2019-03-13	> 250	10	No odour, clear
		2019-07-18	150	50	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0592	North side of 5575 Parker Road, Noble Creek	2018-02-06	> 1000	< 10	No odour, amber
		2018-07-26	-	230	No odour, clear
		2019-03-13	> 500	380	No odour, murky
	Noble Creek	2019-07-18	-	580	
	North side of 5575 Parker Road, Noble Creek	2019-07-18	300	580	No odour, amber
		2020-02-18	> 500	< 10	No odour, amber
SW0603	20 m south of James Bay Anglers	2018-03-07	10	32000	No odour, clear
		2018-08-09	20	940000	Sewer odour, clear
		2019-04-23	6	2000000	No odour, clear
		2019-06-17	5	100000	No odour, clear, geese activity
SW0604	South corner of Canadian Coast Guard lot	2018-03-07	15	23000	No odour, clear
		2018-04-17	30	10000	Sewer odour, clear
		2018-08-09	50	680	Laundry odour, clear
		2019-04-23	8	10	No odour, clear
		2019-06-18	20	230	No odour, clear
SW0604A	Huron Street Coast Guard base, between docks & wharf	2018-03-07	0	-	Dry, not sampled
		2018-08-09	0	-	Dry, not sampled
		2019-04-23	< 1	-	Flow too low to sample
		2019-06-19	0	-	Dry, not sampled
SW0605	5 m west of fire hydrant at Canadian Coast Guard	2018-03-07	1	< 10	No odour, clear
		2018-08-09	0	-	Dry, not sampled
		2019-04-23	< 1	-	Flow too low to sample
		2019-06-18	5	730000	No odour, clear
		2019-07-04	3	290	No odour, clear
SW0606	West of jetty at HMCS Malahat Naval Reserve	2018-03-08	0	-	Dry, not sampled
		2019-06-19	0	-	Dry, not sampled
SW0607	East of Fisherman's Wharf, north west pipe	2018-03-07	200	700	No odour, clear
		2018-08-09	300	17000	Sewer odour, clear
		2019-04-23	10	80000	No odour, slight amber
		2019-06-17	100	71000	No odour, clear
SW0607A	East of Fisherman's Wharf, south east pipe	2018-03-07	20	30	No odour, clear
		2018-08-09	200	< 10	No odour, clear
		2019-04-23	13	120	No odour, clear
		2019-06-17	80	340	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0610	Foot of Oswego Street	2018-02-06	30	470	No odour, clear
		2018-08-08	45	160000	Very foul odour, slightly brown
		2019-02-26	12	2200	No odour, clear
		2019-06-18	50	7600	Sewer odour, murky ; upstream investigation
SW0611	Foot of Menzies Street	2018-03-19	10	92000	No odour, clear
		2018-08-10	30	110000	Strong barnyard odour, potential manure
		2019-02-26	11	32000	No odour, clear, no horses upstream
		2019-06-17	10	2700000	Sewer odour, amber
		2019-07-04	5	2100000	Manure odour, murky , sampled at EOP
SW0613A	Below ornamental tree 5 at Government & Bellville	2018-08-10	200	30	No odour, black silty
		2019-06-17	50	60	No odour, clear
SW0613		2018-03-19	36	11000	no odour, murky discharge
		2018-08-08	26	640	no odour, slightly murky
		2018-08-10	100	9400	no odour, discharge clear
		2018-08-14	24	250	no odour, slightly murky
		2018-09-07	250	22000	no odour, murky discharge
		2018-09-10	60	1800	no odour, clear
		2018-10-25	80	1000	slight chemical odour, black
		2018-10-30	80	620	Chemical odour, turbid black
		2018-11-07	70	200	Chemical/earth odour, turbid dark grey
		2018-11-13	160	320	No odour, clear
		2018-11-22	100	350	No odour, slight grey
		2019-04-23	24	760	No odour, clear
		2019-06-17	70	51000	No odour, clear
SW0614	Humboldt/Wharf & Government	2018-03-20	60	830000	No odour, clear
		2018-08-23	80	10000	Musty, murky
		2018-08-10	50	8700	No odour, clear
		2018-08-14	80	20000	Musty, slightly murky
		2018-09-07	120	6000	Sewer odour, murky
		2018-09-10	80	310000	No odour, clear
		2018-10-25	120	860	Musty, clear
		2018-10-30	320	17000	Musty, amber, surge flow
		2018-11-07	> 200	760	Musty, sewer odour, clear
		2018-11-14	> 1000	2000	Strong sewer odour, amber

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
		2018-11-22	400	590	Sewer odour, murky amber discharge
		2019-04-23	60	77000	Sewer odour, slightly murky
		2019-06-17	20	45000	Musty odour, murky
SW0617B	North of passenger ramp at Air BC terminal	2018-04-12	0	-	Dry, not sampled
		2018-08-08	0	-	Dry, not sampled
		2019-04-24	0	-	Dry, not sampled
		2019-06-19	0	-	Dry, not sampled
SW0618	Foot of Fort Street	2018-04-17	10	8800	No odour, slight murky
		2018-08-09	30	370	Strong odour, clear
		2019-04-24	7	270	No odour, clear
		2019-06-18	15	120	Laundry soap odour, sudsy , surge flow
		2019-06-18	2	200	No odour, clear
SW0619	South side of Johnson Street bridge	2018-03-19	14	7700	No odour, murky
		2018-08-10	100	> 2800000	Sewage odour, potential toilet paper
		2019-02-26	43	8400	No odour, clear
		2019-05-10	> 250	20000	No odour, murky
		2019-06-18	10	150000	No odour, clear
SW0619A	North side of Johnson Street bridge 619A	2018-08-10	150	50	Foul odour, clear
		2019-06-18	3	20	No odour, clear
SW0622	End of Swift Street	2018-03-07	< 1	-	Flow too low to sample
		2018-05-18	2	600	No odour, clear
		2018-06-15	1	790	No odour, clear
		2018-08-09	5	4700	No odour, grey
		2019-04-23	< 1	150	No odour, clear
		2019-06-18	-	90	No odour, amber
SW0623	End of Chatham Street	2018-03-07	< 1	-	Flow too low to sample
		2018-08-08	8	5900	No odour, clear
		2019-04-23	7	740000	No odour, clear
		2019-06-18	2	1500	No odour, clear
SW0626	Behind 2122 Government Street, Rock Bay	2018-04-18	200	1000	Sewage odour, clear
		2018-08-09	200	2700	Sewage odour, clear
		2018-10-25	250	2900	No odour, murky brown
		2018-10-30	> 500	3200	No odour, murky brown
		2018-11-07	360	580	No odour, clear
		2018-11-14	1000	1500	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
		2018-11-22	> 400	300	Sewage odour, amber
		2019-04-23	48	600	No odour, clear
		2019-06-18	300	8600	Foul odour, sudsy grey
SW0627	South side of Ocean Cement, Rock Bay	2018-04-18	300	130000	Sewer odour, cloudy
		2018-08-09	500	2200	Sewer odour, white with plume into ocean
		2018-08-14	400	22000	Foul odour, clear
		2018-08-23	250	200000	No odour, clear
		2018-09-07	400	14000	No odour, clear
		2018-09-07	400	20000	No odour, clear
		2018-09-10	800	36000	No odour, slightly dirty
		2018-10-25	> 500	5600	Organic odour, murky brown
		2018-10-30	> 800	4200	Sewer odour, murky brown (with solids)
		2018-11-07	500	5800	No odour, clear
		2018-11-07	500	6700	No odour, clear
		2018-11-14	> 1200	9900	No odour, slight murky amber
		2018-11-22	> 450	7100	No odour, slight amber
		2019-04-23	72	100000	No odour, clear
		2019-06-18	500	33000	No odour, clear
SW0629	East of Bridge Street, Rock Bay	2019-04-23	12	880	No odour, clear
		2019-06-18	70	67000	Foul odour, clear
SW0634	End of David Street, below Budget Steel	2019-04-23	4	20000	Foul odour, murky
		2019-06-18	2	2300000	Foul odour, murky
SW0636	South side of City of Victoria municipal yard, South Bay	2018-08-10	-	32000	Foul odour, murky
		2018-08-14	800	99000	Foul odour, slightly murky
		2018-08-14	800	94000	Foul odour, slightly murky
		2018-08-23	300	850000	Sewer odour, murky
		2018-09-07	400	70000	Foul odour, murky with floating debris
		2018-09-10	-	180000	Foul odour, grey murky
		2018-10-25	> 250	150000	Muddy odour, murky brown
		2018-10-25	> 250	130000	Muddy odour, murky brown
		2018-10-29	> 300	4400	Earthy odour, murky amber/white
		2018-11-07	> 300	73000	No odour, murky grey with suds
		2018-11-13	> 1200	2800	Earthy odour, murky amber/brown
		2018-11-22	350	9700	No odour, murky
		2019-04-23	88	5200	No odour, murky white
		2019-06-18	350	180000	Foul odour, turbid

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0636-1A	MH#D3043 west side of Bridge & David Street	2019-12-04	12	26000	Vinegar/diesel odour, white murky with oily sheen
SW0636-3A	MH#D4784 middle of BC Transit Yard; Garbally Road	2019-12-04	> 160	26000	Chemical/creosote odour, with turbid brown
SW0641	Cecelia Creek	2018-02-14	> 350	2200	No odour, murky
		2018-08-15	700	32000	No odour, clear
		2018-08-22	700	6700	No odour, clear
		2018-08-29	> 800	3800	No odour, clear
		2018-09-05	850	9400	No odour, clear
		2018-09-12	1500	11000	No odour, slightly murky
		2018-10-09	> 1500	3600	No odour, clear
		2018-10-17	> 1300	3100	No odour, clear
		2018-10-24	> 1000	7700	No odour, clear
		2018-10-29	> 2000	3300	No odour, very murky
		2018-11-07	> 1000	10	No odour, clear
		2019-04-24	-	550	No odour, clear
		2019-04-24	> 350	550	No odour, clear
		2019-09-12	> 500	1000	No odour, clear
		2019-09-12	> 3000		Sewer odour, black with hydrocarbon slick, no bacteria sample collected
		2019-09-13	-	-	No odour, clear
		2019-09-13	> 1000	1000	Sewer odour, silty white plume , no field parameters measured
		2019-11-19	> 3000	310	No odour, clear
SW0643	Foot of Washington Avenue	2018-03-07	< 1	< 10	No odour, clear
		2019-04-24	< 1	210	No odour, clear
		2019-06-18	< 1	200	No odour, clear
SW0645	Carrol Street easement	2018-03-15	5	70	No odour, clear
		2019-02-26	8	930	No odour, clear
		2019-06-19	0	-	Dry, not sampled
SW0645A	Prince Charles Appts/Gorge Road	2018-03-15	10	6200	No odour, clear
		2019-02-26	1	720	No odour, clear
		2019-06-18	5	5200	Strong strange odour, clear
SW0645C	Chapman Pt. west of 105 & 135 Gorge Road	2018-04-04	160	70	No odour, clear
SW0646	20 m east of large concrete outfall	2018-04-04	50	560	No odour, clear
		2019-04-11	1	410	No odour, clear
		2019-06-19	< 0.1	-	Flow too low to sample

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0647	Gorge Road Hospital, across from boat docks	2018-04-04	0	-	Dry, not sampled
		2018-07-27	0	-	Dry, not sampled
		2019-04-11	< 1	830	No odour, clear
		2019-06-19	0	-	Dry, not sampled
SW0649	Head of scoured channel, Gorge Road Hospital	2018-04-04	400	5000	No odour, dirty
		2019-02-26	5	5800	No odour, clear
		2019-04-11	8	1900	No odour, murky
		2019-06-19	3	4400	Foul odour, sudsy grey
SW0650	East of "Outfall" and "Pipeline" signs; Harriet Road	2018-03-15	10	7700	No odour, clear
		2019-02-26	8	20000	No odour, clear
		2019-06-19	< 1	-	Flow too low to sample
SW0652A	In retaining wall, east side of 71 Gorge Road West	2018-04-18	3	< 10	No odour, clear
SW0652B		2018-04-18	5	< 10	No odour, clear
SW0653	Below tennis courts at Cedar Shore Appts	2018-04-04	150	2100	Sewer and asphalt odour, clear
		2018-04-18	900	230	Sewer odour, dirty
		2019-04-11	18	910	No odour, slightly murky
		2019-06-19	25	1400	Foul odour, clear
SW0654	6 m north of tennis courts at Cedar Shore Appts	2018-04-04	75	370	No odour, dirty
		2018-04-18	10	< 10	No odour, clear
		2018-04-18	200	10	Chlorine odour, clear, surge flow
		2019-04-11	6	120	No odour, clear
		2019-06-19	3	180	No odour, clear
SW0655	In small cove in Gorge Park, east of Gorge bridge	2018-04-04	200	1100	Sewage odour, dirty
		2019-04-12	8	110	No odour, clear
		2019-06-19	0	-	Dry, not sampled
SW0658A	Directly below 384 Gorge Road	2018-04-04	80	370	Asphalt odour, dirty
		2019-04-11	5	980	No odour, slightly murky
		2019-07-03	6	37000	No odour, clear (evidence of otter activity nearby)
SW0659	Foot of Gorge View Drive	2018-04-04	160	170	No odour, dirty/foamy
		2019-04-11	1	220	No odour, clear
		2019-07-03	3	340	No odour, clear
SW0671	Foot of Austin Avenue, 5 m west of last white pole	2018-03-14	15	410	No odour, clear
		2019-04-11	6	5200	No odour, clear
		2019-07-03	4	420	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0673	Between Wyndeatt & Adelaide	2018-03-14	< 0.1	-	Flow too low to sample
		2019-04-11	< 0.1	-	Flow too low to sample
		2019-07-03	0	-	Dry, not sampled
SW0676	Across from 820 Gorge Road	2018-03-14	5	< 10	No odour, clear
		2019-04-11	8	60	No odour, clear
		2019-07-03	2	540	No odour, clear
SW0690D	Under 3rd bridge to east, Colquitz River	2018-08-03	null	200	No odour, clear
		2018-08-14	null	50	No odour, clear
		2018-10-07			No odour, clear, very high flow with distressed Coho salmon
		2018-10-26	null	2000	No odour, clear
		2018-10-28	null	600	No odour, clear
		2019-05-07	> 500	140	
		2019-05-07	> 1000	140	No odour, slight amber
		2019-07-10	> 500	680	
		2019-07-10	> 2000	680	No odour, clear
		2019-11-19	> 10000	390	No odour, clear
SW0690D-11	Mohan Brook (Colquitz River watershed)	2019-12-06	60	900	No odour, clear
SW0690E	Garry Road; Cuthbert Holmes Park, parking lot	2018-03-14	100	< 10	No odour, clear
		2019-05-07	40	2000	No odour, clear
		2019-07-19	60	330	No odour, clear
		2019-12-04	24	< 1	No odour, clear
SW0691A	Wilkinson Road right-of-way, 1173A & B Portage Road	2019-05-07	5	< 10	No odour, slight amber
		2019-07-19	< 0.1	-	Flow too low to sample
SW0692	End of Portage Road	2018-03-14	50	< 10	No odour, clear
		2018-08-13	6	590	No odour, clear
		2019-05-07	4	40	No odour, clear
		2019-07-19	8	60	No odour, clear
		2019-12-04	8	7	No odour, clear, evidence of otter den
SW0694	Between Portage and Giles, below MH in walkway	2019-05-07	0	-	Dry, not sampled
		2019-09-16	0	-	Dry, not sampled
SW0695	End of St. Giles Street	2018-04-05	200	270	No odour, clear
		2018-08-01	-	70	Strong sewer odour, silty
		2019-05-07	6	40	No odour, clear
		2019-08-16	5	54	Potential garden waste
SW0697	Hospital Creek	2019-05-07	null	40	No odour, clear
	Beside 152 St. Giles Street, Hospital Creek	2019-08-16	null	550	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0698	End of Stillwater Road	2018-03-14	4	60	No odour, clear
		2019-05-07	< 1	50	No odour, clear
		2019-09-12	50	240	No odour, clear
SW0700	Between 75 and 77 Kingham Place	2018-03-14	2	10	No odour, clear
		2019-05-07	< 0.1	-	Dry, not sampled
		2019-09-12	20	340	No odour, dirty
SW0702	Southeast corner of Helmcken Park	2019-05-07	0	-	Dry, not sampled
		2019-09-12	< 0.1	-	Flow too low to sample
SW0703	Tidewater Road easement; SE corner Helmcken Park	2018-03-14	< 0.1	-	Flow too low to sample
		2019-05-07	< 1	40	No odour, clear
		2019-09-12	60	22000	No odour, muddy
		2019-09-17	10	810	No odour, grey
SW0709B	Craigflower Creek B, under Helmcken Road Bridge	2018-03-14	> 2000	10	No odour, clear
		2018-08-28	400	310	No odour, clear
		2019-05-07	400	80	No odour, clear
		2019-08-22	400	550	No odour, clear
SW0710	15 m south of Helmcken Road Bridge	2018-03-14	30	4400	No odour, sudsy
		2018-03-23	5	130	No odour, clear
		2019-03-13	12	10	No odour, clear
		2019-09-12	> 1000	700	No odour, very dirty with suds, potential first flush conditions
SW0710W	5 m downstream of Craigflower Creek footbridge	2019-03-13	10	30	No odour, clear
		2019-09-12	> 1300	600	No odour, dark brown , potential first flush conditions
SW0711A	South side of 45 Caton Place	2018-03-14	10	< 10	No odour, clear
		2018-08-01	8	40	No odour, clear
		2019-03-13	3	10	No odour, clear
		2019-09-12	70	160	No odour, clear
SW0712	Immediately west of 712A to east of E&N railway	2018-03-14	25	30	No odour, clear
		2018-08-02	35	100	No odour, clear
		2019-03-13	54	90	No odour, clear
		2019-09-12	1200	21000	No odour, black
		2019-09-17	300	1900	Sewer odour, grey
SW0713	Between Shoreline Drive and E&N railway	2018-03-14	10	< 10	No odour, clear
		2018-08-02	5	120	No odour, clear
		2019-04-24	3	< 10	No odour, clear
		2019-09-12	3	50	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0722	Under centre of Craigflower Bridge, PVC pipe	2018-02-16	18	60	No odour, clear
		2018-08-02	10	540	No odour, clear
		2019-03-13	18	360	No odour, clear
		2019-07-05	8	2200	No odour, clear
		2019-12-04	10	300	No odour, clear
SW0722AA	SW corner of Craigflower Bridge rip rap	2018-02-16	10	10	No odour, clear
		2018-08-02	10	230	Slight sewer/musty odour, clear
		2019-03-13	13	100	No odour, clear
		2019-07-05	10	360	No odour, clear
SW0726	S corner of motel at Craigflower and Admirals	2018-03-20	30	50	No odour, clear
		2018-08-02	80	680	No odour, clear
		2019-03-13	24	60	No odour, clear
		2019-07-03	30	380	No odour, clear
SW0727	2 m to west of path at foot of Aral Road	2018-04-04	10	140	No odour, clear
		2018-05-01	10	50	No odour, clear
		2018-06-05	-	740	No odour, clear
		2018-08-02	3	50	Very foul odour, clear
		2019-03-13	10	30	No odour, clear
		2019-07-03	10	4900	Unusual odour, clear
SW0731	West side of 1376 Treebank Road	2018-04-04	60	30	No odour, clear
		2019-03-20	1	< 10	No odour, clear
		2019-07-03	< 0.1	-	Flow too low to sample
SW0733	East side of 948 Rankin Road	2018-04-04	130	100	No odour, clear
		2019-03-20	1	< 10	No odour, clear
		2019-07-03	< 0.1	-	Flow too low to sample
SW0736A	#14-915 Glenvale, man-made stream	2018-03-20	32	60	No odour, murky , surge flow
		2018-08-02	5	370	No odour, clear
		2019-02-26	16	10	No odour, clear
		2019-07-03	8	1300	No odour, clear
SW0737	Foot of Garthland Road	2018-03-20	2	40	No odour, clear
		2019-02-26	6	40	No odour, clear
		2019-07-03	< 0.1	-	Flow too low to sample
SW0742	Foot of Sioux Place, upstream edge of pool dam	2018-03-20	9	160	No odour, clear
		2018-08-02	5	2900	No odour, clear
		2019-02-26	86	110	No odour, clear
		2019-06-20	30	2300	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0742B	Southwest of parking area at Kinsmen Gorge Park	2018-03-20	1	1400	No odour, clear
		2019-02-26	4	1600	No odour, clear
		2019-06-20	0	-	Dry, not sampled
SW0743A	Gorge-Esquamalt Park, north of nursery, south bank	2018-03-20	1	120	No odour, clear
		2018-08-09	0	-	Dry, not sampled
		2019-04-12	2	10000	No odour, clear
		2019-06-20	12	3800	Foul odour, slightly murky
SW0744	Gorge Creek; dual pipes under Craigflower Road	2018-02-15	100	2900	No odour, murky
		2018-08-02	200	8700	No odour, clear
		2019-03-20	180	780	No odour, clear
		2019-06-20	300	690	Foul odour, slightly amber
SW0744A	Gorge-Esquamalt Park, across from upper pond	2018-02-15	14	52000	No odour, murky
		2018-08-02	0	230	No odour, clear, pooled
		2019-03-20	2	10	No odour, clear
		2019-06-20	5	2300	No odour, clear
SW0744B	Gorge-Esquamalt Park, across 1034 Gosper Crescent	2018-03-20	9	93000	No odour, clear
		2018-08-02	20	190000	Foul odour, clear
		2019-02-26	6	2800000	No odour, clear
		2019-06-20	30	> 2800	Very strong sewer odour, grey
		2019-07-03	15	5400000	No odour, clear
SW0747	North of MacNaughton Street	2018-05-09	4	140	No odour, clear
SW0749	South side of 306 Uganda Avenue	2018-03-20	1	460	No odour, clear
		2018-08-07	5	22000	Laundry/sewer odour, clear, surge flow
		2019-04-12	4	800	No odour, clear
		2019-06-19	2	2000	Unpleasant odour, clear
SW0749A	Property line 930 Selkirk Avenue, old wooden spillway	2018-03-20	0	-	Dry, not sampled
		2018-08-07	1	32000	Foul odour, murky
		2019-04-12	0	-	Dry, not sampled
		2019-06-19	4	1100	Very foul odour, grey
SW0751	Pipe and concrete spill pad behind 928 Selkirk	2018-03-20	8	20	No odour, clear
		2018-08-07	2	860	No odour, clear
		2019-04-12	8	66000	No odour, clear
		2019-06-19	2	80	Foul odour, clear, leak in wall just west of EOP
		2019-06-19	10	200	No odour, clear, EOP (evidence of otter activity)

