

JUAN DE FUCA LAND USE COMMITTEE

Notice of Meeting on Tuesday, **November 21, 2023, at 7 pm**

Juan de Fuca Local Area Services Building, #3 – 7450 Butler Road, Otter Point, BC

AGENDA

1. Territorial Acknowledgment
2. Approval of Agenda
3. Adoption of Minutes of September 26, 2023
4. Chair's Report
5. Planner's Report
6. Radiocommunication and Broadcasting Antenna Systems Application
 - a) Supplemental Report for LP000034 - Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 (6246 Gordon Road)
7. Adjournment

PLEASE NOTE: The public may attend the meeting in-person or electronically through video or teleconference. To attend electronically, please contact us by email at jdfinfo@crd.bc.ca so that staff may forward meeting details.



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**Minutes of a Meeting of the Juan de Fuca Land Use Committee
Held Tuesday, September 26, 2023, at the Juan de Fuca Local Area Services Building
3 – 7450 Butler Road, Otter Point, BC**

PRESENT: Director Al Wickheim (Chair), Vern McConnell, Roy McIntyre, Ron Ramsay, Anna Russell (EP)
Staff: Darren Lucas, Planner, JdF Community Planning; Wendy Miller, Recorder
PUBLIC: 2 EP

EP – Electronic Participation

The meeting was called to order at 7:00 pm.

1. Territorial Acknowledgement

The Chair provided a Territorial Acknowledgment.

2. Approval of the Agenda

MOVED by Dale Risvold, **SECONDED** by Vern McConnell that the agenda be approved.

CARRIED

3. Approval of the Supplementary Agenda

No supplementary items.

4. Adoption of Minutes from the Meeting of July 18, 2023

MOVED by Roy McIntyre, **SECONDED** by Ron Ramsay that the minutes from the meeting of July 18, 2023, be adopted.

CARRIED

5. Chair's Report

It was requested that questions for staff or applicants be directed through the Chair.

6. Planner's Report

No report.

7. Provision of Park Land for Subdivision

a) SU000759 and SU000754 – Rem. Parcel A (DD 143426I) of Section 97, Renfrew District, Except Plans 15462, VIP77871, EPP24972 and EPP104826 (Parkinson Road)

Darren Lucas spoke to the staff report addressing the provision of 5% park land or cash-in-lieu pursuant to Section 510 of the *Local Government Act* for two sequential subdivisions that create a 31-lot bare land strata.

The proposed subdivision, the existing CRD statutory right-of-way (the SROW), the proposed re-alignment of the SROW, the extension of the SROW into lands that have not previously provisioned park land requirements, and support from the Juan de Fuca Electoral Area Parks and Recreation Advisory Commission were highlighted.

It was confirmed that the application representative was not present.

MOVED by Roy McIntyre, **SECONDED** by Dale Risvold that the Land Use Committee recommends to the CRD Board:

That in accordance with Section 510 of the *Local Government Act*, park dedication in the amount of 5% be required for the 1.38 ha land area proposed by the subdivision of Parcel A (DD 143426I) of Section 97, Renfrew District, except plans 15462, VIP77871, EPP24972 and EPP104826 (PID: 009-592-423), except that a lesser amount may be acceptable where the owner agrees to dedicate land and construct a roadside trail to JdF Community Parks and Recreation Standards on that portion of the subject property and amending the Capital Regional District Statutory Right-of-Way CB96336 registered on the affected and new title certificates prior to subdivision approval.

CARRIED

8. Temporary Use Permit Application

a) TP000012 – Lot 1, Section 97, Renfrew District, Plan EPP24972 (17086 Parkinson Road)

Darren Lucas spoke to the staff report for a temporary use permit application to authorize the use of tourist facilities in the form of 18 mobile tourist cabins on land zoned Community Residential – One (CR-1) under Bylaw No. 3109.

The subject property map, site plan and proposed cabins were highlighted.

It was confirmed that the application agent was present.

The agent gave a presentation and spoke to the development proposal as included in the staff report.

The agent responded to questions from the LUC advising that each proposed cabin will have its own water supply and be connected to an onsite sewage system. It was further advised that siting of the cabins will consider existing vegetation.

MOVED by Roy McIntyre, **SECONDED** by Vern McConnell that staff be directed to refer Temporary Use Permit TP000012 to authorize the placement and use of 18 mobile tourist accommodation units on Lot 1, Section 97, Renfrew District, Plan EPP24972, to a public information meeting, appropriate CRD departments and the following external agencies for comment:

BC Hydro
Cowichan Valley Regional District
District of Sooke
Island Health
Ministry of Forests - Archaeology Branch
Ministry of Forests - Water Protection Section
Ministry of Land, Water and Resource Stewardship
Ministry of Transportation & Infrastructure
RCMP
Sooke School District #62

CARRIED

9. Adjournment

The meeting adjourned at 7:57 pm.

Chair



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**SUPPLEMENTAL REPORT TO THE JUAN DE FUCA LAND USE COMMITTEE
MEETING OF TUESDAY, NOVEMBER 21, 2023**

SUBJECT **Radiocommunication and Broadcasting Antenna Systems Application for Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 - 6246 Gordon Road**

ISSUE SUMMARY

To consider supplemental information submitted by Greenwave Radio, formerly known as 1291956 BC ULC (the “proponent”), for an application for a 49 m radio communication antenna system (the “tower”).

BACKGROUND

LP000034 was previously considered by the Land Use Committee (LUC) and CRD Board in accordance with the CRD’s Juan de Fuca Radiocommunication and Broadcasting Antenna Systems Application Policy (CRD Policy) and Innovation, Science and Economic Development Canada (ISED) Circular CPC-2-0-03. At its meeting of January 17, 2023, the LUC considered public input and recommended that the CRD Board issue a statement of non-concurrence for the application (Appendices A and B). At its meeting of February 8, 2023, the CRD Board discussed the LUC recommendation, procedure, jurisdiction, siting, and potential impacts. The CRD Board directed that the issue be referred back to the LUC and area residents for the proponent to provide more clarity on the application’s intention (Appendix C).

The approximately 18.4 hectare (ha) subject property is located at 6246 Gordon Road (Appendix D). There is an existing tower on the property, operated by Rogers Communications, which is located approximately 25 m to the north of the proposed tower site. A second tower, operated by Telus, is located on Crown land, approximately 200 m to the west of the proposed tower site.

Application LP000034 has been revised by Greenwave Radio to include additional information for a 49 m radio communication antenna system. The revisions also include minor design changes to the arrangement of communication systems on the tower (Appendix E). As the land use authority for the application, the CRD Board is requested to provide a statement of concurrence or non-concurrence to the applicant and ISED.

Matters that are considered relevant and may be considered in determining whether to issue a statement of concurrence or non-concurrence include siting, site safety and security, visibility or aesthetics and local context. ISED makes the final decision on disputes and concurrence by reviewing only relevant considerations.

