



# Development Permit

## DP2205E (BALFOUR RESORT OWNERS ASSOCIATION)

Date: September 20, 2023

Issued pursuant to Section 490 and 491 of the *Local Government Act*

1. This Development Permit is issued to Balfour Resort Owners Association (hereinafter called the "Permittee") and shall only apply to those lands within the Regional District of Central Kootenay, in the Province of British Columbia legally described as LOT A DISTRICT LOT 337 KOOTENAY DISTRICT PLAN NEP20829 (PID: 018-467-806) as shown on the attached Schedules 1 and 2, forming part of this Permit, referred to hereafter as the "said lands".
2. This Development Permit is issued subject to compliance with all of the bylaws of the Regional District of Central Kootenay applicable thereto, except as specifically varied or supplemented by this Permit.
3. This Development Permit shall not have the effect of varying the use or density of land as specified in the applicable Zoning Bylaw of the Regional District of Central Kootenay, nor a Floodplain Specification under Section 524 of the Local Government Act.
4. The said lands have been designated 'Agriculture (AG)' and are located within a Development Permit Area pursuant to the Electoral Area 'E' Official Community Plan Bylaw No. 2260 as amended.
5. The Permittee has applied to the Regional District of Central Kootenay for a Watercourse Development Permit in order to remove the western retaining wall and restore portions of the shoreline including the revegetation and restoration of the slope from the existing RV sites down to the natural boundary of Kootenay Lake. Pursuant to this Development Permit and subject to the terms and conditions herein contained, as well as all other applicable Regional District Bylaws, the Regional District of Central Kootenay hereby authorizes the use of the said lands for this purpose.
6. The Permittee is required to obtain approval in writing from the Regional District of Central Kootenay prior to any further disturbance, construction of any new buildings, external additions to existing buildings or for any deviation from the development authorized under Section 5 and Schedules 2 and 3 of this Development Permit. Furthermore, the Permittee is hereby advised of the following requirements:
  - 6.1 Development is authorized in accordance with the terms described in the report titled "7298 Highway 3A, Balfour, BC: Riparian Assessment" prepared by Masse Environmental Consultants Ltd., dated December 1, 2022 and attached to this permit as Schedule 3. Compliance with all terms, conditions, guidelines and recommendations is required.
    - 6.1.1 The development authorized by this permit shall be substantially in accordance with "7298 Hwy 3A Foreshore Restoration: Conceptual Restoration Site Plan" drawn by Fiona Lau, dated July 27, 2022 which is attached to this permit as Schedule 2.
    - 6.1.2 Environmental Monitoring: QEP will be onsite for a pre-construction meeting with Owner and Contractor to ensure that all parties are aware of environmental sensitivities and familiar with the proposed mitigation measures.

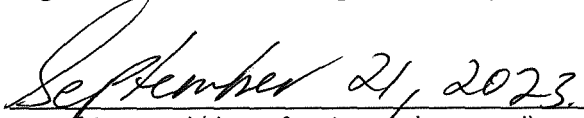
- 6.1.2.1 QEP to provide guidance during restoration and revegetation, as required.
- 6.1.2.2 QEP will conduct a post construction site visit once planting is complete to assess compliance and completion of the project and submit an environmental summary report to the RDCK.
- 6.1.2.3 The following indicators of success of riparian plantings are the following:
  - Plant composition includes mostly native shrubs, perennials and grasses.
  - Establishment of >80% of planted riparian species after 3 full years would be a reasonable indication that the mitigation plan has been successfully completed.

- 7. As a condition of the issuance of this Permit, the Regional District shall hold an irrevocable Letter of Credit submitted by the Permittee in the amount of \$31,388.75 to ensure the landscaping and restoration requirements as described in the Riparian Assessment (Schedule 3) are completed and in accordance with the following provisions:
  - 7.1 A condition of the posting of the Letter of Credit is that should the Permittee fail to carry out the works and services as herein above stated, according to terms and conditions of this permit within the time provided, the Regional District may use the Letter of Credit to complete these works or services by servants, agents or contractors, and any surplus shall be paid over to the Permittee. If the amount of funds is insufficient to cover the actual cost of completing the works, then the Permittee shall pay such deficiency to the Regional District immediately upon receipt of the Regional District's bill for same.
  - 7.2 The Permittee shall complete the landscaping works required by this Permit prior to September 21, 2025. Within this time period the required landscaping must be inspected and approved by the Regional District.
  - 7.3 If the landscaping is not approved within this time period, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is completed or has the option of drawing from the Letter of Credit to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter into the property to undertake the required landscaping for which the Letter of Credit was submitted.
  - 7.4 If the landscaping is approved within this time period without the Regional District having to draw on the Letter of Credit, 90% of the original amount of the Letter of Credit shall be returned to the Permittee.
  - 7.5 A hold back of 10% of the original amount of the Letter of Credit shall be retained until a final inspection is undertaken within 12 months of the date of the original inspection and approval was given to the landscaping. If the landscaping receives approval at final inspection, the 10% hold back will be returned to the Permittee. If after the final inspection, approval of the landscaping is not given, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is approved or has the option of drawing on the Letter of Credit the funds to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter onto the property to undertake the required landscaping for which the Letter of Credit was submitted.
- 8. The said lands shall be developed strictly in accordance with the terms and conditions of this Development Permit and the requirements of all applicable Regional District Bylaws as well as any plans and specifications which may, from time to time, be attached to this Permit shall form a part thereof.

9. In accordance with the Local Government Act, if the development authorized by this Development Permit is not commenced within two years of the date of this Permit, this Permit shall lapse.
10. In accordance with the Local Government Act, 'Notice' shall be filed in the Land Title Office that the said lands are subject to this Development Permit.
11. The terms of this Development Permit including subsequent amendments, are binding on all persons who acquire an interest in the said lands associated with this Permit.
12. It is understood and agreed that the Regional District has made no representations, covenants, warranties, guarantees, promises, or agreement (verbal or otherwise) with the Permittee other than those in this Development Permit. It is solely the responsibility of the Permittee to ensure that the requirements of all other applicable government agencies are satisfied.
13. This Development Permit does not constitute a building permit.
14. This Development Permit shall come into force and effect 14 days after the date of issuance unless a Waiver of Appeal is received from the Permittee at which time the Development Permit shall be deemed to be issued upon receipt of the Waiver of Appeal. OR If a Notice of Appeal is received the Development Permit shall be suspended until such time as the Board of the Regional District of Central Kootenay has decided the Appeal.



Sangita Sudan, General Manager of Development and Community Sustainability Services



Date of Approval (date of review and approval)

September 22, 2023

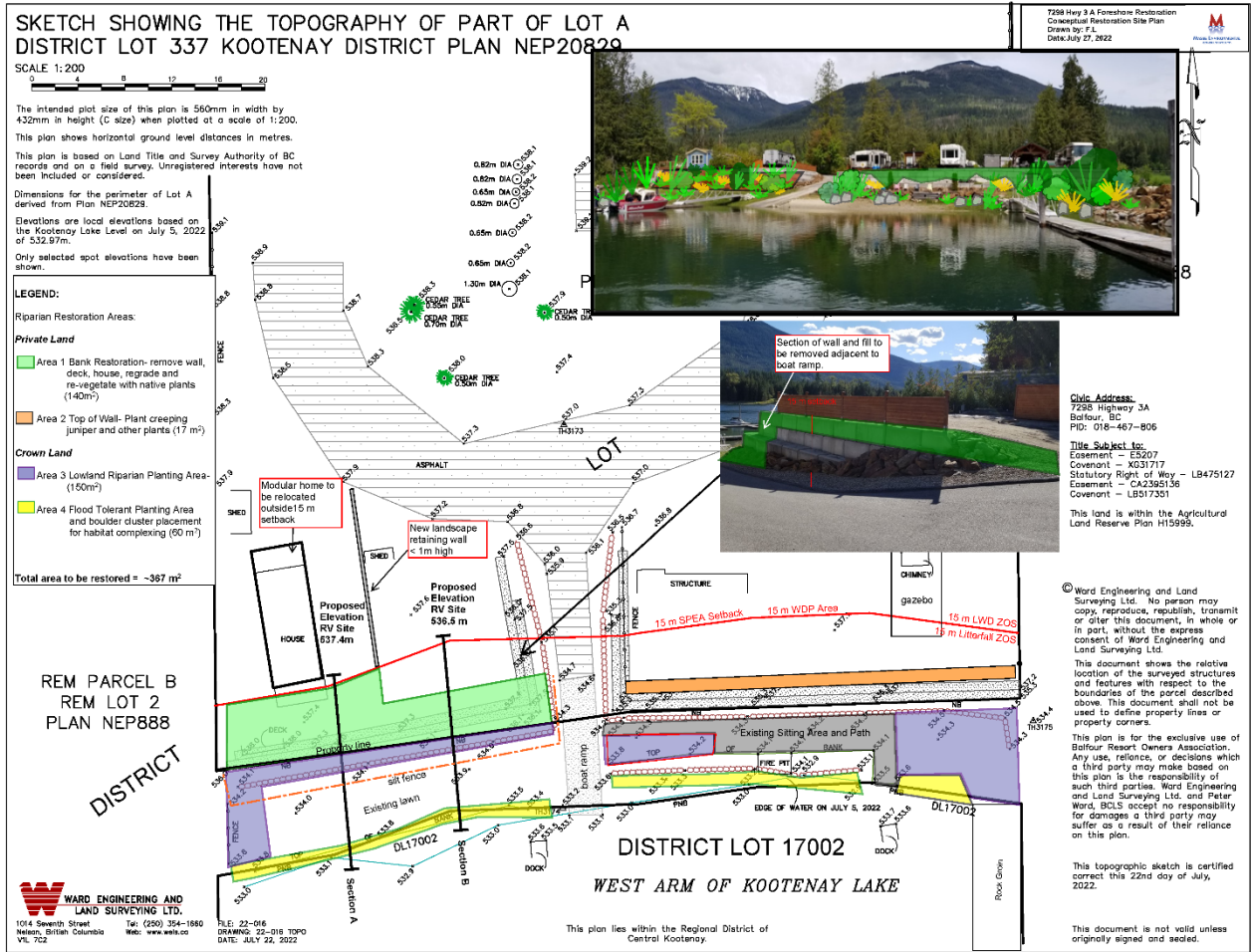
Date of Issuance (pending receipt of securities)