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0754	3 m upstream of rock wall at end of Arm Street	2018-03-20	40	310	Slight perfume odour, clear, surge flow
		2018-05-01	> 40	3300	No odour, clear, sampled during surge flow
		2018-08-07	3	2500	No odour, grey
		2019-04-12	5	2600	No odour, clear
		2019-06-19	< 0.1	-	Flow too low to sample
SW0757	West side of small bay at foot of Burleith Crescent	2018-03-15	5	2200	No odour, clear
		2018-08-07	0	-	Dry, not sampled
		2019-04-12	1	110	No odour, clear
		2019-06-20	0	-	Dry, not sampled
SW0758A	Below play area in Banfield Park	2018-03-07	20	7800	Sewage odour, clear
		2018-08-07	1	250	Foul odour, grey
		2019-04-16	2	40	No odour, clear
		2019-06-20	< 0.1	-	Flow too low to sample
SW0759	West of Trestle Bridge at foot of Currie Lane	2018-03-07	15	520	No odour, clear
		2018-08-08	2	140	No odour, clear
		2019-04-16	< 0.1	-	Flow too low to sample
		2019-06-20	3	3200	Foul odour, clear, sampled from EOP
SW0768	Below parking area east of 65 Songhees Road	2018-04-16	500	2800	Sewer odour, clear
		2018-08-08	60	2300	Unpleasant odour, clear
		2019-04-24	16	24000	No odour, clear
		2019-06-20	40	410	No odour, clear
SW0769	Foot of Cooperidge Place	2018-02-16	60	210	No odour, clear
		2018-04-16	250	980	Sewer odour, clear
		2018-05-18	30	50000	No odour, clear
		2018-06-05	140	20	No odour, clear, likely a surge flow
		2018-06-15	60	3300	No odour, clear
		2018-08-08	150	25000	No odour, clear
		2018-11-22	60	210	No odour, clear
		2019-04-24	60	380	No odour, clear
		2019-06-20	45	140	Sewer odour, clear, evidence of otter activity
SW0772	Catherine Street behind Spinnakers rock wall 10 ft down	2018-08-10	5	2500	No odour, clear
		2019-04-16	0	-	Dry, not sampled
SW0775	Foot of Robert Street	2018-04-16	60	1600	Sewer odour, clear
		2018-08-08	< 0.1	-	Flow too low to sample
		2019-04-16	5	2700	No odour, clear
		2019-06-20	< 1	30	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0777A	Curve in rock wall at foot of Barnard Avenue	2018-01-19	40	6500	No odour, clear
		2018-01-19	40	7000	No odour, clear
		2018-02-15	36	21000	No odour, clear
		2018-02-15	36	5200	No odour, clear
		2018-08-08	60	1200000	Foul odour, evidence of sewage
		2019-02-07	80	160000	No odour, murky
		2019-02-07	80	180000	No odour, murky
		2019-06-20	60	170000	Strong sewer odour, grey
		2019-10-30	100	-	Sewer odour, murky
SW0779	West Bay, west of 531 West Bay Terrace	2018-02-16	10	230	No odour, clear
		2018-08-08	1	870	No odour, clear
		2019-03-08	5	3600	No odour, clear
		2019-06-20	< 1	1200	No odour, clear
SW0780	Under boardwalk, below 537 Head Street, West Bay	2018-02-16	12	48000	No odour, clear
		2018-08-08	15	91000	Foul sewer odour, foamy brown
		2019-03-08	8	2200000	No odour, clear
		2019-06-20	< 0.1	-	Flow too low to sample
SW0781	Below heritage building at 503 Head Street, West Bay	2018-04-16	600	860	Sewer odour, silty
		2018-08-08	80	13000	No odour, clear
		2019-03-08	120	36000	No odour, clear
		2019-06-20	100	310	Unusual odour, clear
SW0805	8 m west of beach access at foot of Kinver Street	2018-01-15	-	-	After sewer overflow; enterococci was 86 CFU/100 mL
		2018-02-05	-	200000	After sewer overflow
		2018-08-08	25	140000	Very foul odour, murky
		2019-03-08	12	6900	No odour, clear
		2019-06-20	10	9300	Slight sewer odour, clear
SW0806	10 m west of beach access at foot of Kinver Street	2018-01-15	< 0.1	-	After sewer overflow
		2018-02-05	-	14000	After sewer overflow
		2018-08-08	10	11000	Sewer odour, clear
		2019-03-08	6	58000	No odour, clear
		2019-06-20	25	4300	Slight sewer odour, amber
SW0813	Foot of Foster Street, east side of cove	2018-02-16	10	130	No odour, clear
		2018-08-08	< 0.1	-	Flow too low to sample
		2019-01-07	20	-	No odour, clear; sampled after sewage bypass event
		2019-03-08	3	2400	No odour, clear
		2019-06-20	< 0.1	-	Flow too low to sample

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0814	Crack in rocks at foot of Grafton Street	2018-02-16	8	500	No odour, clear
		2018-08-08	3	2000	No odour, clear
		2019-03-08	1	10	No odour, clear
		2019-06-20	8	290	No odour, clear
SW0854	Foot of Gate Road off Admirals Road	2018-04-18	80	800	Strong sewer odour, clear
		2018-08-10	16	7800000	Foul odour, murky
		2019-04-23	36	5400	No odour, clear
		2019-07-03	20	25000	Sewage odour, clear
SW0855	10 m north of 854 below Naden Road	2018-04-18	2	20	No odour, clear
		2018-08-10	0	-	Dry, not sampled
SW0865AB	North of 200 Maplebank Road	2018-04-16	6	3600	Sewer odour, clear
		2018-08-09	0	-	Dry, not sampled
		2019-05-10	< 0.1	-	Flow too low to sample
		2019-07-03	< 0.1	-	Flow too low to sample
SW0865B	Below baseball field and small wood sided house	2018-04-16	0	-	Dry, not sampled
		2018-08-09	0	-	Dry, not sampled
		2019-05-10	0	-	Dry, not sampled
		2019-07-03	0	-	No flow observed
SW0865C	North of dead Gary Oak; south end of Plumber Bay	2018-04-16	1	80	No odour, clear
		2018-08-09	0	-	Dry, not sampled
		2019-05-10	0	-	Dry, not sampled
		2019-07-03	0	-	No flow observed
SW0865D	South of red roofed house; south end Plumper Bay	2018-04-16	60	200	Foul odour, murky
		2018-06-22	< 1	370	No odour, clear
		2018-08-09	0	-	Dry, not sampled
		2019-05-10	6	30	No odour, clear
		2019-07-03	4	1700	Sewer odour, clear; iron oxide sheen
SW0865E	Middle of Plumber Bay, south side of playground	2018-06-22	< 0.1	-	Flow too low to sample
SW0865F	North end of Plumber Bay	2018-04-16	10	130	No odour, very murky
		2018-06-22	1	670	No odour, iron bacteria on
		2018-08-09	30	3200	Odd odour, dirty
		2019-05-10	4	4600	No odour, clear
		2019-07-03	5	310	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0865G	Thetis Cove, end of Hallowell Road (access trail)	2018-04-16	null	45000	Sewer odour, murky
		2018-08-10	25	540	Foul odour, clear
		2019-05-10	8	9600	No odour, clear
		2019-07-03	20	5300	No odour, clear
SW0866	Portage Park, west of rock outcropping	2018-03-14	20	40	No odour, clear
		2018-08-10	0	-	Dry, not sampled
SW0870	Foot of Beaumont	2018-03-14	0	-	Dry, not sampled
		2018-08-09	0	-	Dry, not sampled
SW0872	Below PS at foot of Stewart, 3 m west of walkway	2018-03-14	10	1200	No odour, clear
		2018-08-09	0	-	Dry, not sampled
		2019-05-10	3	1100	No odour, clear
		2019-08-13	10	120	No odour, clear
SW0874	Foot of Heddle Avenue, below park bench, Tovey Bay	2018-03-14	0	-	Dry, not sampled
		2018-08-09	0	-	Dry, not sampled
SW0883A	Six Mile Road, south of E&N overpass	2018-03-13	0	-	Dry, not sampled
		2018-08-13	0	-	Dry, not sampled
SW0883B	Six Mile Road, South of E&N overpass, beside 883A	2018-03-13	5	330	No odour, black and foamy
		2018-08-13	0	-	Dry, not sampled
SW0885	Southwest side of Parsons Bridge	2018-03-13	20	50	Slight sewage odour, cloudy scum on surface
		2018-08-13	5	30	No odour, iron oxidizing bacteria
		2019-05-13	10	70	No odour, clear
		2019-08-13	15	20	No odour, clear
SW0886	Mill Stream below 1700 Wilfert Road, rapids	2018-03-13	500	120	No odour, clear
		2018-08-15	1000	100	No odour, clear
		2018-08-22	1000	200	No odour, clear
		2018-08-29	1000	160	No odour, clear
		2018-09-05	1000	110	No odour, clear
		2018-09-12	1500	50	No odour, clear
		2018-10-09	> 2500	60	No odour, clear
		2018-10-17	> 800	20	No odour, clear
		2018-10-24	> 1000	20	No odour, clear
		2018-10-28	> 1500	340	No odour, clear
		2018-11-07	> 5000	50	No odour, clear
		2019-05-13	> 2000	70	No odour, clear
		2019-08-13	> 1000	40	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0886-2A	Discharge into Mill Stream, access 2670 Wilfert Road	2019-09-03	1	2900	Musty odour, slight murky colour
		2019-09-16	20	21	Slight musty odour, slightly murky
SW0902	Station SW0902	2018-04-13	60	70	No odour, clear
SW0902A	Approximately 45 m SE of 101 Wilfert Road entrance	2019-05-13	40	90	No odour, clear
		2019-08-13	30	3400	No odour, clear
SW0912	2 m north of fence, east side of Fort Rodd Hill	2018-03-14	5	30	No odour, clear
		2018-08-13	0	-	Dry, not sampled
		2019-05-13	0	-	Dry, not sampled
		2019-08-15	0	-	Dry, not sampled
SW0913	120 m west of bridge; east end of Esquimalt Lagoon	2018-03-08	80	50	No odour, clear
		2019-05-13	4	20	No odour, clear
		2019-07-25	0	-	Dry, not sampled
SW0914	Below curve in Ocean Boulevard, 25 m west of 913	2018-03-08	15	20	No odour, clear
		2018-08-13	0	-	Dry, not sampled
SW0916	Colwood Creek	2018-03-13	1000	10	No odour, clear
		2018-08-13	100	370	No odour, clear
		2019-03-08	> 1000	10	
		2019-03-08	> 600	10	No odour, clear
		2019-07-17	200	580	No odour, clear
		2019-08-13	> 1000	580	
		2020-01-30	> 1000	50	No odour, clear
SW0922	100 m south of 921, Hatley Creek	2019-11-27	-	-	No odour, clear
SW0926	Bee Creek	2018-03-13	500	30	No odour, clear
		2018-08-13	500	40	No odour, clear
		2019-03-08	250	10	5/30 sampling
		2019-08-15	1400	210	5/30 sampling
		2019-08-22	1400	60	5/30 sampling
		2019-08-29	1400	90	5/30 sampling
		2019-09-05	1400	50	5/30 sampling
		2019-09-12	1400	70	5/30 sampling
		2019-10-07	> 2000	3400	5/30 sampling
		2019-10-17	1800	60	5/30 sampling
		2019-10-21	> 3000	50	5/30 sampling
		2019-10-31	2000	80	5/30 sampling

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0928	Selleck Creek	2018-03-13	400	10	No odour, clear
		2018-08-13	400	150	No odour, clear
		2019-03-08	60	10	5/30 sampling
		2019-08-15	700	330	5/30 sampling
		2019-08-22	700	40	5/30 sampling
		2019-08-29	700	17	5/30 sampling
		2019-09-05	700	40	5/30 sampling
		2019-09-12	700	36	5/30 sampling
		2019-10-07	> 1500	1000	5/30 sampling
		2019-10-17	> 1000	150	5/30 sampling
		2019-10-21	> 2000	460	5/30 sampling
		2019-10-31	1000	10	5/30 sampling
SW0930	Below 3279 Anchorage Drive, 4 m north of stairs	2018-03-08	30	< 10	No odour, clear
		2018-08-10	30	30	No odour, clear
		2018-10-30	50	51	No odour, clear
		2019-03-08	7	< 10	No odour, clear
		2019-07-25	90	30	No odour, clear
SW0931	SW side of 3279 Anchorage Avenue, Lagoon Brook	2018-03-08	15	< 10	No odour, clear
		2018-08-10	25	170000	No odour, clear
		2019-03-08	8	2000	No odour, turbid brown
		2019-07-25	30	70	No odour, clear
		2019-10-21	8	98	No odour, clear
SW0932	Ditch; south end of Esquimalt Lagoon	2018-03-08	180	< 10	No odour, clear
		2018-08-10	300	30	No odour, clear
		2019-03-08	24	< 10	No odour, clear
		2019-07-17	200	40	No odour, clear, waterfowl in area
		2019-10-21	32	3400	No odour, clear
SW0933	Pipe at south end of Esquimalt Lagoon	2018-03-08	150	< 10	No odour, clear
		2018-05-15	70	250	No odour, clear
		2018-08-10	200	160	No odour, clear
		2019-03-08	32	40	No odour, clear
		2019-07-17	250	520	No odour, clear, waterfowl in area
SW0935A	Foot of Milburn below discharge 936	2018-03-08	250	10	No odour, clear
		2018-08-13	100	10	No odour, clear
		2019-03-08	16	10	No odour, clear
		2019-07-17	180	250	No odour, clear
SW0937	Below north side of Ocean Boulevard cul de sac	2019-10-21	10	120	No odour, clear

Table 1. Core Area Stormwater Discharge Bacterial Data (2018-2020)

Discharge ID	Discharge Location	Sample Date	Flow Rate (L/min)	E. Coli (CFU/100 mL)	Sample Comments
SW0939	15 m south of Ocean Boulevard beach access	2018-03-08	20	< 10	No odour, clear
		2018-08-13	0	-	Dry, not sampled
SW0940A	North end of retention pond, rip rap buried pipe	2018-03-08	500	< 10	No odour, clear
		2018-08-13	0	-	Dry, not sampled
		2019-03-13	12	20	No odour, clear
		2019-07-17	0	-	Dry, not sampled
SW6003	Goldstream River	2018-04-10	null	< 10	No odour, clear, flow too high to estimate
		2018-08-29	> 3000	50	No odour, clear
		2019-03-26	> 5000	< 10	No odour, clear
		2019-08-13	null	80	No odour, clear, flow not estimated
		2019-10-25	> 5000	23	No odour, discharge clear, spawning salmon
SW6004	West side of Saanich Inlet, north of power lines	2019-10-25	> 1000	10	No odour, clear
SW6006	Saanich Inlet, Hall's Boat House driveway	2019-03-26	2	< 10	No odour, clear, creosote logs in channel
		2019-08-13	0	-	Dry, not sampled
SW6007	Between 3640 & 3680 Trans Canada Hwy	2018-04-10	0	-	Dry, not sampled, station discontinued in 2018
SW6008	North of barn style building; 3680 Trans Canada Hwy	2018-04-10	60	< 10	No odour, clear
		2019-03-26	16	< 10	No odour, clear
		2019-08-13	15	8500	No odour, clear
		2019-10-25	10	9	No odour, clear

Notes:
Flow is visually estimated; CFU is colony forming units; "- " means measurement was not conducted; "null" means measurement was attempted, but could not be carried out (e.g., if there was no flow); red text highlights samples collected in 2019.

APPENDIX D

***ESCHERICHIA COLI* SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2019**

APPENDIX D

***ESCHERICHIA COLI* SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2019**

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APPENDIX D

***ESCHERICHIA COLI* SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2019**

1.0 INTRODUCTION

Quality assurance and quality control (QA/QC) programs are a set of protocols adopted to ensure that the results of a study are valid, internally consistent and comparable with similar projects. These protocols are set out in writing and based on current and relevant research. This appendix discusses:

- field sampling methods
- sample handling procedures
- analytical procedures
- field and laboratory replication (quality control)
- data assessment

The data collected for the QA program are used to ensure consistency in field handling and analytical methods. If the data exceed a specified precision criterion then the lab is notified of a potential problem in the procedure and steps are taken to resolve the issue.

2.0 METHODS FOR *ESCHERICHIA COLI* SAMPLING

CRD staff collected water samples in 500-mL wide-mouth sterile disposable bottles containing 1.5 mL of sodium thiosulphate (a sample preservative). Bottles were supplied by Bureau Veritas (formerly Maxxam Analytics) in Victoria, BC. Labelled samples were stored in an insulated cooler with ice packs and delivered the same day to the laboratory. Maxxam analyzed samples for *Escherichia coli* (*E. Coli*) bacteria following the procedures in Standard Methods (APHA, 1998) and reported as colony forming units/100 mL (CFU/100 mL).

CRD staff collected samples for QC on days that the weather was representative of the sampling season (wet or dry). Conditions such as "first flush", major storms or any other effect that might tend to prejudice the results were avoided.

2.1 Stormwater Discharge Sampling

Field samplers collected stormwater discharge samples from the point of discharge. Care was taken to avoid contamination of the sample with substances that did not originate in the stormwater (e.g., salt water, other discharges) that may confuse the results.

2.2 Quality Assurance

2.2.1 Stormwater Sample Replicates (Field Splits)

Ten percent of the samples collected were replicated and the field replicate samples identified as "field splits". CRD staff collected a single sample in a 500-mL sample bottle and inverted 30 times to ensure that the sample was well-mixed. The sample was then split evenly into two separate bottles. Staff labelled the bottles submitted them to Maxxam for analysis. These samples were submitted as blind samples (not identified as field splits).

2.2.2 Quality Control Precision Assessment

In 2019, field staff collected 18 field splits at six stormwater discharges in the core area of the CRD. Samples were analyzed for *E. Coli* levels. Field splits were used to establish the precision criterion for the CRD Core Area, District of Sooke and Salt Spring Island Electoral Area sampling programs. The discharges were chosen based on previous high, moderate, or low levels of *E. Coli* concentrations (two discharges for each category) to represent the varying *E. Coli* counts that would be analyzed. Staff collected three individual 500-mL grab samples at each of the six stations and split each into two replicate bottles. Staff also submitted three blank samples of potable water in 500-mL sample bottles as part of the assessment. Each sample had a unique identification number and was submitted blindly to the lab (i.e., the lab had no information about the sample).