IMPLICATIONS

Public Consultation and Referral

In accordance with CRD Policy, the original application was referred to applicable CRD departments, a notice was published in the local newspaper, and a notice was delivered to property owners and occupants within 500 m of the subject property to advise of the application and the opportunity to provide written comments and questions. The notice was published on September 15, 2022, and submissions were to be received by 9:00 am on October 14, 2022. Nine submissions and a web petition with 90 names were received for LP000034 during the notification period and forwarded to the proponent for response. All comments received from the public and CRD departments with the proponent’s response matrix were maintained as public record and provided in the staff report for the January 17, 2023, LUC meeting.

As part of the consultation and LUC review process, an interest list was maintained by JdF Planning staff. Those individuals who expressed interest in the application were notified of the November 21, 2023, LUC meeting. In addition, a further notice of the November 21, 2023, LUC meeting was delivered to property owners and occupants within 500 m of the subject property to advise of the public meeting.

Supplementary Information

At its meeting of February 8, 2023, the CRD Board discussed the LUC's recommendation of non-concurrence. The Board heard from delegations that included local residents and a representative for the proponent, and passed the following resolution:

MOVED by Director Tait, **SECONDED** by Director Kobayashi,
That the issue be referred back to the Juan de Fuca Land Use Committee to provide more clarity to the committee and area residents on the intention of the application.

CARRIED

Opposed: Wickheim

The Board sought clarity on a number of items including: 1) the purpose of the tower and the application of what was described as experimental technology; 2) the jurisdiction of the tower; 3) the referral process; 4) the effect of the tower in responding to increased marine activity, including tanker traffic; and 5) requirements for co-location of equipment on existing towers or on the proposed tower. In response, the proponent has provided supplementary information including materials presented at its public open house session held at the East Sooke Community Hall on September 13, 2023 (Appendix F).

The original application information stated that the proposed tower is private infrastructure for business communication purposes, specifically for Greenwave Radio. The supplementary information clarified that the purpose of the tower is to supplement and act as redundancy for existing cable and fiber optic infrastructure. The antenna system will use existing radio communication technology that operates in the 7.5 to 23.5 MHz (short-wave radio) frequency range. In addition, a microwave antenna will be installed to enable point-to-point communication with a separate tower to provide uninterrupted last-mile connectivity in the event of a fibre or cable line disruption affecting their corporate network. The proponent has provided information stating that energy from the microwave antenna will be concentrated in a direct beam and does not contribute to exposure at ground level. There are no intended consumer services for personal residences, delivery vehicles, or marine traffic. The proponent has also stated that Greenwave Radio is not associated with government, military, cellular service providers, or new wireless/mobile technology. Personal data will not be monitored, collected and/or stored. The more recently developed technology, which was described as "experimental" in the original application, involves channel switching to adapt to changes in the ionosphere for improved reception.

While the proposed tower is sited in the East Sooke community of the Juan de Fuca Electoral Area on lands subject to CRD land use authority, the application is subject to final approval by ISED Canada. The CRD's role is to provide a statement of concurrence or non-concurrence in relation to matters that are under its purview. As the approving authority, ISED may resolve potential disputes that arise between the land use authority and the proponent either by making a final decision on the issue in question or by suggesting an alternate dispute resolution process. Should a dispute continue, either party may request that ISED make the final decision.

The supplementary information included an updated tower design (Appendix E) with space for the Island Trunk VHF/UHF Radio System to improve search and rescue communications south of the Malahat. In accordance with CPC-2-0-03, there may also be potential for co-location of consumer communication services in the future. The proponent has also suggested that the tower could include sensors for early wildfire warning; however, any agreements for equipment or infrastructure benefiting the public would need to be resolved outside the ISED public consultation process.

CPC-2-0-03 explains that proponents are not normally expected to construct a new tower where supporting structure exists and co-location is feasible, unless a new structure is preferred by the land-use authority. The proponent retained a site acquisition consultant who identified 11 potential sites within the CRD. The evaluation is summarized in Appendix F, Annex B. Co-location is neither feasible on the Rogers' tower due to its limited height, nor on the Telus (SBA) tower due to its structural limitations and the proponent's antenna requirements. The supplementary information includes a summary of rationale for the new tower and a visual impact assessment by Underhill Geomatics.

Additional supplementary information included information from the proponent's public open house (Appendix F, Annex D), statements regarding health and safety that include a Safety Code 6 Compliance Review (Appendix F), and comparative information related to power use. While health and safety concerns related to radio systems are outside the scope of local government consideration, the proponent has advised that typical transmitter power output is in the range of 400-600 W, with a maximum output of

1,000 W.

CONCLUSION

Application LP000034 for the construction of a 49 m telecommunications antenna system at 6246 Gordon Road by Greenwave Radio was considered by the Land Use Committee on January 17, 2023. The LUC passed a motion recommending that a statement of non-concurrence be provided to the proponent. The Regional Board considered the LUC's recommendation at their meeting of February 8, 2023, and passed a referral motion directing that the item be referred back to the LUC for consideration of additional information from the proponent. The proponent has submitted supplementary information for the LUC's consideration.

RECOMMENDATION

There is no recommendation. This report is for information only.

Submitted by:	Iain Lawrence, MCIP, RPP, Senior Manager, JdF Local Area Services
Concurrence:	Kevin Lorette, P.Eng., MBA, General Manager, Planning & Protective Services
Concurrence:	Ted Robbins, B.Sc., C. Tech., Chief Administrative Officer

ATTACHMENTS

- Appendix A: Staff Report to the LUC, January 17, 2023
- Appendix B: Land Use Committee Minutes, January 17, 2023
- Appendix C: CRD Board Minutes, February 8, 2023
- Appendix D: Subject Property Map
- Appendix E: Tower Design Changes
- Appendix F: Supplementary Application Information

Appendix A: Staff Report to the LUC, January 17, 2023

The January 17, 2023, staff report and appendices can be found at the following link:

[Capital Regional District - File #: 23-010 \(legistar.com\)](#)

Appendix B: Land Use Committee Minutes, January 17, 2023

**Juan de Fuca Land Use Committee Meeting Minutes
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7. Planner's Report

a) Powers of the Committee as Prescribed by Bylaw No. 3166, "Juan de Fuca Land Use Committee Bylaw No. 1, 2004"

Iain Lawrence outlined the LUC's composition and its powers, as granted by the CRD Board by Bylaw No. 3166.

At 7:10 pm Natalia Day recused herself from participating in the proceedings related to the application at 6246 Gordon Road due to a non-pecuniary conflict of interest as a resident living in proximity to the proposed site.

8. Radiocommunication and Broadcasting Antenna Systems Application

a) LP000034 - Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 (6246 Gordon Road)

Iain Lawrence spoke to the staff report for the application received from 1291956 BC ULC for a 49 m radio communication antenna system for the purpose of providing long-range, high-throughput data communications in the high frequency band to support business activities in the area of data communications.

Iain Lawrence outlined the public consultation process required by the Juan de Fuca Radiocommunication and Broadcasting Antenna Systems Application Policy. It was advised that CRD First Nations Relations responded to the referral sent to CRD departments commenting that the closest registered archaeological site is located ~800 m north of the proposed tower. CRD Regional Parks commented that its primary concern is that the tower be sited in such a way as to minimize the height difference between the tower and the surrounding trees in order to reduce its visual impact on park visitors. CRD Regional Parks further replied that it does not support any trail or road development from the tower compound into East Sooke Regional Park.