Schedule 1: Subject Property

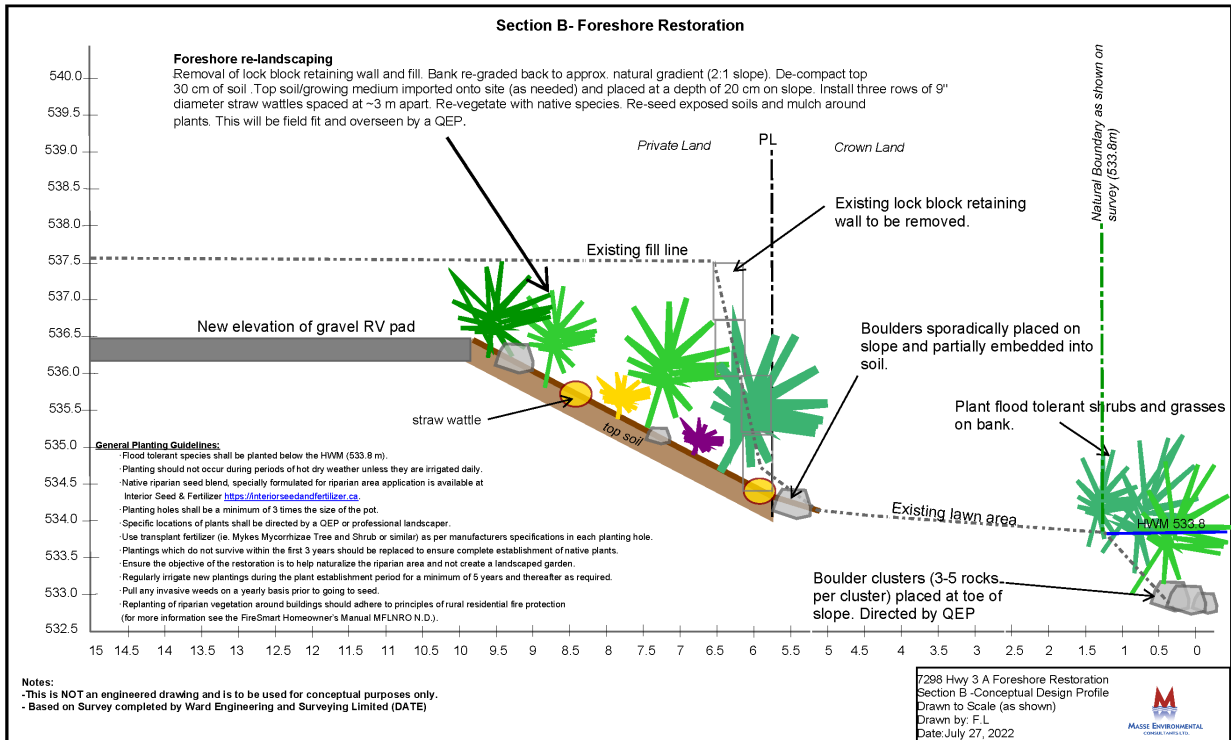
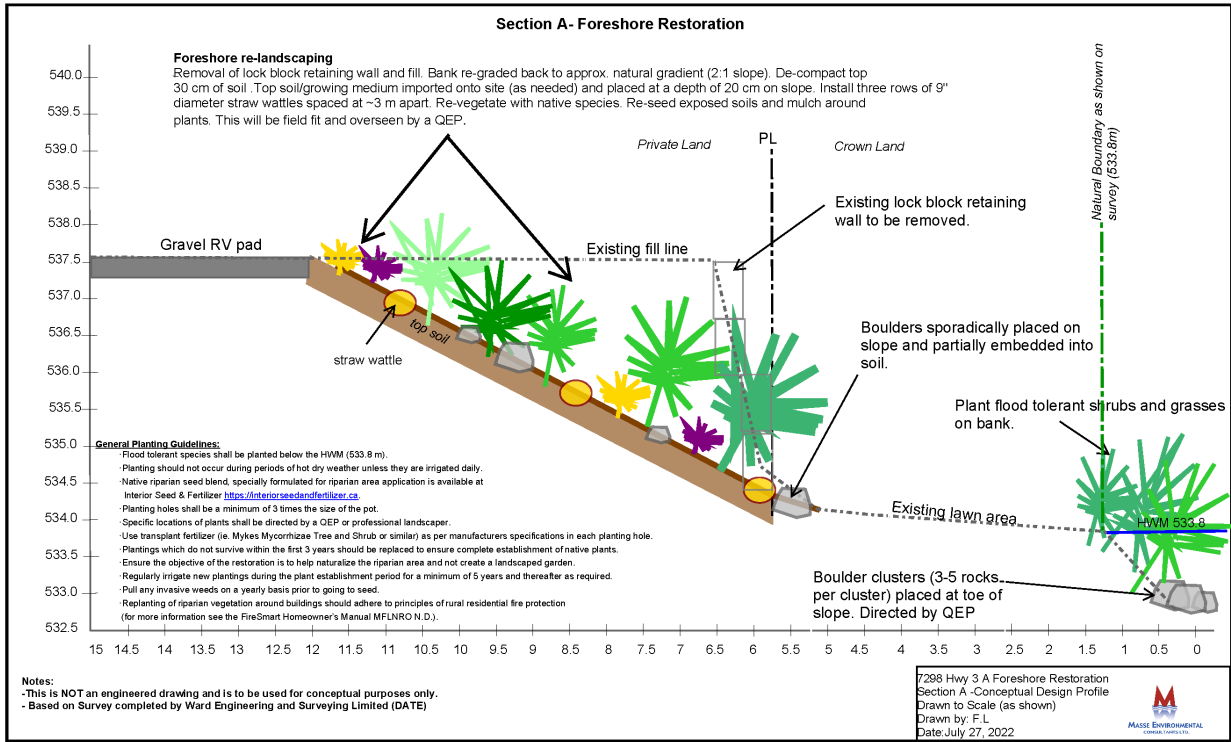




**Schedule 2: "7298 Hwy 3A Foreshore Restoration: Conceptual Restoration Site Plan" drawn by Fiona Lau, dated July 27, 2022**



Schedule 2 Continued: Conceptual Design Profiles for Sections 'A' and 'B'



**Schedule 3:** "7298 Highway 3A, Balfour, BC: Riparian Assessment" prepared by Masse Environmental Consultants Ltd., dated December 1, 2022



7298 HWY 3A  
BALFOUR, BC

## Riparian Assessment



Prepared for:  
Regional District of Central Kootenay  
202 Lakeside Drive,  
Nelson BC, V1L 5R4

Prepared by:  
Masse Environmental Consultants Ltd.  
812 Vernon St.  
Nelson, BC, V1L 4G4

Dec 1, 2022 V2.0





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#### ABBREVIATIONS

- AHI: Aquatic Habitat Index
- DBH: Diameter at Breast-Height
- FIM: Foreshore Inventory Mapping
- GSC: Geodetic Survey of Canada
- HWM: High Water Mark
- LWD: Large Woody Debris
- FLNRORD: Forests, Lands and Natural Resource Operations and Rural Development
- QEP: Qualified Environmental Professional
- RAR: Riparian Area Regulation
- RDCK: Regional District of Central Kootenay
- ROW: Right of Way
- SPEA: Streamside Protection and Enhancement Area
- WDP: Watercourse Development Permit
- ZOS: Zones of Sensitivity

## 1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by Balfour Resorts Owner Association (BROA; “the Owners”), to provide environmental consulting services for a watercourse development permit (WDP) application for the proposed removal of an unauthorized and failing lock block retaining wall at 7298 Hwy 3a (Lot A, Plan NEP20829, District Lot 337, Kootenay Land District; PID: 018-467-806). The retaining wall was constructed by Balfour Resort and Marina Ltd (“the Developer”) without a building permit or site specific floodplain exemption permit in 2013, during the re-development of the Balfour Resort and Marina.

Site visits were completed on September 16, 2021 and May 31, 2022 by Fiona Lau, B.Tech., A.Sc.T., to conduct a riparian assessment on the property within the 15 m WDP area. The riparian assessment evaluates the existing conditions of the property and riparian areas, identifies habitat values, assesses potential environmental impacts, and recommends measures to compensate for the alteration of the riparian area in order to maintain environmental values. The assessment is based on the following regulatory framework and best management practices documents:

- Electoral Area ‘E’ Rural Official Community Plan Bylaw *No. 2260, 2013*.
- British Columbia *Riparian Areas Regulation*
- Kootenay Lake Shoreline Management Guidelines
- British Columbia *Water Sustainability Act*
- General BMPs and Standard Project Considerations (Ministry of Environment)
- On the Living Edge: Your Handbook for Waterfront Living
- Develop with Care. Environmental Guidelines for Urban and Rural Land Development in British Columbia
- British Columbia Firesmart Homeowners Manual
- Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting
- BC Tree Replacement Criteria
- A Homeowner’s Guide to Stormwater Management.

This report has been prepared by Fiona Lau B.Tech., A.Sc.T., and reviewed by Sylvie Masse, MSc, RPBio.

I, Fiona Lau, hereby certify that:

- a) I am a Qualified Environmental Professional (QEP), as defined in Section 21 of the *Riparian Areas Protection Regulation* made under the *Riparian Areas Protection Act*;
- b) I am qualified to carry out the assessment of the proposal made by the owner (BROA), which is described in Section 2.3 of this Assessment Report (the “development proposal”);
- c) I have carried out my assessment of the development proposal, and my assessment is set out in this Assessment Report; and
- d) In carrying out my assessment of the development proposal, I have followed the specifications of the *Riparian Areas Protection Regulation* and assessment methodology set out in the Minister’s manual.



## 2 PROJECT OVERVIEW

### 2.1 Location

The subject property is located in Balfour, BC, and is bordered by private property to the east and west, MoTI ROW to the north, and Kootenay Lake to the south (Appendix 1). The property covers ~4.22 acres with ~70 m of frontage on Kootenay Lake. The property was observed to be slightly sloped, with a dry and warm southern aspect.

The project area is within the Interior Cedar Hemlock dry warm variant 1 (ICHdw1) biogeoclimatic subzone (MacKillop and Ehman 2016). This moist climatic region is characterized by very hot, moist summers; and very mild winters with light snowfall. Soils generally dry out in late summer for varying extents of time ranging from insignificant to extensive. Snowpacks are very shallow to shallow and of short duration and combined with the mild climate result in no significant soil freezing (MacKillop and Ehman 2016).

### 2.2 Existing Site Conditions

#### 2.2.1 Watercourses

##### *Kootenay Lake*

The property is located on Kootenay Lake in the narrows of the West Arm. This section of the lake experiences continual current throughout the year (Photo 1). Kootenay Lake's main inflows include the Lower Duncan River to the north and the Kootenay River to the south. It drains through the west arm into the Kootenay River. Kootenay Lake typically experiences one seasonal water level increase annually which occurs in late spring and early summer months (late May through July). Lake levels can vary by up to 4 m throughout the year affecting the extent of exposed shoreline.

