



DECISIONS AND ACTIONS

Steering Committee
Wednesday, November 21, 2018

Victoria Canoe and Kayak Club

Present: Dorothy Chambers, Angela Hanes, Doug Critchley, Bruce Bevan, Brad Proctor, Craig Elder, Ann Klein, Jack Meredith, Vicki and George Blogg, Julian Anderson, Bill Thomas, Mick Collins, Sara Stallard, Phil Lancaster, Natalie Bandringa, Kitty Lloyd, Joe Boyd, Morley Eldridge, John Mullane, Brianne Czypyha

Guests: Sean Wong (MoTI), Ian Bruce (PSS), Jean Chandler and several others from VCKC, John Sillby, Andrew Anderson (MoTI)

DECISIONS			
1	GWI will send a coordinated response to VCKC regarding their proposed dock expansion		
Next Meeting: 16 January 2019			
ACTIONS		ACTION BY	DUE
1	Forward Bridge lighting letter for final comment	Kitty	(done)
2	Request that MoTI come to next meeting and present McKenzie interchange project update	Kitty	January
3	Review meeting notes and PDF of VCKC dock expansion presentation; send comments to Kitty	All	Dec 5
4	Send coordinated response to VCKC on dock proposal	All	Dec/Jan
5	Consult Jacques about birds and fireworks: is it light and sound, just sound, is there a time of year that's particularly bad?	Doug	Winter
6	If strange fish behavior is seen in any creeks, please let Sara Stallard know	All	ASAP
7	Ask Jacques Sirois: Are birds impacted by light and sound, or mostly just sound? Is there a time of year that's particularly bad?	Kitty/Jacques	Next meeting
8	Let Kitty know if interested in a spring field trip to clip fins on out-migrating salmon at Goldstream Hatchery and Bill Thomas will get us involved	All	Winter

INFORMATION

Review of action items from September meeting:

- Yogi forwarded the letter the group drafted to City of Victoria regarding the lighting on the Johnson St Bridge.
- Canadian Wildlife Service spoke with Capital Region Invasive Species Partnership (CRISP) about problem geese in the region:
 - municipalities identified that they are interested in pursuing this issue, will continue the conversation with CWS,
 - there's an inter-government working group for south island, will connect with them and see what they are doing

Presentation: McKenzie Interchange outfall proposed wetland water quality treatment – Sean Wong, Manager, Biological Programs, Ministry of Transportation and Infrastructure (See Appendix 1)

- Proposed treatment wetland to be located at the culvert outlet at one end of the cloverleaf, 70cm black culvert between embankment and Colquitz River.
- Outfall flows into disturbed habitat, low ecological value, mainly storm water and highway runoff feeding the 3 culverts here
- Runoff flows from culvert through a weedy zone dominated by invasive plants, into estuary of Portage Inlet. That area seems to be fairly intact riparian tidal and estuary floodplain with wildlife habitat
- 3 culverts discharge into treatment area, lower culvert had standing water even in the summer, suggesting that this is a naturally wet environment
- Didn't look very fish-hospitable, need to polish and treat the water before it discharges into Portage Inlet
- Rather than making it more hospitable for fish, considering biological treatment, to clean the water and polish before it flows into estuary
- Originally considered a rock lined culvert channel, but this was considered over-engineered, and was later nixed
- Andrew Anderson (MoTI civil engineer with Restoration of Natural Systems training), will be monitoring flows over the course of the winter season, looking at erosion potential
- Could consider some estuarine plants rather than just terrestrial plants for the treatment site; will look at the tidal influence there; want to maintain a functional riparian buffer zone
- If flow hydraulics cause more erosion, will use less hardening
- Key thing is to target elevation +/- 0.5 m, aim to have different elevations within the wetland
- Considering not attracting amphibians, but could install bat boxes
- Outlet from this pond feature will be 2 spillways, need to be suitably robust, so will be made from riprap, integrate woody debris, will put material into voids in the riprap
- Primary perimeter berm elevation at 3m, up to 1.2m in deep spots, with some elevated areas (vegetation mounds – see drawings in attached presentation)
- Will need to build up a perimeter bank, so that fish can't access it
- Looking at oil skimmers and other options for containing any potential fuel slicks or spills: e.g. install a log in outlet channel so that anything floating is skimmed and kept in the pond
- Engineers proposed something more ornate with baffles
- Had a field meeting earlier today with Dorothy, Julian, Ian Bruce and others

- If chum were expected here, could put down a spawning pad for them (DC: very few chum in this system)
- GWI members do not recommend adding spawning material
- Plan to incorporate aquatic and estuarine plants
- Open to having community involvement in the planting and final restoration of the site

Comment: This is a vast improvement from what was originally proposed

Q: What about using oyster shells to absorb some heavy metals from stormwater?

A: Open to ideas, want to slow the runoff and allow plants to biofilter contaminants

Q: Access into the park from adjacent parking lot?

A: will need to be integrated into the pond as there is very little room (5 – 10m strip). Proposing to make access up on the slope rather than crossing the channel with a footpath. Pond will be 5 – 10m wide, 75 m long parallel to the curved cloverleaf

Q: What about flows?

A: Installed staff gauges and will monitor this

Q: From experience at location where highway crosses Craigflower Cr, wondering how the oily debris and spills will be treated or prevented from entering the creek?

A: baffle type system in the cloverleaf, wanting to collect the surficial materials and skim it off. Once the pond has vegetation established, plants will slow the flow and clean the runoff

Q: How many of the outfalls and overflow stormwater pipes will go directly into the creek, rather than through this engineered pond?

A: [answer from Sean in a follow-up email:] “...this catchment appears to capture the majority of the Interchange related runoff...All of these discharge to the Colquitz floodplain, but are not direct discharges to the river, since there is a natural riparian buffer and also, as presented, further treatment is proposed for the cloverleaf outfalls. The Urban Systems drainage report also shows a culvert to the E of the Admirals cloverleaf and E of Grange. From mapping, it looks to discharge into a riparian strip prior to its entry into Portage Inlet, downstream of the Colquitz confluence.”

Q: Have been trying to ask highways where all the drains are located along Portage Inlet from the highway, have not had any answers. These outfalls should be monitored

- Note: CRD monitors the outfalls in Portage Inlet for bacterial content

A: [answer from Sean in a follow-up email] “...other older piping and drainages in the vicinity (including a pipe that was punctured last year during construction) – that may be a bit of an ongoing legacy of how drainage was historically managed and piped, and could be well outside of the scope of the McKenzie Interchange Project or MOT to address.”

ACTION: Request that MoTI come to next meeting and present project update

VCKC Dock upgrade - Joe Boyd, President, VCKC

- VCKC 50 years old this year, at this clubhouse for 30 years
- Want to increase length of moorage, cater to aging membership, 500 members, most are over 45
- Kneeling dock pad – 8 feet long attachment to wharf would allow boat storage and easy launching of outriggers
- Using this presentation as part of public consultation
- Launching the outriggers using current system is a big production, very heavy, need at least 5 people
- Showed video of how a kneeling dock pad works, much safer and easier

- Saanich holds a license of occupation extending farther than the existing dock; VCKC wants to extend dock into more of the water license area
- Want to minimize impact to public space, need to be mindful of impacts to natural environment
- Want to fit in with neighbourhood, want a professionally well-built facility, public safety an important consideration
- 3 concepts being considered:
 - Long extension to the east where dragon boat is currently tied, with 2 kneeling dock pads, dock about 4.5 ft wide
 - Rectangle about same size as existing one, 2 kneeling pads on two sides, also to the east
 - Same as above but attached to seaward side of existing dock, concern is that it's shallow at the outer end
- Advantages of dock proposals:
 - Outriggers would be stored on the kneeling dock pads
 - Less foot traffic in and out of the water, thereby minimizing turbidity
 - Additional habitat improvement via bird and bat boxes on or near the dock
- Gathering feedback from community, then will make a formal request to Saanich, VCKC will propose to pay for this, then proceed with detailed design

GWI Comment: For dock safety and security, bigger and heavier is more stable, best design is a T or an L shape; make it wider or longer to increase stability

Comment: Docks provide more substrate for marine life than much of the modified shores along the Gorge

ACTION: Joe will send a PDF of the presentation; GWI send comments to Kitty, will send a coordinated response to VCKC

Fireworks and bird disturbance - Doug Critchley, PIPS

- Fireworks at Halloween were much longer, louder than in past
- Study in Holland of fireworks reported that birds flew much higher and farther away for a long time following fireworks
- Disorientation from lights at night
- View Royal – fireworks bylaw was written around 2006, most municipalities in the region adopted similar bylaws at same time
- Hoping that either fireworks are banned altogether, or allow only consumer fireworks, and no display fireworks
- Need to get all municipalities to change bylaws together, have a regional approach
- Currently, fireworks are only allowed on Halloween between 5 - 7:00 p.m., other than a special event

Comments:

- Any difference in cities that use silent fireworks?
- There are “safe and sane” types of fireworks
- Many municipalities ban fireworks altogether
- VR fire marshal will consult with other municipalities to see what they want to do
- Could join forces with a dog group – lots of feedback from dog groups regarding fireworks
- Does GWI want to make a recommendation?