Iain Lawrence highlighted the subject property, tower proposal and site photos. The existing towers on site and adjacent to the subject property were identified.

Iain Lawrence advised that nine submissions and a web petition with 90 names were received for LP000034 during the notification period. Attention was directed to the 24 submissions and the updated petition received and circulated in the supplementary agenda. It was reported that the updated petition with 221 names is in opposition to the proposal and that submission comments stated concern regarding radiofrequency electromagnetic fields (EMF) impact on the public and wildlife, the outdatedness of Health Canada's standards, the experimental nature of the proposal, impact of construction on roads, and benefit to the community. Staff is recommending that a statement of concurrence be provided, as the proposal addresses the evaluation criteria in the CRD's Juan de Fuca Radiocommunication and Broadcasting Antenna Systems Application Policy and as the concerns raised in the submissions are outside the scope of the Innovation, Science and Economic Development Canada's Procedures Circular (ISED) CPC-2-0-03.

The Chair confirmed that the application representatives were present.

Liv Desaulniers introduced herself as counsel for 1291956 BC ULC, Fred Mullie with Core One Consulting and Wayne Logan, director and part owner of 1291956 BC ULC.

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Wayne Logan stated that:

- the application representatives have reviewed the comments received
- Health Canada's Safety Code 6 is current and tested
- the purpose of the tower is to test short wave radio
- the data collected is the extent of the experiment
- 1291956 BC ULC's head office is located in Calgary with the majority of investors located in Canada
- 1291956 BC ULC has three approved towers in Ontario

Fred Mullie stated a Radio Frequency Engineer has provided a report confirming compliance with Safety Code 6

Lindsay Trowell, East Sooke

- asked where the three towers in Ontario are located
- asked why the subject property in East Sooke was selected
- East Sooke is rural and residents wish to keep it that way
- technology moves faster than regulation
- regulations are not keeping up with technology

Sean Minaker, East Sooke

- asked how close the Ontario towers are to residential uses

Eric Hughes, East Sooke

- asked the output of the Ontario towers
- asked if 1000W is considered a high transmission
- 1000W is considered a high transmission under US standards
- Safety Code 6 is outdated
- questioned if the proponent has Radio Frequency Engineers on staff
- application is causing tension in the community
- residents have moved to East Sooke due to its rural nature and distance from radio towers
- requested that consideration of the application be postponed, noting that this is the first meeting of the new LUC membership
- more information is required regarding frequencies/outputs

Shandelle Conrad, East Sooke

- Safety Code 6 is outdated
- the subject property is designated Settlement by the East Sooke Community Plan
- land for settlement/development in East Sooke is limited
- the subject property is capable of receiving piped water
- the subject property is not in an industrial area
- the subject property is not in the middle of nowhere
- more details are required before a decision is made
- residents have been consulted but opportunity to appeal has not been given

Connor Nicol, East Sooke

- the CRD recently purchased a property across the street from the subject property to enhance East Sooke Regional Park and protect species at risk such as the Warty Jumping-slug

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Member of the public, East Sooke

- questioned the residency of the representatives
- questioned the number of protesters required for an alternative location to be considered
- asked the representatives to explain what they mean by traditional, terrestrial transport technologies, as stated in responses to residents
- asked how long it takes to install a tower
- did not move to East Sooke to live beside a 49 m tower
- asked that consideration of the application be postponed as experts in the field of radio frequency are not in attendance

Member of the public, East Sooke

- questioned if other industrial locations in western Canada could be considered for the project

Linda Minaker, East Sooke

- moved to East Sooke to live in a rural residential neighbourhood
- questioned how an industrial tower can be installed in a rural residential neighbourhood
- Regional Parks supports the tower being lower than the tree canopy
- asked the representatives to explain what they mean by traditional, terrestrial transport technologies, as stated in responses to residents

Josh Stewart, East Sooke

- minimal data has been provided
- questioned how changes in wattage and/or ownership are communicated
- questioned if the tower will be permanent

Ron King, East Sooke

- questioned how long the testing will last
- communications from the applicant indicate that the intent of the tower was for the duration of the testing

Zig Readers, East Sooke

- with testing there is generally an expected result/desired outcome
- questioned who the end customer will be, should the experiment be deemed successful

Member of the public, East Sooke

- questioned who is responsible for removing the tower

Kyle Darling, Port Renfrew

- questioned if 1291956 BC UCL would be selling, renting, or leasing space to another company

Dana Livingstone, East Sooke

- had to move from her previous home due health impacts from a radio tower
- asked the LUC to learn more before making a recommendation on the proposal
- other local governments have listened to residents
- concerned for the community, East Sooke Regional Park, local wildlife, including insects, and those who live with electromagnetic hypersensitivity (EHS)

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Member of the public, East Sooke

- many concerns have been expressed
- good questions have been asked
- if residents are being heard, another site should be considered

Charlotte Senay, East Sooke

- questioned who would own/operate of the tower
- questioned if there have been any studies on radio frequency impact on wildlife, including insects
- residents move to East Sooke to live with nature
- residents are taking issue with the proposal

Marg Friesen

- not all increases in tower height require public consultation
- 10.7 – 11.7GHz is not short wave
- the World Health Organization has established a task group on radiofrequency fields and health risks
- requested that consideration of the application be postponed until all requested information is made available including information on the Ontario towers

Steve Pridgeon, East Sooke

- questioned if the technology is related to commercial drone control
- questioned if sight lines into/out of East Sooke Regional Park have been determined

Marcia Waterway, East Sooke

- questioned how many other sites were considered and where those sites are and why there were rejected

NJ Hewitt, East Sooke

- questioned why the environment and health are not considered relevant

Iain Lawrence read aloud from the ISED Client Procedures Circular CPC-2-0-03 which outlines public consultation items that are considered reasonable or unreasonable in the evaluation of the proposal.

Iain Lawrence responded to questions from the public advising that:

- health concerns are outside the scope of the matters that are considered relevant by the ISED Client Procedures Circular CPC-2-0-03
- health concerns are outside the scope of land use
- the Juan de Fuca Land Use Committee may recommend issuance of a statement of concurrence or non-concurrence to the CRD Board
- the CRD Board does not have the authority to approve or not approve antenna towers

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The representatives responded to questions from the public advising that:

- the subject property was selected due to local climate and the property's proximity to microwave and potential for long-term testing
- the subject property is not in a densely populated area and has existing towers on site
- the proposed tower will have low visual impact
- other towers in the area were considered for co-location and were identified as not being suitable
- other areas/sites were considered and identified as not being suitable
- the towers in Ontario are located in an industrial area
- the Ontario towers were tested, meeting Safety Code 6 standards
- there are Radio Frequency Engineers on staff but not in attendance
- willing to appoint a communications representative to answer questions
- the technology is not new
- the technology that is being tested is short wave radio and not related to drone control
- the proposed tower and compound are located outside of the area designated sensitive by the CRD
- line of sight study has not been done
- CRD Regional Parks has stated that its interests will not be unduly impacted by the tower
- should concurrence be received, installation could start within six months with construction taking approximately two months
- 1291956 BC UCL would be the owner/operator of the tower
- ISED would need to be informed of changes to the tower
- 1291956 BC UCL has a one-year license for development/testing purposes
- the desired outcome of the experiment is to provide an alternative to fiberoptic cable for data transmission
- the long-term intention is a permanent tower
- there is no intention to invite co-location on this tower unless co-location is required by ISED
- 1291956 BC UCL would be responsible for tower removal
- the proposal is compliant with Health Canada's Safety Code 6
- the evaluation criteria in the CRD's Juan de Fuca Radiocommunication and Broadcasting Antenna Systems Application Policy has been met