During the site visit, the visible high-water mark (HWM) of Kootenay Lake was confirmed at ~533.5 m elevation, approximately the natural boundary line as shown on the legal survey completed in July 2022 by Ward Engineering and Land Surveying Ltd. (Appendix 2).

Based on the definition of natural boundary, the natural boundary of Kootenay Lake shown on the survey will be used as the HWM from which the streamside protection area setback will be determined as per the Riparian Area Protection Regulation.

“Natural Boundary” means the visible high water mark of any lake, river, stream or other body of water is where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the body of water a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself.”

##### *Unnamed ephemeral stream*

A small unnamed ephemeral creek was observed at the northeast corner of the subject property and flows from upland, across the highway through culvert, onto the property for ~30 m (partially culverted) and then onto the neighboring property to the east (Photo 2). The channel has an average width of 1 m (based

on upstream measurements, north of highway) and a gradient through the property of ~2%. This was not picked up on the most recent survey, as no proposed works are being conducted in this area.



Photo 1. View of Kootenay Lake foreshore looking west during peak lake levels (~533.0 m onsite), June 12, 2022. Photo credit BROA.

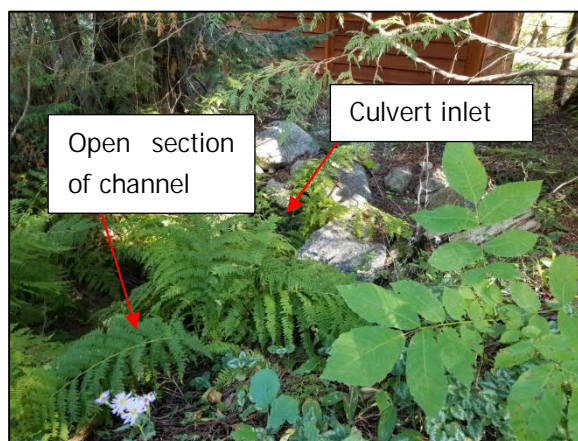


Photo 2. Section of unnamed ephemeral stream at northeast corner of property, Sep 8, 2021.

### 2.2.2 Existing Site History and Development

The property has operated as a campground, and recreation vehicle (RV) resort for many decades. In 2011, Ron Juris purchased the property, which was then taken over by Balfour Resort and Marina Ltd. The resort is located within the Agricultural Land Reserve of BC and is governed by a Restrictive Covenant Agreement (RCA; July 2013).

In 2011-2013, the resort underwent redevelopment which included development of 46 designated Recreational Vehicle (RV) lots and one site approved for a permanent residence. This work involved re-grading of the south end of the property, utility upgrades (water, sewer and storm), marina upgrades (Photo 3 and Photo 6) and construction of a new wrap around road. Specific upgrades that were completed within the riparian area (15 m from the natural boundary) included the removal of riparian vegetation, placement of fill, construction of a boat ramp, patio/pathway area with fire pit, and construction of two-3.3 m high lock block retaining walls along the south property line (Photo 3 and Photo 4). The placement of fill and construction of the lock block retaining walls by the Developer were unpermitted and would have required at the time a Site-Specific Floodplain Exemption and Building Permits from the Regional District Central Kootenay (RDCK). The western lock block retaining wall is 27 m long along the foreshore, while the eastern retaining wall is 35 m long.

BROA was established in 2013, when the re-development was complete and 47 fractional shares were sold. There are currently 44 individual owners and an elected Board of Directors. Over the years, the Owners of the five RV lots located along the foreshore above the lock block retaining walls have installed landscaping, privacy fences, decks, gazebo, sheds, concrete pads and patios. The large gazebo and concrete patio located

at the southeast corner of the property and partially encroaching into the WDP area was permitted by the RDCK on April 10, 2018 (BP024358, Photo 7).

In 2020, the western retaining wall began to fail. The Owners noticed that there was continuous settling and deflection, as well as water build up behind the wall. The Owners retained the services of WSA Engineering initially, then Masse Environmental Consultants Ltd and Ward Engineering and Land Surveying Ltd. were retained to provide remedial design options for the failing wall. In consultation with the RDCK Planning Department, the remedial option decided upon was to remove the failing retaining wall and restore the bank to its approximate natural gradient.



Photo 3. View of developed foreshore area looking north on the subject property, May 31, 2022



Photo 4. Approximate property line along foreshore looking west May 31, 2022.



Photo 5. View of boat ramp and tie back lock block retaining walls looking south, Sept 16, 2021.



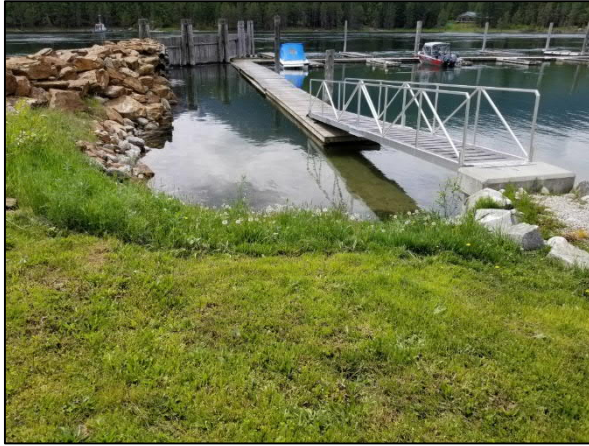


Photo 6. View of new access ramp onto dock, as part of the marina upgrade, May 31, 2022.



Photo 7. View of shed, gazebo and firepit/ patio constructed in southeast corner of property, Sept 16, 2021.

### 2.3 Proposed Development

The proposed development within the 15 meter WDP area will involve the following activities:

- Remove western lock block retaining wall along foreshore and remove imported fill material;
- Remove deck and relocate modular home on far west RV site to outside of the 15 m setback;
- Restore WDP area- Re-grade slope back to natural gradient (~2:1) and revegetate with native plants; and
- Revegetate along top of eastern retaining wall.

In addition to restoration within the subject property, foreshore restoration within Crown Land is proposed, which includes removal of rock armour along front side of western retaining wall, removal of paving stones, revegetation of native species and habitat complexing. This work requires a Section 11 Authorization under the Water Sustainability Act and Permission to work on Crown Land.

Refer to Section 7 for detailed prescription and Appendix 3 for Conceptual Site Restoration Plan.

#### 2.3.1 Removal of Retaining Wall and Fill Material

The western lock block retaining wall is sited mostly inside the WDP area with the exception of a length of wall (~10 m long) along the east side, which will partially encroach into the 15 WDP area by 4 m. Prior to removing the wall, boulders placed around the wall will be removed and some stockpiled on site for habitat complexing. The western retaining wall will be mostly removed. This section of wall will be brought down one full block height (~0.75m) tiered at the existing 1:1 slope, with each tier 0.75 cm high to allow for the retention of the fill on the RV site and re-grading of the WDP area (Appendix 3). Site regrading will involve removal of imported fill material back to the approximate natural bank gradient at 2 (H):1 (V) slope. In addition, the RV pad located adjacent to the boat ramp will be brought down to an elevation of 536.5 m. The other RV site will be left at 537.5 m elevation. A small retaining wall (<1.0 min height) will be



constructed between the two sites outside of the 15 m WDP area. The transition area between the two lots within the WDP will be naturally sloped and revegetated. Excavation work will mostly be completed using an excavator from the top of the bank and pulling material back into private property. Fill material will be hauled offsite. BROA will be retaining a geotechnical engineer to oversee the removal and re-grading of the bank.

### *2.3.2 Restoration of 15 m WDP Area*

The proposed restoration of the 15 m WDP area will involve restoring the area where the retaining wall and fill were removed. This will involve sporadic placement and embedment of boulders, importing growing medium and re-vegetating with native riparian plant species. Refer to Section 7.1 for site revegetation prescriptions. Boulders will be embedded and placed sporadically along the slope at the QEP's direction to create habitat complexity. This work will be field fit by the Contractor, with recommendations made by the Qualified Environmental Professional (QEP) and Owner.

## 2.4 Services

Domestic water for the RV resort is extracted and gravity fed from Laird Creek (MFLNROD Water License #146727). The waterline enters the property at the northern property line and water is treated by a water treatment facility, authorized under the Interior Health Water System Operating Permit (12-098-00835). Water is then distributed to each of the RV lots. BROA maintains the system on a daily basis, while Aqua Diversities (Certified Operator) completes independent visits, inspections or maintenance, collection of samples, and reporting to Interior health as necessary.

Individual RV lots have gravity fed sewer connections to two central sewage processing facilities, which are located centrally in the property, the first collection tank and drainage field is ~ 40 m upland from the southern property boundary. The second tank and field are located further upland. BROA has taken operating responsibility for this system and All Around Septic Service is retained to attend annual system checks and pump out, as required. The current septic system is in accordance with the BC Sewerage System Standard Practice Manual – Version 3 (MoH 2014).

## 3 REGULATORY REVIEW

### 3.1 Streamside Protection and Enhancement Area

The default WDP area is 15 m from the natural boundary of Kootenay Lake. To determine whether the 15 m WDP setback from the High Water Mark (HWM) of Kootenay Lake aligns with the Riparian Area Protection Regulation (RAPR) criteria, a detailed assessment of the subject property was conducted to calculate the Streamside Protection and Enhancement Area (SPEA) setbacks. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1 and Appendix 3.

As per the RAPR, the large woody debris (LWD), and litter ZOS were plotted 15 m inland from the HWM of Kootenay Lake, with the shade ZOS plotted 0 m from the HWM. The SPEA setback is determined based on

the ZOS with the greatest width. Therefore, within the subject property the SPEA from the HWM of Kootenay Lake is 15 m.

The BC Riparian Areas Regulation (BC 2015) defines “High Water Mark” and “Stream” as follows:

“High Water Mark” means the visible high water mark of a stream where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the stream a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself, and includes the active floodplain.”

“Stream” includes any of the following that provides fish habitat:

- (a) a watercourse, whether it usually contains water or not;
- (b) a pond, lake, river, creek or brook;
- (c) a ditch, spring or wetland that is connected by surface flow to something referred to in paragraph (a) or (b).

Table 1. Results of detailed RAPR assessment.