ACTION: Ask Jacques Sirois: Are birds impacted by light and sound, or mostly just sound? Is there a time of year that's particularly bad?

Salmon deaths at Colquitz counting fence - Sara Stallard

- There were some strange fish behaviours, rains in Oct 3 -5 started to bring the fish up the creeks, had fish who couldn't stay upright, gasping, being preyed on
- Followed by dry weather, then more rains early November; opened the traps and found several dead salmon, pressed up against the fence, even ones that were only in there 1.5 hrs, 5 fully grown salmon dead in the trap
- Removed the panels in the trap so fish can pass through, have never seen this happen before, 11 dead fish in 5 days, have not found the source, what is it different this year?
- These are not first flush events, Yogi has dissected them, getting tissue analyses done
- Is cumulative stress greater this year?
- DFO has authorized putting panels back in since no "smoking gun" found
- Fish counts are low in Craigflower as well

ACTION: If you see anything strange, please let Sara know

Partner Updates

Rods & Reels Fishing Club:

Portage Inlet Cutthroat Initiative

- Raised \$18,000; support from Freshwater Fisheries Society; analyzed 24 significant reports, Colquitz, Craigflower and receiving environments, annotated bibliography put together by Heather Wright
- PICI poster and maps in draft form were handed out
- Have another year before they need to report back
- Will outline priorities for in-stream improvements; lucky to have WFT in town, they have expertise and do high quality work

Johnson Street Bridge Lighting Report:

- Want to ensure everything is correct before submitting to CoV

Goldstream Hatchery:

- collected way more fish than in some years, 200K coho and 300K chum eggs;
- **ACTION:** let Kitty know and Bill will get us involved if interested in a spring field trip to clip fins on out-migrating salmon

CoV: upgrade to Cecelia Ravine Park underway, going to have a more accessible pathway.

In the rain garden at end of Cecelia Rd, will be doing some analysis for metals and hydrocarbons, will look at upgrading the plantings in that rain garden, it's 7 years old now; there's conflicting information about whether it's better to remove soils or keep it in place

SIASS: AGM next week;

Sara: Water quality in and around the Gorge: we know about spills into the Colquitz because people are aware of this creek and let people like Dorothy know about these things, but other spills etc into the Gorge are not systematically recorded;

For example – in Cecelia Creek watershed:

- there was a recent spill of 70 liters of diesel;
- nearby drain service business installed a new system, dealing with high volumes of water that have to settle; they were told to stop letting this go into the storm drain;
- water main in Saanich broke last week and sediment was all churned up way into the Gorge;
- what can we do to document and keep track of these events? Brianne: CoV probably reports these to EMBC; any idea for reviving the Rock Bay;
- Last major report on regional stormwater management was by UVic Environmental Law Centre - Reinventing Rainwater Management; CRD role in the past was to create model

stormwater bylaws, and best management practices that municipalities can model their own regulations on

GTCA: Executive is turning attention to how to reduce GHGs, turning to environmental issues
Bruce: 47 males, 77 females, 125 jacks so far this year; short on males, otters are a problem around the traps; continuous problems with beavers; problem with outlet to Prior Lake, CRD will not give permission for a pond leveler; mediocre year so far for returning salmon
Have not had any fin-clipped fish return so all the ones they added to Prior Lake have disappeared (20,000 were fin clipped, from Goldstream hatchery)

PISCES: put up 6 signs: “Sensitive wildlife habitat - Please do not disturb”, in the inlet and along Colquitz; speaking with MoTI to address the drains into the Gorge that all use old technology, lots of contaminants being flushed into the inlet

Saanich: updating local area plans; getting public input, Cadboro Bay, Cordova Bay; updating environmental policies and climate plan: 2 events next week; can provide input to this

Q: Any update about RioCan re-invigorating plans for residential towers at Tillicum Mall?

A: Nothing has been submitted recently; the DPA was approved 10 years ago, there’s a clause that it expires in 2 years, but rarely enforced; if any changes are wanted, it would have to go in front of council again, and staff would have input into it; they have an approved Streamside DPA in place

GWAS: Nature house closed for the winter, re-open in spring break; AGM on Nov 29, received grant from Esquimalt and BC Gaming to add some engagement items for NH, bought some microscopes and slides

PIPS: VR has applied for an extension to the boat launching ramp on Shoreline Dr; deadline for public input is Dec. 11; <https://arfd.gov.bc.ca/ApplicationPosting/viewpost.jsp?PostID=56130>

Friends of Swan Creek: 3 riffles completed this summer/fall, ongoing water quality assessments, 5 in 30 summer and fall sampling; have not seen any salmon this year

View Royal Advisory Comm: Made a presentation to VR about the issues with the HandiDart proposal on Craigflower Cr; first offer is still to BC Transit; council not interested in passing this; we need a lens that incorporates climate change and the environment into decisions; new council wants better community engagement

CRD Harbours Program Updates - Natalie

Elk/Beaver Lake: The RFP for a pilot aeration project in Beaver Lake went out to the public, but costs came in much higher than expected. Now, a revised scope for the RFP has gone out to qualified consultants to develop an in-lake remediation plan and design for the whole EBL system, which will support the Business Case. EBLI Coordinator Jill Robinson is developing a Communications Plan to support the development of a watershed management plan. She is planning for public consultation beginning in January.

Non-migratory geese discussion: Brought up issue of geese/eelgrass at CRISP meeting when CWS was there earlier this week; lots of interest from parks staff and some elected officials, will continue to work on this

Harbour Survey: in 2019 will be re-doing the ecological survey that was done in 1999; will be coming to the GWI to get input about key indicators, how the maps should be created so they’re user friendly and available. Looking into alternative methods for assessing eelgrass beds (aerial photos, satellite imagery)

Coordinator Updates – Kitty

- Meeting schedule for 2019 handed out
- 2019 work plan will be discussed at January meeting

Adjournment: 9:40pm

McKenzie Interchange SE Outfall Proposed Wetland Water Quality Treatment For Gorge Waterway Initiative Nov. 21, 2018