LUC comments included:

- have heard the concerns expressed by the community
- acknowledge that health concerns are outside the scope of land use considerations
- insufficient rationale has been provided for the proposed location compared to alternate locations
- information on the Transport Canada's requirements for aeronautical markings has not been provided but a flashing light at the top is likely
- information on why the tower needs to be so high has not been provided
- it appears that the top of the tower with flashing light will be at the same level as the top of Mt. Maguire
- plan dimensions are difficult to understand as no scale has been provided
- it appears that the antenna will be 10 – 15 m wide and 6 – 11 m above the tree canopy
- no sight line report has been provided; however, based on location, height and topography, it appears that the tower will be visible from the beginning of the Coppermine Road trail, from residences on Gillespie Road and from Sooke Harbour
- proposal does not provide critical infrastructure for public benefit
- cannot overlook community concerns

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- additional information from the applicant could be received at a future meeting, should the proposal be referred or postponed
- the CRD makes the final recommendation to ISED
- ISED is the authority for approving antenna towers

MOVED by Roy McIntyre, **SECONDED** by Anna Russell that the Juan de Fuca Land Use Committee recommends to the Capital Regional District Board:

That a statement of non-concurrence be provided to 1291956 BC UCL. for the proposed 49 m radio communication and broadcasting antenna system on Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290.

Opposed: Director Wickheim, Vern McConnell

CARRIED

At 9:10 pm Natalia Day returned to the meeting.

Appendix C: CRD Board Minutes, February 8, 2023

Capital Regional District Board Meeting Minutes February 8, 2023

3.1. [23-114](#) Minutes of the January 11, 2023 Capital Regional District Board Meeting

MOVED by Director Tait, **SECONDED** by Director Goodmanson,
That the minutes of the Capital Regional District Board meeting of January 11,
2023 be adopted as circulated.
CARRIED

4. REPORT OF THE CHAIR

The Chair welcomed staff, directors and the public and thanked everyone for attending today's meeting. He congratulated the Board on unanimously agreeing on the strategic priorities, and said that it is a wonderful sign that the CRD Board is working together effectively. He looks forward to seeing how the strategic priorities manifests within the CRD's corporate plan that staff will be bringing to the Board at a future date. He thanked staff for their work.

5. PRESENTATIONS/DELEGATIONS

5.1. Presentations

5.1.1. [23-136](#) Presentation: Larry Stevenson (Chief Executive Officer), Island Corridor Foundation; Re: Rail on Vancouver Island Update

L. Stevenson provided a presentation regarding an update on the Island Corridor Foundation.

Discussion ensued regarding:
- services included in the business plan
- provincial funding
- land use development benefit
- implications of decommissioning the railway
- regional district support across the island

5.2. Delegations

5.2.1. [23-142](#) Delegation - Eric Hughes; Resident of Sooke: Re: Agenda Item 8.1. Radiocommunication and Broadcasting Antenna Systems Application for Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 - 6246 Gordon Road

E. Hughes spoke to Item 8.1.

5.2.2. [23-144](#) Delegation - Linda Gordon; Resident of Sooke: Re: Agenda Item 8.1. Radiocommunication and Broadcasting Antenna Systems Application for Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 - 6246 Gordon Road

L. Gordon spoke to Item 8.1.

- 5.2.3. [23-145](#) Delegation - Travis Moreau; Resident of Sooke: Re: Agenda Item 8.1. Radiocommunication and Broadcasting Antenna Systems Application for Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 - 6246 Gordon Road
T. Moreau spoke to Item 8.1.
- 5.2.4. [23-146](#) Delegation - Philippe Lucas; Representing Biosolid Free BC: Re: Agenda Item 8.5. Biosolids Short-term Contingency Beneficial Use Plan
P. Lucas spoke to Item 8.5.
- 5.2.5. [23-147](#) Delegation - Liv Desaulniers; Representing 1291956 BC ULC: Re: Agenda Item 8.1. Radiocommunication and Broadcasting Antenna Systems Application for Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 - 6246 Gordon Road
L. Desaulniers spoke to Item 8.1.
- 5.2.6. [23-150](#) Delegation - Jordan Reichert; Representing Animal Alliance of Canada: Re: Agenda Item 7.1. AAP Results & Adoption for Bylaw 4522 - Regional Goose Management Service
J. Reichert spoke to Item 7.1.
- 5.2.7. [23-151](#) Delegation - Jonathan O'Riordan; Peninsula Biosolids Coalition: Re: Agenda Item 8.5. Biosolids Short-term Contingency Beneficial Use Plan
J. O'Riordan spoke to Item 8.5.

6. CONSENT AGENDA

Item 6.7. was removed from the consent agenda and moved to be considered under Reports of Committees as item 8.6.

**MOVED by Director Thompson, SECONDED by Director Alto,
That the consent agenda Items 6.1. through 6.6. and Items 6.8. through 6.14. be approved.
CARRIED**

- 6.1. [23-087](#) Enforcement Practices for Alternative Forms of Housing
**That the Enforcement Practices for Alternative Forms of Housing report be referred back to staff for further review based on Electoral Areas Committee direction.
CARRIED**
- 6.2. [23-128](#) Ability to Regulate Wood Burning Appliances and Air Quality on Salt Spring Island
This report was received for information.

- 8.1. [23-010](#) Radiocommunication and Broadcasting Antenna Systems Application for Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290 - 6246 Gordon Road

Director Wickheim spoke to Item 8.1.

Discussion ensued regarding:

- the purpose of the tower and the application of the technology
- jurisdiction of tower
- referral process
- effects of increased marine activity
- co-location with other antennas

MOVED by Director Wickheim, **SECONDED** by Director Little,
That a statement of non-concurrence be provided to 1291956 BC UCL. for the proposed 49 m radio communication and broadcasting antenna system on Lot 2, District Lots 143 and 200, and Section 154, Sooke District, Plan 42290.

Referral Motion

MOVED by Director Tait, **SECONDED** by Director Kobayashi,
That the issue be referred back to the Juan de Fuca Land Use Committee to provide more clarity to the committee and area residents on the intention of the application.