2.2.3 Calculation of Laboratory Precision

Laboratory precision for *E. Coli* analysis (e.g., a measure of consistency by the lab) is determined by analyzing 18 pairs of field samples (field splits). The following, taken from Standard Methods, 18th Edition (APHA, 1998), explains the procedure for calculating the precision criterion and determining whether the log ranges for the field splits are “acceptable” or “unacceptable”:

- The data are arranged in pairs (D_1 and D_2). The log of each field measurement is determined (L_1 , L_2) and the difference (range) in the log value between each pair of field splits is calculated: $R = (L_2 - L_1)$. An average range (Mean-R) is then determined for all of the pairs.
- The precision criterion is calculated by multiplying the Mean-R by 3.27 and is rounded to one decimal place.
- The log range (R) is calculated for each of the field splits and compared to the precision criterion, to determine whether the sample is acceptable or not, according to the following criterion:

Acceptable (A) If the calculation is less than the precision criterion, then the field data are within normal variability.

Unacceptable (U) If the calculation is greater than the precision criterion, then the field data are outside of the normal variability. All data collected after the last "acceptable" set of data should be discarded and no further analysis should be done until the source of the problem is identified by the lab.

It is important not to put too severe an interpretation on the results from the QA calculation, especially when they are close to the "unacceptable" guideline. Each result represents a value within a 95% confidence interval, which gets proportionately larger as the actual result gets smaller. Therefore, one can expect 5% of the samples to be outside of the precision criterion, through randomness. Also, any *E. Coli* count under 200 FC/100 mL is considered too small an amount to accurately calculate or compare to a precision criterion (APHA, 1998). It is also important to note that discharges with *E. Coli* counts lower than 200 FC/100 mL receive a low public health concern rating.

The results are rounded to one decimal place and compared to the precision criterion (e.g., 0.5). If the calculated value from the duplicate results still exceeds the criterion (e.g., 0.55 or greater) then an informal investigation of the laboratory should be initiated. If only a few duplicates are unacceptable (e.g., one out of every 20 pairs of duplicates) the lab is probably meeting the guideline.

The overall process is intended to act as an "alarm", alerting the study group to potential problems with the sampling and analytical procedures. As part of the review, the following elements are considered:

- the number of pairs exceeding the criterion
- the actual *E. Coli* value of the pairs of data
- field notes on the "field split" procedure
- comments from the laboratory

3.0 RESULTS

3.1 Quality Assurance Results

Field staff collected 18 pairs of stormwater samples from six discharges having historically high, moderate or low levels of *E. Coli* bacteria. Staff blindly submitted samples to the lab for analysis of the *E. Coli* concentration and used the data to calculate the precision criterion.

3.1.1 Blanks

Field staff submitted three blank samples (Greater Victoria tap water) to the lab for analysis for *E. Coli* bacteria. Blanks were reported as having <10 CFU/100 mL. Therefore, the results meet the QA requirements.

3.1.2 Precision Criterion

Table 1 shows the lab results of the 18 pairs of samples used to determine the precision criterion for the 2019 stormwater monitoring program. The calculated criterion for this laboratory, using these 18 sets of duplicates, was low (0.2).

3.1.3 Field Splits

Wet Weather Sampling

Table 2 presents the results for the field splits collected in the core area during the wet period of the 2019 stormwater sampling program. Data were compared to the precision criterion (0.2), as described in Section 3.1.2. One of the field splits exceeded the precision criterion; however, it had counts below 200 CFU/100 mL and, therefore, is still acceptable. Another exceeded the criterion as well; however, it is expected that 5% of samples will have results outside of the precision criterion through randomness. Therefore the results are acceptable.

Dry Weather Sampling

Table 3 presents the results for the field splits collected in the core area during the dry period of the 2019 stormwater sampling program. One of the field splits exceeded the precision criterion; however, it is expected that 5% of samples will have results outside of the precision criterion, through randomness. Therefore, the results are acceptable.

4.0 CONCLUSIONS

Requirements for the Environmental Monitoring Program QA/QC program were carried out in 2019. The QA/QC results were acceptable for rating stormwater discharges for public health concerns.

5.0 REFERENCES

APHA, 1998. American Public Health Association, American Water Works Association, Water Pollution Control Federation, 20th Edition. Standard Methods for the Examination of Water and Wastewater.

Drinnan, R.W. 1995. Memo to R. Miller, CRD Engineering, February 7; 4pp.

Hutcheson, D. 1995. Memo to R. Miller, CRD Engineering, February 7; 2pp.

Table 1 Laboratory Quality Assurance Exercise Results for 2019

CRD Data, Batch Samples: 18 pairs, January 2019						
Discharge No.	Pair No.	1 st Duplicate D1	2 nd Duplicate D2	Log D1 L1	Log D2 L2	Range of Logs (Rlog) (Log L1 - Log L2)
411A	1	10	20	1.0000	1.3010	0.3010
	2	30	20	1.4771	1.3010	0.1761
	3	<10	10	1.0000	1.0000	0.0000
468	1	<10	<10	1.0000	1.0000	0.0000
	2	10	<10	1.0000	1.0000	0.0000
	3	<10	<10	1.0000	1.0000	0.0000
3118	1	520	710	2.7160	2.8513	0.1353
	2	570	720	2.7559	2.8573	0.1015
	3	680	690	2.8325	2.8388	0.0063
503	1	430	400	2.6335	2.6021	0.0314
	2	440	400	2.6435	2.6021	0.0414
	3	390	440	2.5911	2.6435	0.0524
222	1	39,000	34,000	4.5911	4.5315	0.0596
	2	29,000	37,000	4.4624	4.5682	0.1058
	3	38,000	28,000	4.5798	4.4472	0.1326
777A	1	160,000	180,000	5.2041	5.2553	0.0512
	2	150,000	160,000	5.1761	5.2041	0.0280
	3	150,000	140,000	5.1761	5.1461	0.0300
Mean - R _{log} (Sum R _{log} /18)						0.0696
Precision Criterion (3.27 x Mean-R _{log})						0.2275

Table 2 Laboratory Quality Assurance Results – Wet Period 2019

Date	Discharge Number	<i>E. Coli</i> Counts CFU/100 mL	Log	Log Range	Acceptable (A) or Unacceptable (U)
21-Feb	212	60	1.7782	0.1761	A
		40	1.6021		
26-Feb	611	32,000	4.5051	0.0746	A
		38,000	4.5798		
26-Feb	736A	10	1.0000	0.0000	A
		<10	1.0000		
6-Mar	505	10	1.0000	0.0000	A
		<10	1.0000		
8-Mar	813	2,400	3.3802	0.0580	A
		2,100	3.3222		
11-Mar	316	460	2.6628	0.0193	A
		440	2.6435		
12-Mar	574	80	1.9031	0.1383	A
		110	2.0414		
13-Mar	722	360	2.5563	0.0792	A
		300	2.4771		
26-Mar	6006	<10	1.0000	0.0000	A
		<10	1.0000		
11-Apr	659	220	2.3424	0.2258	A
		370	2.5682		
12-Apr	754	2,600	3.4150	0.0928	A
		2,100	3.3222		
23-Apr	607A	120	2.0792	0.3802	U*
		50	1.6990		
23-Apr	854	5,400	3.7324	0.0248	A
		5,100	3.7076		
24-Apr	769	380	2.5798	0.1027	A
		300	2.4771		
7-May	697	40	1.6021	0.0969	A
		50	1.6990		
10-May	620	65,000	4.8129	0.2285	U
		110,000	5.0414		
29-May	503	2,400	3.3802	0.0969	A
		3,000	3.4771		

Notes:

*Counts below 200 CFU/100 mL are not expected to meet the criterion.

5% of samples will have results outside of the precision criterion, through randomness.

Table 3 Laboratory Quality Assurance Results – Dry Period 2019

Date	Discharge Number	<i>E. Coli</i> Counts CFU/100 mL	Log	Log Range	Acceptable (A) or Unacceptable (U)
14-Jun	222	220,000	5.3424	0.0202	A
		210,000	5.3222		
18-Jun	610	7,600	3.8808	0.1565	A
		5,300	3.7243		
19-Jun	629	67,000	4.8261	0.0930	A
		83,000	4.9191		
20-Jun	744	690	2.8388	0.0588	A
		790	2.8976		
20-Jun	769	140	2.1461	0.0000	A
		140	2.1461		
3-Jul	659	340	2.5315	0.0483	A
		380	2.5798		
4-Jul	249	6,000	3.7782	0.0280	A
		6,400	3.8062		
4-Jul	611	2,100,000	6.3222	0.0435	A
		1,900,000	6.2788		
5-Jul	321	510	2.7076	0.1394	A
		370	2.5682		
5-Jul	722	2,200	3.3424	0.0726	A
		2,600	3.4150		
16-Jul	545	10	1.0000	0.0000	A
		<10	1.0000		
18-Jul	574	180	2.2553	0.1065	A
		230	2.3617		
13-Aug	6008	8,500	3.9294	0.7833	U
		1,400	3.1461		
12-Sep	712	21,000	4.3222	0.1761	A
		14,000	4.1461		

Notes:

*Discharges with counts below 200 CFU/100 mL are not expected to meet the criterion.

5% of samples will have results outside of the precision criterion, through randomness.

APPENDIX E
2019 CORE STORMWATER CONTAMINANT DATA

Table 1. Stormwater Sediment Analytical Data (2019)

Marine Sediment Quality Guidelines		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH
	CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2
	CCME ISQG	7.24	0.7	52.3	18.7	30	0.13	1	124	-	-
	CCME PEL	42	4.2	160	108	112	0.7	2.2	271	-	-
Vancouver Island Background		4	0.95	65	100	40	0.15	1	150	-	-
SW0212	2019-11-21	2.31	0.065	16.9	24.9	20.9	< 0.05	< 0.05	54.3	0.042	0.009
SW0216-3A	2019-11-22	8.64	0.071	58.6	45.2	7.73	0.069	0.078	91.6	0.04	0.02
SW0218	2019-11-22	-	-	-	-	-	-	-	-	-	-
SW0306-1	2019-11-21	-	-	-	-	-	-	-	-	-	-
SW0306-2	2019-11-21	-	-	-	-	-	-	-	-	-	-
SW0306-2A	2019-11-21	3.07	0.398	30.9	64	166	0.157	0.164	201	14	2.5
SW0307-2	2019-11-21	3.72	0.327	49.5	69	107	0.082	0.097	184	290	210
SW0307-2A	2019-11-21	4.85	0.348	47.3	78.6	81.1	0.083	0.107	233	6.4	1.3
SW0310-1	2019-11-22	-	-	-	-	-	-	-	-	-	-
SW0310-2	2019-11-22	-	-	-	-	-	-	-	-	-	-
SW0310-3	2019-11-22	3.18	0.104	30.3	61.5	23.1	< 0.05	< 0.05	161	2.7	0.73
SW0310-5	2019-11-22	2.3	0.191	23.7	31.5	155	< 0.05	< 0.05	158	17	2.3
SW0310-8	2019-11-22	7.61	0.175	31.8	116	43.9	< 0.05	0.239	170	10	1.5
SW0316	2019-10-16	3.68	0.102	20.6	26.8	13.2	< 0.05	< 0.05	122	0.27	0.051
SW0316	2019-10-31	2.37	0.092	16.1	18.8	14.3	< 0.05	< 0.05	94.2	3.1	0.24
SW0316-1A	2019-09-05	4.17	0.089	23.9	33	29.4	< 0.05	< 0.05	141	0.99	0.12
SW0316-3B	2019-10-16	3.95	0.087	31.6	43.4	12.8	< 0.05	< 0.05	114	0.93	0.27
SW0316-3B	2019-10-31	2.45	0.100	20.7	30.5	16.7	< 0.05	< 0.05	99.3	0.39	0.067
SW0316-4B	2019-10-16	2.53	0.137	36.7	31.5	23.6	< 0.05	< 0.05	115	1.5	0.32
SW0316-4B	2019-10-31	3.14	0.132	25.3	38.9	35.0	< 0.05	< 0.05	145	0.96	0.35
SW0316-5	2019-10-16	5.72	0.094	24	23.9	10.2	< 0.05	< 0.05	90.7	0.18	0.043
SW0316-5	2019-10-31	7.28	0.108	27.4	26.2	13.6	< 0.05	< 0.05	104	0.18	0.031
SW0316-5C	2019-11-29	3.03	0.539	40.6	73.1	66.6	0.102	0.252	247	1.1	0.22
SW0316-5D	2019-11-29	12.9	1.34	42.9	232	106	0.179	0.46	508	1.3	0.33
SW0324	2019-11-25	2.82	0.318	37.4	59.1	57.3	< 0.05	0.057	200	21	1.3
SW0505-1	2019-11-25	1.84	0.128	28.5	52.5	68.1	0.691	0.096	96.2	2.1	0.51
SW0505-3	2019-11-25	2.44	0.16	22.4	25.9	410	0.499	22.1	110	7.7	1.6
SW0669	2019-11-29	-	-	-	-	-	-	-	-	-	-
SW0672	2019-11-29	11.9	0.659	30.6	76.5	93.4	0.103	0.143	267	1.2	0.22
SW0689	2019-12-03	1.86	0.084	28.1	59.7	4.87	< 0.05	< 0.05	68.1	0.14	0.03
SW0690E	2019-12-04	4.2	0.079	48.1	46.5	8.03	< 0.05	0.169	72.2	0.048	0.0086
SW0692	2019-12-04	2.31	0.123	23.2	59.2	19.8	< 0.05	< 0.05	333	0.026	0.0031
SW0695-1A	2019-11-27	5.27	0.236	34.5	53.7	14.9	0.062	0.106	258	0.13	0.019
SW0698	2019-11-27	4.3	0.274	29.5	48.7	31.6	< 0.05	0.081	145	2.4	1
SW0710	2019-11-27	3.35	0.11	36.4	58.7	6.82	< 0.05	< 0.05	202	0.89	0.098
SW0712	2019-11-27	2.75	0.119	44.4	47.1	25.7	< 0.05	< 0.05	100	58	12

Table 1, continued

Marine Sediment Quality Guidelines		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH
	CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2
	CCME ISQG	7.24	0.7	52.3	18.7	30	0.13	1	124	-	-
	CCME PEL	42	4.2	160	108	112	0.7	2.2	271	-	-
Vancouver Island Background		4	0.95	65	100	40	0.15	1	150	-	-
SW0722	2019-11-27	-	-	-	-	-	-	-	-	-	-
SW0742-u/s	2019-10-16	2.12	0.062	21.2	44.4	2.14	<0.050	<0.050	48.2	-	-
SW0742-u/s2	2019-10-16	3.93	0.152	21.3	20.6	7.64	0.056	0.079	79.8	-	-
SW0882	2019-11-27	-	-	-	-	-	-	-	-	-	-
SW0887	2019-11-27	-	-	-	-	-	-	-	-	-	-
SW0921	2019-11-27	1.75	< 0.05	9.74	2.26	2.75	< 0.05	< 0.05	16.8	0.022	0.013
SW0922	2019-11-27	1.79	< 0.05	10.1	3.38	2.06	< 0.05	< 0.05	15.2	0.053	0.014
SW0926	2019-09-05	1.61	< 0.05	17.5	9.44	4.85	< 0.05	< 0.05	33	0.76	0.25
SW0926	2019-10-17	1.13	0.11	15.1	7	3.85	< 0.05	< 0.05	24	0.96	0.33
SW0926-2	2019-10-31	42.2	0.319	20.6	29.0	13.5	< 0.05	0.188	71.4	0.42	0.37
SW0928	2019-10-31	4.91	0.207	25.4	39.2	15.6	0.053	0.062	94.7	3.4	0.46
SW0928	2019-10-17	2.69	0.096	22	23.5	6.09	< 0.05	< 0.05	58.5	0.41	0.07
SW0931	2019-10-21	2.28	0.082	23.6	20.1	8.21	< 0.05	< 0.05	61.9	0.0063	< 0.001
SW0932	2019-10-21	1.72	0.056	32.3	77	6.33	< 0.05	< 0.05	61	0.12	0.035
SW0937	2019-10-21	2.43	0.064	22.1	24.8	4.97	< 0.05	< 0.05	52.2	0.2	0.025
SW6003	2019-10-25	3.69	0.056	33.2	21.2	8.76	< 0.05	< 0.05	49.1	0.15	0.015
SW6004	2019-10-25	6.13	0.152	37.7	42.4	13.2	< 0.05	0.058	92.4	0.075	0.013
SW6008	2019-10-25	2.18	0.167	104	80.3	149	< 0.05	< 0.05	206	0.4	0.075

Notes:
Concentrations are in mg/kg
CRD MSQG =Marine sediment quality guidelines adopted from Washington State's Department of Ecology for protection of marine aquatic life.
LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively
CCME = Canadian Council of Ministers of the Environment
ISQG = interim sediment quality guideline; concentrations above this level but below the PEL will occasionally result in adverse effects on aquatic life
PEL = probable effects level; concentrations above this level will frequently result in adverse effects to aquatic life
Vancouver Island Background Concentrations are regional estimates (95th percentiles); https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_4.pdf
Italicized values are those that exceed a guideline but are below the Vancouver Island background concentration

value is greater than or equal to the CCME ISQG
 value is greater than or equal to the CCME PEL
 value it greater than or equal to CRD MSQG

For mercury only, the CRD MSQG is lower than the CCME PEL
Some samples are not collected at the discharge to marine and therefore marine guidelines are not applicable but are used for screening purposes
Carbon normalized PAH guideline comparison was done separately

Table 2. Calculation of Sediment Contaminant Ratings (2019)

		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH	Sum of Ratios	Contaminant Rating
	CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2		
Station	Date	Ratios of Concentration to Guideline											
SW0212	2019-11-21	0.04	0.01	0.07	0.06	0.05	0.12	0.01	0.13	0.00	0.00	0.50	Low
SW0216-3A	2019-11-22	0.15	0.01	0.23	0.12	0.02	0.17	0.01	0.22	0.00	0.00	0.94	Low
SW0306-2A	2019-11-21	0.05	0.08	0.12	0.16	0.37	0.38	0.03	0.49	1.17	0.48	3.33	High
SW0307-2	2019-11-21	0.07	0.06	0.19	0.18	0.24	0.20	0.02	0.45	24.17	40.38	65.95	High
SW0307-2A	2019-11-21	0.09	0.07	0.18	0.20	0.18	0.20	0.02	0.57	0.53	0.25	2.29	Moderate
SW0310-3	2019-11-22	0.06	0.02	0.12	0.16	0.05	0.12	0.01	0.39	0.23	0.14	1.29	Moderate
SW0310-5	2019-11-22	0.04	0.04	0.09	0.08	0.34	0.12	0.01	0.39	1.42	0.44	2.97	High
SW0310-8	2019-11-22	0.13	0.03	0.12	0.30	0.10	0.12	0.04	0.41	0.83	0.29	2.38	High
SW0316	2019-10-16	0.06	0.02	0.08	0.07	0.03	0.12	0.01	0.30	0.02	0.01	0.72	Low
SW0316	2019-10-31	0.04	0.02	0.06	0.05	0.03	0.12	0.01	0.23	0.26	0.05	0.87	Low
SW0316-1A	2019-09-05	0.07	0.02	0.09	0.08	0.07	0.12	0.01	0.34	0.08	0.02	0.91	Low
SW0316-3B	2019-10-16	0.07	0.02	0.12	0.11	0.03	0.12	0.01	0.28	0.08	0.05	0.89	Low
SW0316-3B	2019-10-31	0.04	0.02	0.08	0.08	0.04	0.12	0.01	0.24	0.03	0.01	0.68	Low
SW0316-4B	2019-10-16	0.04	0.03	0.14	0.08	0.05	0.12	0.01	0.28	0.13	0.06	0.94	Low
SW0316-4B	2019-10-31	0.06	0.03	0.10	0.10	0.08	0.12	0.01	0.35	0.08	0.07	0.99	Low
SW0316-5	2019-10-16	0.10	0.02	0.09	0.06	0.02	0.12	0.01	0.22	0.02	0.01	0.67	Low
SW0316-5	2019-10-31	0.13	0.02	0.11	0.07	0.03	0.12	0.01	0.25	0.02	0.01	0.76	Low
SW0316-5C	2019-11-29	0.05	0.11	0.16	0.19	0.15	0.25	0.04	0.60	0.09	0.04	1.68	Moderate
SW0316-5D	2019-11-29	0.23	0.26	0.17	0.59	0.24	0.44	0.08	1.24	0.11	0.06	3.41	High
SW0324	2019-11-25	0.05	0.06	0.14	0.15	0.13	0.12	0.01	0.49	1.75	0.25	3.15	High
SW0505-1	2019-11-25	0.03	0.03	0.11	0.13	0.15	1.69	0.02	0.23	0.18	0.10	2.66	High
SW0505-3	2019-11-25	0.04	0.03	0.09	0.07	0.91	1.22	3.62	0.27	0.64	0.31	7.20	High
SW0672	2019-11-29	0.21	0.13	0.12	0.20	0.21	0.25	0.02	0.65	0.10	0.04	1.93	Moderate
SW0689	2019-12-03	0.03	0.02	0.11	0.15	0.01	0.12	0.01	0.17	0.01	0.01	0.63	Low
SW0690E	2019-12-04	0.07	0.02	0.19	0.12	0.02	0.12	0.03	0.18	0.00	0.00	0.74	Low
SW0692	2019-12-04	0.04	0.02	0.09	0.15	0.04	0.12	0.01	0.81	0.00	0.00	1.29	High
SW0695-1A	2019-11-27	0.09	0.05	0.13	0.14	0.03	0.15	0.02	0.63	0.01	0.00	1.25	Moderate
SW0698	2019-11-27	0.08	0.05	0.11	0.12	0.07	0.12	0.01	0.35	0.20	0.19	1.32	Moderate
SW0710	2019-11-27	0.06	0.02	0.14	0.15	0.02	0.12	0.01	0.49	0.07	0.02	1.10	Moderate
SW0712	2019-11-27	0.05	0.02	0.17	0.12	0.06	0.12	0.01	0.24	4.83	2.31	7.94	High
SW0921	2019-11-27	0.03	0.01	0.04	0.01	0.01	0.12	0.01	0.04	0.00	0.00	0.27	Low
SW0922	2019-11-27	0.03	0.01	0.04	0.01	0.00	0.12	0.01	0.04	0.00	0.00	0.27	Low
SW0926	2019-09-05	0.03	0.01	0.07	0.02	0.01	0.12	0.01	0.08	0.06	0.05	0.46	Low
SW0926	2019-10-17	0.02	0.02	0.06	0.02	0.01	0.12	0.01	0.06	0.08	0.06	0.46	Low
SW0926-2	2019-10-31	0.74	0.06	0.08	0.07	0.03	0.12	0.03	0.17	0.04	0.07	1.42	Moderate
SW0928	2019-10-31	0.09	0.04	0.10	0.10	0.03	0.13	0.01	0.23	0.28	0.09	1.10	Moderate