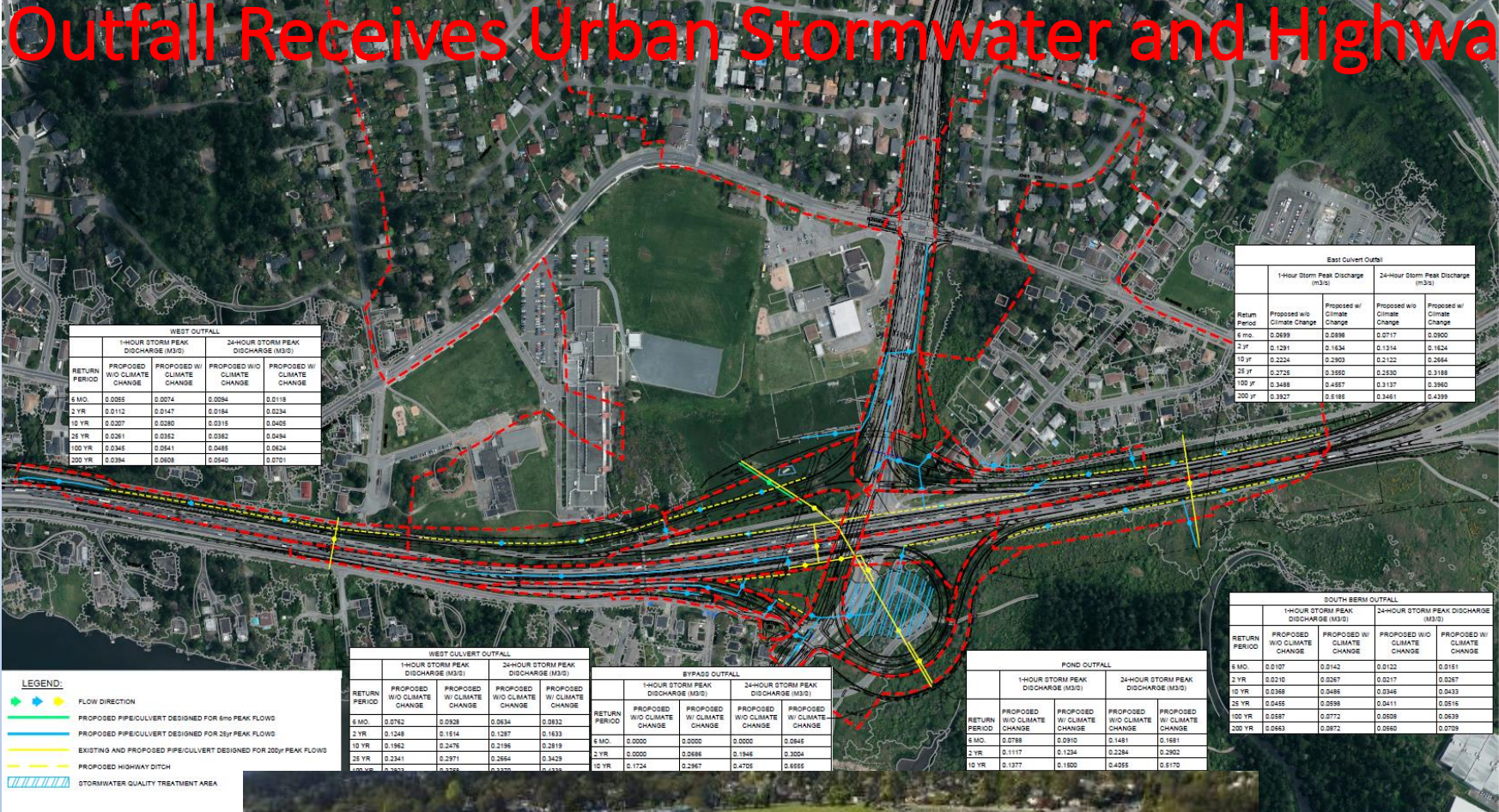
Sean Wong
Senior Biologist



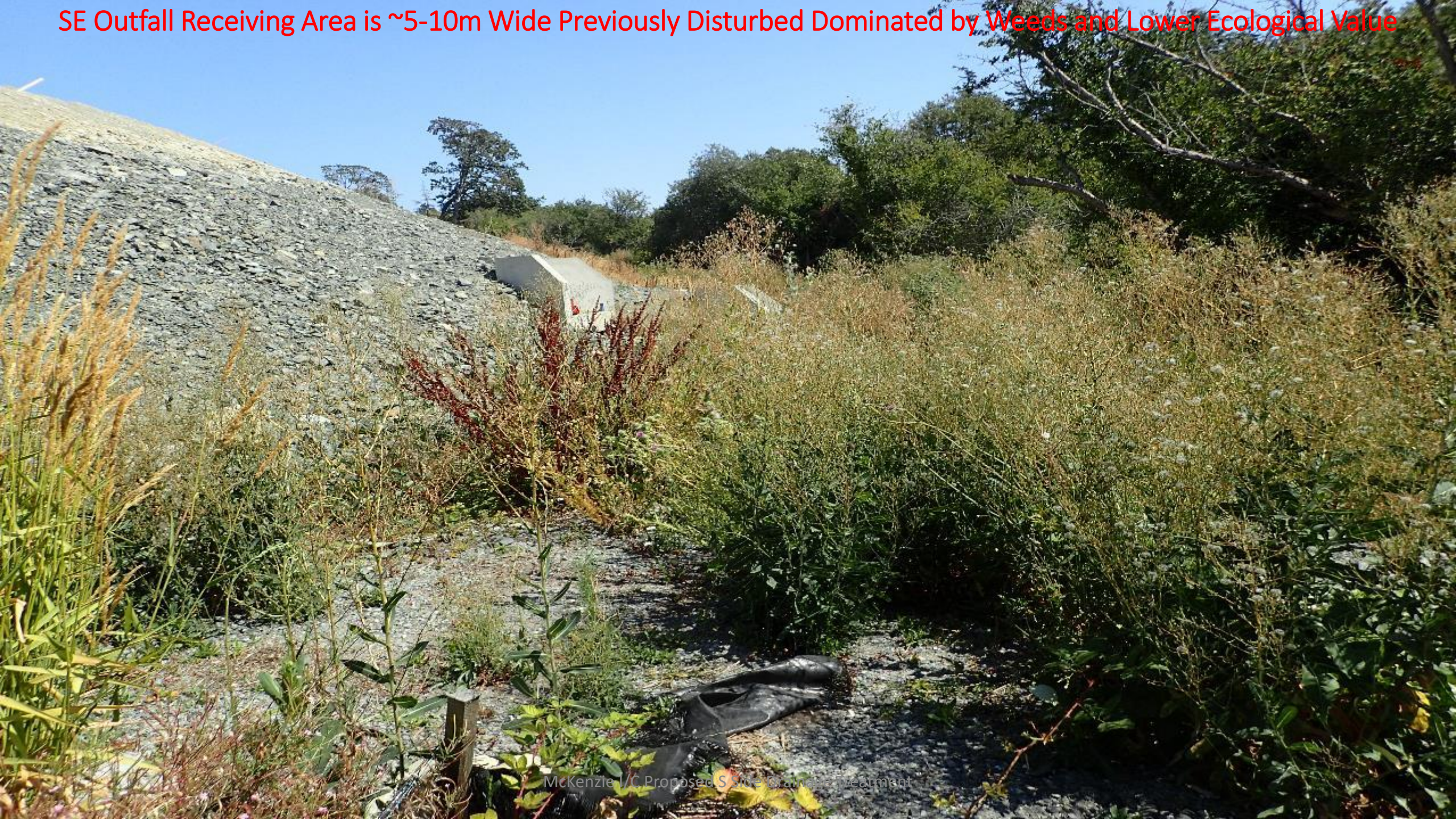
McKenzie I/C Proposed S Side Drainage Treatment

Appendix 1

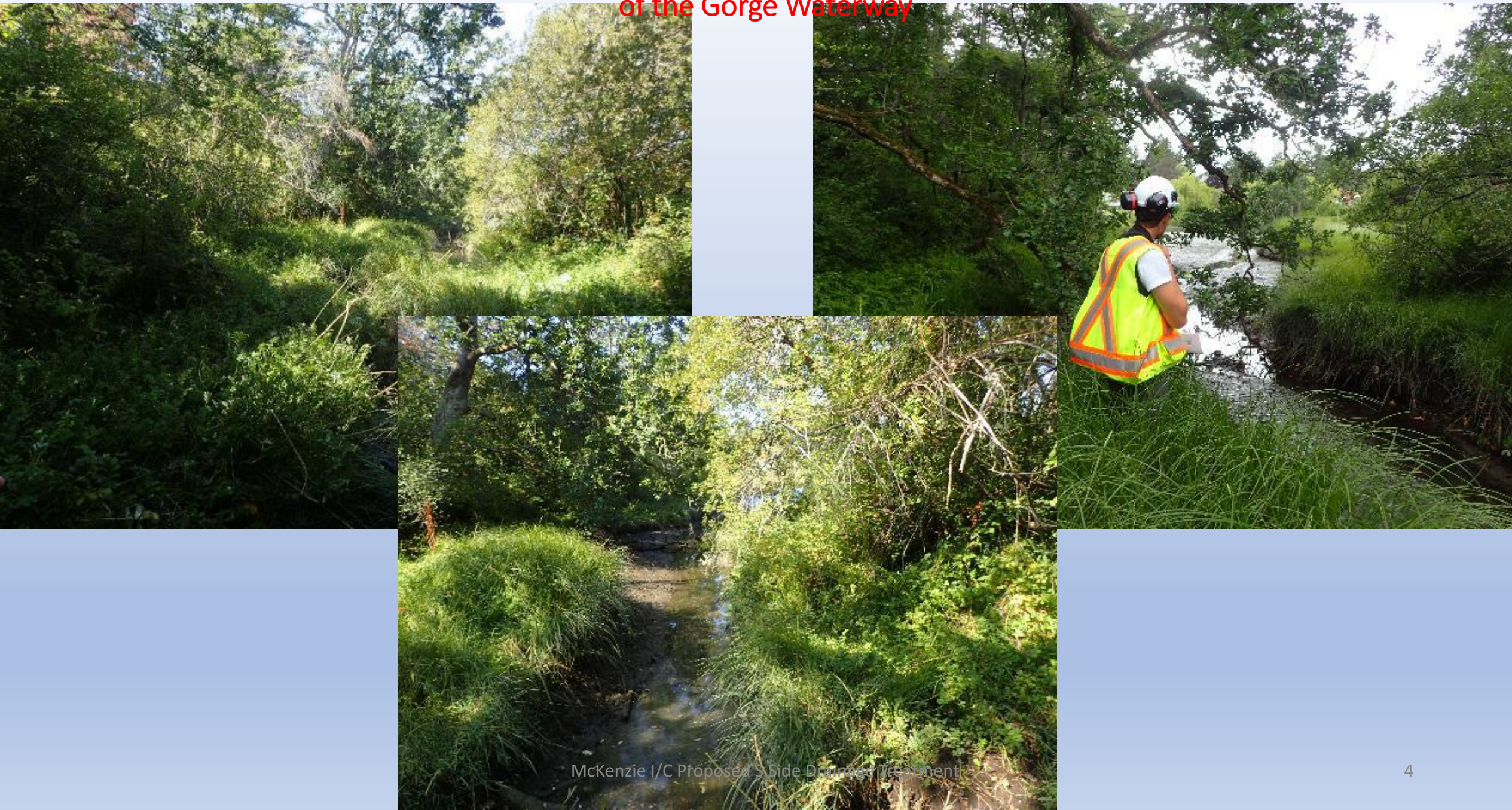
SE Outfall Receives Urban Stormwater and Highway Runoff