CARRIED

Opposed: Wickheim

- 8.2. [22-688](#) Zoning Amendment Application for Strata Lot A (3692 Waters Edge Drive) & Strata Lot B (12051 West Coast Road), Section 2, Renfrew District, Strata Plan VIS6939, Together with an interest in the Common Property in proportion to the unit entitlement of the Strata Lot as shown on Form V

MOVED by Director Tait, **SECONDED** by Director Wickheim,
1. That the referral of proposed Bylaw No. 4519, "Juan de Fuca Land Use Bylaw, 1992, Amendment Bylaw No. 159, 2022", to the Shirley-Jordan Advisory Planning Commission, CRD departments, BC Hydro; District of Sooke; the Archaeology Branch and Water Protection Section within the Ministry of Forests; the Ministry of Land, Water, and Resource Stewardship; the Ministry of Transportation & Infrastructure; the Pacheedaht First Nation; RCMP; Sooke School District #62; and the T'Sou-ke First Nation be approved and the comments received.

CARRIED

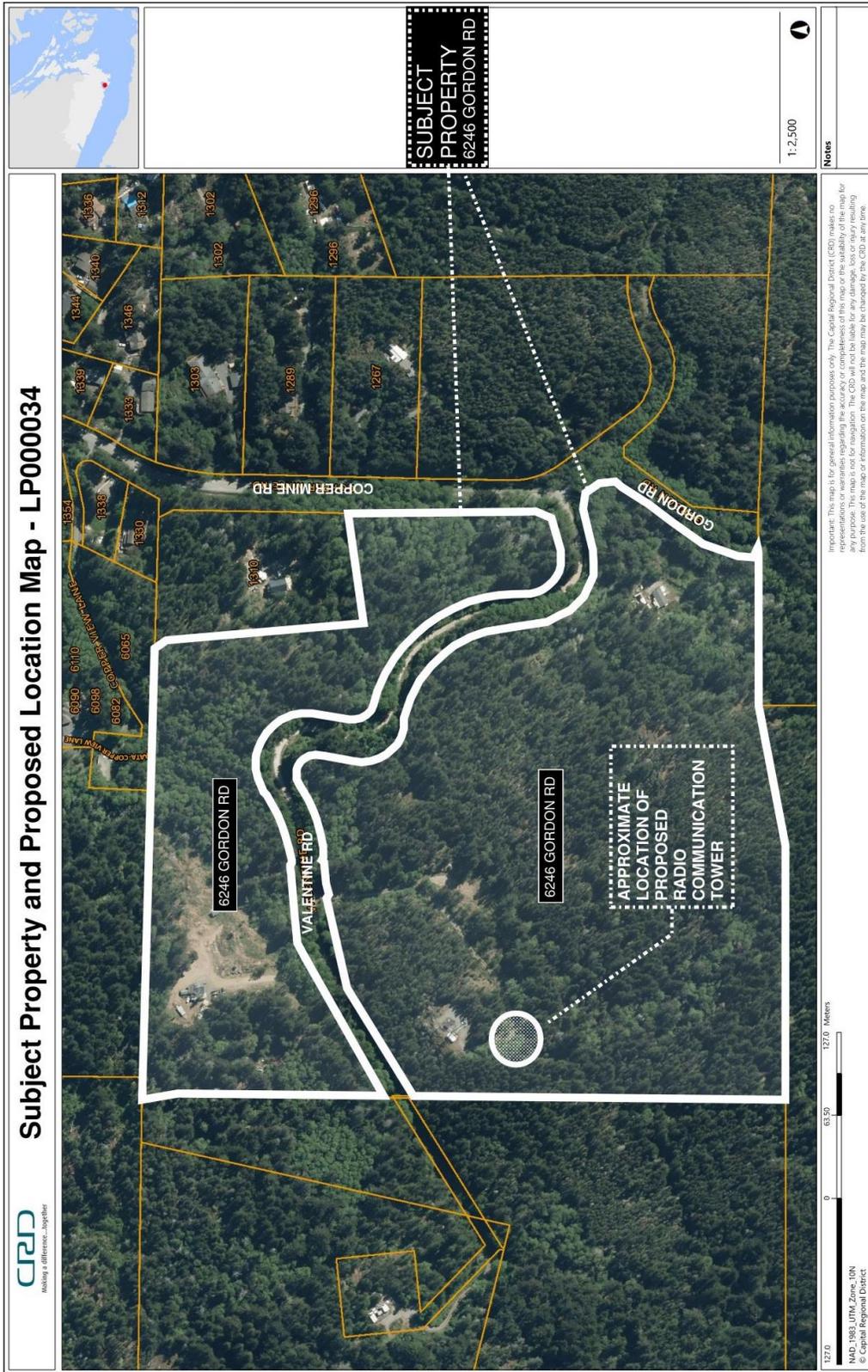
MOVED by Director Tait, **SECONDED** by Director Goodmanson,
2. That proposed Bylaw No. 4519 be introduced and read a first time and read a second time.

CARRIED

MOVED by Director Tait, **SECONDED** by Director Little,
3. That in accordance with the provisions of section 469 of the Local Government Act, the Director for the Juan de Fuca Electoral Area, or Alternate Director, be delegated authority to hold a Public Hearing with respect to Bylaw No. 4519.