Feature Type	SPVT <sup>1</sup>	Zones of Sensitivity			SPEA
		LWD	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	0m	15 m

<sup>1</sup> SPVT: site potential vegetation type (TR-tree)

### 3.2 Kootenay Lake Shoreline Management Guidelines

The Kootenay Lake Foreshore Inventory Mapping (FIM) and the Kootenay Lake Shoreline Management Guidelines documents (EEC 2016, KLP 2018) were used to help determine the site specific risks for riparian habitat, Ktunaxa Nation cultural values, and archaeological resources along the shoreline. The property (7298 Hwy 3a) is within FIM segment 40. The environmental and archaeological risk results identified in the FIM are presented in Table 2.

Table 2. Environmental and archaeological risk results (FIM).

Segment	Aquatic Habitat Index Rating (AHI)	Aquatic Sensitivity	Archaeological Risk	Enhanced Engagement Required
40	High	Yes	Orange	No

## 4 RESOURCES

### 4.1 Fish and Aquatic Habitat

The foreshore area along Kootenay Lake, which consists of the area between the high and low water marks, is a gently sloped sandy beach (up to ~10% gradient) with substrate consisting predominantly of sand and silt (Photo 8 and Photo 9). A rock retaining wall ~1m in height is present in front of the eastern lock block wall along the natural property boundary (Photo 8), while the western side consists of a vegetated slope

with grass(30%-50%) and some evidence of soil erosion at the west end (Photo 10 and Photo 11). The shoreline is devoid of native riparian shrubs and trees, which are important contributors to fish habitat and nutrient inputs. Fish habitat along the foreshore may support juvenile rearing, fish migration and staging habitat. No shore spawning has been reported in this area (Redfish 2011). The West Arm of Kootenay Lake supports a variety of fish species, including several species of regional interest, such as Rainbow Trout (*Oncorhynchus mykiss*), Bull Trout (*Salvelinus confluentus*), Kokanee (*O. nerka*), White Sturgeon (*Acipenser transmontanus*), Westslope Cutthroat Trout (*O. clarki lewisii*), and Burbot (*Lota lota*).



Photo 8. View of beach area fronting the property, Sept 8, 2021.



Photo 9. View of typical instream substrate, Sept 8, 2021.

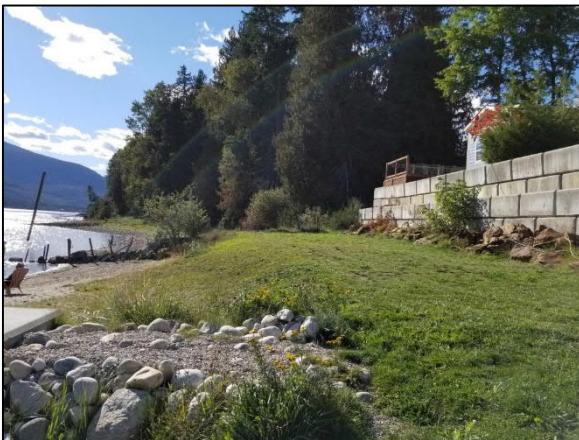


Photo 10. View of foreshore area fronting western retaining wall, looking west, May 31, 2022.



Photo 11. View of foreshore and visible erosion fronting western retaining wall, looking north, May 31, 2022.

#### 4.2 Riparian Vegetation

The natural topography along the shoreline of the subject property has changed substantially due to the works that were completed and most of the native riparian vegetation was removed (Photo 8, 10 and 11). Species observed on the site included black hawthorn (*Crataegus douglasii*), blue elderberry (*Sambucus cerulea*), rose sp. (*rosa sp.*), ornamental cedar (*Thuja sp.*), common horsetail (*Equisetum arvense*), wild



strawberry (*Fragaria virginiana*), and pasture sage (*Artemisia frigida*). Non-native species observed included agronomic grasses, bugle-weed (*Ajuga reptans*; Photo 13Photo 14Photo 1), clover (*Trifolium sp.*), dandelion (*Taraxacum officinale*), spotted knapweed (*Centaurea maculosa*), vetch (*Vicia sativa*). Noxious weeds included common tansy (*Tanacetum vulgare*) and scotch broom (*Cytisus scoparius*, Photo 14).

A survey of the adjacent riparian areas to the north and south of the property was conducted to identify native species naturally occurring in the area. Riparian vegetation is a mixed conifer and deciduous forest consisting of black cottonwood (*Populus balsamifera*), Western red cedar (*Thuja plicata*), lodgepole pine (*Pinus contorta*), alder species (*Alnus sp.*) and willow species (*Salix sp.*) (Photo 10).



Photo 12. View of grassy area at SE corner of property within Crown Land.



Photo 13. Bugle-weed located within rock along the front of the retaining walls.



Photo 14. Scotch broom plant located at SW corner of property.

#### 4.3 Wildlife Habitat

##### 4.3.1 Reptiles and Amphibians

The riparian area in its current state does not provide good habitat for reptiles such as northern alligator lizard (*Elgaria coerulea*), western skink (*Plestiodon skiltonianus*) or garter snakes (*Thamnophis spp.*), due



the high level of disturbance, lack of vegetation and cover. Interspatial habitat along the rock armouring below the lock block retaining walls may provide some cover habitat. Once the proposed re-vegetation has established, it is expected that this area will become more attractive to reptiles.

#### 4.3.2 Birds

The subject property is likely visited by songbird and waterfowl; however due to the lack of vegetation within the riparian area, bird habitat is limited. During the most recent site visit, bank swallow (*Riparia riparia*), osprey (*Pandion haliaetus*) and bald eagle (*Haliaeetus leucocephalus*) were observed to be flying over. Bank swallow nesting activity was also observed along the front faces of the lock block retaining walls. Netting had been placed by the Owners over the front face of these walls to deter nesting. Proposed re-vegetation within the riparian area will likely increase potential nesting and feeding habitat for songbirds.

#### 4.3.3 Mammals

The property in its current state does not provide any potential habitat for ungulates, bears and limited habitat for small mammals. Even after the restoration is complete, habitat use by mammals is expected to be minimal due to the medium-density use of the property, habitat fragmentation (ie. fencing along both sides), and more suitable undisturbed riparian vegetation located directly to the west.

#### 4.4 Species at Risk

A 10 km buffer around the subject property was used to query BC Conservation Data Center records using the [CDC iMap](#) tool. Based on this query, two species at risk occurrences are known within the 10 km of the project area:

- 1) The Upper Kootenay River white sturgeon (*Acipenser transmontanus*; BC Red-listed, COSEWIC-Endangered and SARA - Endangered) population. The nearest white sturgeon Critical Habitat is at the Crawford Creek delta ~14 km east of the property (Environment Canada 2014).
- 2) Wild licorice (*Glycyrrhiza lepidota*; BC Blue-listed) recorded observation ~3.1 km away in Queens Bay on Kootenay Lake.

#### 4.5 Archaeological Resources

Kootenay Lake is part of the traditional territory of the Sinixt, Okanagan and Ktunaxa First Nations and archaeological evidence is documented at multiple shoreline sites. A review of archaeological resources on this property is outside the scope of this report.

## 5 IMPACT ASSESSMENT

The proposed development was assessed based on pre-existing development, current site conditions and proposed development within the WDP area and Crown Land foreshore area. Table 3 summarizes the types of development, estimated areas, and associated benefits and impacts. The total area to be restored and/or enhanced is ~367 m<sup>2</sup> on both private and crown land.

Table 3. Impact assessment.

Status	Disturbance Type	Affected Area	Riparian Benefits and Impacts
<b>Private land</b>			
Current	<ul style="list-style-type: none"> <li>Riparian vegetation removal</li> <li>Fill placement</li> <li>Lock block retaining walls</li> <li>Boat ramp</li> <li>Structures and impervious surfaces</li> </ul>	~466 m <sup>2</sup>	<p><i>Benefits</i>-None</p> <p><i>Impacts</i>- riparian habitat loss, loss of riparian function and wildlife habitat, increased runoff potential, potential for invasive species establishment, lack of top soil for native plant recruitment and change of site drainage.</p>
Proposed	<ul style="list-style-type: none"> <li>Removal of western lock block retaining wall and deck, re-grading and revegetation of slope</li> <li>Planting along top of eastern retaining wall</li> </ul>	~157 m <sup>2</sup>	<p><i>Benefits</i>- Restoration of riparian area function over time, wildlife habitat creation, soil stabilization, riparian area buffer, and improvement to site drainage. In addition, improvement to foreshore and site aesthetic value.</p> <p><i>Impacts</i>- Short- term disturbance of soils and noise during construction period.</p>
<b>Crown land</b>			
Current	<ul style="list-style-type: none"> <li>Riparian vegetation removal</li> <li>Historical fill placement</li> <li>Boat ramp construction</li> <li>Semi-pervious paving stone area</li> <li>Firepit</li> <li>Rock armouring fronting retaining walls</li> </ul>	~ 470 m <sup>2</sup>	<p><i>Benefits</i>- rock armour provides soil stabilization of bank areas and protection to retaining walls. Rock provides interstitial habitat for reptiles and juvenile fish.</p> <p><i>Impacts</i>- riparian habitat loss, lack of habitat complexity, and increased surface runoff.</p>
Proposed	<ul style="list-style-type: none"> <li>Removal of paving stones</li> <li>Planting along natural boundary and lowland areas</li> <li>Removal of rock armour fronting western retaining wall</li> </ul>	~210 m <sup>2</sup>	<p><i>Benefits</i>- Restoration of riparian area function over time, wildlife habitat creation, soil stabilization, riparian area buffer, overhanging vegetation and shade, increased interstitial habitat, and improved site drainage. In addition, improvement to foreshore and aesthetic value.</p> <p><i>Impacts</i>- Short- term disturbance of soils and noise during construction period.</p>

The most significant impact associated with the current site developments is the permanent removal of riparian vegetation within the SPEA from the placement of fill and retaining walls, which decrease riparian vegetation function, ultimately affecting the health and productivity of aquatic ecosystems. This includes future loss of large woody debris recruitment, shade potential, water temperature regulation and nutrient

input including litter fall and insect drop. In addition, the removal of riparian vegetation and increased human activity within the riparian area reduces wildlife habitat for birds, mammals, reptiles, and amphibians, increases noise and light disturbance to local wildlife, increases erosion and sediment potential, and stormwater runoff.

Provided that measures to protect the SPEA are followed, and the recommended mitigation plan is implemented, negative wildlife and riparian impacts from the proposed development will be reduced and riparian function should be restored overtime.

## 6 MEASURES TO PROTECT THE INTEGRITY OF SPEA

This section provides measures to protect the integrity of the SPEA as described in RAPR, as well as recommended best management practices.