SE Outfall Receiving Area is ~5-10m Wide Previously Disturbed Dominated by Weeds and Lower Ecological Value



Drainage to the S Enters an Intact Riparian Tidal and Estuary Floodplain of the Colquitz River Upstream of Portage Inlet of the Gorge Waterway



Three Culverts Discharge Into the Treatment Area



750mm with standing water, 700mm dry & 450mm Ø
HDPE with trickle flow on June 12 & Aug. 1, 2018
Low water level used to set target low water 2.3m ±
0.5m wetland control elevation



McKenzie Interchange Drainage and Stormwater Report

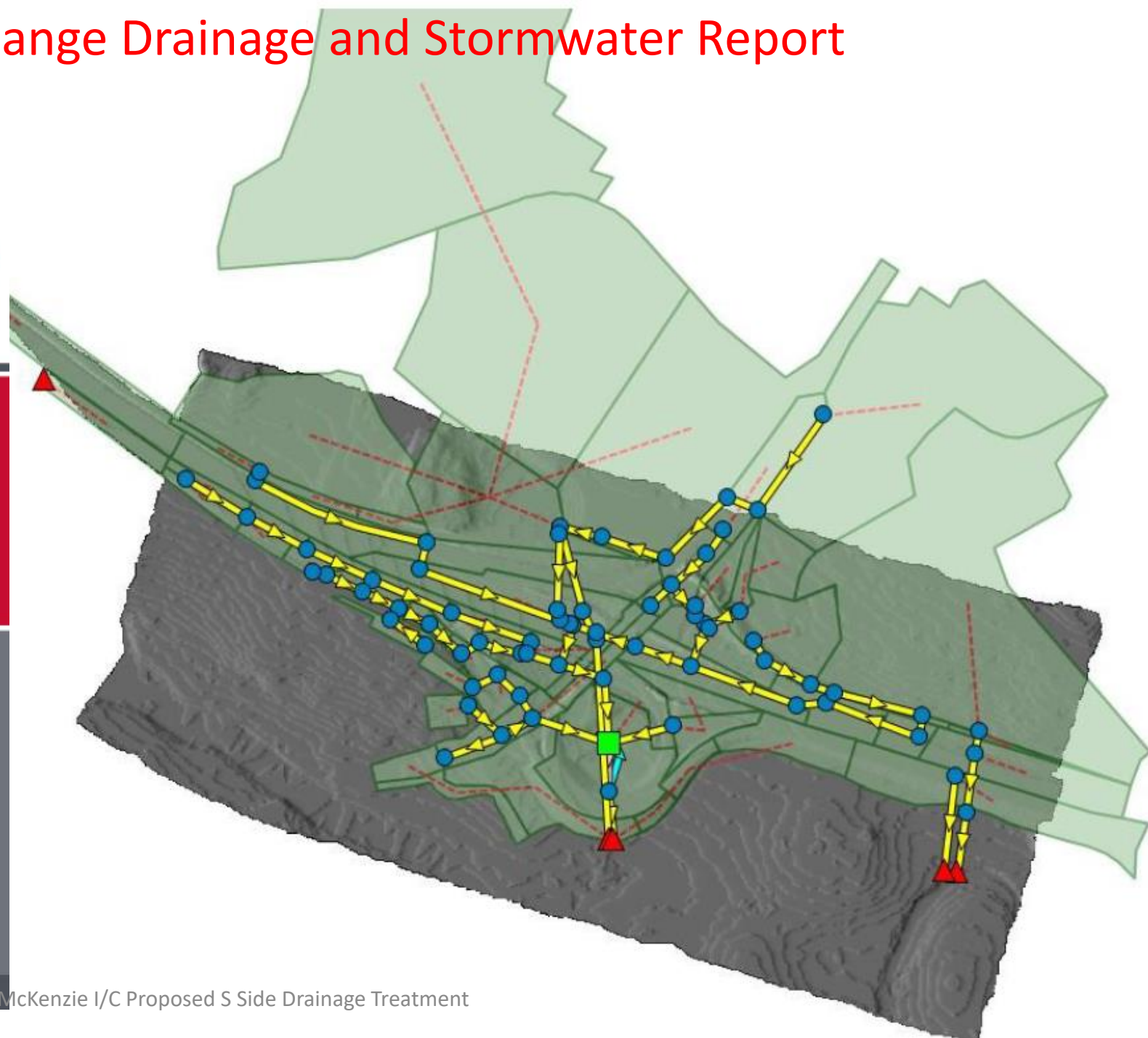
REPORT

PREPARED FOR THE MINISTRY OF TRANSPORTATION
AND INFRASTRUCTURE

Admirals / McKenzie Interchange Project
Drainage Design Criteria and Stormwater Management
Final Report (Rev. 1)