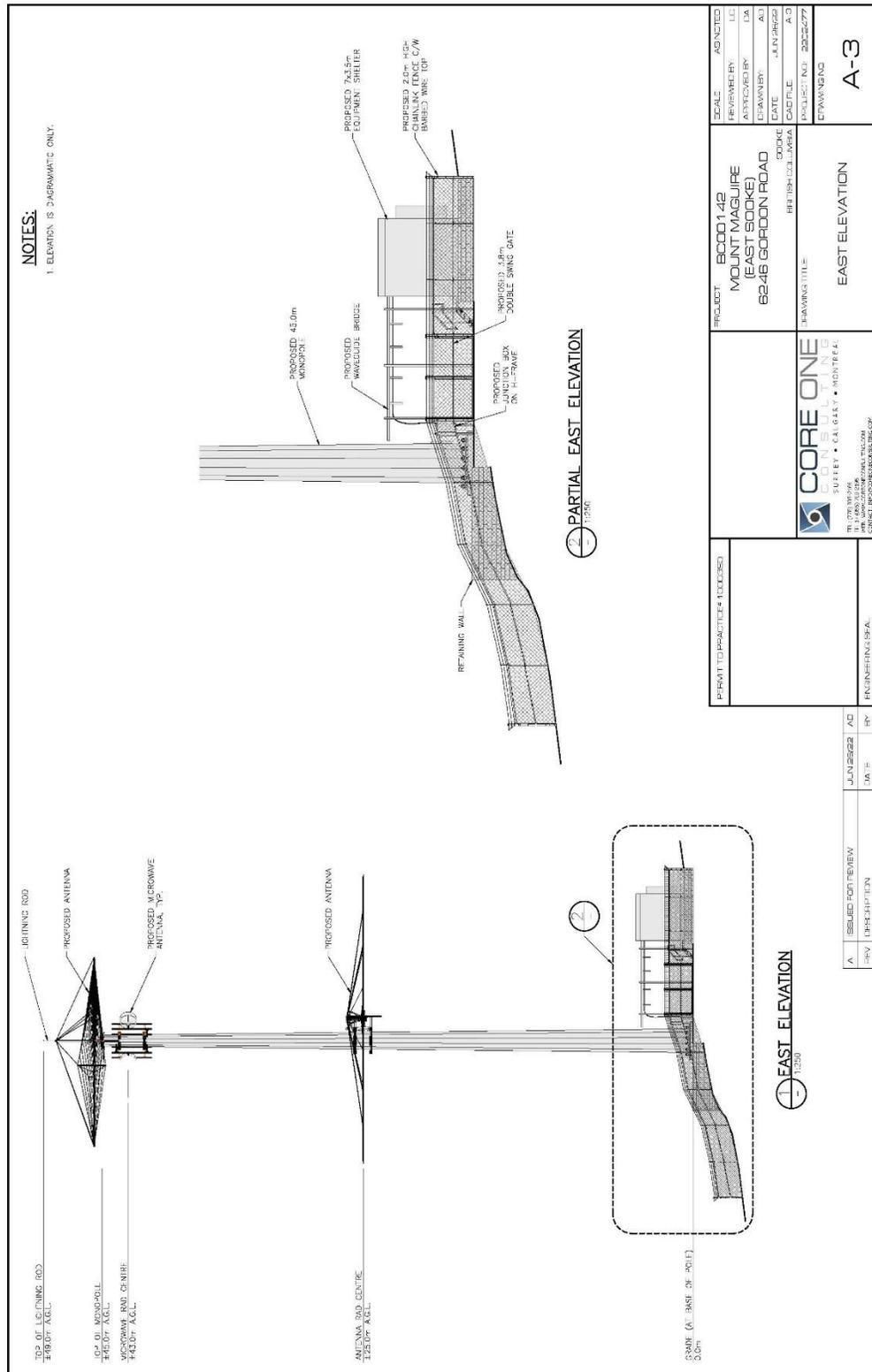
CARRIED

Appendix D: Subject Property Map

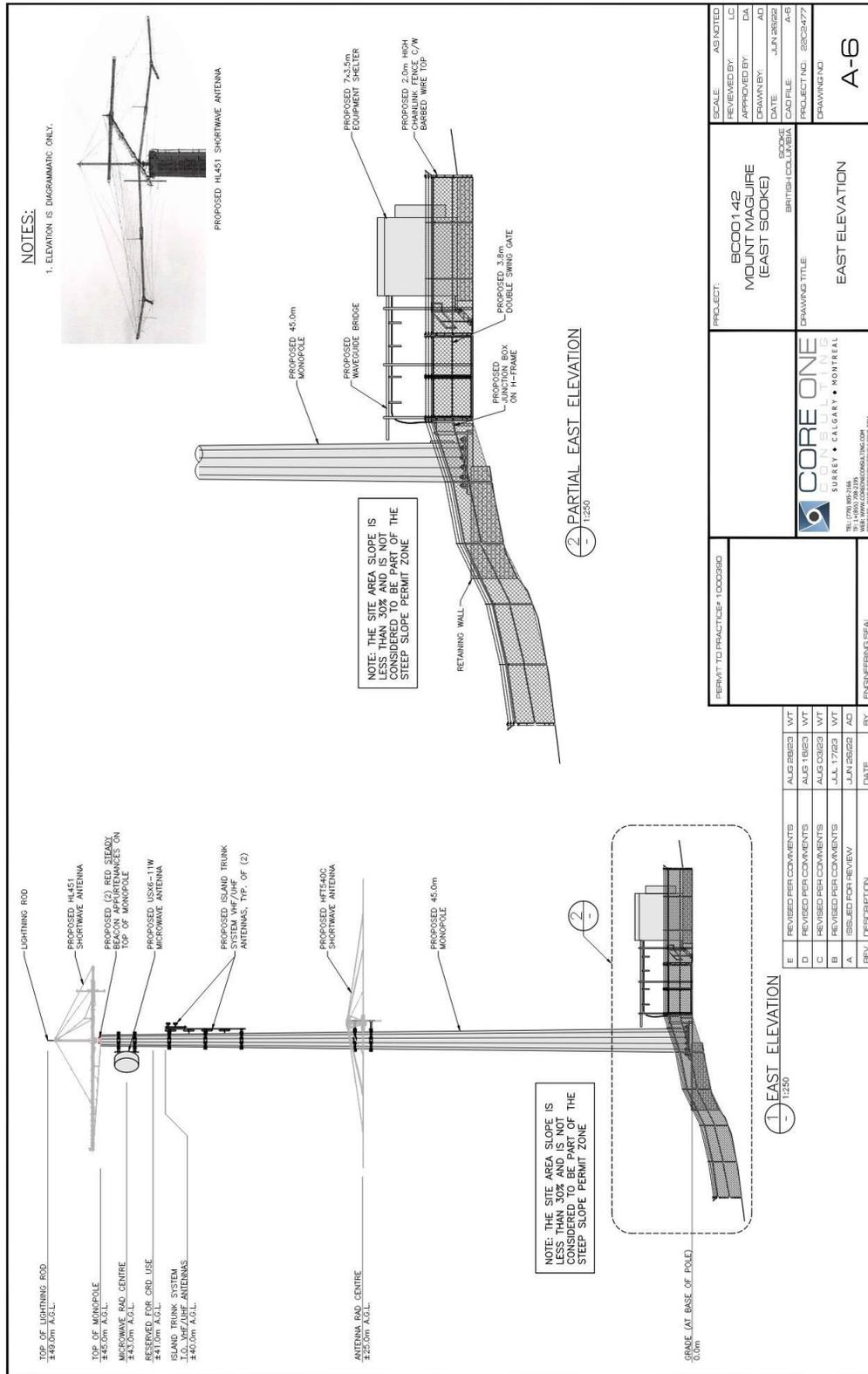


Appendix E: Tower Design Changes

Original Tower Design (provided to the LUC on January 17, 2023)



Revised Tower Design



Appendix F: Supplementary Application Information

Annex A – CRD Evaluation Criteria Compliance Summary

The CRD Board has published formal evaluation criteria for antenna system projects. Greenwave Radio has commissioned and conducted the appropriate studies, prepared the relevant documentation, and deeply engaged with the local community to ensure that all evaluation criteria have been fully met.

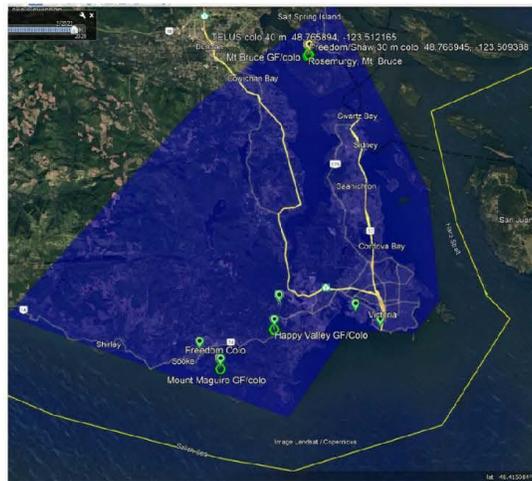
The CRD Board may consider the following when reviewing an application for an antenna system:

CRD Evaluation Criteria	Greenwave Radio Compliance Response
1. Rationale for proposed location	Comply Rationale is detailed on page 2 of our application form in the community impact statement. We also included a list of other sites considered and reasons not feasible in Annex B: Site Acquisition Search
2. Proximity to residential uses, institutions and public lands	Comply Proximity to local areas is detailed in the attached visual impact assessment carried out by licensed surveyors Underhill Geomatics and professionally drafted by Core One Consultants. See Annex C: Visual Impact Assessment.
3. Visibility and measures to integrate the antenna system into the local surroundings	Comply Visibility, integration, and sightlines to local surroundings are detailed in the attached visual impact assessment carried out by licensed surveyors Underhill Geomatics and professionally drafted by Core One Consultants. See Annex C: Visual Impact Assessment.
4. Security measures	Comply Security measures are detailed on page 2 of our application form in the community impact statement and ensure that the site is absolutely secure and inaccessible, except for authorized persons.
5. Alternatives and/or mitigation measures	Comply Mitigation measures are detailed on page 2 of our application form in the community impact statement and in our updated SC6 report, and alternative sites, including reasons for non-selection, can be found in Annex B: Site Acquisition Search.
6. Hazardous areas	Comply Hazardous area is limited to climbing on the actual tower structure itself, within the fenced area, on private property with restricted access, and does not extend to any residential or public park areas. There are no hazardous areas at ground level, even directly under the tower. The details can be found in our updated SC6 report and in Annex G: Health & Safety.

7. Environmentally sensitive areas	<p>Comply</p> <p>There are no environmentally sensitive or steep slope areas within the tower compound. Details can be found in Annex F: Site Plans.</p>
8. Transport Canada’s aeronautical safety requirements	<p>Comply</p> <p>Both Transport Canada (file #ATS-22-23-00044520) and NAV Canada (file #22-4607) approvals have been obtained, and steady nighttime beacon lights have been included in updated site plan. There will be no daytime lights and no flashing lights required on the tower per Transport Canada.</p> <p>See Annex F: Site Plans.</p>
9. Referral responses including compliance with BC Building Code, if applicable	<p>Comply</p> <p>Site is in compliance with applicable code: See Annex F: Site Plans</p>
10. Comments received through public notification	<p>Comply</p> <p>In addition to answering public comments and questions in writing via the LUA process, Greenwave Radio carried out a public open house on Sept. 13, 2023 to ensure deep community engagement and to answer local residents questions via a live Q&A session with more than 80 local residents over a 2-hour period. Prominent ads were taken out in the local newspaper in the two weeks prior to the event, and physical flyers were delivered to the closest 636 residences to the proposed tower location. In addition, Greenwave Radio distributed written materials to residents such as the updated Safety Code 6 report and the Visual Impact Assessment documents during the event. See Annex D: Community Engagement.</p>
11. Potential impact on the community if the application is approved	<p>Comply</p> <p>This is addressed on page 2 of our application form in the community impact statement. Additional details can also be found in Annex D: Community Engagement.</p>
<p>12. Designs that address the following guidelines:</p> <ul style="list-style-type: none"> i) Antenna systems are as unobtrusive and inconspicuous as possible; ii) The visual aesthetic impacts on the community is minimized; iii) Landscaping or screening is incorporated; iv) Displays of any type of lighting are avoided except where required by Transport Canada. Where lighting is proposed for security reasons, it shall be shielded from adjacent properties and kept to a minimum intensity by being of capped, downward facing and motion-sensory designs; v) Antenna systems are set back at least three times the height of the antenna system from adjacent dwellings. The CRD may request a different setback due to factors such as buffering topography and vegetation, transportation and utility corridors, watercourses, or public comments. 	<p>Comply</p> <p>These items are addressed on page 2 of our application form in the community impact statement and additional details can be found in Annex F: Site Plans and in Annex C: Visual Impact Assessment. The closest residential use is at 370 meters from the proposed tower location which is a setback of more than seven times the height of the antenna system, well within compliance with the requirement of three times antenna system height.</p>

ANNEX B: Site Acquisition Search

The area highlighted in Blue in the map below was provided to a specialized site acquisition firm called Scott Telecom <https://www.scotttelecom.com/>, who has a local specialist based inside the search area on Vancouver Island. They evaluated dozens of different options and the following 11 options that met preliminary selection criteria were submitted to Greenwave Radio for final evaluation. Several factors are considered, but not limited to: Antenna azimuth not blocked by natural or manmade obstacles, available height/structural integrity of colocation options, there is a willing landlord, current zoning is appropriate for required use, integration to natural environment, power availability and access.



- 1) **Rogers W0290 colocation (48.358250, -123.683892) - [REDACTED] parcel**: Tower top is not available for our HL451 antenna, and the latticed tower type is not appropriate for SteppIR antenna collocation. Not technically feasible.
- 2) **New tower build adjacent to the existing Rogers tower on [REDACTED] parcel (48.357778, -123.684167)**: This was the option selected by Greenwave Radio since it complies with all technical requirements and is also located on private land, more than three tower lengths away from the closest residence, and is located in a secluded place under the shadow of the Mt. Maguire peak. Furthermore, it uses an existing access road and BC Hydro access built for the neighbouring Roger's tower. Full selection criteria included in our application documents.
- 3) **SBA colocation Mt. Maguire – Freedom Mobile & Telus (48.358666, -123.686756)**: Tower was deemed not feasible because, in its current condition, it would not be able to accommodate the weight and dimensions of our equipment.
- 4) **Rogers W4515 - Sooke BC (48.380551, -123.725401)**: colocation on tower right in town. 30m tower insufficient height. Western antenna azimuth is blocked.
- 5) **Freedom BVI0061 – Happy Valley colocation & Greenfield option (48.409520, -123.578068)**: 18m existing tower, insufficient height. Mountain immediately to NW rising two hundred meters, blocking antenna azimuth.
- 6) **TELUS BC1098 Mt. McDonald (48.441666, -123.568911)**: Colocation option reviewed but tower top not available for shortwave antenna. Several mountains immediately to NW blocking antenna azimuth.
- 7) **Freedom BVI0035, 1325 Esquimalt Road, Esquimalt BC (48.429904, -123.418648)**: a 28m Rooftop colocation which had insufficient height for network functionality.
- 8) **Freedom BVI0035, 670 Dallas Road, Victoria BC (48.410032, -123.370311)**: Site is a 45m rooftop and would not allow for collocation of both shortwave antennas. Furthermore, western antenna azimuth is blocked by mountains.
- 9) **Three colocation options (BC Hydro, Freedom, TELUS) as well as a Greenfield Option were explored on Mt. Bruce, Salt Spring Island**: All crown land, or a sublease on existing TELUS leased lands. Access to the island and no line of sight to closest tower were deemed barriers.