Table 2, continued

		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH	Sum of Ratios	Contaminant Rating
	CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2		
Station	Date	Ratios of Concentration to Guideline											
SW0928	2019-10-17	0.05	0.02	0.08	0.06	0.01	0.12	0.01	0.14	0.03	0.01	0.54	Low
SW0931	2019-10-21	0.04	0.02	0.09	0.05	0.02	0.12	0.01	0.15	0.00	0.00	0.50	Low
SW0932	2019-10-21	0.03	0.01	0.12	0.20	0.01	0.12	0.01	0.15	0.01	0.01	0.67	Low
SW0937	2019-10-21	0.04	0.01	0.09	0.06	0.01	0.12	0.01	0.13	0.02	0.00	0.49	Low
SW6003	2019-10-25	0.06	0.01	0.13	0.05	0.02	0.12	0.01	0.12	0.01	0.00	0.54	Low
SW6004	2019-10-25	0.11	0.03	0.15	0.11	0.03	0.12	0.01	0.23	0.01	0.00	0.79	Low
SW6008	2019-10-25	0.04	0.03	0.40	0.21	0.33	0.12	0.01	0.50	0.03	0.01	1.69	Moderate

Notes:
CRD MSQG =Marine sediment quality guidelines adopted from Washington State's Department of Ecology for protection of aquatic life.
These are ratios of the measured value over the MSQG.
LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively.
values are approaching (i.e.>0.75 the value of) the guideline
values exceed the MSQG
Some samples are not collected at the discharge to marine and therefore marine guidelines are not applicable, but are used for screening purposes.

Table 3. Summary of Recent Chemical Contaminant Ratings and Recommendations

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time								Notes and Recommendations
			2012	2013	2014	2015	2016	2017	2018	2019	
210 West of Holland Pt	37	Victoria	–	–	–	–	–	–	–	–	Sampled upstream in 2007, due to lack of sediment at discharge point. No sediment in 2017 or 2018. Conduct water sampling in 2020.
212 East of Finlayson Pt	39	Victoria	–	Low	–	–	–	–	Moderate	Low	Elevated lead in 2018, low in 2019. Confirm rating in 2020.
216 Ross Bay	40	Victoria	Moderate to High upstream	Moderate	High	–	High upstream	–	–	Low	Elevated mercury upstream and discharge; 216 is tidal, sampled at 216-3A. Action Required. CRD narrowed down a source of mercury. No sediment upstream in 2018 to confirm. Low at discharge in 2019; resample in 2020.
218 Ross Bay	40	Victoria	–	–	Moderate	–	–	–	–	–	No sediment in 2019.
229 Gonzales Bay	41	Victoria	–	–	–	–	–	–	–	–	Discharge tidal, no sediment upstream in 2017 or 2018.
244 McNeill Bay	43	Oak Bay	Moderate	–	–	–	–	Moderate	–	–	Lead slightly elevated in 2012, low in 2017. Resample in 2022.
245 McNeill Bay	43	Oak Bay	–	Low	–	–	–	–	–	–	Low in 2001, 2004 and 2013. No sediment available in 2018. Attempt to resample in 2020.
250 McNeill Bay	43	Oak Bay	Moderate upstream	–	High upstream	Moderate	–	High / Moderate	–	–	Elevated PAHs. 250-2A is point of discharge but doesn't drain all the catchment. Action Required. High in 250-1A and moderate at 250-2A. Continue to delineate the contamination.
306 Orchard & Newport Avenue	45	Oak Bay	Low	–	–	–	–	High	High	High upstream	Elevated HPAH and lead Action Required. 2019: no sediment at 306-1 and 306-2; elevated HPAH and lead at 306-2a. Sample upstream sediment and downstream water in 2020.
307 Oak Bay Marina	45	Oak Bay	Moderate	Moderate	High	High	Moderate	–	High	High	Sampled at 307 and 307-2. Elevated PAH, mercury, lead and zinc. Action Required. Oak Bay cleaned out manholes at Currie & Newport in 2017. May have narrowed down contamination to intersection of Newport and Currie; Oak Bay to remove more sediment in 2020.
310 Windsor Road	45	Oak Bay	–	–	High	–	Low upstream	High upstream	–	High upstream	Copper, lead, zinc and PAH elevated (310-1). Other contaminants upstream. Low at 310-5 in 2016 elevated PAH in 2019 Upstream contamination at Windsor and Monterey. Action Required. Oak Bay to remove contaminated sediment in 2020.
311 1420 Beach Drive	45	Oak Bay	–	–	–	–	–	–	–	–	Short line, packed with beach sand in 2017. Intertidal. Cease sampling
316 Bowker Creek	46	Oak Bay	Moderate to high upstream	Low but high upstream	–	–	–	–	–	Moderate	Sediment rated low but copper elevated in water. Upstream, 316-5D rated high, due to copper and zinc Sample in 2024.
320 Dalhousie Street	46	Oak Bay	–	–	–	–	–	–	Low	–	Resample in 2023.

Table 3, continued

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time								Notes and Recommendations
			2012	2013	2014	2015	2016	2017	2018	2019	
323 North Esplanade	46	Oak Bay	–	–	–	–	Low	–	–	–	Resample in 2021.
324 Cattle Point	46	Oak Bay	–	–	–	–	–	–	–	High	Sampled for first time in 2019; Elevated HPAH. Confirm rating.
325 Rutland Rd	48	Oak Bay	High	Moderate	Moderate	–	–	–	–	–	Sample discharge in 2020.
327 Cadboro Bay	49	Oak Bay	–	Low	–	–	–	–	Low	–	Resample in 2023.
503 Cadboro Bay	50	Saanich	–	–	–	–	High	Low	Moderate	–	Elevated PAHs in 2016. Resample in 2023.
505 Cadboro Bay	50	Saanich	Low	–	–	–	–	High	High	High	Overflow for CRD's Penrhyn Station. Elevated Pb, Hg and PAH in 505-3. Sample 505-1 or -3 to avoid tidal influence. Action Required. Saanich cleaned line out 2019. Hg elevated in sediment. Collect water sample. Continue to narrow down.
558 Mt. Douglas beach	59	Saanich	–	–	–	–	–	Low	–	–	Sample in 2022.
559 Douglas Creek	60	Saanich	–	Low	–	–	Low	Low	–	–	Sampled above weir (559-2) after spill June 17 had elevated zinc and PAHs. Resample in 2021.
574 Cordova Bay Road	63	Saanich	–	–	–	–	Low	–	–	–	Resample 2021.
578 Cordova Bay Road	63	Saanich	–	–	–	Low	–	–	–	–	Resample 2020.
586 Parker Avenue	64	Saanich	–	Moderate	–	–	–	–	Low	–	Sample in 2023.
589 Burnham Brook	65	Saanich	–	–	–	Low	–	–	–	–	Drains golf course. Sample in 2020.
592 Noble Creek	65	Saanich	–	–	Low	–	–	Low	–	–	Sample in 2020 (Noble Creek).
603 James Bay Anglers	36	Victoria	Low	High	–	–	–	Moderate	NA	–	Elevated zinc and PAH in 2017; no sediment in 2018. Action Required. Sediment not available. Confirm lower rating.
613 Government Street & Belleville	35	Victoria	–	–	Moderate	–	–	–	–	–	Sampled at 613-2 (MH D2719). Sample in 2020.
613A Government Street & Belleville	35	Victoria	–	–	High upstream	–	–	–	–	–	Rated high in 2014, due to mercury and zinc behind Crystal Gardens. Cease sampling, line is intertidal.

Table 3, continued

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time								Notes and Recommendations
			2012	2013	2014	2015	2016	2017	2018	2019	
614 Wharf & Government	35	Victoria	High upstream	–	Moderate	–	–	High upstream	Moderate	–	Elevated lead, mercury and zinc. Tidal. 614-1A is a short tributary, from a shallow line that drops into the discharge, confirmed by dye.
											Samples trapped at 614-2 in 2009 and 2014. Sampled 614-1A in 2017. Action Required. CRD narrowed down source. City of Victoria pumped out manhole at tourist sign and catch basin in front of Empress Hotel.
620 North of Johnson Street bridge	34	Victoria	High upstream	–	–	–	–	–	–	–	Action Required. Consistently rated high for zinc, but copper and lead elevated in past.
											Couldn't access site in 2018. Fire upstream in 2019, elevated metals in water. Resample in 2020.
627 Rock Bay	34	Victoria	Moderate to High upstream	Moderate to High upstream	–	–	–	–	–	–	Tidally influenced at discharge 627 and 627-3
											Action Required. Access difficult.
629 Rock Bay	26	Victoria	High upstream	–	–	–	–	–	–	–	Remediation being undertaken.
											Action Required. Access difficult.
630 Rock Bay	26	Victoria	–	–	–	–	–	–	–	–	Access difficult. Sample in 2020.
633 Bay Street Bridge	26	Victoria	–	–	–	–	–	Moderate	–	–	Sampled at 633-2. Resample in 2021.
634 David Street	26	Victoria	High	–	–	–	–	–	–	–	Action Required. Rated high for zinc in 2009. Metals in water elevated. Sample upstream in 2020.
635 Ralmax	26	Victoria	–	–	–	–	–	–	–	–	This discharge is tidal and cannot be sampled upstream; sampling ceased.
636 S. of Victoria works yard	26	Victoria	High	Moderate	High	–	–	–	Metals elevated in water	–	Zinc elevated in 2014. Other metals elevated in past. Action Required. Conducted water sampling in 2018.
641 Cecelia Creek	26	Victoria	High	Moderate upstream	Low	Moderate	–	–	Moderate	–	Zinc and PAH above freshwater sediment guidelines. Resample in 2021
645 Carrol Street	27	Victoria	–	–	–	–	–	–	Moderate	–	Site was inaccessible in 2017.
649 Gorge Road. Hospital	27	Victoria private	–	–	High	High	–	–	–	–	Copper, mercury and zinc elevated; Copper elevated in water sample; may be sampling historical sediment.
											Action Required. Hospital investigating sources; Continue water sampling.
653 Cedar Shore Appts	27	Saanich	–	–	–	–	–	–	–	–	Could not access site in 2018. Sample in 2020.
654 Cedar Shore Appts	27	Saanich private	–	Moderate	–	–	–	–	–	–	Rated high in past, but potential tidal influence.
											No sediment in 2016 or 2018. Attempt sampling in 2020.
655 E. of Gorge Bridge	28	Saanich	–	–	High	–	Low	Low	–	–	Resample in 2022.

Table 3, continued

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time								Notes and Recommendations
			2012	2013	2014	2015	2016	2017	2018	2019	
657 W. of Gorge Bridge	28	Saanich	–	–	Moderate	–	–	–	–	–	Tidal, sample at 657-1. Resample in 2020.
669 Dysart Road	29	Saanich	–	–	–	–	–	Moderate	–	–	Report of oil coming out of pipe in June 2018. No sediment in pipe in 2018 or 2019; Resample in 2020.
672 Adelaide Avenue	29	Saanich	–	–	Low	–	–	–	–	Moderate	Arsenic elevated; Confirm in 2020.
679 Gorge & Admirals	29	Saanich	–	Moderate	–	–	–	–	Low	–	Resample in 2023.
687 Westing Road	30	Saanich	–	–	–	–	Moderate	–	–	–	Resample in 2022.
689 Below Admirals Road	33	Saanich	Moderate	–	–	–	–	–	–	Low	Resample in 2024
690BB Foot of Dysart	33	Saanich	–	–	–	–	–	–	–	–	Tidal at discharge and no upstream sampling location.
690D Colquitz River	33	Saanich	Low	–	–	–	Low	Low	–	–	Resample in 2022.
690E Colquitz River	33	Saanich					Moderate	–	–	Low	Confirm in 2020.
692 Portage Road	32	Saanich	–	–	Moderate	–	–	–	–	High	Elevated zinc. Confirm in 2020.
695-1A Camden Avenue	32	View Royal	–	–	–	–	–	Moderate	–	Moderate	Zinc above ISQG; below PEL; Confirm rating in 2020.
697 Hospital Creek	31	View Royal	Low upstream	High upstream	High	–	–	–	–	–	Zinc in ditch near hospital parking lot. Source narrowed down. Cannot be sampled at discharge (sampling ceased).
698 Stillwater Road	31	View Royal	–	Moderate	Moderate	–	–	–	–	Moderate	Elevated PAHs in 2009. Resample in 2021
709B Craigflower Creek	31	View Royal	–	Low	–	Low	–	–	–	–	Continue monitoring.
710 Helmcken Road bridge	31	View Royal	Low	–	–	–	–	–	Moderate	Moderate	Resample in 2024.
712 Old Island Hwy	30	View Royal	Moderate	–	–	–	–	Moderate	Low	High	Elevated PAHs; Lead previously elevated. Confirm rating in 2020
722 Craigflower Bridge	30	View Royal	–	–	–	–	–	–	–	–	No sediment in 2016 or 2019. Copper and zinc elevated in water, upstream construction. Do more water sampling.
726 Craigflower & Admirals	29	Esquimalt	Moderate	–	–	–	–	Low	Low	–	Moderate rating confirmed. Resample in 2022.

Table 3, continued

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time								Notes and Recommendations
			2012	2013	2014	2015	2016	2017	2018	2019	
737 Garthland Road	29	Esquimalt	–	High	High	–	High	Low but High upstream	–	–	Elevated zinc and PAHs upstream. Action Required. Source appears to be catch basin in Garthland Place (737-1). Esquimalt asked to clean out manhole. Resample when action taken.
742 Sioux Place	28	Esquimalt	Low	High	High	–	–	High	–	Low upstream	Sampled at 742-2 as 742 is tidal. Source narrowed. Mercury 5X > guideline. Action Required. Esquimalt and golf course have been notified. Low mercury on the golf course.
744 Gorge-Esquimalt Park	28	Esquimalt	High	–	Moderate	Moderate	–	–	–	–	Resample in 2020.
749 Uganda Street	28	Esquimalt	High	Moderate upstream	High	Moderate	–	High	–	–	Samples marine-influenced before 2008. Zinc and mercury elevated in 2017. Appears to be food waste present upstream. Oil spill in past. Action Required. Source narrowed down. Esquimalt contacted. Resample after action taken
758A Bamfield Park	27	Victoria	–	–	–	–	–	–	–	–	Discharge is intertidal. Rating based on 758A-1. Resample in 2020.
767 Ocean Pt Resort	25	Victoria	–	–	–	–	–	–	–	–	Short line, all intertidal. Not accessible in 2016. Zinc elevated in 2005. Removed from action list as sediment has not been available since 2005.
780 Head Street	24	Esquimalt	High	–	Moderate	Moderate	–	–	–	–	Confirm rating in 2020.
781 Head Street	23	Esquimalt	–	–	–	High	–	–	–	–	Elevated lead in 2015. Not enough sediment in 2016. No sediment in 2017 or 2018.
806 Kinver Street	22	Esquimalt	High	High	High upstream	High upstream	–	–	–	–	Copper and zinc in discharge; zinc and PAH upstream of Hatfield and Kinver, but not farther upstream. Action Required. CRD narrowed down to within two blocks. Resample discharge in 2020.
847 Concrete building	19	DND	Moderate	–	–	–	–	–	–	–	Action no longer required. Rating confirmed. Could not access site in 2018. Resample in 2021.
849 Fleet building	19	DND	High	High	Moderate	Moderate	–	–	–	–	Findings shared with DND.
866 Portage Park	16	View Royal	–	–	High	–	–	–	High upstream	–	Action Required. Rated high for zinc. Narrowed down; potentially historic source. Elevated copper and zinc in stream. View Royal to clean out manhole and catch basins upstream.
873 Helmcken Road	16	View Royal	–	–	Moderate	Moderate	–	–	–	–	Resample in 2020.
873A Helmcken Road	16	View Royal	–	–	–	–	–	–	–	–	Sampled at 873 to represent discharge of 873, 873A and 873C. Zinc elevated in ditch upstream likely due to corroded pipe. Zinc low at discharge.
873C Helmcken Road	16	View Royal	–	High	Moderate	Moderate	–	–	–	–	Sampled at 873 to represent discharge of 873, 873A and 873C. Corroded pipe upstream but zinc low at discharge.
874 Tovey Bay	15	View Royal	–	–	–	–	–	–	–	–	Action Required. Zinc and PAH. Source may be corroded pipe Resample in 2020.

Table 3, continued

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time								Notes and Recommendations
			2012	2013	2014	2015	2016	2017	2018	2019	
875 View Royal Avenue	15	View Royal	–	–	–	Low	–	–	–	–	Resample in 2020.
879 Price Road	15	View Royal	–	–	–	Moderate	–	–	–	–	Confirm rating in 2020.
882 Parsons Bridge	13	View Royal	–	–	–	–	–	Moderate	–	–	No sediment in 2019.
886 Millstream Creek	14	View Royal	–	–	Low	–	–	–	Low	–	Resample in 2023 (Mill Stream Creek).
887 Wilfert Road	14	View Royal	–	–	–	–	–	–	–	–	Low in past. No sediment in 2018 or 2019.
902 Joe's Creek	13	DND	–	–	–	–	–	–	Low	–	Resample in 2023 (Joe's Creek).
916 Colwood Creek	9	Royal Roads	–	Low	–	–	–	Low	–	–	Resample in 2022.
921 Esquimalt Lagoon	8	Royal Roads	–	–	–	–	–	–	–	Low	Resample in 2024.
922 Hatley Creek	8	Royal Roads	–	–	–	–	–	–	–	Low	Resample in 2024.
926 Bee Ck.	8	Colwood	–	–	–	–	Low	–	–	Low	Elevated arsenic measured upstream. Resample in 2020.
927 Miller Brook	8	Colwood	–	Moderate	–	–	–	–	Low	–	Resample in 2023.
928 Selleck Creek	8	Colwood	Low	–	–	–	–	Low	–	Moderate	Sampled with 5 in 30s; Resample in 2024.
931 Lagoona Brook	7	Colwood	–	–	Low	–	–	–	–	Low	Resample in 2024.
932 S end Esquimalt Lagoon	7	Colwood	–	–	Low	–	–	–	–	Low	Resample in 2024.
933 S end Esquimalt Lagoon	7	Colwood	–	–	–	–	Low	–	–	–	Resample in 2021.
934 Ocean Blvd	7	Colwood	–	–	–	Low	–	–	–	–	Resample in 2020.
937 Ocean Blvd	7	Colwood	–	–	Low	–	–	–	–	Low	Resample in 2024.
6003 Goldstream River	67	Langford	Low	–	–	–	Low	–	–	Low	Resample in 2021.
6004 Saanich Inlet	67	Langford	High	Low	Low	–	–	–	–	Low	Resample in 2024.

Table 3, continued

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time								Notes and Recommendations
			2012	2013	2014	2015	2016	2017	2018	2019	
6006 Saanich Inlet	68	Langford	–	High	–	–	–	High	–	–	Action Required.
											Resample after action is taken. Creosote log pile is likely source.
6008 Trans Canada	68	Langford	–	–	–	–	–	–	Moderate	Moderate	Slightly elevated zinc. Sample water in 2020.