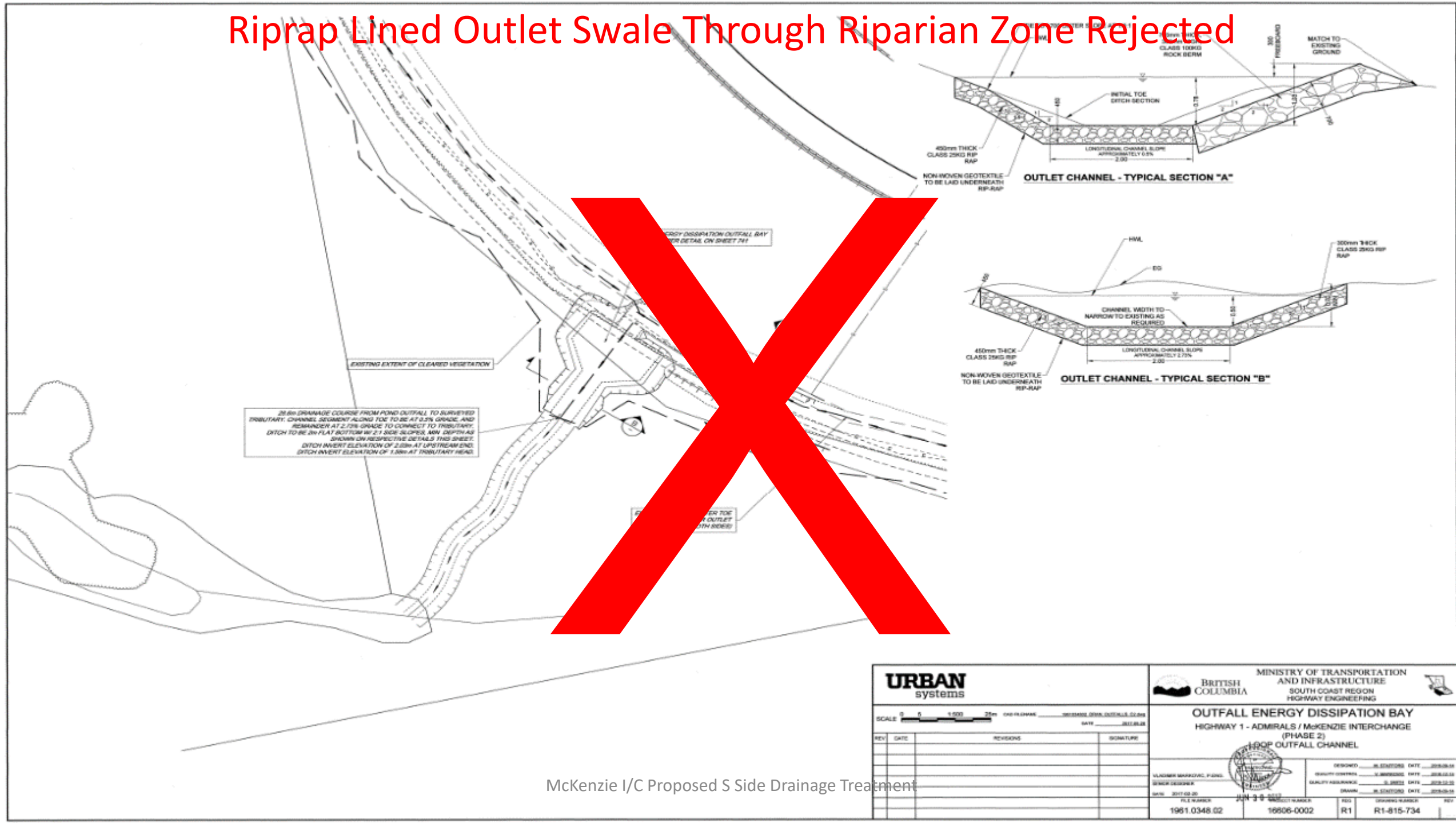
URBAN
systems

urbansystems.ca



McKenzie I/C Proposed S Side Drainage Treatment

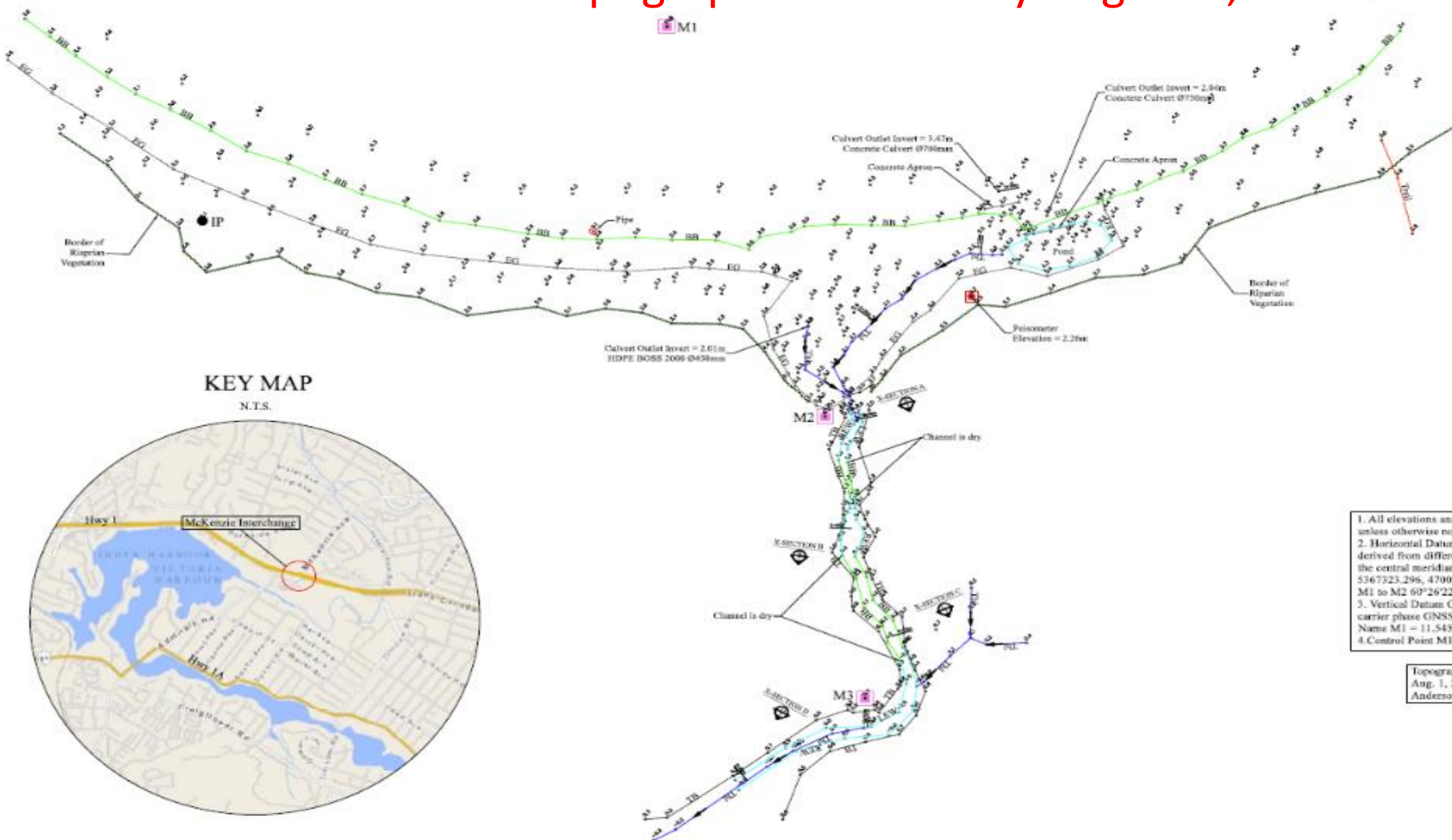
Riprap Lined Outlet Swale Through Riparian Zone Rejected



McKenzie I/C Proposed S Side Drainage Treatment

URBAN systems		BRITISH COLUMBIA MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE SOUTH COAST REGION HIGHWAY ENGINEERING	
SCALE: 0 5 10 20m		OUTFALL ENERGY DISSIPATION BAY HIGHWAY 1 - ADMIRALS / MCKENZIE INTERCHANGE (PHASE 2) LOOP OUTFALL CHANNEL	
DESIGNED: M. SEXTON DATE: 2010-08-15		DESIGNED: M. SEXTON DATE: 2010-08-15	
CHECKED: M. SEXTON DATE: 2010-08-15		CHECKED: M. SEXTON DATE: 2010-08-15	
DRAWN: M. SEXTON DATE: 2010-08-15		DRAWN: M. SEXTON DATE: 2010-08-15	
FILE NUMBER: 1951.0348.02		PROJECT NUMBER: 16806-0002	
R1		R1-815-734	

Detailed Topographic Site Survey August 1, 2018



KEY MAP

N.T.S.



LEGEND

LEW	Left edge water
REW	Right edge water
TW	Thalweg
→	Flow direction
•	Spot elevation
—	Water level
—	Riparian vegetation edge
BB	Bottom bank
EG	Edge of gravel
● IP	Iron pin
● M2	Control point

NOTES

1. All elevations and dimensions are in meters and decimals thereof unless otherwise noted.
2. Horizontal Datum NAD83 (CSRS) Epoch 1997, grid bearings are derived from differential carrier phase GNSS observations referred to the central meridian of UTM Zone 10. Point Name M1 = N 5367323.296, 470056.720. Estimated Horizontal Accuracy 0.003m. M1 to M2 60°26'22" 34.541m.
3. Vertical Datum CGVD28 (HTV2.0) is derived from differential carrier phase GNSS observations referred to the geoid model. Point Name M1 = 11.543m.
4. Control Point M1 is a pk nail set in a wooden hub.

Topographic surveys were carried out on Aug. 1, 2018 by Kim Robertson and Andrew Anderson.



K. Robertson, ASCT,
Environmental Technologist
Survey & Drafting
krobertson@earthlink.net

McKenzie Interchange Water Quality Treatment Pond - Overall Plan View - Draft for Discussion
McKenzie I/C Proposed S Side Drainage Treatment
For M.O.T Environmental Management - Sean Wong, Senior Biologist

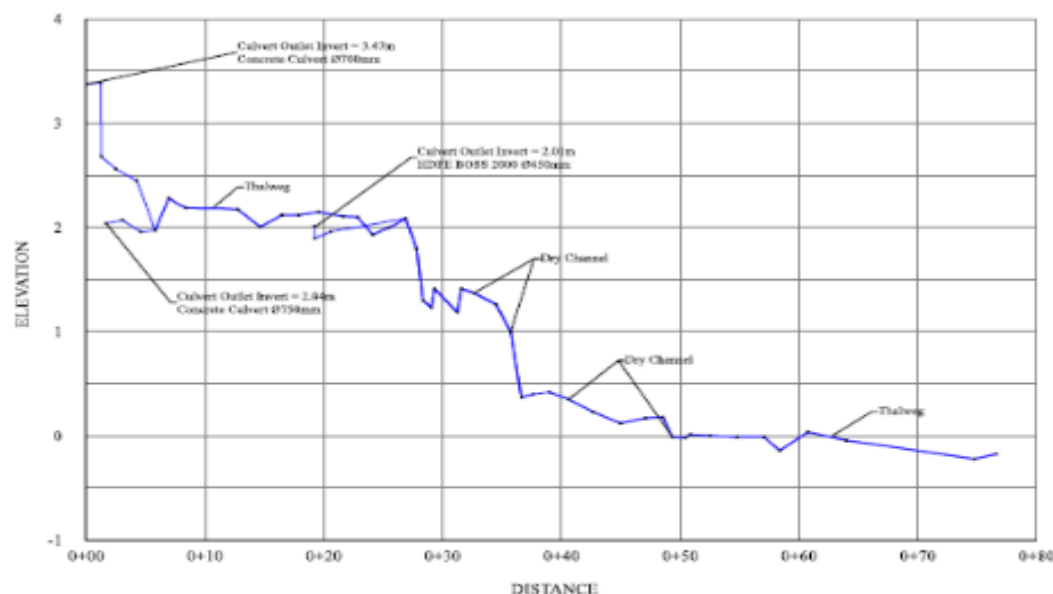


DWG. No. 2018-05-31
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REVISION NO. 0