### 6.1 Danger Trees

Overall tree cover on the site is sparse and no hazard tree indicators were observed. A certified danger tree assessor was not retained as a part of this assessment. BROA engages the services of Loki Tree Services to provide an annual assessment of trees on and adjacent to the resort.

### 6.2 Windthrow

There was no potential windthrow risk observed on the property. Further assessment of windthrow risk is beyond the scope of this report, and any such assessment should be led by a Registered Professional Forester (RPF) or qualified practitioner.

### 6.3 Slope Stability

BROA will be retaining a geotechnical engineer to oversee the removal and re-grading of the bank. Further assessment of geotechnical hazard is beyond the scope of this report, and any such assessment should be led by a P.Geol, or P.Eng.

### 6.4 Protection of Trees and Vegetation in the SPEA

As there is minimal riparian vegetation within the SPEA, the following mitigation measures proposed are to protect the integrity of the existing native soil and the single deciduous tree along the western property line:

- Staging and access should only occur in previously disturbed areas of the site.
- No pollutants should be allowed to contaminate the soil around existing vegetation.

### 6.5 Encroachment

As the proposed development occurs within the SPEA, further development beyond the previously disturbed areas and restoration areas is discouraged to promote re-establishment of riparian vegetation and the

function of the riparian area. Any future development proposed within the SPEA will require a QEP review and a Watercourse Development Permit.

#### 6.6 Erosion and Sediment Control

The following mitigation measures should be implemented to reduce the risk of erosion and sediment input to Kootenay Lake:

- Any surface runoff should be controlled and directed away from exposed soils.
- Sediment fencing shall be installed along the south side of the bank restoration works (Appendix 3). Sediment fencing shall be left in place and maintained in a functional condition until exposed soil has been mulched or stabilized.
- In the event of heavy rainfall, additional mitigation measures such as covering soils may be required to ensure turbid wastewater does not leave the construction site.
- Excavation to remove part of the imported fill should be monitored closely to ensure that the native ground is exposed but not further disturbed.
- Soil should be safely stockpiled outside of the 15 m riparian setback in a manner that eliminates the possibility of erosion and sediment transport.
- Disturbed soils should be revegetated as soon as possible.

#### 6.7 Stormwater Management

The proposed revegetation within the riparian area is expected to decrease stormwater runoff, as it will be naturally absorbed into the vegetation. The following mitigation measures will help decrease stormwater impacts:

- Downspouts from modular home and RVs should direct rainwater into suitable landscape features which can absorb and utilize runoff.
- Stormwater discharges must adhere to the *Water Sustainability Act* or any other applicable legislation.

#### 6.8 Floodplain Concerns

The two RV lots located behind the re-graded bank will be above the 536.5 m flood construction level and structures will be located outside of the 15 m floodplain setback. No floodplain concerns were identified.

#### 6.9 Scheduling of Environmentally Sensitive Activities

Works should be scheduled to avoid impacts to SPEA vegetation, aquatic habitat, and nesting birds. The best timing for proposed work is September-mid May when Kootenay Lake water levels are lower. Works in and around existing trees and shrubs should be monitored for nesting birds if works are completed during the breeding bird season which extends from April 1 to August 15, to minimize disturbance.

#### 6.10 Protection of Fish Habitat

Protection of fish habitat shall be implemented by:

- Limit beach modification to permitted areas.
- Adhere to erosion and sediment control, stormwater, and waste management best practices outlined in this report to ensure that there is no release of deleterious materials into Kootenay Lake.

#### 6.11 Management of Equipment and Fuel/Lubricant Materials

The most likely source of any contaminant is from equipment or vehicles used or stored on-site, either during fueling or from unanticipated leaks or the failure of a hydraulic hose. To minimize the likelihood and impact of a spill within the riparian area, ensure that:

- Each piece of heavy equipment will be equipped with its own spill response kit.
- Equipment will arrive clean and in good working condition.
- All staff will be familiar with the use of spill kits and their contents. The contents of the kits will be replaced immediately after use.
- Equipment will be stored in a designated area as far from Kootenay Lake as possible and secondary containment will be utilized to capture any potential spills or leaks.

#### 6.12 Invasive Plant Management

Construction activities have the potential to increase prevalence of invasive plant species which can out-compete native riparian vegetation, causing damage to habitat and ecosystem function. The following mitigation measures are recommended to reduce the establishment and proliferation of invasive plant species on site:

- All equipment should be thoroughly washed and inspected before entering the project site to prevent the import of new invasive plant seeds and root fragments.
- Amount of soil disturbance should be minimized.
- All exposed soils should be re-vegetated immediately following construction.
- Remove scotch broom bush with excavator located at the SW corner of the property.
- Hand pull other invasive weeds such as spotted knapweed and common tansy within the SPEA.
- Double bag and dispose of invasive weeds at a licensed landfill facility (Castlegar or Salmo Landfills).

## 7 MITIGATION PLAN

The Shoreline Management Guidelines for Kootenay Lake outlines general principles for shoreline development in order to achieve a “No Net Loss” of habitats present. The principle is achieved by applying the following priority sequence of mitigation options: 1. *Avoidance* of environmental impacts; 2. *Minimization* of unavoidable impacts; 3. On-site *restoration*; and 4. *Offset* residual impacts that cannot be minimized through compensation (KLP 2018). Avoidance was not achievable with the existing and proposed development as the disturbance has already occurred; therefore, mitigation measures to minimize proposed new development and restoration of the disturbed riparian area are being recommended and are described in the following sections. Refer to Appendix 3 for Conceptual Site Restoration Plan.

Restoration within the foreshore area involves de-constructing the western lock block retaining wall, removing fill material within the 15 m setback, re-grading to approximate natural bank gradient of 2(H): 1 (V) slope and re-vegetating area with native plant species. In addition, three areas along the foreshore within crown land that are currently grassy and/or hardscaped will be replanted with native shrubs and grasses.

The objective of this restoration area will be to create riparian shrub habitat with some trees at the west and east ends of the site. Plant species selected will improve bird and pollinator habitat by attracting birds, bees, butterflies, hummingbirds and moths. Landscaping will be field fit by the landscape Contractor, with direction and recommendations made by the QEP and Owners. The overall goal of the restoration will be to naturalize the riparian area and create a non-landscaped garden look.

### 7.1 Site Revegetation

The proposed revegetation is designed with a focus on naturalizing the foreshore and creating a vegetation buffer between the development and foreshore area. The area will require re-grading and re-vegetating with a combination of native potted stock (1 to 5 gallon pot size) and re-seeding with specifically formulated herbaceous seed blends to promote shrub habitat establishment. In addition, straw wattles will be placed on the re-graded slope to help stabilize soil and reduce sediment runoff.

The final plant species selection and quantities shall be determined by the QEP in consultation with the Owners and will be dependent on plant availability at the time of ordering. The landscape design shall provide mixed plant structure and layering, which meets or exceeds the below prescription. The proposed revegetation will require ongoing maintenance (ie. irrigation and weeding), until it becomes naturalized over the moderate to long term.

Revegetation within private property includes the revegetation of the re-graded slope where the west retaining wall will be removed (Area 1) and planting along the top of the existing east retaining wall (Area 2).

#### *Area 1: Bank restoration (140m<sup>2</sup>)*

- De-compact top 30 cm of native soil with excavator bucket and leave in rough and loose condition.
- Place topsoil on slope to a depth of 20 cm.
- Install two to three rows of 9" diameter straw wattles, spaced at ~3 m apart (Product Nilex straw wattle or similar product). Bottom row should be installed at toe of slope and top row near the crest of the slope. It is estimated that twelve, 25' rolls are required for the restoration area. Refer to Appendix 4 for installation guide.
- Plant a minimum of 120 shrubs and perennials at an average of ~1 meter spacing on slope. Refer to Table 4 for recommended plant species. Plant placement will be dependent on species and plant size.

- Spread mulch around each plant to a thickness of 8 cm (3") thickness
- Spread recommended seed mix on exposed soil at a rate of 35 kg/Ha. Refer to Table 5 for recommended seed mix.

*Area 2: Top of wall restoration (17 m<sup>2</sup>)*

- Excavate gravel trench line along top of wall to a depth of ~0.4 m and 0.5 m wide, line with non-woven geotextile fabric and fill with growing medium.
- Plant eight creeping juniper (1 or 2 gallon pot size) at 4 m spacing between each plant. Encourage growth over the top and down the retaining wall face.
- Spread mulch on exposed soils to a thickness of 8 cm (3").

## 7.2 Crown Land Revegetation

For reference purposes only, the proposed revegetation areas on Crown Land along the foreshore will be in accordance with the Section 11 Authorization. This will include revegetation on the lowland bench area on the foreshore (Area 3) and planting along the natural boundary with flood tolerant species (Area 4). In addition, habitat complexing is proposed, which will involve placement of boulder clusters along the toe of the bank in Area 4 which will target terrestrial species and could provide habitat to aquatic species during high waters.

*Area 3: Lowland Riparian Planting Area (150 m<sup>2</sup>)*

- Remove rock armouring along front of west retaining wall and re-grade back to natural slope.
- Remove paving stones along the front side of sitting area (west of the firepit). De-compact soil to 30 cm depth and add necessary growing medium into planting holes.
- Plant at least 5 native trees or tall shrubs (2 or 5 gallon pot size) and 100 native plants spaced at ~1.0 m between each plant and/or directed by the QEP.
- Spread mulch around each plant to a thickness of 8 cm (3").
- Spread recommended seed mix on exposed soils.

*Area 4: Flood Tolerant Planting Area (60 m<sup>2</sup>)*

- Place boulder clusters (3-5 boulders) along toe of slope.
- Plant at least 40 flood tolerant shrubs (1 gallon pot size), sedges and grasses (plugs, 4" or 1 gallon). Recommended species can be found in Table 4. Plant spacing to be >0.5m apart and/or directed by QEP in the field.
- Additional growing medium to be used in planting holes as required.

Table 4. Recommended plant list.