Notes:
¹Contaminant rating for a discharge is based on samples collected at the point of discharge. Ratings from samples collected upstream are indicated.
Ratings from 2012 to 2019 are displayed; refer to previous reports for ratings prior to 2012.
Metals: arsenic As, cadmium Cd, chromium Cr, copper Cu, lead Pb, mercury Hg, silver Ag and zinc Zn.
Organic substances: high and low molecular weight polycyclic aromatic hydrocarbons HPAH and LPAH.
u/s is upstream

Table 4. Freshwater Stream Sediment Analytical Data (2019)

			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH
CCME (ISQG)			5.9	0.6	37.3	35.7	35	0.17	0.5	123	0.1	0.1
CCME (PEL)			17	3.5	90	197	91	0.486	-	315		
Vancouver Island Background		Date	4	0.95	65	100	40	0.15	1	150	-	-
Bowker Creek	SW0316	2019-10-16	3.68	0.102	20.6	26.8	13.2	< 0.05	< 0.05	122	0.27	0.051
	SW0316	2019-10-31	2.37	0.092	16.1	18.8	14.3	< 0.05	< 0.05	94.2	3.1	0.24
	SW0316-1A	2019-09-05	4.17	0.089	23.9	33	29.4	< 0.05	< 0.05	<i>141</i>	0.99	0.12
	SW0316-3B	2019-10-16	3.95	0.087	31.6	43.4	12.8	< 0.05	< 0.05	114	0.93	0.27
	SW0316-3B	2019-10-31	2.45	0.100	20.7	30.5	16.7	< 0.05	< 0.05	99.3	0.39	0.067
	SW0316-4B	2019-10-16	2.53	0.137	36.7	31.5	23.6	< 0.05	< 0.05	115	1.5	0.32
	SW0316-4B	2019-10-31	3.14	0.132	25.3	38.9	35.0	< 0.05	< 0.05	145	0.96	0.35
	SW0316-5	2019-10-16	5.72	0.094	24	23.9	10.2	< 0.05	< 0.05	90.7	0.18	0.043
	SW0316-5	2019-10-31	7.28	0.108	27.4	26.2	13.6	< 0.05	< 0.05	104	0.18	0.031
	SW0316-5C	2019-11-29	3.03	0.539	40.6	73.1	66.6	0.102	0.252	247	1.1	0.22
	SW0316-5D	2019-11-29	12.9	1.34	42.9	232	106	0.179	0.46		1.3	0.33
Bee Creek	SW0926	2019-09-05	1.61	< 0.05	17.5	9.44	4.85	< 0.05	< 0.05	33	0.76	0.25
	SW0926	2019-10-17	1.13	0.11	15.1	7	3.85	< 0.05	< 0.05	24	0.96	0.33
	SW0926-2	2019-10-31	42.2	0.319	20.6	29.0	13.5	< 0.05	0.188	71.4	0.42	0.37
Selleck Creek	SW0928	2019-10-17	2.69	0.096	22	23.5	6.09	< 0.05	< 0.05	58.5	0.41	0.07
	SW0928	2019-10-31	4.91	0.207	25.4	39.2	15.6	0.053	0.062	94.7	3.4	0.46
Stream	SW6003	2019-10-25	3.69	0.056	33.2	21.2	8.76	< 0.05	< 0.05	49.1	0.15	0.015
Boathouse ditch	SW6004	2019-10-25	6.13	0.152	37.7	42.4	13.2	< 0.05	0.058	92.4	0.075	0.013
Stream	SW6008	2019-10-25	2.18	0.167	104	80.3	149	< 0.05	< 0.05	206	0.4	0.075

Notes:
Concentrations are in mg/kg
LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively
CCME = Canadian Council of Ministers of the Environment
ISQG = interim sediment quality guideline; concentrations above this level but below the PEL will occasionally result in adverse effects on aquatic life
PEL = probable effects level; concentrations above this level will frequently result in adverse effects to aquatic life
Vancouver Island Background Concentrations are regional estimates (95th percentiles); https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_4.pdf
Italicized values are those that exceed a guideline but are below the Vancouver Island background concentration
value is greater than or equal to the CCME ISQG
value is greater than or equal to the CCME PEL

Table 5. 2019 Aqueous Metals in Stormwater Discharges Data

			Aluminum		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Zinc		Sample Comments
			DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	
	Marine Aquatic Life Guidelines	max	-	-	-	12.5	-	0.12	-	-	-	3	-	-	-	140	-	10	
		average	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	-	
	Freshwater Aquatic Life Guidelines	max	100	-	-	5	0.29	-	-	1/9 ¹	-	6.7	350	1000	-	34	-	33	
		average	50	-	-	-	0.13	-	-	-	-	2	-	-	-	5	-	7.5	
SW0316	Bowker Ck, south of Somass Drive	2019-10-16	21	272	0.709	0.774	<0.005	0.0071	0.49	0.94	6.39	8.17	104	465	0.342	1.26	5.68	12.2	sewer odour, clear
		2019-10-21	19	237	0.967	0.961	0.0066	0.0136	0.58	1.02	5.75	8.42	118	435	0.402	1.16	12.9	21	no odour, clear
		2019-10-31	5.91	21.4	0.681	0.708	<0.005	0.0056	0.34	0.36	2.71	2.86	42.4	113	0.0504	0.13	3.72	4.42	no odour, clear
		2019-11-07	5.87	21.6	0.597	0.663	<0.005	<0.005	0.18	0.2	2.54	2.78	73.4	178	0.062	0.187	3.72	4.37	no odour, clear
SW0505-3	Manhole at Penrhyn Pump Station	2019-11-25		689		1.01		0.0493		2.29		8.65		1940		6.34		18.7	sulphur odour, slight murky flow
SW0636-1A	Manhole #D3043, Bridge Street and David Street	2019-12-04		1100		1.09		0.718		3.11		149		2470		16.1		175	vinegar/diesel odour, white murky with oily sheen
SW0636-3A	Manhole #D4784 in BC Transit Yard; Garbally Road	2019-12-04		444		2.44		0.243		1.39		23.5		976		2.75		86.1	chemical/creosote odour, with turbid brown
SW0690D-11	Mohan Br. (Colquitz River watershed)	2019-12-06		43.2		0.788		0.0156		0.32		6.24		279		0.12		39.9	no odour, clear
SW0690D-12	Haliburton Br. at bridge	2019-11-28	4.32		0.544		0.0053		0.19		2.51		61.9		0.0245		1.96		no odour, clear
		2019-12-11	5.39		0.459		<0.005		0.14		1.51		22.1		0.0097		0.39		no odour, clear
SW0690D-15	Hamsterly Ck/Whiskey Ck, east side of beach	2019-11-28	28.9		0.327		0.0057		0.31		1.82		438		0.183		7.67		no odour, clear
		2019-12-11	30.2		0.344		0.0059		0.32		1.94		487		0.178		6.97		no odour, clear
SW0690D-17	O'Donnell Ck, at bridge	2019-11-28	24.3		0.419		<0.005		0.22		1.41		137		0.028		2.67		no odour, clear
		2019-12-11	29.8		0.512		0.0058		0.2		1.44		200		0.0377		2.97		no odour, clear
SW0690D-23	Linnet Ck, access off of Linnet Lane	2019-11-28	17.5		0.16		<0.005		0.12		0.753		33		0.0061		0.24		no odour, clear
		2019-12-11	15.4		0.146		<0.005		0.11		0.705		33.5		0.0065		0.14		no odour, clear
SW0690D-8	Colquitz River, downstream of Beaver Lake	2019-11-28	1.66		0.852		<0.005		<0.1		0.213		11.5		0.0069		0.38		no odour, clear
		2019-12-11	1.1		0.802		<0.005		<0.1		0.216		11.4		0.0067		0.78		no odour, clear
SW0690D-8B	Beaverdale Ck, 4697 West Saanich Road	2019-12-11	30.8		0.29		<0.005		0.16		0.27		840		0.0761		0.94		no odour, clear, sampled at 716 Beaver Lake Rd (upstream of dedicated sample station)
SW0690E	Pipe, Garry Road at Cuthbert Holmes Park	2019-12-04		121		0.624		0.0097		0.61		3.04		150		0.057		1.3	no odour, clear
SW0692	Pipe, end of Portage Road	2019-12-04		17.7		0.272		0.0091		0.17		2.02		111		0.0345		4.9	no odour, clear, evidence of Otter den
SW0695-1A	Ditch, debris trap, Camden Avenue at St. Giles Street	2019-11-27		191		0.471		0.0078		0.36		2.92		188		0.13		4.63	no odour, clear
SW0698	Pipe, end of Stillwater Road	2019-11-27		527		1.24		0.0538		1.02		11.9		918		3.12		17.9	no odour, clear
SW0710	Pipe, 15 m south of Helmcken Road Bridge	2019-11-27		63.3		0.365		0.0116		0.22		2.43		94.1		0.0436		4.38	no odour, clear
SW0712	Pipe, east of E&N Railway, north of Old Island Hwy	2019-11-27		30.6		0.361		0.0175		0.21		4.17		48.9		0.068		5.1	no odour, clear
SW0722	Pipe, under Craigflower Bridge	2019-11-27		18700		3.5		0.69		15.7		79.1		16800		30.2		148	no odour, very turbid (construction upstream)
		2019-12-04		297		0.757		0.0149		0.8		3.91		438		1.1		16.3	no odour, clear
SW0921	Spring channel, 65 m west of 920	2019-11-27		57.3		0.589		0.005		0.6		1		432		0.2		2.2	no odour, clear
SW0922	Hatley Ck, 100 m south of 921	2019-11-27		41.2		0.649		<0.005		0.89		1.08		162		0.092		<1	no odour, clear
SW0926	Bee Ck, north of Ocean Grove	2019-10-17	13.9	89.8	0.341	0.412	<0.005	<0.005	0.28	0.46	0.446	0.62	82	239	0.0242	0.102	0.64	<1	no odour, clear, construction upstream
		2019-10-31	5.11	41	0.239	0.289	<0.005	<0.005	0.16	0.27	0.254	0.4	31.5	116	0.0112	0.053	<0.1	<1	no odour, construction upstream clear
		2019-11-07	5.05	48.9	0.247	0.281	<0.005	<0.005	0.12	0.31	0.209	0.48	23.3	145	<0.005	0.075	0.22	<1	no odour, clear, construction upstream
SW0928	Selleck Ck, foot of Portsmouth Drive	2019-10-17	6.71	71.4	0.209	0.232	<0.005	<0.005	0.31	0.4	0.796	1	52.3	149	0.0181	0.121	0.95	1.6	no odour, clear, construction upstream
		2019-10-21	11	862	0.262	0.571	<0.005	0.0312	0.26	1.99	1.09	5.71	49.7	1450	0.0346	1.89	1.63	12.4	no odour, clear
		2019-10-31	3.73	22	0.176	0.25	<0.005	0.0856	0.23	0.34	0.526	0.902	32.3	59.5	0.0076	0.131	0.47	1.35	no odour, clear
SW0931	Lagoon Br, Esquimalt Lagoon	2019-10-21		57.2		0.197		0.0086		0.61		1.92		62.2		0.187		3.4	no odour, clear
SW0932	Ditch, south end of Esquimalt Lagoon	2019-10-21		90.6		0.143		0.0699		0.52		1.43		126		0.203		6.3	no odour, clear
SW0937	Pipe, below north side of Ocean Blvd cul de sac	2019-10-21		46.1		0.19		0.0297		0.55		1.12		60.9		0.148		9.2	no odour, clear
SW6003	Goldstream River	2019-10-25		56.8		0.193		<0.005		0.16		0.89		79.4		0.067		<1	no odour, discharge clear, spawning salmon
SW6004	Stream; west side of Saanich Inlet	2019-10-25		18.5		0.112		<0.005		<0.1		0.498		9.5		0.0137		0.39	no odour, clear
SW6008	Stream; bedside 3680 Trans Canada Hwy	2019-10-25		20.6		0.128		0.0075		<0.1		0.645		53.6		0.0472		9.38	no odour, clear

Table 5, continued

Notes:
All data is in ug/L
DIS = dissolved state; TOT = total state
British Columbia water quality guidelines for protection of freshwater or marine aquatic life were used for comparison
Although aquatic life guidelines would not apply to storm drains, as they are not viable habitat for aquatic life, these comparisons indicate potential impacts to the marine environment
a hardness of 50 mg/L CaCO₃ was used to calculate hardness dependant water quality parameters
¹ Cr(IV) / Cr (III)

XX	value exceeds the provincial guideline for protection of freshwater aquatic life
XX	value exceeds the provincial guideline for protection of marine aquatic life
XX	value exceeds the provincial guideline for the marine and freshwater aquatic life
<u>XX</u>	Italicized value exceeds a guideline which is only partially applicable. Further investigation is needed.

APPENDIX F
2019 WATERCOURSE MONITORING DATA

Table 1 Summary Table for 5 in 30 Water Quality Data Collected for Bowker, Bee and Selleck Creeks in 2019

Creek/Station/Season	Parameter		Flow Rate	Oxygen	pH	Sp. Conductivity	Temp.	Turbidity	Aluminum	Aluminum	Antimony	Antimony	Arsenic	Arsenic
	State		NA	DISS	NA	NA	NA	NA	DISS	TOT	DISS	TOT	DISS	TOT
	Unit		L/min	mg/L	pH units	µS/cm	°C	NTU	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum		5 ¹	6.5 to 9	80 ²	17 ³	9 ⁴	100			20 ⁵		5
		average		8 ¹				6 ⁴	50					
Bowker Creek														
Discharge SW0316	n		5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		975	7.45	6.87	223.8	15.9	1.24	8.45	29.7	0.397	0.394	0.912	0.873
	max		975	9.16	7.7	368.9	17.1	5.65	22.2	152	0.776	0.836	1.19	1.25
	average		975	8.61	7.4	311.4	17	2.68	12.2	69	0.509	0.517	0.996	1.02
	standard deviation		0	0.7	0.3	53	0.5	1.8	5.7	49	0.15	0.18	0.11	0.1
	standard error		0	0.3	0.1	24	0.2	0.8	2.6	22	0.07	0.08	0.05	0.1
winter	n		4	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		1500	9.2	6.56	47.4	8	1.11	5.87	21.4	0.272	0.25	0.597	0.663
	max		3000	11.38	7.69	448.4	13.1	54.6	29.1	1410	0.584	0.845	0.967	1.33
	average		2125	10.27	7.36	240	11	16	16.18	392.4	0.393	0.522	0.737	0.887
	standard deviation		629	0.8	0.5	150	2	22	10	581	0.131	0.234	0.1	0.3
	standard error		315	0.4	0.2	67	1	10	5	260	0.058	0.105	0.1	0.1
Bowker SW0316-3B	n		5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		900	4.86	7.16	260	17	1.78	7.61	57.7	0.224	0.217	0.686	0.651
	max		900	5.35	7.31	294	18	2.73	13	97.5	0.462	0.499	0.844	0.959
	average		900	5.15	7.24	278.8	17.5	2.33	9.9	68	0.286	0.298	0.766	0.80
	standard deviation		0	0.2	0.1	13	0.4	0.3	2	17	0.099	0.114	0.1	0.1
	standard error		0	0.1	0.0	6	0.2	0.2	1	8	0.044	0.051	0.03	0.05
winter	n		4	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		1500	5.89	6.58	58	10.1	2.06	5.68	38.9	0.204	0.207	0.499	0.607
	max		4000	9.81	7.41	392.5	13.5	30.3	25.5	927	0.517	0.689	0.69	1.13
	average		2150	7.68	7.15	247.7	12.3	12.7	14.7	315	0.337	0.447	0.601	0.77
	standard deviation		1234	1.6	0.3	133	1.5	12.6	9.5	363	0.138	0.233	0.1	0.2
	standard error		617	0.7	0.2	59	0.7	5.6	4.2	162	0.062	0.104	0.0	0.1
Bowker SW0316-4B	n		5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		800	7.1	7.3	233.7	18.3	2.5	9.88	78.2	0.185	0.186	0.843	0.936
	max		800	7.98	7.55	260.9	18.7	7.63	14.9	156	0.254	0.264	0.963	1.04
	average		800	7.57	7.5	244.1	18.5	4.20	11.9	110	0.216	0.221	0.905	0.97
	standard deviation		0	0.3	0.1	12	0.2	2.1	1.9	36	0.025	0.028	0.1	0.0
	standard error		0	0.1	0.04	5	0.1	0.9	0.9	16	0.011	0.012	0.0	0.0
winter	n		4	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		1000	8.6	6.66	61	12.2	2.24	6.81	45.9	0.089	0.113	0.362	0.446
	max		3000	9.68	7.62	326.1	14.2	28.4	30.3	768	0.556	0.773	0.845	1.17
	average		1625	9.11	7.2	190.9	13.2	12.7	17.4	299	0.299	0.425	0.709	0.83
	standard deviation		946	0.4	0.4	104	0.9	12.7	10.9	300	0.181	0.291	0.2	0.3
	standard error		473	0.2	0.2	47	0.4	5.7	4.9	134	0.081	0.130	0.1	0.1

Table 1, continued

Station	Parameter		Flow Rate	Oxygen	pH	Sp. Conductivity	Temp.	Turbidity	Aluminum	Aluminum	Antimony	Antimony	Arsenic	Arsenic
	Dissolved or Total State		NA	DISS	NA	NA	NA	NA	DISS	TOT	DISS	TOT	DISS	TOT
	Unit		L/min	mg/L	pH units	µS/cm	°C	NTU	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum		5 ¹	6.5 to 9	80 ²	17 ³	9 ⁴	100			20 ⁵		5
		average		8 ¹				6 ⁴	50					
Bowker SW0316-5	n		5	5	5	5	5	5	5	5	5	5	5	5
	summer	% non-detects	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		min	200	5.53	6.58	108.3	16.9	2.09	4.51	54.8	0.116	0.129	0.395	0.412
		max	300	6.45	6.8	149	18.6	3.59	10.7	80.1	0.176	0.195	0.568	0.635
		average	250	5.97	6.7	125.8	17.5	2.55	7.4	67	0.143	0.156	0.485	0.52
		standard deviation	35	0.4	0.1	15	1	0.6	2.3	12	0.026	0.029	0.1	0.1
		standard error	16	0.2	0.0	7	0.3	0.3	1.1	5	0.012	0.013	0.03	0.04
	winter	n	5	5	5	5	5	5	5	5	5	5	5	5
		% non-detects	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		min	80	5.27	6.44	117.2	10.4	1.63	9.39	41	0.106	0.1	0.335	0.399
		max	1000	8.08	6.74	174	13.7	26.2	43	878	0.36	0.515	0.899	1.31
		average	736	6.2	6.6	150.3	12.3	10	21.1	264	0.230	0.289	0.565	0.70
		standard deviation	380	1.2	0.1	21	1.4	10.7	14	354	0.115	0.180	0.2	0.4
		standard error	170	0.5	0.0	9	0.6	4.8	6	158	0.051	0.081	0.1	0.2
Bee Creek Discharge (SW0926)														
summer														
	n		5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	60%	60%	0%	0%
	min		1400	9.57	7.7	274.5	13.3	4.28	4.57	65.4	0.02	0.02	0.301	0.331
	max		1400	10.72	7.78	359.4	14.4	10.9	5.98	155	0.024	0.022	0.336	0.404
	average		1400	10.24	7.8	336.8	13.7	6.4	5.3	105	0.021	0.020	0.317	0.37
	standard deviation		0	0.4	0.0	36	0.5	2.6	1	35	0.002	0.001	0.01	0.04
	standard error		0	0.2	0.0	16	0.2	1.2	0	16	0.001	0.000	0.01	0.02
winter	n		5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	80%	60%	0%	0%
	min		1800	10.31	7.33	325.4	8.3	3.45	5.05	41	0.02	0.02	0.239	0.281
	max		3000	11.67	7.7	374.6	11.1	31.8	40.9	432	0.04	0.041	0.417	0.69
	average		2120	10.98	7.6	359.4	10.1	14	15.3	201	0.02	0.026	0.316	0.44
	standard deviation		502	0.5	0.2	21	1.2	14	14.8	195	0.01	0.009	0.07	0.17
	standard error		224	0.2	0.1	9	0.5	6	6.6	87	0.00	0.004	0.03	0.08
Selleck Creek Discharge (SW0928)														
summer	n		5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	40%	40%	0%	0%
	min		700	8.61	7.46	119	15.7	1.27	2.59	16.3	0.02	0.02	0.149	0.15
	max		700	9.5	7.66	382.7	17.3	3.9	4.01	81.5	0.03	0.022	0.249	0.174
	average		700	9.01	7.5	322.0	16.2	2.1	3.12	45	0.02	0.02	0.190	0.2
	standard deviation		0	0.4	0.1	114	0.6	1.0	0.54	26	0.002	0.001	0.042	0.0
	standard error		0	0.2	0.0	51	0.3	0.5	0.24	12	0.001	0.000	0.019	0.0
winter	n		5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%
	min		1000	9.87	6.9	127.8	7.6	1.01	3.42	15.9	0.02	0.02	0.166	0.185
	max		2000	11.13	7.47	404.7	12.9	28.3	11.2	963	0.05	0.077	0.262	0.571
	average		1300	10.38	7.3	326.8	10.6	11.6	7.2	387	0.03	0.054	0.213	0.34
	standard deviation		447	0.5	0.2	115	2.3	13.6	3.78	482	0.01	0.03	0.04	0.16
	standard error		200	0.2	0.1	51	1.0	6.1	1.69	215	0.01	0.01	0.02	0.07