BRITISH COLUMBIA MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

Detailed Topographic Site Survey August 1, 2018

MAINSTEM PROFILE



ELEVATION
SCALE 1:50

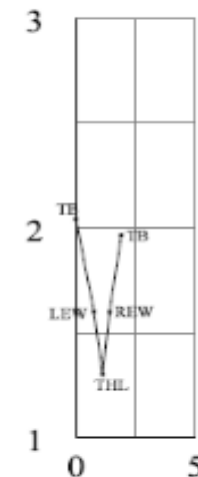


SCALE

HORIZONTAL 1:500
VERTICAL 1:50

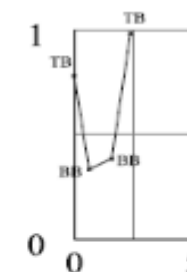
X-SECTIONS

**X-Section A
Station 0+29**



LEGEND	
LEW	LEFT EDGE WATER
REW	RIGHT EDGE WATER
TB	TOP BANK
BB	BOTTOM BANK
THL	THALWEG

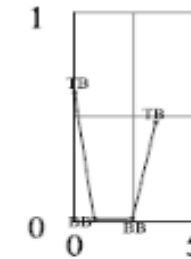
**X-Section B
Station 0+42**



**X-Section C
Station 0+49**



**X-Section D
Station 0+63**



SCALE

HORIZONTAL 1:250
VERTICAL 1:25

ELEVATION
SCALE 1:25



K. Robertson, ASCT,
Environmental Technologist
Survey & Drafting

McKenzie Interchange Water Quality Treatment Pond - Mainstem Profile and X-Sections - Draft for Discussion

McKenzie I/C Proposed S-Side Drainage Treatment
For M.O.T Environmental Management - Sean Wong, Senior Biologist



DWG. No. 2018-05-11

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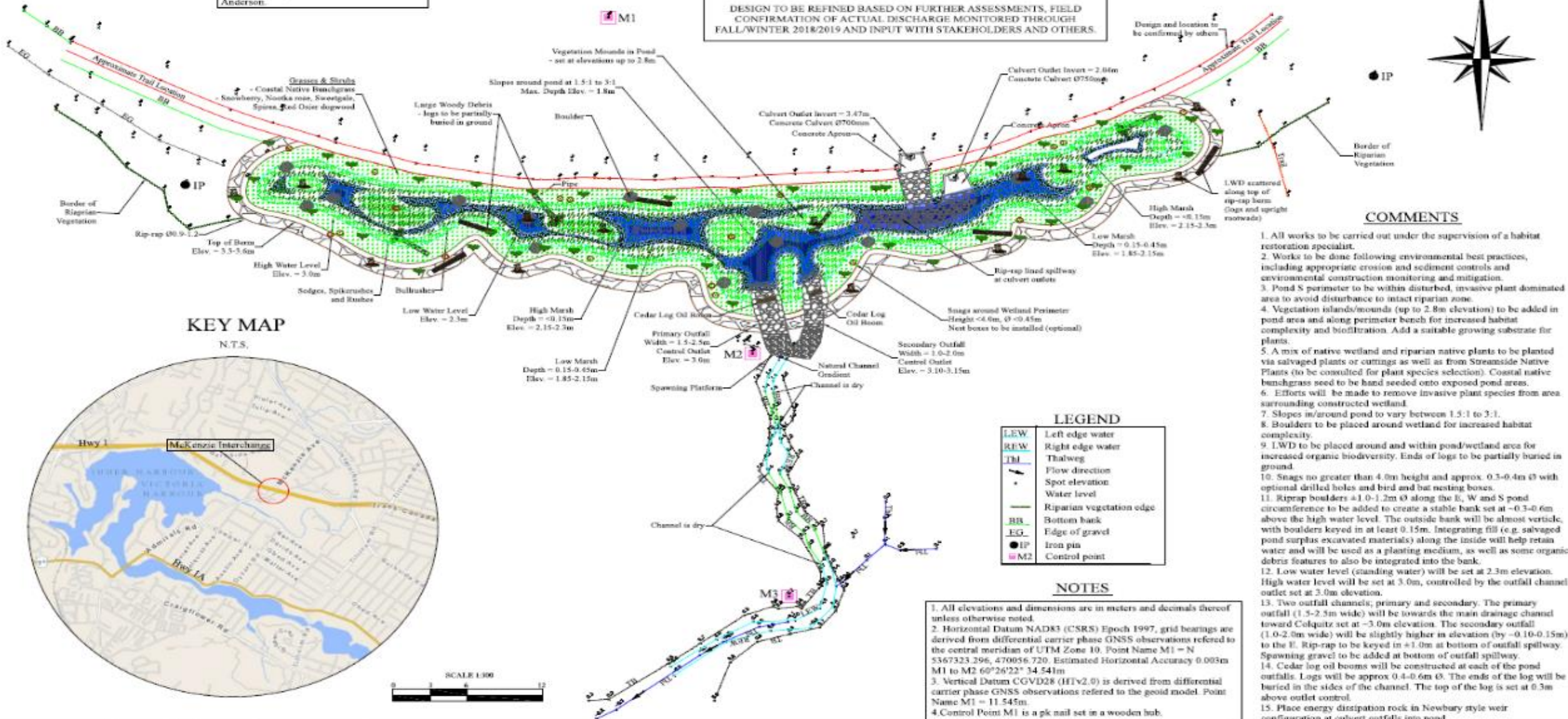
McKENZIE INTERCHANGE WATER QUALITY TREATMENT POND PLAN, PROFILE AND X-SECTIONS

Conceptual Prescription November 2018

Topographic surveys were carried out on Aug. 1, 2018 by Klara Robertson and Andrew Anderson.

HABITAT PRESCRIPTION BY SEAN WONG

DESIGN TO BE REFINED BASED ON FURTHER ASSESSMENTS, FIELD CONFIRMATION OF ACTUAL DISCHARGE MONITORED THROUGH FALL/WINTER 2018/2019 AND INPUT WITH STAKEHOLDERS AND OTHERS.



COMMENTS

1. All works to be carried out under the supervision of a habitat restoration specialist.
2. Works to be done following environmental best practices, including appropriate erosion and sediment controls and environmental construction monitoring and mitigation.
3. Pond S perimeter to be within disturbed, invasive plant dominated area to avoid disturbance to intact riparian zone.
4. Vegetation islands/mounds (up to 2.8m elevation) to be added in pond area and along perimeter bench for increased habitat complexity and biodiversity.
5. A mix of native wetland and riparian native plants to be planted via salvaged plants or cuttings as well as from Streamside Native Plants (to be consulted for plant species selection). Coastal native bunchgrass seed to be hand seeded onto exposed pond areas.
6. Efforts will be made to remove invasive plant species from area surrounding constructed wetland.
7. Slopes in/around pond to vary between 1.5:1 to 3:1.
8. Boulders to be placed around wetland for increased habitat complexity.
9. LWD to be placed around and within pond/wetland area for increased organic biodiversity. Ends of logs to be partially buried in ground.
10. Snags no greater than 4.0m height and approx. 0.3-0.4m Ø with optional drilled holes and bird and bat nesting boxes.
11. Riprap boulders 1.0-1.2m Ø along the E, W and S pond circumference to be added to create a stable bank set at -0.3-0.6m above the high water level. The outside bank will be almost vertical with boulders keyed in at least 0.15m. Integrating fill (e.g. salvaged pond surplus excavated materials) along the inside will help retain water and will be used as a planting medium, as well as some organic debris features to also be integrated into the bank.
12. Low water level (standing water) will be set at 2.3m elevation. High water level will be set at 3.0m, controlled by the outfall channel outlet set at 3.0m elevation.
13. Two outfall channels; primary and secondary. The primary outfall (1.5-2.5m wide) will be towards the main drainage channel toward Colquitz set at -3.0m elevation. The secondary outfall (1.0-2.0m wide) will be slightly higher in elevation (by -0.10-0.15m) to the E. Riprap to be keyed in 1.0m at bottom of outfall spillway. Spawning gravel to be added at bottom of outfall spillway.
14. Cedar log oil booms will be constructed at each of the pond outfalls. Logs will be approx 0.4-0.6m Ø. The ends of the log will be buried in the sides of the channel. The top of the log is set at 0.3m above outlet control.
15. Place energy dissipation rock in Newbury style weir configuration at culvert outfalls into pond.

LEGEND

LEW	Left edge water
REW	Right edge water
Th	Thalweg
FD	Flow direction
SE	Spot elevation
WL	Water level
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CP	Control point

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4. Control Point M1 is a pk nail set in a wooden hub.