Common Name	Latin Name	Recommended Pot size
Trees		
Lodgepole pine	<i>Pinus contorta</i>	#2 or #5
Paper birch	<i>Betula papyrifera</i>	#2
Western red cedar	<i>Thuja plicata</i>	#2 or #5
Shrubs		
blue elderberry	<i>Sambucus cerulea</i>	#1 or #2
common snowberry	<i>Symphoricarpos albus</i>	#1 or #2
Douglas maple	<i>Acer glabrum</i>	#1 or #2
Lewis' mock orange	<i>Philadelphus lewisii</i>	#1 or #2
mallow ninebark	<i>Physocarpus malvaceus</i>	#1 or #2
nootka rose ( <i>flood tolerant</i> )	<i>Rosa nootkana</i>	#1 or #2
oceanspray	<i>Juniperus communis</i>	#1 or #2
Oregon grape	<i>Mahonia aquifolium</i>	#1 or #2
Pacific willow ( <i>flood tolerant</i> )	<i>Salix lucida</i>	#1 or #2
red flowering currant	<i>Ribes sanguineum</i>	#1 or #2
red osier dogwood ( <i>flood tolerant</i> )	<i>Cornus stolonifera</i>	#1 or #2
sandbar willow ( <i>flood tolerant</i> )	<i>Salix exigua</i>	#1 or #2
Saskatoon	<i>Amelanchier alnifolia</i>	#1 or #2
scoulers willow	<i>Salix scouleriana</i>	#1 or #2
sitka mountain ash	<i>Sorbus sitchensis</i>	#1 or #2
sitka willow ( <i>flood tolerant</i> )	<i>Salix sitchensis</i>	#1 or #2
woods rose	<i>Rosa woodsii</i>	#1 or #2
Perennials, grasses and sedges		
shrubby penstemon	<i>Penstemon fruiticosa</i>	#1
Birch leaved spirea	<i>Spirea betulifolia</i>	4" or #1
common yarrow	<i>Achillea millefolium</i>	4" or #1
coral bells -	<i>Heuchera cylindrica</i>	#1
old mans whiskers	<i>Geum triflorum</i>	4"
golden aster	<i>Heterotheca villosa</i>	4"
Canada goldenrod	<i>Solidago canadensis</i>	4" or #1
Canadian reedgrass ( <i>flood tolerant</i> )	<i>Calamagrostis canadiensis</i>	4" or #1
lakeshore sedge ( <i>flood tolerant</i> )	<i>Carex lenticularis</i>	Plugs, 4" or #1
Elijah blue fescue	<i>Festuca glauca</i>	#1
Karl Foerster feather reed grass	<i>Calamagrostis acutiflora</i>	#1



Table 5. Recommended seed mix blend for shrub habitat.

Native Riparian Blend 1	% weight	% by species
slender wheatgrass	25.0%	18%
streambank wheatgrass	25.0%	18%
fringed brome grass	24.7%	9%
northern wheatgrass	20.0%	14%
sheep fescue	3.0 %	10%
tufted hairgrass	1.0 %	11%
fowl bluegrass	1.0 %	9%
yarrow	0.3 %	3%

### 7.3 General Planting and Maintenance Guidelines

- Planting should not occur during periods of hot dry weather unless they are irrigated daily.
- Plant species selection shall be completed in consultation with the QEP.
- Native riparian seed blend specially formulated for riparian area application is available at Interior Seed & Fertilizer <https://interiorseedandfertilizer.ca> (Table 5).
- Locally adapted native plants are preferable to those collected or grown outside the region. The species listed in Table 4 are available from Sagebrush Nursery in Oliver <https://sagebrushnursery.com>, or Nupqu Native Plants <https://nupqu.com/native-plants-nursery-home/> near Kimberley.
- Planting holes shall be a minimum of 3 times the size of the pot.
- Specific locations of plants shall be directed by a QEP or landscaper.
- Use transplant fertilizer (ie. Mykes Mycorrhizae Tree and Shrub or similar) as per manufacturers specifications in each planting hole.
- Plantings which do not survive should be replaced to ensure complete establishment of native plants, and exclusion of exotic plants.
- Ensure the objective of the restoration is to naturalize the riparian area and not create a landscaped garden.
- Regularly irrigate new plantings during the plant establishment period for a minimum of 3 years and thereafter as required.
- Pull any invasive weeds on a yearly basis prior to going to seed.
- Replanting of riparian vegetation around buildings should adhere to principles of rural residential fire protection (for more information see the FireSmart Homeowner's Manual MFLNRO N.D.).

## 8 ENVIRONMENTAL MONITORING

The anticipated effort for environmental monitoring and professional guidance on this project includes the following:

- QEP will be onsite for a pre-construction meeting with Owner and Contractor to ensure that all parties are aware of environmental sensitivities and familiar with the proposed mitigation measures.
- QEP to provide guidance during restoration and revegetation, as required.

- QEP will conduct a post construction site visit once planting is complete to assess compliance and completion of the project and submit an environmental summary report to the RDCK.
- The following indicators of success of riparian plantings are the following:
  - Plant composition includes mostly native shrubs, perennials and grasses.
  - Establishment of >80% of planted riparian species after 3 full years would be a reasonable indication that the mitigation plan has been successfully completed.

## 9 CONCLUSION

Overall, the mitigation plan as proposed will help mitigate the environmental impacts caused by unauthorized activities within the WDP area. As the restoration areas become re-established with native species, the riparian function should become partially restored along the foreshore over time.

## 10 CLOSURE

This report has been prepared by a Qualified Environmental Professional (QEP) who has not acted for, or as an agent(s) of the RDCK and was at the expense of the property owner.

I, Fiona Lau, certify that I am qualified to carry out this assessment; and that the assessment methods under the Regulation have been followed; and that, in my professional opinion:

- (i) if the development is implemented as proposed, or
- (ii) if the streamside protection and enhancement areas identified in the report are protected from the development, and
- (iii) if the developer implements the measures identified in the report to protect the integrity of those areas from the effects of the development,

then there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area.

If you have any comments or questions, please do not hesitate to contact the undersigned.

Sincerely,



Fiona Lau, ASCT, BTech.  
[fiona@masseenvironmental.com](mailto:fiona@masseenvironmental.com)

Reviewed by:



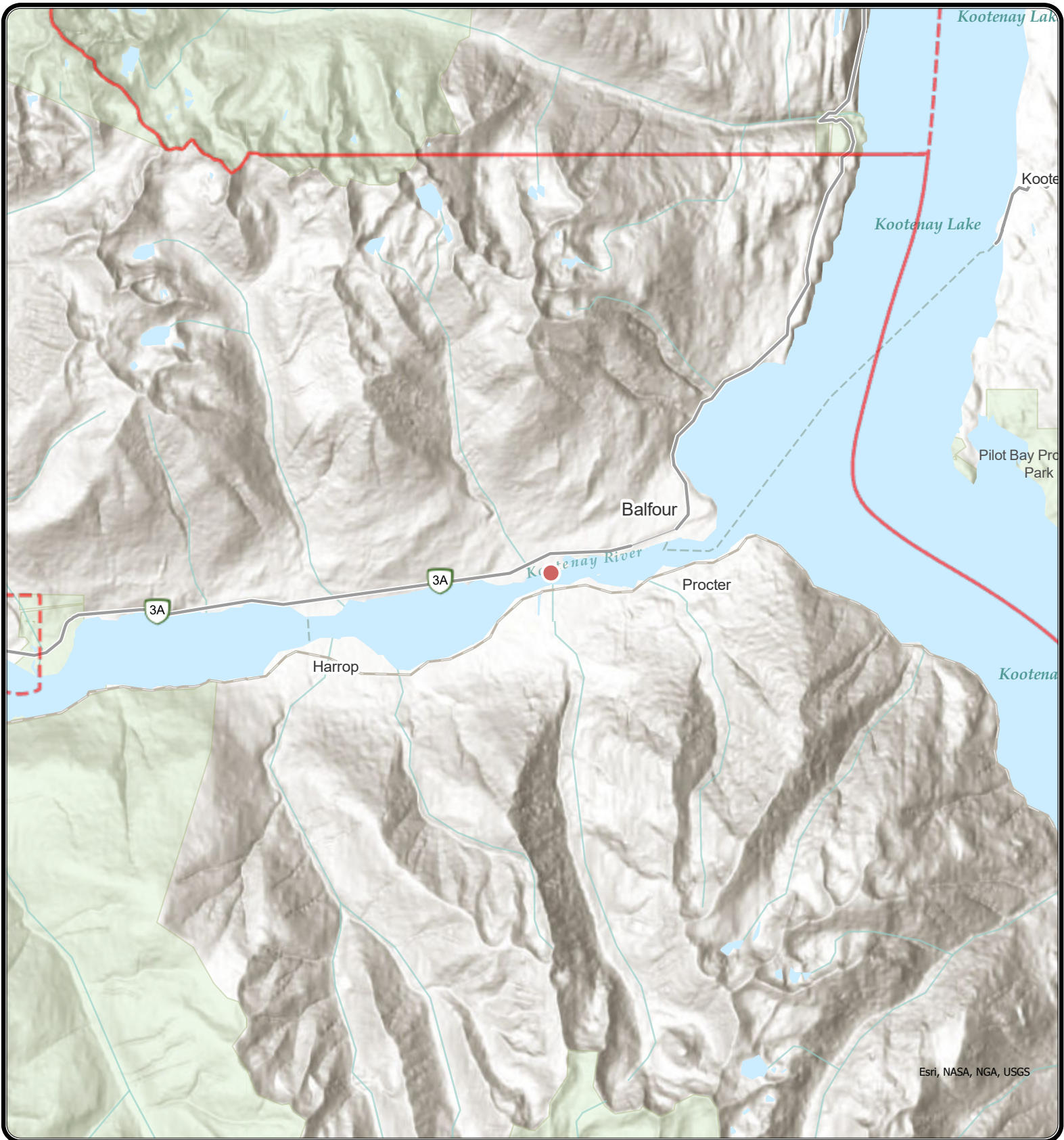
Sylvie Masse, RPBio, MSc.  
Masse Environmental Consultants

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APPENDIX 1  
LOCATION MAP

# RDCK Map



REGIONAL DISTRICT OF CENTRAL KOOTENAY  
Box 590, 202 Lakeside Drive,  
Nelson, BC V1L 5R4  
Phone: 1-800-268-7325 [www.rdck.bc.ca](http://www.rdck.bc.ca)  
[maps@rdck.bc.ca](mailto:maps@rdck.bc.ca)

## Legend

 Electoral Areas

## Map Scale:

1:150,000

Date: August 2, 2022



The mapping information shown are approximate representations and should only be used for reference purposes. The Regional District of Central Kootenay is not responsible for any errors or omissions on this map.

APPENDIX 2  
LAND SURVEY



# SKETCH SHOWING THE TOPOGRAPHY OF PART OF LOT A DISTRICT LOT 337 KOOTENAY DISTRICT PLAN NEP20829



The intended plot size of this plan is 560mm in width by 432mm in height (C size) when plotted at a scale of 1:200.

This plan shows horizontal ground level distances in metres.