Table 1, continued

Station	Parameter		Barium	Barium	Beryllium	Beryllium	Bismuth	Bismuth	Boron	Boron	Cadmium	Cadmium	Caffeine	Calcium	Calcium	Chromium	Chromium
	Dissolved or Total State		DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum		5,000 ⁵		0.13 ⁵				1,200	0.09-0.26 ⁶						1 / 9 ^{5,7}
		average		1,000 ⁵							0.1-0.3 ⁶						
Bowker Creek																	
Discharge SWO316	n		5	5	5	5	5	5	5	5	5	5	4	5	5	5	5
summer	% non-detects		0%	0%	100%	100%	100%	80%	0%	0%	100%	60%	25%	0%	0%	0%	0%
	min		10.4	10.8	0.01	0.01	0.005	0.005	43	51	0.005	0.005	0.02	17.8	18.3	0.21	0.27
	max		13.4	14	0.01	0.01	0.005	0.017	73	79	0.005	0.0066	0.103	31.8	31.8	0.91	1.21
	average		11.9	12.4	0.01	0.01	0.005	0.010	61	64	0.005	0.00548	0.06	27	27.2	0.38	0.49
	standard deviation		1.4	1	0.0	0.00	0.0	0.004	12	11	0.000	0.001	0.03	5	5	0.30	0.40
	standard error		0.6	1	0.0	0.00	0.0	0.002	5	5	0.000	0.000	0.02	2	2	0.13	0.18
winter	n		5	5	5	5	5	5	5	5	5	5	2	5	5	5	5
	% non-detects		0%	0%	100%	80%	100%	40%	0%	0%	80%	20%	0%	0%	0%	0%	0%
	min		3.15	9.02	0.01	0.01	0.005	0.005	14	13	0.005	0.005	0.414	3.78	4.35	0.18	0.2
	max		14.6	15.3	0.01	0.025	0.005	0.089	129	123	0.0066	0.0515	0.581	35.3	36.5	1.36	4.36
	average		9.8	13	0.01	0.013	0.005	0.0256	62	61.4	0.005	0.017	0.498	21.136	20.85	0.59	1.4
	standard deviation		5	2	0.0	0.01	0.0	0.04	45	42	0.001	0.020	0.12	13	13	0.46	2
	standard error		2	1	0.0	0.00	0.0	0.02	20	19	0.000	0.009	0.08	6	6	0.20	1
Bowker SW0316-3B	n		5	5	5	5	5	5	5	5	5	5	4	5	5	5	5
summer	% non-detects		0%	0%	100%	100%	100%	100%	0%	0%	60%	60%	50%	0%	0%	0%	0%
	min		8.97	8.92	0.01	0.01	0.005	0.005	51	52	0.005	0.005	0.02	23.1	21.5	0.16	0.23
	max		11.4	12	0.01	0.01	0.005	0.01	59	66	0.0064	0.0105	0.074	25.2	25.9	0.35	0.53
	average		10.0	10.6	0.01	0.01	0.005	0.009	56	59	0.005	0.006	0.04	24.52	24.6	0.21	0.31
	standard deviation		1	1	0.0	0.00	0.0	0.0	3	5	0.001	0.002	0.03	1	2	0.08	0.12
	standard error		0	0	0.0	0.00	0.0	0.0	1	2	0.000	0.001	0.01	0	1	0.04	0.06
winter	n		5	5	5	5	5	5	5	5	5	5	2	5	5	5	5
	% non-detects		0%	0%	100%	60%	100%	60%	0%	0%	80%	20%	0%	0%	0%	0%	0%
	min		4.03	9.93	0.01	0.01	0.005	0.005	18	19	0.005	0.005	0.508	5.04	5.55	0.15	0.24
	max		13.3	13.8	0.01	0.017	0.005	0.052	72	65	0.0064	0.0332	0.634	33.6	31.6	1.25	3.2
	average		9.9	12.4	0.01	0.0116	0.005	0.02	49	48	0.005	0.014	0.571	21.488	20.8	0.49	1.2
	standard deviation		4	2	0.000	0.003	0.000	0.020	22	20	0.001	0.012	0.09	12	11	0.45	1.2
	standard error		2	1	0.000	0.001	0.000	0.009	10	9	0.000	0.005	0.06	5	5	0.20	0.5
Bowker SW0316-4B	n		5	5	5	5	5	5	5	5	5	5	4	5	5	5	5
summer	% non-detects		0%	0%	100%	100%	100%	80%	0%	0%	100%	40%	25%	0%	0%	0%	0%
	min		8.16	8.82	0.01	0.01	0.005	0.005	40	43	0.005	0.005	0.02	20.8	20.2	0.22	0.35
	max		8.99	10.2	0.01	0.01	0.005	0.01	48	53	0.005	0.0083	0.069	23.1	23.6	0.32	0.52
	average		8.6	9.5	0.01	0.01	0.005	0.01	44	48	0.005	0.006	0.05	21.62	21.6	0.25	0.42
	standard deviation		0	1	0.00	0.00	0.00	0.002	3	5	0.000	0.001	0.02	1	1	0.04	0.07
	standard error		0	0	0.00	0.00	0.00	0.001	1	2	0.000	0.001	0.01	0	1	0.02	0.03
winter	n		5	5	5	5	5	5	5	5	5	5	2	5	5	5	5
	% non-detects		0%	0%	100%	80%	100%	60%	0%	0%	40%	20%	0%	0%	0%	0%	0%
	min		4.35	7.06	0.01	0.01	0.005	0.005	15	15	0.005	0.005	0.584	5.02	5.18	0.22	0.24
	max		10.5	11.8	0.01	0.015	0.005	0.059	96	96	0.0105	0.0395	192	28.7	28.3	1.58	3.16
	average		7.8	10.3	0.01	0.011	0.005	0.03	44	46	0.007	0.016	96.3	16.264	16.1	0.64	1.25
	standard deviation		3	2	0.00	0.00	0.00	0.02	32	32	0.002	0.014	135	9	9	0.57	1.24
	standard error		1	1	0.00	0.00	0.00	0.01	15	14	0.001	0.006	95.7	4	4	0.26	0.55

Table 1, continued

Station	Parameter		Barium	Barium	Beryllium	Beryllium	Bismuth	Bismuth	Boron	Boron	Cadmium	Cadmium	Caffeine	Calcium	Calcium	Chromium	Chromium
	Dissolved or Total State		DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum		5,000 ⁵		0.13 ⁵				1,200	0.09-0.26 ⁶						1 / 9 ^{5,7}
		average		1,000 ⁵							0.1-0.3 ⁶						
Bowker SW0316-5	n		5	5	5	5	5	5	5	5	5	5	4	5	5	5	5
summer	% non-detects		0%	0%	100%	100%	80%	100%	40%	20%	80%	40%	100%	0%	0%	20%	0%
	min		3.78	4.82	0.01	0.01	0.005	0.005	10	10	0.005	0.005	0.02	8.98	9.15	0.1	0.18
	max		5.04	5.92	0.01	0.01	0.011	0.01	12	16	0.0104	0.26	0.02	11.9	12.1	0.19	0.29
	average		4.6	5.5	0.01	0.01	0.0062	0.01	11	13	0.006	0.057	0.020	10.564	10.6	0.14	0.23
	standard deviation		1	0	0.00	0.0	0.003	0.00	1	3	0.002	0.114	0.00	1	1	0.04	0.05
	standard error		0	0	0.00	0.0	0.001	0.00	0	1	0.001	0.051	0.00	1	1	0.02	0.02
winter	n		5	5	5	5	5	5	5	5	5	5	2	5	5	5	5
	% non-detects		0%	0%	100%	80%	100%	40%	0%	0%	20%	0%	0%	0%	0%	0%	0%
	min		5.2	6.07	0.01	0.01	0.005	0.005	10	12	0.005	0.0058	0.085	8.67	8.52	0.16	0.2
	max		8.38	14.3	0.01	0.018	0.005	0.02	20	20	0.0132	0.0446	0.411	14	13.2	1.07	2.53
	average		7.0	9.1	0.01	0.012	0.005	0.01	15	16	0.008	0.021	0.248	11.5	11.3	0.42	0.9
	standard deviation		1	3	0.00	0.004	0.00	0.01	4	3	0.003	0.016	0.23	1.9	2	0.4	1
	standard error		1	2	0.00	0.002	0.00	0.003	2	1	0.001	0.007	0.16	0.9	1	0.2	0
Bee Creek Discharge (SW0926)																	
summer																	
	n		5	5	5	5	5	5	5	5	5	5	3	5	5	5	5
	% non-detects		0%	0%	100%	100%	100%	100%	0%	0%	100%	40%	100%	0%	0%	0%	0%
	min		4.46	5.25	0.01	0.01	0.005	0.01	31	28	0.005	0.005	0.02	32.3	33.2	0.13	0.3
	max		4.59	6.42	0.01	0.01	0.005	0.01	38	40	0.005	0.0087	0.02	35.7	33.8	0.18	0.51
	average		4.5	5.8	0.01	0.01	0.005	0.01	34	35	0.005	0.006	0.020	34	33.5	0.15	0.39
	standard deviation		0.05	0.42	0.00	0.00	0.00	0.00	3	4	0.000	0.002	0.00	1.4	0.3	0.02	0.1
	standard error		0.02	0.19	0.00	0.00	0.00	0.00	1	2	0.000	0.001	0.00	0.6	0.1	0.01	0.0
winter	n		5	5	5	5	5	5	5	5	5	5	2	5	5	5	5
	% non-detects		0%	0%	100%	100%	100%	100%	0%	0%	100%	60%	100%	0%	0%	0%	0%
	min		4.34	4.81	0.01	0.01	0.005	0.01	29	28	0.005	0.005	0.02	30.6	30.8	0.12	0.27
	max		6.08	9.39	0.01	0.01	0.005	0.01	33	35	0.005	0.0141	0.05	35.6	35.5	0.46	1.4
	average		5.2	6.8	0.01	0.01	0.005	0.01	31	32	0.005	0.008	0.035	33.3	33	0.25	0.7
	standard deviation		0.72	2.05	0.00	0.00	0.00	0.00	2	3	0.000	0.005	0.02	1.9	2	0.13	0.51
	standard error		0.32	0.92	0.00	0.00	0.00	0.00	1	1	0.000	0.002	0.02	0.8	1	0.06	0.23
Selleck Creek Discharge (SW0928)																	
summer	n		5	5	5	5	5	5	5	5	5	5	4	5	5	5	5
	% non-detects		0%	0%	100%	100%	100%	100%	0%	0%	100%	100%	100%	0%	0%	0%	0%
	min		4.45	4.52	0.01	0.01	0.005	0.01	36	33	0.005	0.005	0.02	32.4	34.1	0.17	0.22
	max		4.76	5.3	0.01	0.01	0.005	0.01	42	43	0.005	0.005	0.02	35.8	35.5	0.24	0.34
	average		4.63	5.0	0.01	0.01	0.005	0.01	38	37	0.005	0.005	0.020	34.2	34.6	0.20	0.27
	standard deviation		0.14	0.3	0.00	0.00	0.00	0.00	2	4	0.000	0.000	0.00	1.5	0.5	0.03	0.05
	standard error		0.06	0.1	0.00	0.00	0.00	0.00	1	2	0.000	0.000	0.00	0.7	0.2	0.01	0.02
winter	n		5	5	5	5	5	5	5	5	5	5	2	5	5	5	5
	% non-detects		0%	0%	100%	60%	100%	80%	0%	0%	100%	40%	100%	0%	0%	0%	0%
	min		4.96	5.11	0.01	0.01	0.005	0.005	26	26	0.005	0.005	0.02	29.4	28.9	0.23	0.26
	max		5.75	11.3	0.01	0.026	0.005	0.0228	36	35	0.005	0.0856	0.05	36	37.3	0.31	2.23
	average		5.4	7.6	0.01	0.0154	0.005	0.012	32	33	0.005	0.031	0.035	33	34.2	0.26	1.04
	standard deviation		0.4	3	0.00	0	0.00	0.01	4	4	0.000	0.033	0.02	3	3.3	0.03	1.0
	standard error		0.2	1	0.00	0	0.00	0.003	2	2	0.000	0.015	0.02	1	1.5	0.01	0.4

Table 1, continued

Station	Parameter		Cobalt	Cobalt	Copper	Copper	O. Carbon	O. Carbon	Hardness	Hardness	Iron	Iron	Lead	Lead	Lithium	Lithium	Magnesium	Magnesium
	Dissolved or Total State		DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L as CaCO ₃	mg/L as CaCO ₃	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
	BC Water Quality Guidelines	maximum		110		3.5-15 ⁸					350	1,000		8.1-123 ⁹		870 ⁵		
		average		4		1.5-5.2 ⁸								4.2-7.8 ⁹				
Bowker Creek																		
Discharge SWO316	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		0.0372	0.077	2.68	3.34	3.4	2.9	60.4	58.8	26.7	99.7	0.0423	0.189	1.01	1.04	3.84	4.03
	max		0.0928	0.147	11.1	13.5	11	9.5	114	113	105	312	0.277	0.669	1.38	1.47	8.4	8.33
	average		0.0616	0.1	4.7	5.6	6	4.8	97	96	51	168	0.106	0.333	1.2	1.23	7.1	6.95
	standard deviation		0.02	0.03	3.6	4.4	3	2.7	21	22	31	84	0.10	0.20	0.15	0.19	1.9	1.75
	standard error		0.01	0.01	1.6	2.0	1	1.2	9	10	14	38	0.04	0.09	0.07	0.09	0.8	0.78
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%
	min		0.0223	0.0993	2.54	2.78	3.4	3.4	12.6	16.3	42.4	113	0.0504	0.13	0.5	0.91	0.762	1.31
	max		0.109	1.13	6.39	16.2	6.9	6.5	131	134	118	2170	0.402	6.68	1.26	1.45	10.5	10.3
	average		0.0618	0.35	4.33	7.7	4.56	4.5	76.6	76.1	81.1	672	0.24648	1.88	0.91	1.14	5.8244	5.832
	standard deviation		0.03	0.44	2	5.5	1.5	1.2	48	47	30.1	851	0.18	2.7	0.33	0.2	4	4
	standard error		0.02	0.20	1	2.5	0.7	0.5	21	21	13.5	381	0.08	1.2	0.15	0.1	2	2
Bowker SW0316-3B	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		0.0282	0.065	1.74	2.32	2.5	2.6	85.8	79.7	40.6	173	0.0374	0.178	1.05	0.96	6.37	6.3
	max		0.0492	0.106	4.81	6.59	5.9	5.1	95.9	96.1	89.1	273	0.113	0.355	1.38	1.43	8.03	7.91
	average		0.0369	0.08	2.6	3.35	3.9	3.5	90.2	89	61.5	203	0.060	0.225	1.2	1.23	7.1	6.96
	standard deviation		0.0081	0.02	1.27	1.83	1.25	1.0	3.8	6	18.7	40	0.03	0.07	0.12	0.18	0.6	0.60
	standard error		0.0036	0.01	0.57	0.82	0.56	0.4	1.7	3	8.4	18	0.01	0.03	0.06	0.08	0.3	0.27
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%
	min		0.0324	0.0836	1.82	2.41	3.4	3.4	17.5	20.2	85.4	289	0.0426	0.242	0.5	0.89	1.2	1.55
	max		0.0852	0.728	6.73	12	6.6	6.2	126	118	130	1920	0.462	3.84	1.34	1.21	10.3	9.43
	average		0.0504	0.3	4.0	7	4.3	4.5	79	77	108	709	0.220	1	1.0	1.05	6.2	6.03
	standard deviation		0.0242	0.27	2.15	5	1.4	1.2	44	41	21	691	0.17	1.5	0.35	0.12	3.7	3.38
	standard error		0.0108	0.12	0.96	2	0.6	0.5	20	18	9	309	0.08	0.7	0.16	0.06	1.7	1.51
Bowker SW0316-4B	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		0.0282	0.067	2.28	2.78	2.2	2.7	75.5	74	47.2	188	0.0585	0.282	0.89	1.01	5.65	5.64
	max		0.044	0.113	4.02	5.28	4.2	4	81.7	80.2	88.5	281	0.11	0.402	1.1	1.18	6.59	6.41
	average		0.0330	0.1	3.0	4.0	3	3.3	79	77	62	228	0.077	0.345	1.1	1.10	6.0	5.95
	standard deviation		0.006	0.017	0.7	1.05	1	0.6	2.7	3	16	46	0.02	0.04	0.09	0.08	0.4	0.31
	standard error		0.003	0.008	0.3	0.47	0	0.3	1.2	1	7	20	0.01	0.02	0.04	0.04	0.2	0.14
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%
	min		0.0136	0.075	1.34	2.42	2.4	2.7	17.2	18.6	55.6	231	0.0825	0.288	0.5	0.58	1.14	1.38
	max		0.06	0.654	7.71	13.8	6.5	6.1	106	105	129	1200	0.433	3.82	1.13	1.31	8.23	8.28
	average		0.0377	0.3	4.6	7.8	4.0	4.1	59.2	59	89	553	0.249	1.52	0.8	0.94	4.5	4.60
	standard deviation		0.02	0.25	2.5	5.5	1.5	1.3	35.2	34	32	404	0.14	1.47	0.27	0.30	2.8	2.72
	standard error		0.01	0.11	1.1	2.5	0.7	0.6	15.7	15	14	181	0.06	0.66	0.12	0.13	1.3	1.22