Westwood Environmental

Survey & Drafting

K. Robertson, ASCT

McKenzie Interchange Project Water Quality Treatment Pond/Constructed Wetland

Overall Plan View - Draft Issued for Discussion

For M.O.T Environmental Management - Sean Wong, Senior Biologist



Ministry of
Transportation and
Infrastructure

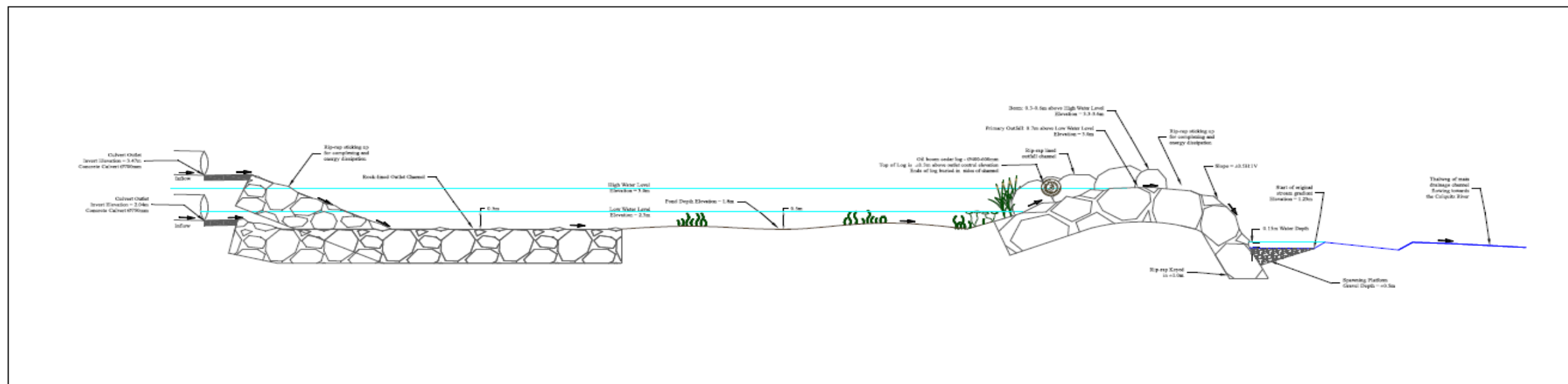
DWG. No: 2018-10-22

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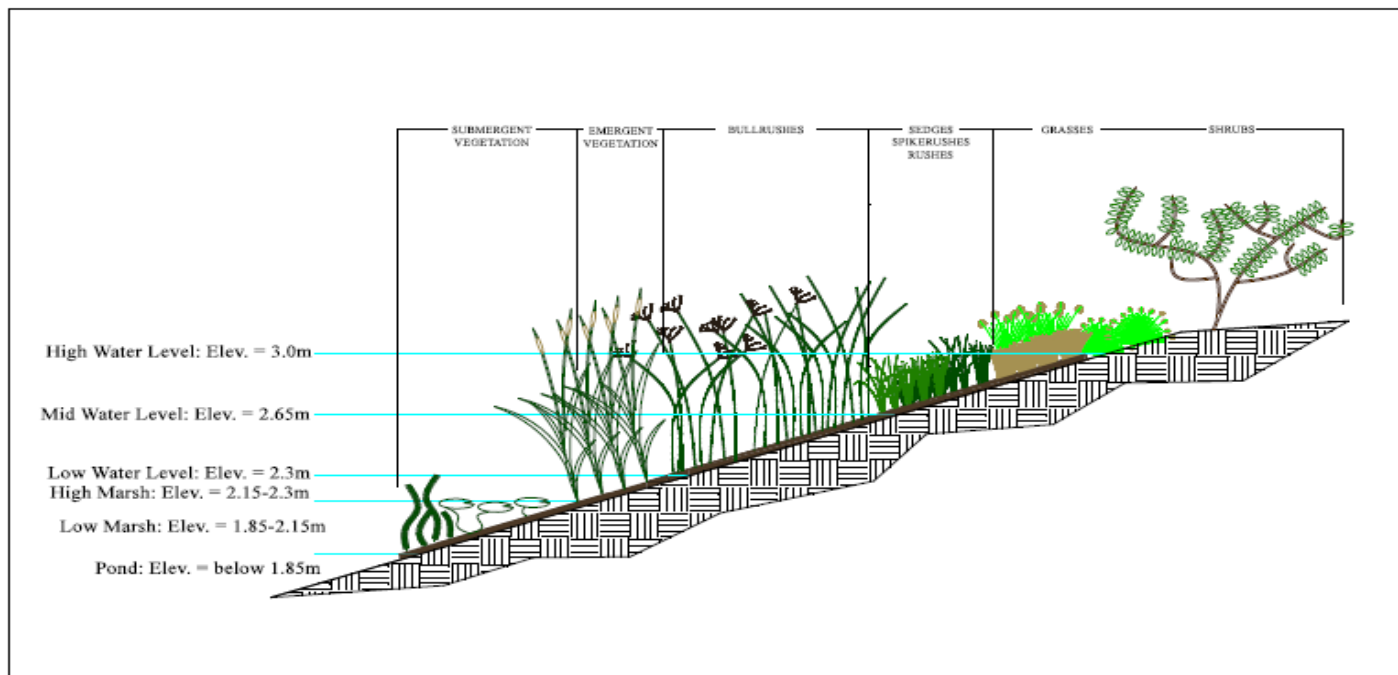
Conceptual Prescription November 2018

Water Quality Treatment Pond/Constructed Wetland Profile

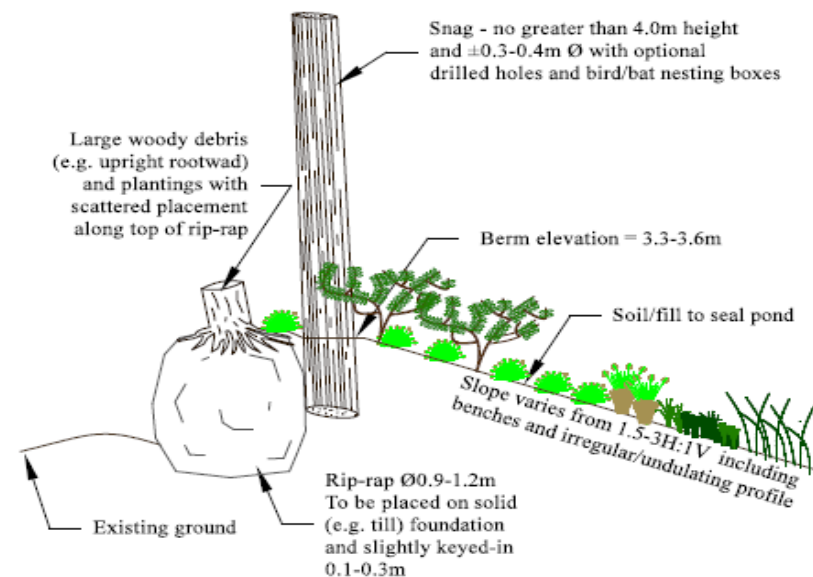


Conceptual Prescription November 2018

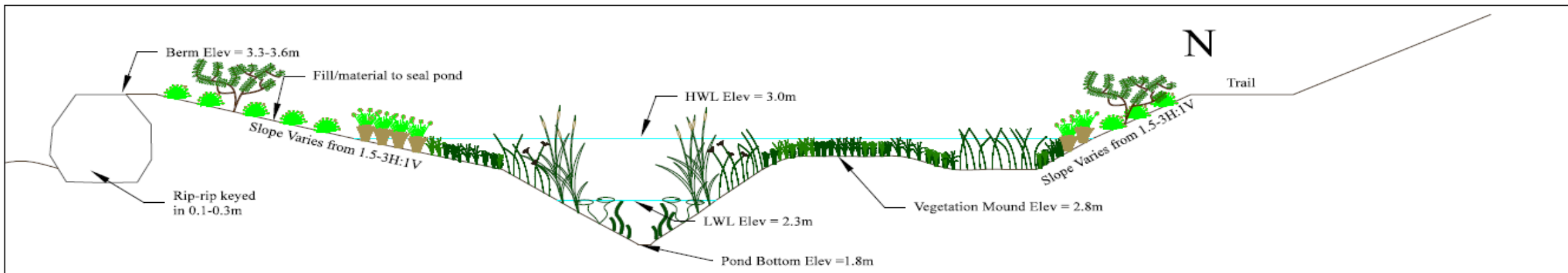
Planting Profile



Typical Wetland Outer Berm X-Section



Vegetation Benches Example: X-section across Pond



Westwood Environmental
Survey & Drafting
K. Robertson, ASCT

kiera.m.smith@gmail.com

McKenzie Interchange Project: Water Quality Treatment Pond/Constructed Wetland
Planting Profile, Vegetation Benches & Berm X-Section - Draft Issued for Discussion