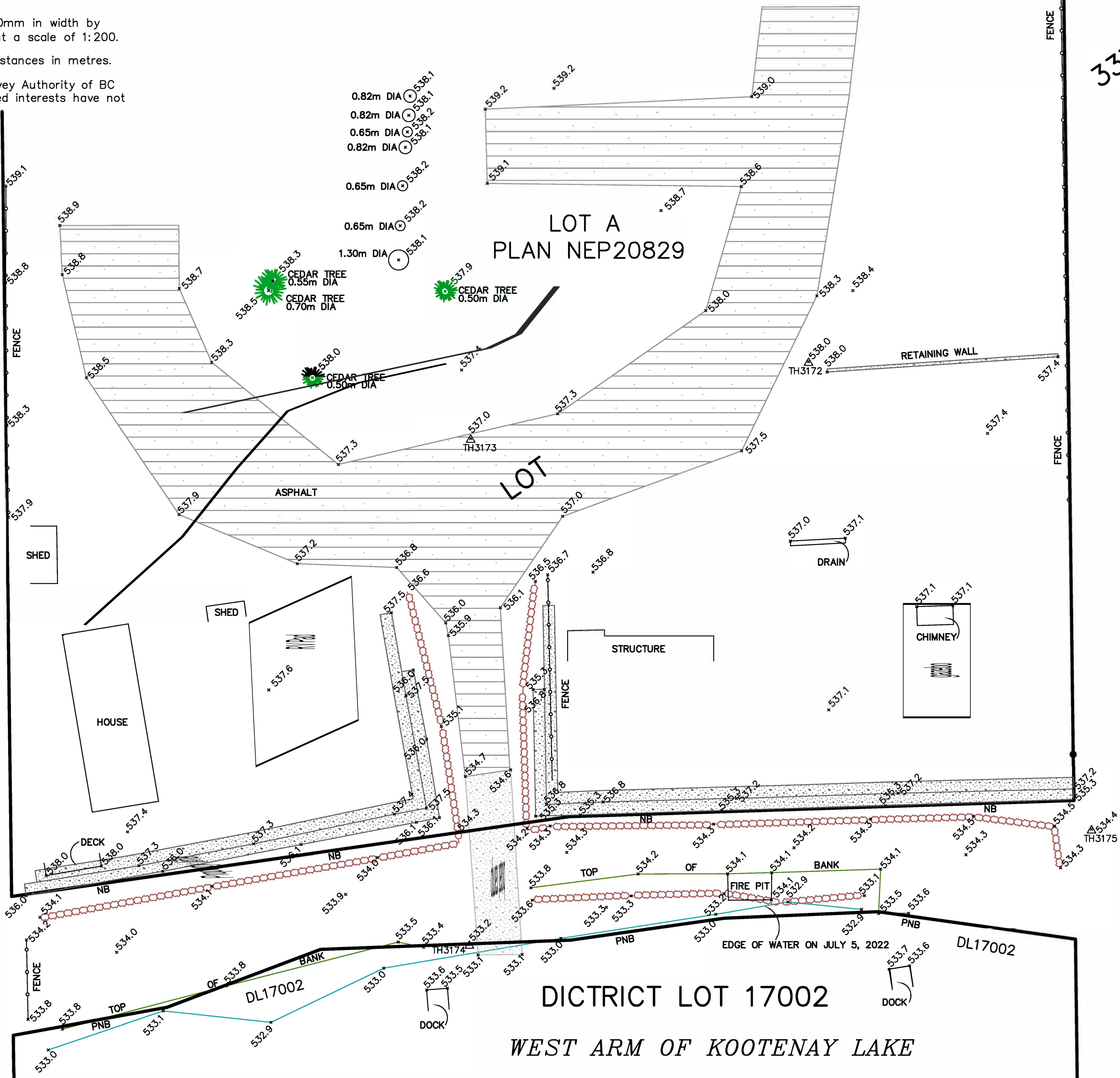
This plan is based on Land Title and Survey Authority of BC records and on a field survey. Unregistered interests have not been included or considered.

Dimensions for the perimeter of Lot A derived from Plan NEP20829.

Elevations are local elevations based on the Kootenay Lake Level on July 5, 2022 of 532.97m.

Only selected spot elevations have been shown.

- Legend:**
- DENOTES IRON PIN FOUND
  - ⊕ DENOTES TRVERSE HUB WITH ELEVATION
  - ⊙ DENOTES TREE
  - ⊙ DENOTES MANHOLE
  - ▭ DENOTES ASPHALT
  - ▭ DENOTES CONCRETE
  - ▭ DENOTES RETAINING WALL
  - DENOTES FENCE
  - ⊖ DENOTES EDGE OF ROCK WALL
  - DENOTES WATERS EDGE
  - NB DENOTES NATURAL BOUNDARY FROM PLAN NEP20829
  - PNB DENOTES PRESENT NATURAL BOUNDARY SHOWN ON SURVEY OF DL17002 CROWN FILE 4402986



337

## REM LOT 1 PLAN NEP888

**Civic Address:**  
7298 Highway 3A  
Balfour, BC  
PID: 018-467-806

**Title Subject to:**  
Easement - E5207  
Covenant - XG31717  
Statutory Right of Way - LB475127  
Easement - CA2395136  
Covenant - LB517351

This land is within the Agricultural Land Reserve Plan H15999.

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This document shows the relative location of the surveyed structures and features with respect to the boundaries of the parcel described above. This document shall not be used to define property lines or property corners.

This plan is for the exclusive use of Balfour Resort Owners Association. Any use, reliance, or decisions which a third party may make based on this plan is the responsibility of such third parties. Ward Engineering and Land Surveying Ltd. and Peter Ward, BCLS accept no responsibility for damages a third party may suffer as a result of their reliance on this plan.

This topographic sketch is certified correct this 22nd day of July, 2022.

This document is not valid unless originally signed and sealed.

REM PARCEL B  
REM LOT 2  
PLAN NEP888

DICTRICT

DICTRICT LOT 17002  
WEST ARM OF KOOTENAY LAKE

**WARD ENGINEERING AND LAND SURVEYING LTD.**  
1014 Seventh Street Nelson, British Columbia V1L 7C2  
Tel: (250) 354-1660 Web: www.wels.ca

FILE: 22-016  
DRAWING: 22-016 TOPO  
DATE: JULY 22, 2022

This plan lies within the Regional District of Central Kootenay.