Table 1, continued

Station	Parameter		Cobalt	Cobalt	Copper	Copper	O. Carbon	O. Carbon	Hardness	Hardness	Iron	Iron	Lead	Lead	Lithium	Lithium	Magnesium	Magnesium
	Dissolved or Total State		DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L as CaCO ₃	mg/L as CaCO ₃	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
	BC Water Quality Guidelines	maximum		110		3.5-15 ⁸					350	1,000		8.1-123 ⁹		870 ⁵		
		average		4		1.5-5.2 ⁸								4.2-7.8 ⁹				
Bowker SW0316-5	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%
	min		0.0085	0.053	1.47	1.89	2.8	2.3	33.2	33.8	48.6	190	0.0325	0.261	0.5	0.5	2.62	2.64
	max		0.0477	0.096	3.05	3.82	4.2	3.9	42.5	43.1	174	349	0.189	0.458	0.5	0.5	3.31	3.26
	average		0.0271	0.08	2.2	2.8	3	3.1	38.5	38.3	119	286	0.092	0.346	0.5	0.50	2.9	2.92
	standard deviation		0.017	0.02	0.7	0.9	0.5	0.7	4.1	4.3	46	67	0.06	0.09	0.00	0.00	0.3	0.27
	standard error		0.007	0.01	0.3	0.4	0.2	0.3	1.8	1.9	21	30	0.03	0.04	0.00	0.00	0.1	0.12
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	60%	0%	0%
	min		0.0135	0.138	2.7	3.35	3.3	3.6	31.2	31.5	160	392	0.125	0.603	0.5	0.5	2.32	2.48
	max		0.143	0.741	7.71	14.6	7.8	8.1	51.2	49.2	255	1540	1.27	3.91	0.5	0.97	3.95	3.94
	average		0.0997	0.299	5.1	7.8	5.3	5.3	42.6	42.0	208	688	0.519	1.89	0.5	0.61	3.4	3.35
	standard deviation		0.05	0.255	2.4	5.1	2.1	2.1	7.3	6.6	39	495	0.44	1.71	0.0	0.20	0.6	0.54
	standard error		0.02	0.114	1.1	2.3	1.0	1.0	3.3	2.9	18	221	0.20	0.76	0.0	0.09	0.3	0.24
Bee Creek Discharge (SW0926)																		
summer																		
	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		0.0702	0.128	0.191	0.47	1.2	1.3	124	120	13.8	175	0.0089	0.088	0.65	0.73	9.72	9.31
	max		0.0802	0.181	0.237	0.72	2.4	1.7	125	132	22.2	311	0.0133	0.174	0.93	0.98	10.1	10.3
	average		0.0747	0.150	0.215	0.58	1.8	1.5	125	125	18.8	222	0.010	0.127	0.8	0.85	9.9	9.8
	standard deviation		0.0043	0.021	0.016	0.10	0.5	0.1	1	5	3.3	56	0.00	0.03	0.11	0.09	0.2	0.43
	standard error		0.0019	0.010	0.007	0.04	0.2	0.1	0	2	1.5	25	0.00	0.01	0.05	0.04	0.1	0.19
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%
	min		0.0718	0.113	0.209	0.4	1.8	2.2	114	112	23.3	116	0.005	0.053	0.57	0.66	8.91	8.7
	max		0.127	0.457	0.8	2.12	15	15	131	132	174	858	0.0448	0.404	0.82	0.91	10.2	10.5
	average		0.095	0.240	0.4	1.1	6	6.1	123	123	78	429	0.021	0.202	0.7	0.83	9.8	9.7
	standard deviation		0.023	0.158	0.2	0.8	5.3	5.2	7	7	60	363	0.02	0.17	0.09	0.11	0.6	0.67
	standard error		0.010	0.071	0.1	0.4	2.4	2.3	3	3	27	163	0.01	0.08	0.04	0.05	0.3	0.30
Selleck Creek Discharge (SW0928)																		
summer	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%
	min		0.0265	0.051	0.343	0.44	1.3	1.2	132	124	14.2	53.2	0.005	0.048	0.91	0.93	11.2	10.4
	max		0.0461	0.113	0.464	0.73	2.6	1.9	136	137	24.8	151	0.0077	0.147	1.24	1.26	11.9	11.6
	average		0.0371	0.077	0.383	0.60	2	1.6	134	131	19.8	104	0.006	0.097	1.1	1.10	11.5	11.2
	standard deviation		0.007	0.025	0.048	0.11	0.5	0.3	1	5	4.8	39	0.00	0.04	0.14	0.12	0.3	0.5
	standard error		0.003	0.011	0.021	0.05	0.2	0.1	1	2	2.2	17	0.00	0.02	0.06	0.05	0.1	0.2
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%
	min		0.0286	0.0587	0.458	0.581	2.1	2.2	109	112	22.7	59.5	0.005	0.0446	0.64	0.88	8.94	9.26
	max		0.0797	0.911	1.09	5.71	5.1	5.1	143	138	60.4	1450	0.0346	1.89	1	1.45	12	11.8
	average		0.0629	0.39	0.776	2.5	3.5	3.5	130	127	43.5	610	0.020	0.769	0.8	1.10	10.9	10.7
	standard deviation		0.022	0.394	0.282	2	1.3	1.2	14	11	15.5	714	0.01	0.92	0.14	0.21	1.3	1.01
	standard error		0.010	0.176	0.126	1	0.6	0.5	6	5	6.9	319	0.01	0.41	0.06	0.09	0.6	0.45

Table 1, continued

Station	Parameter		Manganese	Manganese	Mercury	Molybdenum	Molybdenum	Nitrate as N	Nitrite as N	NO2 + NO3 (as N)	Nickel	Nickel	Phosphorus	Potassium	Potassium	Selenium	Selenium
	Dissolved or Total State		DISS	TOT	TOT	DISS	TOT	DISS	DISS	DISS	DISS	TOT	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	µg/L	mg/l	mg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum		720-2060 ¹⁰			2,000	0.06	32.8			25 -110 ^{5,11}	10 ¹²		373 - 432		2
		average		773-1181 ¹⁰			1,000	0.02	3				5 ¹²				
Bowker Creek																	
Discharge SW0316	n		5	5	4	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		0.346	11.2	0.002	1.48	1.51	0.0062	0.397	0.404	0.563	0.68	450	1.39	1.27	0.049	0.071
	max		7.1	15.6	0.003	2.52	2.59	0.0116	0.667	0.676	1.1	1.42	124	2.07	2.07	0.109	0.119
	average		3.40	13.0	0.002	1.87	2	0.008	0.546	0.55	0.773	0.91	89	2	1.75	0.075	0.084
	standard deviation		3.0	1.8	0.000	0.4	0.4	0.002	0.115	0.115	0.219	0.30	29	0.3	0.33	0.02	0.02
	standard error		1.4	0.8	0.000	0.2	0.2	0.001	0.051	0.051	0.098	0.13	13	0.1	0.15	0.01	0.01
winter	n		5	5	2	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%
	min		0.278	6.17	0.002	0.479	0.533	0.0061	0.154	0.168	0.361	0.879	38	1.13	1.24	0.04	0.062
	max		11.4	134	0.002	2	2.04	0.0144	0.813	0.819	0.956	2.94	184	2.01	1.85	0.089	0.079
	average		4.2	37	0.002	1.13	1.28	0.01028	0.473	0.483	0.745	1.44	89	1.63	1.57	0.062	0.07
	standard deviation		4.60	55	0.000	1	0.62	0.0040	0.252	0.248	0.248	0.87	57	0.36	0.26	0.02	0.01
	standard error		2.06	25	0.000	0	0.28	0.0018	0.113	0.111	0.111	0.39	26	0.16	0.12	0.01	0.00
Bowker SW0316-3B	n		5	5	4	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	100%	0%	0%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		0.774	16	0.002	0.614	0.63	0.0023	0.302	0.304	0.439	0.59	239	0.998	0.92	0.053	0.054
	max		13.1	33.1	0.002	0.971	1.03	0.005	0.424	0.424	0.775	0.97	77	1.57	1.61	0.096	0.091
	average		7.69	23.7	0.002	0.81	1	0.004	0.375	0.38	0.553	0.69	59	1.2	1.22	0.068	0.066
	standard deviation		6.2	6.2	0.000	0.1	0.2	0.001	0.047	0.046	0.131	0.16	21	0.2	0.26	0.02	0.02
	standard error		2.8	2.8	0.000	0.1	0.1	0.001	0.021	0.021	0.059	0.07	9	0.1	0.12	0.01	0.01
winter	n		5	5	2	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	40%	0%
	min		0.474	17.3	0.002	0.424	0.479	0.005	0.161	0.174	0.411	0.728	32	1.01	1.09	0.04	0.051
	max		20	116	0.002	0.813	0.801	0.0176	0.525	0.531	0.829	1.99	166	1.52	1.49	0.064	0.082
	average		9.5	45	0.002	0.63	1	0.009	0.372	0.38	0.665	1.17	77	1.3	1.30	0.052	0.0604
	standard deviation		9.2	40.3	0.000	0.1	0.1	0.006	0.142	0.140	0.168	0.52	54	0.2	0.15	0.01	0.01
	standard error		4.1	18.0	0.000	0.1	0.1	0.002	0.063	0.063	0.075	0.23	24	0.1	0.07	0.01	0.01
Bowker SW0316-4B	n		5	5	4	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	min		0.665	14.2	0.002	0.552	0.59	0.0069	0.514	0.523	0.371	0.5	378	0.91	0.89	0.052	0.062
	max		8.61	21.4	0.0033	0.653	0.674	0.0117	0.743	0.754	0.621	0.83	123	1.72	1.63	0.074	0.076
	average		5.01	17.1	0.002	0.61	0.6	0.010	0.581	0.59	0.49	0.65	72	1.1	1.12	0.061	0.07
	standard deviation		4.0	2.6	0.001	0.0	0.0	0.002	0.094	0.094	0.11	0.16	32	0.3	0.30	0.01	0.01
	standard error		1.8	1.2	0.000	0.0	0.0	0.001	0.042	0.042	0.05	0.07	15	0.1	0.13	0.00	0.00
winter	n		5	5	2	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	0%	0%	40%	0%	0%	0%	0%	0%	0%	0%	40%	0%
	min		0.284	14.2	0.002	0.234	0.249	0.005	0.171	0.182	0.314	0.54	436	0.776	0.74	0.04	0.05
	max		14.2	98.6	0.002	0.843	0.865	0.0115	0.568	0.568	0.685	1.69	130	1.34	1.25	0.063	0.066
	average		6.68	38.0	0.002	0.49	0.5	0.008	0.356	0.36	0.55	1.02	87	1.1	1.07	0.048	0.0568
	standard deviation		5.9	34.6	0.000	0.2	0.2	0.003	0.194	0.189	0.17	0.52	36	0.2	0.21	0.01	0.01
	standard error		2.7	15.5	0.000	0.1	0.1	0.001	0.087	0.084	0.08	0.23	16	0.1	0.09	0.00	0.00

Table 1, continued

Station	Parameter		Manganese	Manganese	Mercury	Molybdenum	Molybdenum	Nitrite as N	Nitrate as N	NO2 + NO3 (as N)	Nickel	Nickel	Phosphorus	Potassium	Potassium	Selenium	Selenium
	Dissolved or Total State		DISS	TOT	TOT	DISS	TOT	DISS	DISS	DISS	DISS	TOT	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	µg/L	mg/l	mg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum		720-2060 ¹⁰			2,000	0.06	32.8			25 -110 ^{5,11}	10 ¹²		373 - 432		2
		average		773-1181 ¹⁰			1,000	0.02	3				5 ¹²				
Bowker SW0316-5	n		5	5	4	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	50%	0%	0%	60%	0%	0%	0%	0%	0%	0%	0%	100%	40%
	min		0.563	33.5	0.002	0.209	0.204	0.002	0.258	0.258	0.199	0.3	249	0.258	0.27	0.04	0.04
	max		29.1	51.9	0.0027	1.11	1.21	0.0079	0.285	0.285	1.18	0.63	662	0.55	0.56	0.04	0.047
	average		12.8	42.3	0.002	0.45	0.5	0.005	0.271	0.27	0.5	0.46	48	0.4	0.44	0.04	0.04
	standard deviation		12.3	7.4	0.000	0.4	0.4	0.002	0.011	0.010	0.4	0.14	16	0.1	0.13	0.00	0.00
	standard error		5.5	3.3	0.000	0.2	0.2	0.001	0.005	0.004	0.2	0.06	7	0.1	0.06	0.00	0.00
winter	n		5	5	2	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	60%
	min		1.7	85.3	0.002	0.2	0.205	0.0099	0.185	0.197	0.478	0.581	17	0.474	0.473	0.04	0.04
	max		82.1	127	0.002	0.944	0.915	0.0168	0.331	0.341	0.792	2.16	145	1.86	1.81	0.045	0.073
	average		55.4	101.7	0.002	0.43	0.4	0.013	0.229	0.24	0.6	1.03	67	1.0	0.96	0.041	0.05
	standard deviation		34.6	16.4	0.000	0.3	0.3	0.003	0.059	0.058	0.1	0.67	54	0.6	0.56	0.00	0.02
	standard error		15.5	7.4	0.000	0.1	0.1	0.001	0.026	0.026	0.1	0.30	24	0.3	0.25	0.00	0.01
Bee Creek Discharge (SW0926)																	
summer																	
	n		5	5	4	5	5	5	5	5	5	5	4	5	5	5	5
	% non-detects		0%	0%	100%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	100%	20%
	min		1.01	36.1	0.002	0.083	0.078	0.002	3.69	3.69	0.295	0.43	20	0.611	0.59	0.04	0.04
	max		10.3	69.4	0.002	0.127	0.254	0.005	3.97	3.97	0.314	0.63	28	0.647	0.66	0.04	0.051
	average		5.3	48.3	0.002	0.09	0.1	0.004	3.79	3.79	0.3	0.52	25	0.6	0.62	0.04	0.05
	standard deviation		4.3	13.6	0.000	0.0	0.1	0.001	0.11	0.109	0.0	0.09	3	0.0	0.03	0.00	0.00
	standard error		1.9	6.1	0.000	0.0	0.0	0.001	0.05	0.049	0.0	0.04	2	0.0	0.01	0.00	0.00
winter	n		5	5	2	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	50%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	60%	0%
	min		3.31	23.2	0.002	0.07	0.059	0.005	1.78	1.78	0.324	0.43	14	0.65	0.65	0.04	0.041
	max		43.4	139	0.0035	0.129	0.147	0.005	3.77	3.77	0.62	1.25	74	3.11	2.99	0.103	0.17
	average		18.1	75.7	0.003	0.09	0.1	0.005	2.99	2.99	0.4	0.82	40	1.4	1.40	0.056	0.08
	standard deviation		15.4	57.0	0.001	0.0	0.0	0.000	0.81	0.807	0.1	0.41	30	1.0	0.95	0.03	0.05
	standard error		6.9	25.5	0.001	0.0	0.0	0.000	0.36	0.361	0.1	0.18	11	0.4	0.42	0.01	0.02
Selleck Creek Discharge (SW0928)																	
summer	n		5	5	4	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	40%	40%	0%	0%	0%	0%	0%	20%	0%	0%	100%	100%
	min		0.331	10.7	0.002	0.05	0.05	0.0098	5.61	5.62	0.19	0.23	2	0.649	0.61	0.04	0.04
	max		8.9	19.8	0.002	1.47	1.22	0.0116	5.98	6	0.221	0.35	21	0.783	0.78	0.04	0.04
	average		5.0	15.4	0.002	0.34	0.3	0.011	5.84	5.85	0.2	0.28	14	0.7	0.68	0.04	0.04
	standard deviation		4.3	4.3	0.000	0.63	0.52	0.001	0.15	0.157	0.0	0.05	8	0.1	0.07	0.00	0.00
	standard error		1.9	1.9	0.000	0.28	0.23	0.000	0.07	0.070	0.0	0.02	30	0.0	0.03	0.00	0.00
winter	n		5	5	2	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	20%
	min		0.16	10.8	0.002	0.095	0.115	0.0065	0.447	0.455	0.274	0.3	5	0.796	0.818	0.04	0.04
	max		34.2	104	0.002	0.158	0.174	0.0083	6.28	6.29	0.386	1.88	104	1.53	1.5	0.081	0.127
	average		14.4	49.1	0.002	0.13	0.1	0.008	4.29	4.30	0.3	0.96	49	1.1	1.07	0.053	0.076
	standard deviation		12.5	47.8	0.000	0.02	0.03	0.001	2.38	2.384	0.1	0.77	47	0.3	0.28	0.02	0.04
	standard error		5.6	21.4	0.000	0.01	0.01	0.0003	1.07	1.066	0.0	0.35	21	0.1	0.12	0.01	0.02

Table 1, continued

Station	Parameter		Silicon	Silicon	Silver	Silver	Sodium	Sodium	Strontium	Strontium	Sulphur	Sulphur	Thallium	Thallium	Tin	Tin	Titanium	Titanium
	Dissolved or Total State		DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum				0.1-3.0 ¹³								0.3				2,000 ⁵
		average				0.05-1.5 ¹³								0.8				4,600
Bowker Creek																		
Discharge SWO316	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	100%	80%	0%	0%	0%	0%	0%	0%	80%	40%	100%	100%	80%	20%
	min		3030	3340	0.005	0.005	17.4	17.2	72.5	70.7	4.4	3.5	0.002	0.002	0.2	0.2	0.5	1.47
	max		5150	5400	0.005	0.027	25.8	25.3	138	137	7.3	8.1	0.0029	0.0022	0.2	0.2	1.35	7
	average		4638	4750	0.005	0.01	19.9	19.6	117	115	5.6	5.6	0.00218	0.002	0.2	0.2	0.7	3
	standard deviation		906	839	0.00	0.01	3.4	3.2	26	27	1.2	1.7	0.0004	0.0001	0.0	0.0	0.4	2
	standard error		405	375	0.00	0.00	1.5	1.5	12	12	0.5	0.8	0.0002	0.0000	0.0	0.0	0.2	1
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	60%	0%	0%	0%	0%	40%	40%	100%	60%	100%	80%	40%	0%
	min		615	2430	0.005	0.005	3	2.94	13.7	17.8	3	3	0.002	0.002	0.2	0.2	0.5	1.05
	max		5690	5680	0.005	0.012	27.1	26.5	165	153	6.6	6.7	0.002	0.0071	0.2	0.59	0.93	53
	average		3477	3954	0.005	0.009	15.8	15.5	93.1	89.5	4.3	4.2	0.002	0.003	0.2	0.3	0.7	15
	standard deviation		2044	1389	0.000	0.003	10	9	60	55	1	2	0.0000	0.0022	0.0	0.2	0.2	21
	standard error		914	621	0.000	0.001	4	4	27	24	1	1	0.0000	0.0010	0.0	0.1	0.1	10
Bowker SW0316-3B	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	100%	80%	0%	0%	0%	0%	0%	20%	100%	100%	100%	100%	80%	20%
	min		5000	4840	0.005	0.005	14.5	13.4	86.5	82.6	3.5	3	0.002	0.002	0.2	0.2	0.5	2
	max		5300	5720	0.005	0.015	20	21	96.2	102	6.9	7.4	0.002	0.002	0.2	0.2	0.52	3.6
	average		5146	5406	0.005	0.010	16.7	16.6	92	93	4.4	4.6	0.002	0.002	0.2	0.2	0.5	3
	standard deviation		134	346	0.000	0.004	2.2	2.9	4	8	1.4	1.7	0.000	0.000	0.0	0.0	0.01	0.6
	standard error		60	155	0.000	0.002	1.0	1.3	2	4	0.6	0.7	0.000	0.000	0.0	0.0	0.00	0.3
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	80%	0%	0%	0%	0%	40%	40%	100%	60%	100%	60%	40%	0%
	min		873	2130	0.005	0.005	3.4	3.38	18.5	21.9	3	3	0.002	0.002	0.2	0.2	0.5	1.76
	max		5960	5800	0.005	0.014	21.7	19.6	134	128	5.6	5.5	0.002	0.0059	0.2	0.39	1.01	36.5
	average		3832.60	4166	0.005	0.010	13.6	13.12	85	84	4.0	3.9	0.002	0.003	0.2	0.26	0.7	13.7
	standard deviation		2122	1560	0.000	0.00	7.1	6.6	47	45	1.1	1.1	0.000	0.002	0.0	0.1	0.2	14.3
	standard error		949	698	0.000	0.00	3.2	3.0	21	20	0.5	0.5	0.000	0.001	0.0	0.0	0.1	6.4
Bowker SW0316-4B	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	100%	60%	0%	0%	0%	0%	20%	20%	100%	40%	100%	80%	60%	0%
	min		4400	4460	0.005	0.0064	11.7	11.7	77.2	76.7	3	3	0.002	0.002	0.2	0.2	0.5	3
	max		4950	5090	0.005	0.01	15.3	16	80.7	80.4	5.4	5	0.002	0.0025	0.2	0.3	0.95	12.1
	average		4632	4788	0.005	0.009	13.7	13.58	79	79	3.8	3.7	0.002	0.002	0.2	0.22	0.6	6
	standard deviation		235	224	0.000	0.002	1.3	1.6	1	2	1.0	0.8	0.000	0.000	0.0	0.0	0.2	3.7
	standard error		105	100	0.000	0.001	0.6	0.7	1	1	0.4	0.3	0.000	0.000	0.0	0.0	0.1	1.6
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	60%	0%	0%	0%	0%	60%	60%	100%	60%	100%	60%	40%	0%
	min		848	1770	0.005	0.005	3.74	3.51	17.9	19.5	3	3	0.002	0.002	0.2	0.2	0.5	2.74
	max		5190	5120	0.005	0.011	17.4	17.1	107	106	5.1	5.4	0.002	0.0043	0.2	0.36	1.14	30.1
	average		2957.60	3436	0.005	0.009	10.7	10.62	62	61	3.5	3.6	0.002	0.003	0.2	0.248	0.7	13
	standard deviation		1684	1335	0.000	0.003	5.4	5.4	37	34	0.9	1.0	0.000	0.001	0.0	0.1	0.3	11.6
	standard error		753	597	0.000	0.001	2.4	2.4	17	15	0.4	0.5	0.000	0.000	0.0	0.0	0.1	5.2