For M.O.T Environmental Management - Sean Wong, Senior Biologist



DWG. No: 2018-10-22

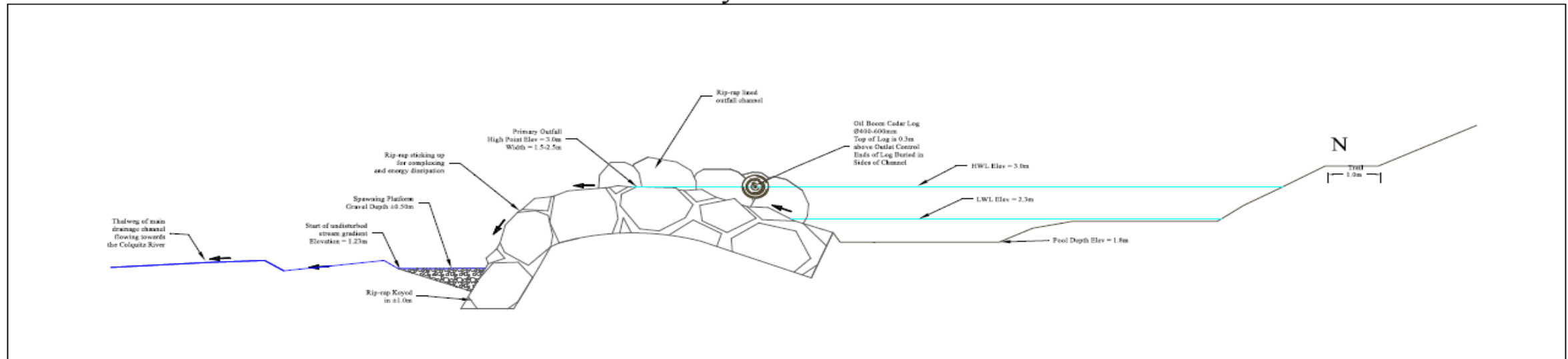
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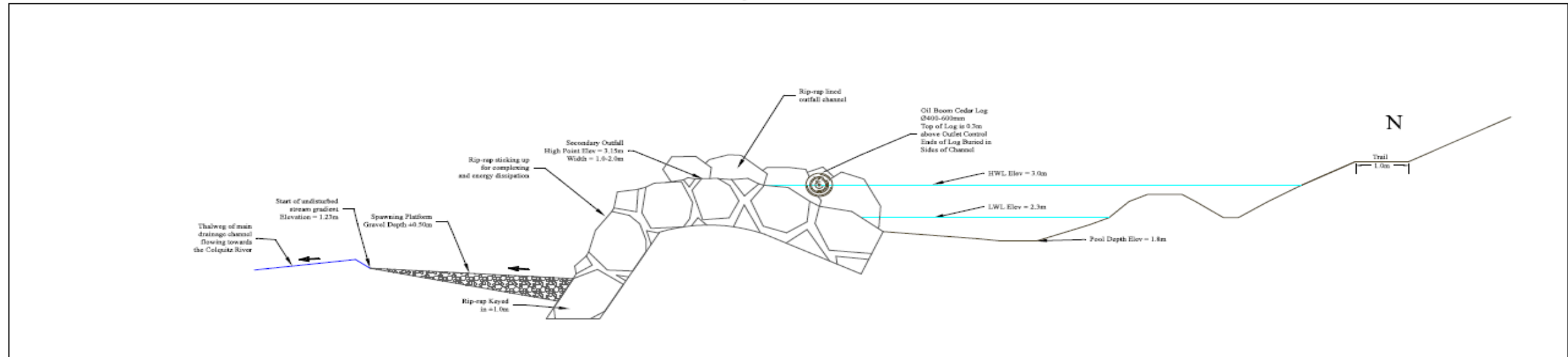
McKENZIE INTERCHANGE PROJECT WATER QUALITY TREATMENT POND/CONSTRUCTED WETLAND DESIGN NOV 30, 2018

Conceptual Prescription November 2018

Primary Outfall Profile



Secondary Outfall Profile



Westwood Environmental
Survey & Drafting
K. Robertson, ASCT

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McKenzie Interchange Project: Water Quality Treatment Pond/Constructed Wetland - Outfall Profiles
Draft Issued for Discussion

For M.O.T Environmental Management - Sean Wong, Senior Biologist



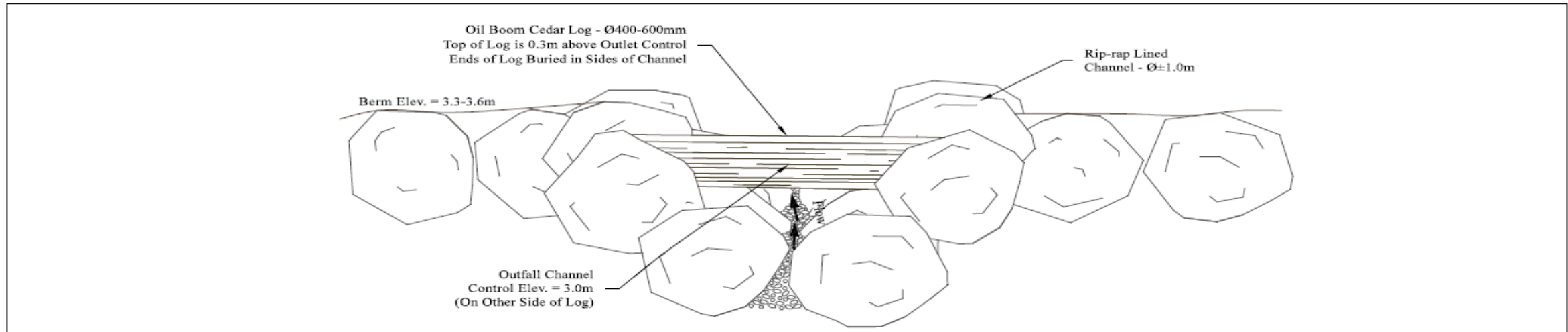
DWG. No: 2018-10-22

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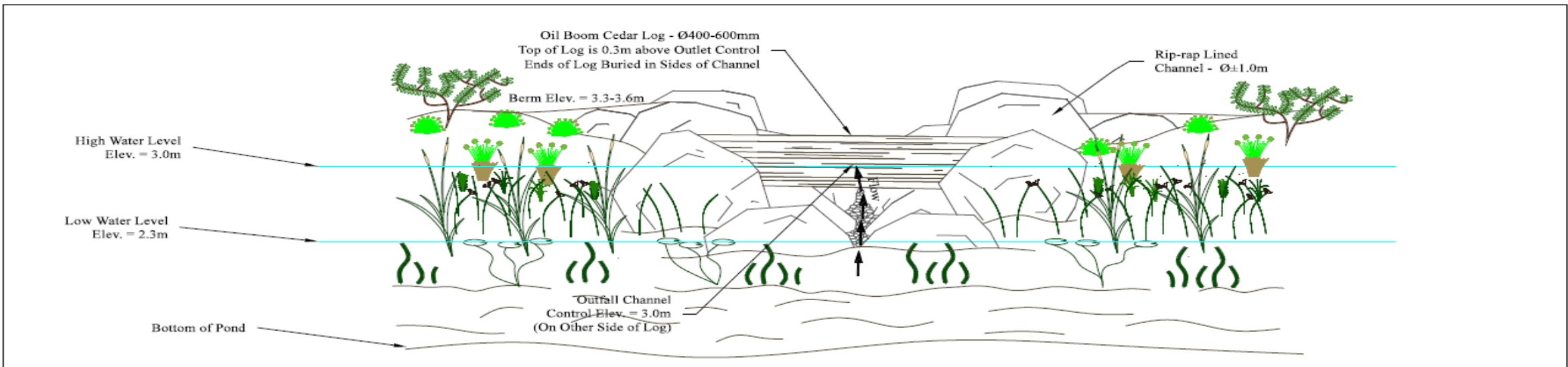
REVISION NO. 2

Conceptual Prescription November 2018

Cedar Log Oil Boom/Skimmer - Construction Diagram



Cedar Log Oil Boom/Skimmer - Post-construction Diagram



Possible Restorative Treatment and Features



- Increased Biodiversity Features via Large Woody Debris, Terrestrial and Wetland Habitat Complexing
- Pollutant Capture via Surficial Oil Skimmer and Mechanical Water Quality Treatment
- Nesting Poles and Boxes
- Invasive Plant Removal & Native Revegetation
- Biofiltration
- Restored Wetland Habitat ...



McKenzie Interchange SE Outfall Proposed Wetland Water Quality Treatment For Gorge Waterway Initiative Nov. 21, 2018



Sean Wong
Senior Biologist



McKenzie I/C Proposed S Side Drainage Treatment