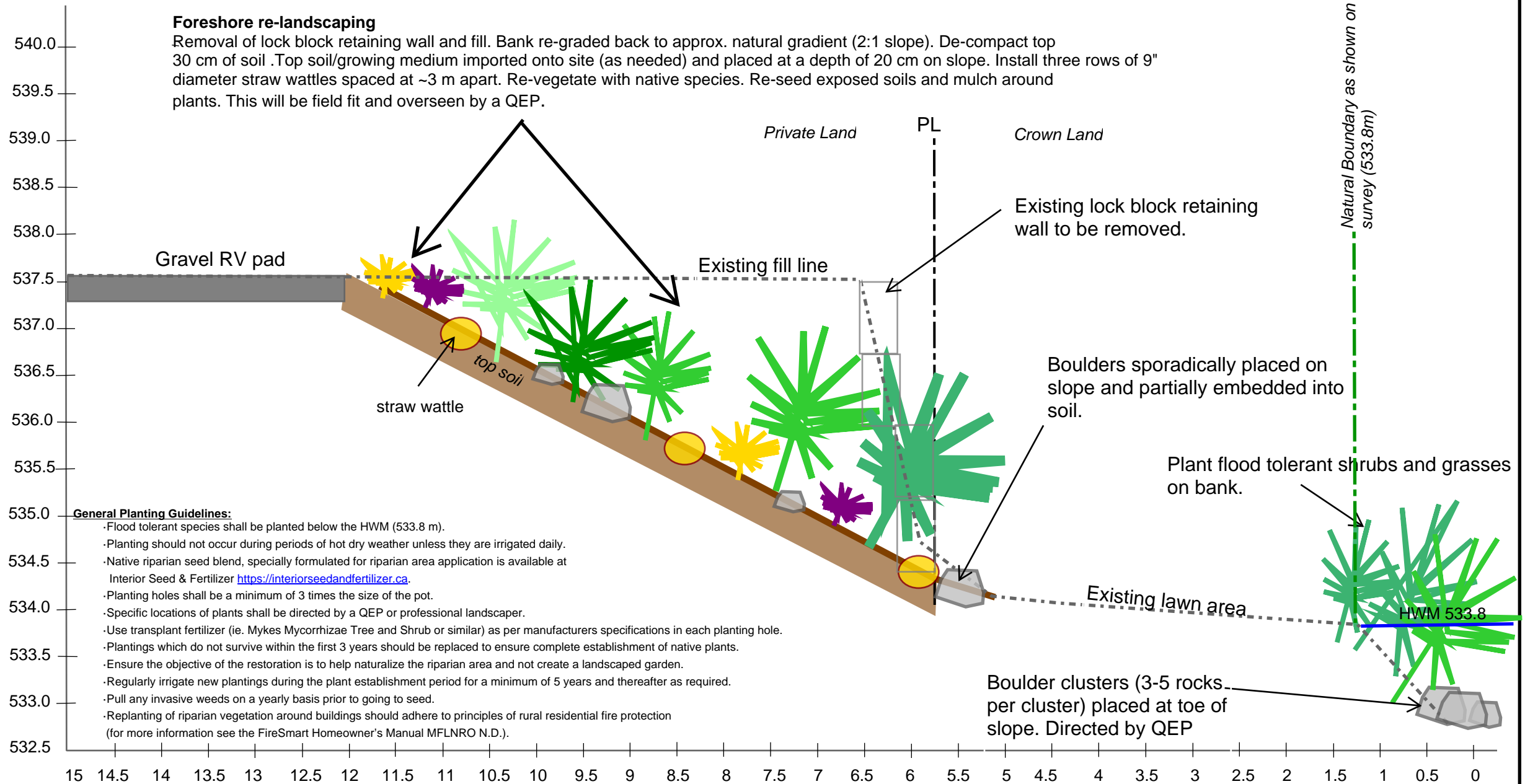
APPENDIX 3  
CONCEPTUAL SITE RESTORATION PLAN







## Section A- Foreshore Restoration

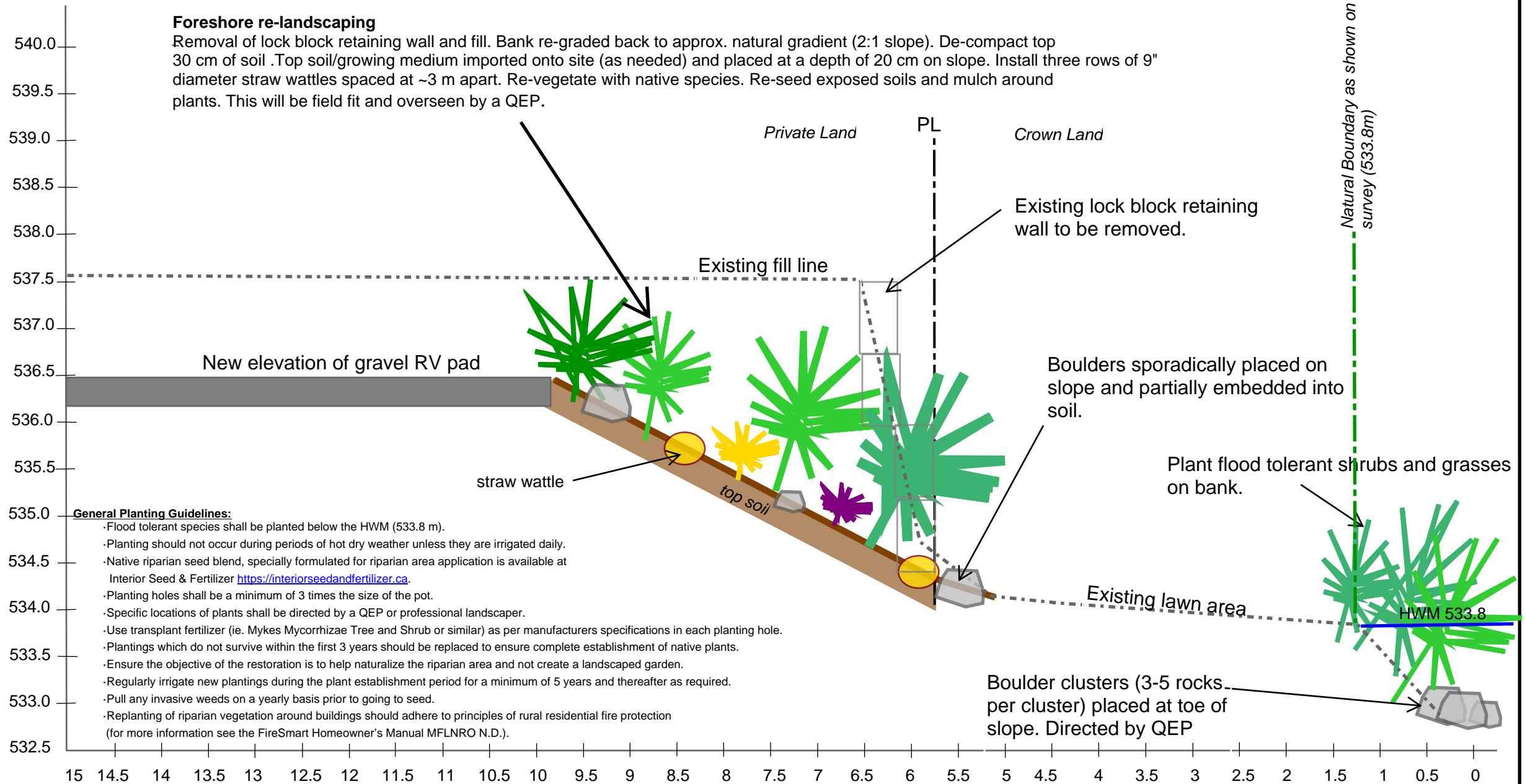


**Notes:**  
 -This is NOT an engineered drawing and is to be used for conceptual purposes only.  
 - Based on Survey completed by Ward Engineering and Surveying Limited (DATE)

7298 Hwy 3 A Foreshore Restoration  
 Section A -Conceptual Design Profile  
 Drawn to Scale (as shown)  
 Drawn by: F.L  
 Date: July 27, 2022



## Section B- Foreshore Restoration



**Notes:**  
 -This is NOT an engineered drawing and is to be used for conceptual purposes only.  
 - Based on Survey completed by Ward Engineering and Surveying Limited (DATE)

7298 Hwy 3 A Foreshore Restoration  
 Section B -Conceptual Design Profile  
 Drawn to Scale (as shown)  
 Drawn by: F.L  
 Date: July 27, 2022





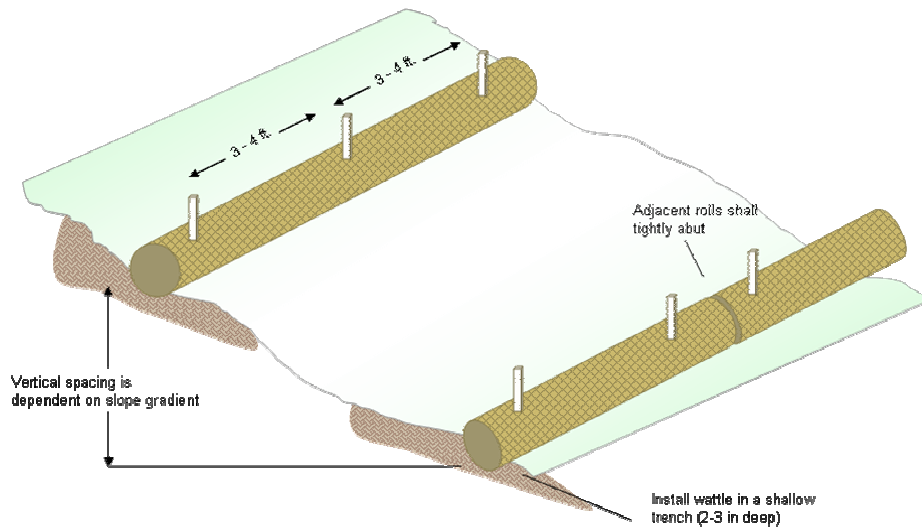
APPENDIX 4  
STRAW WATTLE INSTALLATION GUIDE



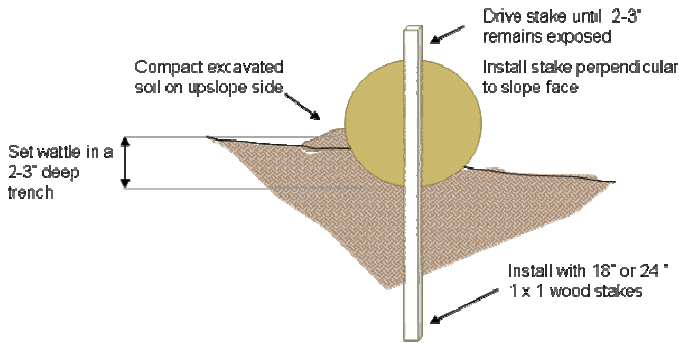
**NORTH AMERICAN GREEN®**

A **tensar** Company

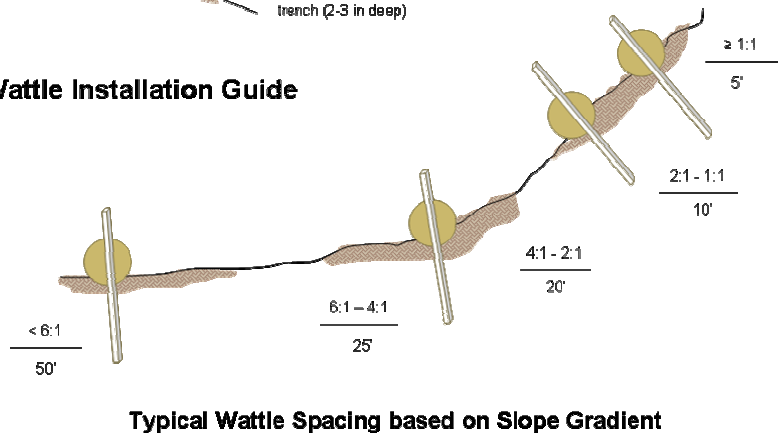
# Straw Wattle Installation Guide



## Typical Wattle Installation Guide



**Entrenchment Detail**



**Typical Wattle Spacing based on Slope Gradient**

1. BEGIN AT THE LOCATION WHERE THE WATTLE IS TO BE INSTALLED BY EXCAVATING A 2-3" (5-7.5 CM) DEEP X 9" (22.9 CM) WIDE TRENCH ALONG THE CONTOUR OF THE SLOPE. EXCAVATED SOIL SHOULD BE PLACED UP-SLOPE FROM THE ANCHOR TRENCH.
2. PLACE THE WATTLE IN THE TRENCH SO THAT IT CONTOURS TO THE SOIL SURFACE. COMPACT SOIL FROM THE EXCAVATED TRENCH AGAINST THE WATTLE ON THE UPHILL SIDE. ADJACENT WATTLES SHOULD TIGHTLY ABUT.
3. SECURE THE WATTLE WITH 18-24" (45.7-61 CM) STAKES EVERY 3-4' (0.9 - 1.2 M) AND WITH A STAKE ON EACH END. STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE WATTLE LEAVING AT LEAST 2-3" (5-7.5 CM) OF STAKE EXTENDING ABOVE THE WATTLE. STAKES SHOULD BE DRIVEN PERPENDICULAR TO SLOPE FACE.

North American Green Straw Wattles are a Best Management Practice (BMP) that offers an effective and economical alternative to silt fence and straw bales for sediment control and storm water runoff.

Guidelines are provided to assist in design, installation, and structure spacing. The guidelines may require modification due to variation in soil type, rainfall intensity or duration, and amount of runoff affecting the application site.

To maximize sediment containment with the Straw Wattle, place the initial structure at the top/crest of the slope if significant runoff is expected from above. If no runoff from above is expected, the initial Straw Wattle can be installed at the appropriate distance downhill from the top/crest of the slope. The final structure should be installed at or just beyond the bottom/toe of the slope. Wattles should be installed perpendicular to the primary direction of overland flow.

Straw Wattles are a temporary sediment control device and are not intended to replace rolled erosion control products (RECPs) or hydraulic erosion control products (HECPs). If vegetation is desired for permanent erosion control, North American Green recommends that RECPs or HECPs be used to provide effective immediate erosion control until vegetation is established. Straw Wattles may be used in conjunction with blankets, mats, and mulches as supplemental sediment and runoff control for these applications. Like all sediment control devices, the effectiveness of the Straw Wattle is dependent on storage capacity.

For additional installation assistance, please contact North American Green's Technical Services Department at 1-800-772-2040

14649 Highway 41 North, Evansville, Indiana 47725

1-800-772-2040 [www.nagreen.com](http://www.nagreen.com)

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