Table 1, continued

Station	Parameter		Silicon	Silicon	Silver	Silver	Sodium	Sodium	Strontium	Strontium	Sulphur	Sulphur	Thallium	Thallium	Tin	Tin	Titanium	Titanium
	Dissolved or Total State		DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT
	Unit		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	BC Water Quality Guidelines	maximum				0.1-3.0 ¹³								0.3				2,000 ⁵
		average				0.05-1.5 ¹³								0.8				4,600
Bowker SW0316-5	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
summer	% non-detects		0%	0%	100%	80%	0%	0%	0%	0%	80%	100%	80%	80%	100%	100%	60%	20%
	min		2440	2470	0.005	0.01	5.94	6.02	31	32.6	3	3	0.002	0.002	0.2	0.2	0.5	2
	max		3120	3410	0.005	0.0733	11.6	11.6	38.6	40.8	3.2	3	0.0092	0.0022	0.2	0.2	0.6	3
	average		2782	2914	0.005	0.023	8.2	8.08	35	36	3.0	3.0	0.00344	0.0020	0.2	0.2	0.5	3
	standard deviation		318	390	0.000	0.03	2.1	2.1	3	4	0.1	0.0	0.003	0.000	0.0	0.0	0.05	0.4
	standard error		142	174	0.000	0.01	0.9	1.0	1	2	0.0	0.0	0.001	0.000	0.0	0.0	0.02	0.2
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	80%	40%	0%	0%	0%	0%	100%	100%	100%	60%	100%	100%	20%	0%
	min		1730	2540	0.005	0.005	8.49	7.89	33.4	35.3	3	3	0.002	0.002	0.2	0.2	0.5	1.86
	max		2910	2980	0.0054	0.014	11.4	11.1	56.1	51.8	3	3	0.002	0.005	0.2	0.2	1.5	35.7
	average		2476	2792	0.00508	0.009	9.9	9.68	44	43	3.0	3.0	0.002	0.0028	0.2	0.2	0.8	11
	standard deviation		455	189	0.000	0.004	1.1	1.2	8	7	0.0	0.0	0.000	0.001	0.0	0.0	0.4	14.3
	standard error		203	84	0.000	0.002	0.5	0.5	4	3	0.0	0.0	0.000	0.001	0.0	0.0	0.2	6.4
Bee Creek Discharge (SW0926)																		
summer																		
	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%	0%
	min		11800	12200	0.005	0.01	16.5	16	88.1	86.9	5	4.9	0.002	0.002	0.2	0.2	0.5	3.1
	max		13100	13400	0.005	0.01	17.1	17.4	91.6	97.1	5.4	5.6	0.002	0.002	0.2	0.2	0.5	6.4
	average		12460	12840	0.005	0.010	16.8	16.52	90	92	5.2	5.2	0.002	0.002	0.2	0.2	0.5	5
	standard deviation		483	434	0.000	0.000	0.3	0.6	1	5	0.2	0.3	0.000	0.000	0.0	0.0	0.0	1.4
	standard error		216	194	0.000	0.000	0.1	0.3	1	2	0.1	0.1	0.000	0.000	0.0	0.0	0.0	0.6
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	100%	60%	100%	100%	80%	0%
	min		10200	11100	0.005	0.01	14.6	14.1	78.6	76.6	4.6	4.8	0.002	0.002	0.2	0.2	0.5	2.2
	max		12200	13800	0.005	0.01	16.6	17.1	96.7	94.8	12	5.6	0.002	0.0034	0.2	0.2	1.46	20.6
	average		11360	11940	0.005	0.010	15.8	15.58	89	88	6.5	5.1	0.002	0.0024	0.2	0.2	0.7	9
	standard deviation		780	1172	0.00	0.00	0.8	1.1	7	8	3.1	0.3	0.000	0.001	0.0	0.0	0.4	8.5
	standard error		349	524	0.00	0.00	0.4	0.5	3	3	1.4	0.1	0.000	0.000	0.0	0.0	0.2	3.8
Selleck Creek Discharge (SW0928)																		
summer	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	80%	100%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%	60%
	min		11200	10700	0.005	0.01	15.6	14.6	95.8	90	4.4	4.5	0.002	0.002	0.2	0.2	0.5	2
	max		12100	12900	0.0069	0.01	16.6	16	98.7	105	5.1	5.6	0.002	0.002	0.2	0.2	0.5	3.2
	average		11680	11860	0.005	0.010	16.1	15.48	97	98	4.8	4.9	0.002	0.002	0.2	0.2	0.5	2
	standard deviation		409	820	0.001	0.00	0.4	0.5	1	6	0.3	0.4	0.000	0.000	0.0	0.0	0.0	0.5
	standard error		183	367	0.0004	0.00	0.2	0.2	1	3	0.1	0.2	0.000	0.000	0.0	0.0	0.0	0.2
winter	n		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	% non-detects		0%	0%	100%	80%	0%	0%	0%	0%	0%	0%	100%	40%	100%	100%	100%	0%
	min		8020	8950	0.005	0.005	12.5	12.4	80.4	85.4	5.5	5.4	0.002	0.002	0.2	0.2	0.5	0.88
	max		11300	11500	0.005	0.01	16.2	16.7	103	103	6.6	6.3	0.002	0.0232	0.2	0.2	0.5	33.4
	average		10176	10650	0.005	0.009	15.0	14.62	95	93	6.0	5.9	0.002	0.0076	0.2	0.2	0.5	14
	standard deviation		1315	1032	0.00	0.00	1.5	1.6	9	7	0.4	0.3	0.000	0.009	0.0	0.0	0.0	16.6
	standard error		588	462	0.00	0.00	0.7	0.7	4	3	0.2	0.2	0.000	0.004	0.0	0.0	0.0	7.4

Table 1, continued

Station	Parameter		Sus. Solids	Uranium	Uranium	Vanadium	Vanadium	Zinc	Zinc	Zirconium	Zirconium	Acetaminophen	Alkalinity-Ph 4.5	Chloride	Sulphate
	Dissolved or Total State		TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	TOT	TOT	DISS	TOT
	Unit		mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
	BC Water Quality Guidelines	maximum	26 ¹⁴		8.5 ⁵				33-69 ¹⁵						
		average	6 ¹⁴						7.5-38.25 ¹⁵						
Bowker Creek															
Discharge SW0316	n		5	5	5	5	5	5	5	5	5	1	-	-	-
summer	% non-detects		40%	0%	0%	0%	0%	0%	0%	100%	100%	100%	-	-	-
	min		1.6	0.0518	0.0594	0.77	1.34	2	3.3	0.1	0.1	0.02	-	-	-
	max		4	0.203	0.204	1.64	2.16	6.91	9.8	0.1	0.1	0.02	-	-	-
	average		2	0.141	0.146	1.21	1.58	3	4.8	0.1	0.1	-	-	-	-
	standard deviation		0.9	0.057	0.05	0.31	0.33	2	2.8	0.0	0.0	-	-	-	-
	standard error		0.4	0.025	0.02	0.14	0.15	1	1.3	0.0	0.0	-	-	-	-
winter	n		5	5	5	5	5	5	5	5	5	2	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	100%	40%	50%	0%	0%	20%
	min		1.1	0.0109	0.0352	0.81	0.88	3.72	4.37	0.1	0.1	0.02	11	3.6	1
	max		64	0.272	0.269	1.08	4.88	12.9	52.8	0.1	0.29	0.125	110	42	22
	average		16	0.11	0.125	0.9	2.02	6.9	19	0.1	0.2	0.073	67	24	11
	standard deviation		27	0.10	0.091	0.1	1.7	3.9	20	0.0	0.1	0.07	40	15	8
	standard error		12	0.05	0.041	0.0	0.7	1.7	9	0.0	0.04	0.05	18	7	4
Bowker SW0316-3B	n		5	5	5	5	5	5	5	5	5	1	-	-	-
summer	% non-detects		40%	0%	0%	0%	0%	0%	0%	100%	100%	0%	-	-	-
	min		1.5	0.0872	0.0914	0.77	1.18	1.82	3.2	0.1	0.1	0.036	-	-	-
	max		4	0.13	0.13	1.42	1.51	5.49	7.8	0.1	0.1	0.036	-	-	-
	average		2	0.101	0.103	1.14	1.32	3	4.4	0.1	0.1	0.036	-	-	-
	standard deviation		1.0	0.017	0.02	0.25	0.13	2	1.9	0.0	0.0	-	-	-	-
	standard error		0.4	0.008	0.01	0.11	0.06	1	0.9	0.0	0.0	-	-	-	-
winter	n		5	5	5	5	5	5	5	5	5	2	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	100%	40%	50%	0%	0%	0%
	min		1.8	0.0108	0.0464	0.6	0.84	1.87	3.63	0.1	0.1	0.05	15	4.2	1.9
	max		38	0.181	0.19	0.9	3.57	14.9	34.4	0.1	0.27	0.1	110	34	17
	average		12	0.091	0.11	0.80	1.74	6	16.1	0.1	0.16	0.1	69	20	10
	standard deviation		15	0.069	0.06	0.12	1.09	5	14.5	0.0	0.1	-	38	11	6
	standard error		6.7	0.031	0.03	0.06	0.49	2	6.5	0.0	0.0	-	17	5	3
Bowker SW0316-4B	n		5	5	5	5	5	5	5	5	5	1	-	-	-
summer	% non-detects		20%	0%	0%	0%	0%	0%	0%	100%	80%	100%	-	-	-
	min		2	0.0902	0.0955	0.88	1.28	2.04	3.5	0.1	0.1	0.02	-	-	-
	max		4	0.117	0.123	1.59	2.05	5.1	8.6	0.1	0.26	0.02	-	-	-
	average		3	0.105	0.108	1.24	1.54	3	5.3	0.1	0.13	-	-	-	-
	standard deviation		0.9	0.012	0.01	0.27	0.32	1	2.0	0.0	0.1	-	-	-	-
	standard error		0.4	0.005	0.01	0.12	0.14	1	0.9	0.0	0.0	-	-	-	-
winter	n		5	5	5	5	5	5	5	5	5	2	5	5	5
	% non-detects		20%	0%	0%	0%	0%	0%	0%	100%	60%	50%	0%	0%	0%
	min		1	0.0135	0.0399	0.47	0.81	1.87	3.67	0.1	0.1	0.02	13	4.6	1.4
	max		33	0.199	0.185	0.85	2.87	19	39.4	0.1	0.23	0.364	88	25	15
	average		11	0.076	0.089	0.75	1.54	8	18.2	0.1	0.15	0.19	51	15	8
	standard deviation		13.1	0.079	0.06	0.16	0.92	7	17.5	0.0	0.1	-	29	9	5
	standard error		5.9	0.035	0.03	0.07	0.41	3	7.8	0.0	0.0	-	13	4	2

Table 1, continued

Station	Parameter		Sus. Solids	Uranium	Uranium	Vanadium	Vanadium	Zinc	Zinc	Zirconium	Zirconium	Acetaminophen	Alkalinity-Ph 4.5	Chloride	Sulphate
	Dissolved or Total State		TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	TOT	TOT	DISS	TOT
	Unit		mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
	BC Water Quality Guidelines	maximum	26 ¹⁴		8.5 ⁵				33-69 ¹⁵						
		average	6 ¹⁴						7.5-38.25 ¹⁵						
Bowker SW0316-5	n		5	5	5	5	5	5	5	5	5	1	-	-	-
	summer	% non-detects	60%	0%	0%	0%	0%	0%	0%	100%	100%	100%	-	-	-
		min	2	0.0057	0.0097	0.58	0.72	1.07	2	0.1	0.1	0.02	-	-	-
		max	4	0.0217	0.0177	0.9	1.36	2.74	3.2	0.1	0.1	0.02	-	-	-
		average	2	0.012	0.014	0.73	0.96	2	2.6	0.1	0.1	-	-	-	-
		standard deviation	0.9	0.006	0.003	0.14	0.25	1	0.5	0.0	0.0	-	-	-	-
		standard error	0.4	0.003	0.002	0.06	0.11	0	0.2	0.0	0.0	-	-	-	-
	winter	n	5	5	5	5	5	5	5	5	5	2	5	5	5
		% non-detects	20%	0%	0%	0%	0%	0%	0%	80%	40%	100%	0%	0%	0%
		min	1	0.0094	0.013	0.41	0.53	2.49	4.5	0.1	0.1	0.02	29	9.8	3.3
		max	29	0.0224	0.063	1.05	3.26	9.82	25.1	0.23	0.3	0.05	47	18	6.2
		average	8	0.017	0.030	0.67	1.37	6.10	11.7	0.13	0.15	0.04	40	15	4.5
		standard deviation	11.7	0.005	0.020	0.27	1.12	3.06	9.1	0.1	0.1	-	7	3	1
		standard error	5.2	0.002	0.009	0.12	0.50	1.37	4.1	0.0	0.0	-	3	1	0
Bee Creek Discharge (SW0926)															
summer															
	n		5	5	5	5	5	5	5	5	5	-	-	-	-
	% non-detects		0%	0%	0%	0%	0%	0%	80%	100%	100%	-	-	-	-
	min		5.2	0.0143	0.0206	0.78	1.03	0.11	1	0.1	0.1	-	-	-	-
	max		18	0.0169	0.0291	1.47	2.09	0.36	1	0.1	0.1	-	-	-	-
	average		12	0.015	0.024	1.12	1.61	0.18	1.0	0.1	0.1	-	-	-	-
	standard deviation		4.6	0.001	0.003	0.29	0.40	0.10	0.0	0.0	0.0	-	-	-	-
	standard error		2.0	0.000	0.001	0.13	0.18	0.05	0.0	0.0	0.0	-	-	-	-
winter	n		5	5	5	5	5	5	5	5	5	2	5	5	5
	% non-detects		0%	0%	0%	0%	0%	20%	60%	100%	80%	100%	0%	0%	0%
	min		4.1	0.011	0.017	0.8	1.05	0.1	1	0.1	0.1	0.02	75	26	14
	max		42	0.0152	0.0466	1.54	3.29	0.77	3.1	0.1	0.14	0.05	100	30	16
	average		18	0.013	0.029	1.06	2.01	0.44	1.7	0.1	0.11	0.04	92	28	16
	standard deviation		16.5	0.002	0.014	0.30	1.10	0.28	1.0	0.0	0.0	-	11	2	1
	standard error		7.4	0.001	0.01	0.13	0.49	0.13	0.5	0.0	0.0	-	5	1	0
Selleck Creek Discharge (SW0928)															
summer	n		5	5	5	5	5	5	5	5	5	1	-	-	-
	% non-detects		20%	0%	0%	0%	0%	0%	80%	100%	100%	100%	-	-	-
	min		2.3	0.0173	0.0177	0.45	0.27	0.29	1	0.1	0.1	0.02	-	-	-
	max		6.8	0.0196	0.0217	1.19	1.13	0.51	1	0.1	0.1	0.02	-	-	-
	average		5	0.018	0.020	0.95	0.88	0.36	1.0	0.1	0.1	-	-	-	-
	standard deviation		1.6	0.001	0.002	0.30	0.35	0.09	0.0	0.0	0.0	-	-	-	-
	standard error		0.7	0.000	0.001	0.13	0.16	0.04	0.0	0.0	0.0	-	-	-	-
winter	n		5	5	5	5	5	5	5	5	5	2	5	5	5
	% non-detects		0%	0%	0%	0%	0%	0%	0%	100%	80%	100%	0%	0%	0%
	min		1.9	0.0231	0.0232	0.81	0.89	0.47	1.12	0.1	0.1	0.02	76	24	18
	max		80	0.0282	0.137	1.28	4.29	1.63	12.4	0.1	0.11	0.05	100	28	20
	average		31	0.026	0.068	1.02	2.28	1.05	5.2	0.1	0.10	0.04	90	27	19
	standard deviation		39	0.002	0.048	0.19	1.76	0.53	5.3	0.0	0.0	-	10	2	1
	standard error		17	0.001	0.021	0.08	0.79	0.24	2.4	0.0	0.0	-	4	1	0

Notes: Statistics calculated with the detection limit where values were not detected.

Minimum upstream hardness average (38 mg/L) was used to calculate hardness-dependant water quality parameters for screening purposes.

samples that exceeded the minimum guideline were assessed based on the guideline associated with their sample hardness

DISS = dissolved state, TOT = total state

¹ minimum values for dissolved oxygen

² BC background level; no guideline

³ draft objective proposed to protect juvenile Coho (the most sensitive species); average weekly temperature at any location in the creeks

⁴ max: 9 NTU (8NTU above ambient levels in the upper Sooke River watershed) at any time during clear flow periods, and average 3 NTU (2NTU above ambient levels during clear flow periods

⁵ BC working water quality guideline

⁶ hardness-dependant; max (e[1.03 * ln(Hss) - 5.274]) ranges from 0.19 to 0.65 µg/L Cd; average (e[0.736 * ln(Hss) - 4.943]) ranges from 0.11 to 0.30 µg/L Cd

⁷ Cr(IV) / Cr (III)

⁸ hardness dependant max: 0.094(H)+2); average: if hardness is <= to 50 mg/L CaCO3 then guideline is 2 ug/L Cu, if hardness is >50 then 0.04(mean hardness) ug/L

⁹ if hardness > 8 mg/L : e(1.273 ln (hardness) - 1.460; if hardness < 8 mg/L : 3 ug/L total lead; if mean hardness > 8 mg/L CaCO3 then, 3.31 + e(1.273 ln (mean hardness) - 4.704) ug/L total lead

¹⁰ 0.01102 hardness + 0.54 maximum mg/L total Mn; 0.0044 hardness + 0.605 average mg/L total Mn

¹¹ 25 ug/L total Ni if hardness is < or = 60 mg/L CaCO₃, 110 ug/L Ni at hardness > 60 to 180 mg/L as CaCO₃, 150 ug/L Ni at hardness of 120 to 180 mg/L as CaCO₃

¹² draft Vancouver Island Objective, applies to monthly samples collected June to September; our data was collected 4 times in 30 days in November

¹³ 0.1 ug/L Ag max, 0.05 ug/L Ag ave if hardness is <=100 mg/L; otherwise 3 mg/L Ag max, 1.5 mg/L Ag ave

¹⁴ 25 and 5 mg/L over ambient levels of 2 mg/L in the upper Sooke River watersheds

¹⁵ if H is >90 mg/L then 33 +0.75 (hardness-90); if H is less < or = 90 mg/L then 33 ug/L or 0.033 mg/L; if H is >90 then 75+0.75(hardness-90); if less < or = 90 then 7.5 ug/L or 0.0075 mg/L

xx	value exceeds the provincial guideline protective for aquatic life
xx	italicized value exceeds a guideline/objective which is only partially applicable. Further investigation is needed.

Bowker Sampling Locations:	
SW0316	Bowker Creek discharge; south of Somass Drive
SW0316-3B	Bowker Creek, immediately downstream of Pearl Street
SW0316-4B	Bowker Creek; Browning Park
SW0316-5	Bowker Creek; immediately upstream of Gordon Head Road
SW0926	Bee Creek; 10 m south of chain link fence on north side of Ocean Grove
SW0928	Selleck Creek; foot of Portsmouth Drive

Table 2 Summary Table for 5 in 30 Bacteriological Data for Bowker, Bee and Selleck Creeks in 2019

		<i>E.Coli</i>	Fecal Coliforms
BC Recreational Water Quality Guidelines	max	400 *	-
	geomean	200 *	-
Bowker Discharge (SW0316)			
summer	n	5	5
	% non-detects	0%	0%
	min	790	840
	max	5000	8000
	median	1300	1700
	geomean	1539	2728
winter	n	5	5
	% non-detects	0%	0%
	min	250	650
	max	9800	11000
	median	1700	5400
	geomean	1947	5710
Bowker SW0316-3B	n	5	5
summer	% non-detects	0%	0%
	min	340	590
	max	1500	3500
	median	600	660
	geomean	683	1570
winter	n	5	5
	% non-detects	0%	0%
	min	110	110
	max	8200	12000
	median	1600	5100
	geomean	937	4900
Bowker SW0316-4B	n	5	5
summer	% non-detects	0%	0%
	min	80	130
	max	940	1200
	median	300	1200
	geomean	259	846
winter	n	5	5
	% non-detects	0%	0%
	min	34	57
	max	3300	5000
	median	200	4600
	geomean	328	2935
Bowker SW0316-5	n	5	5
summer	% non-detects	0%	0%
	min	7	9
	max	230	260
	median	50	76
	geomean	45	95.6
winter	n	5	5
	% non-detects	0%	0%
	min	10	19
	max	4500	5500
	median	30	48
	geomean	154	1978

Table 2, continued

		<i>E.Coli</i>	Fecal Coliforms
BC Recreational Water Quality Guidelines	max	400 *	-
	geomean	200 *	-
Bee Creek Discharge (SW0926)			
	n	5	5
summer	% non-detects	0%	0%
	min	50	70
	max	210	230
	median	70	150
	geomean	91	150
winter	n	5	5
	% non-detects	0%	0%
	min	37	41
	max	3400	3800
	median	60	150
	geomean	125	850
Selleck Creek Discharge (SW0928)			
summer	n	5	5
	% non-detects	0%	0%
	min	17	73
	max	330	310
	median	40	120
	geomean	50	167
winter	n	5	5
	% non-detects	0%	0%
	min	10	20
	max	1000	1400
	median	150	370
	geomean	95	500

Notes:

units are CFU/100 mL

* guideline for protection of primary recreation and cultural uses

xx value exceeds the provincial guideline

Bowker Sampling Locations:	
SW0316	Bowker Creek discharge; south of Somass Drive
SW0316-3B	Bowker Creek, immediately downstream of Pearl Street
SW0316-4B	Bowker Creek; Browning Park
SW0316-5	Bowker Creek; immediately upstream of Gordon Head Road
SW0926	Bee Creek; 10 m south of chain link fence on north side of Ocean Grove
SW0928	Selleck Creek; foot of Portsmouth Drive