Annex C: Visual Impact Assessment



**UNDERHILL
GEOMATICS**

PROFESSIONAL
LAND SURVEYORS &
GEOMATICS ENGINEERS

September 25th, 2023

UGL #: V23CV075

To Whom it may concern,

Underhill Geomatics Ltd. performed a visual impact assessment and sight line study for Greenwave Radio 1291956 B.C. ULC with survey work and post-survey CAD drafting performed during the period between June 29th and August 31st, 2023. The details are as follows:

- Review of legal plans and title in the area.
- Field survey to place drone targets.
- 6-hour drone flight using an UAV with advanced LiDAR (Light Detection and Ranging) sensors to create a high-resolution 3D model of the proposed tower, the topography, and the surrounding environment near the peak of Mt. Maguire (BC000142) in East Sooke B.C. situated over LOT 2, DISTRICT LOTS 143 AND 200, AND SECTION 154, SOOKE DISTRICT, PLAN 42290.
- Based on the output of the site survey, Underhill created the attached topographical plan as follows:
 - Resolved legal boundaries showing any pertinent interests such as SRW/Easement (if registered on title);
 - Proposed tower location on site plan with contours, significant nearby trees and existing Rogers Tower location/height.
 - 360 Photos and Panorama from Proposed Tower Location/Height
 - Created a 3D CAD simulation model of Mt. Maguire, the proposed tower, and the entire Sooke basin allowing for viewpoint sight line analysis from any point in the Sooke and East Sooke areas.
- Based on the imagery and information we collected, Alex Vlad, a Senior Draftsman at Core One Consulting, prepared the attached Visual Impact Assessment document.

We hereby certify that the information and visual images were collected and processed in compliance with geomatics industry standards. The topographic sketch was prepared in accordance with the guidelines found within the Professional Reference Manual produced by the Association of BC Land Surveyors.

Sincerely,

Dave Storback, BSc, BCLS, CLS, P. Surv
Project Manager, Land Surveyor

Mitch Laseur, BCLS
Land Surveyor

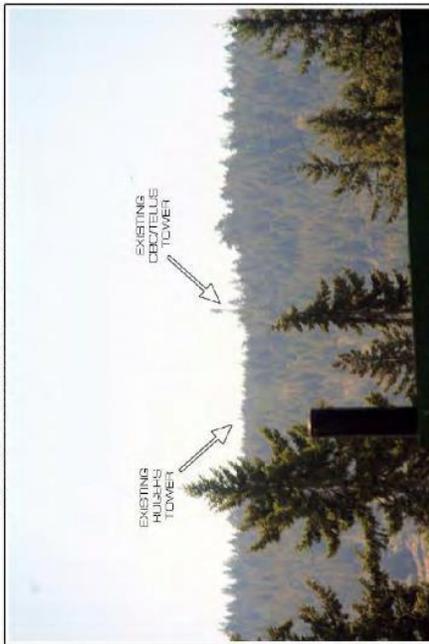
491C 4th Street, Courtenay, BC V9N 1G9 Canada | T: 250-871-4599 | underhill.ca

[KAMLOOPS](#) | [VANCOUVER ISLAND](#) | [VANCOUVER](#) | [WHITEHORSE](#)

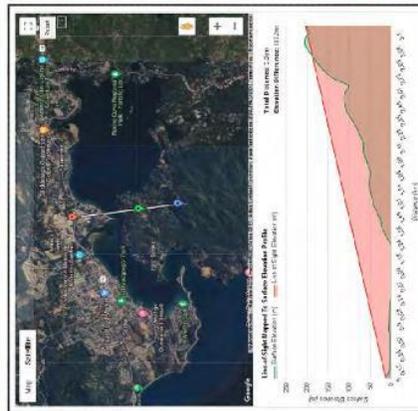
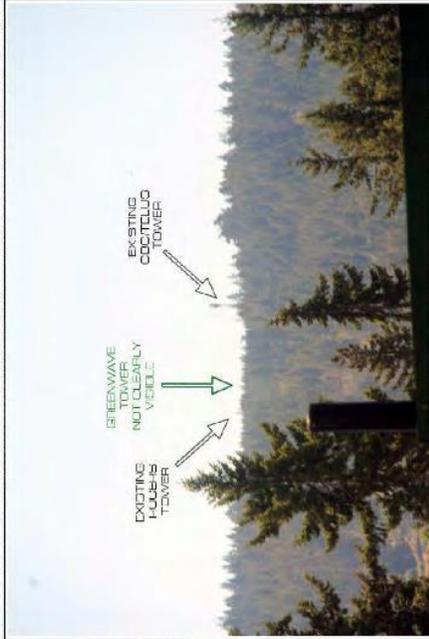
VISUAL IMPACT ASSESSMENT
PROPOSED SHORTWAVE TOWER SITE
COMMISSIONED BY GREENWAVE RADIO 1291956 B.C. ULC

 Greenwave Radio	 CORE ONE SURREY • CALGARY • MONTREAL 1-800-363-6666 www.coreone.com	PROJECT MOUNT MAGUIRE VALENTINE HILL DRAWN BY: ERIC DOLAN DATE: 03/04/2023 PROJECT NO: 20220477 DRAWING NO: T-1	SCALE: 1:100 REVIEWED BY: CA APPROVED BY: LC DRAWN BY: AV DATE: 03/04/2023 PROJECT NO: 20220477 DRAWING NO: T-1
--------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------

EXISTING SITE PHOTO - IDLEMORE ROAD

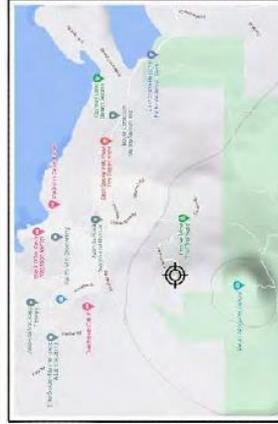


PROPOSED SITE PHOTO - GREENWAVE TOWER NOT CLEARLY VISIBLE



ELEVATION PROFILE

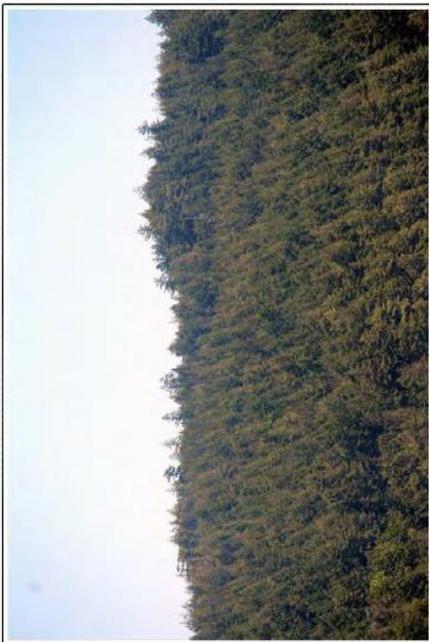
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 CAMERA: 483862206, -12316908150 - Photo Level: 18m
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 CAMERA TO TOWER BEARING: 253
 EFFECTIVE 35mm FOCAL LENGTH: 26mm



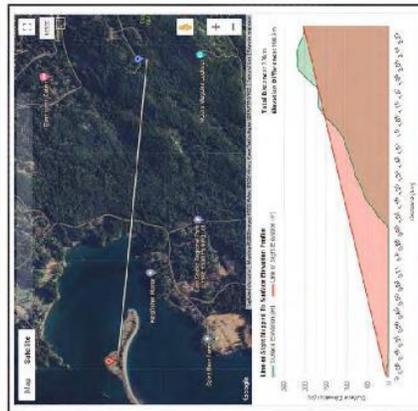
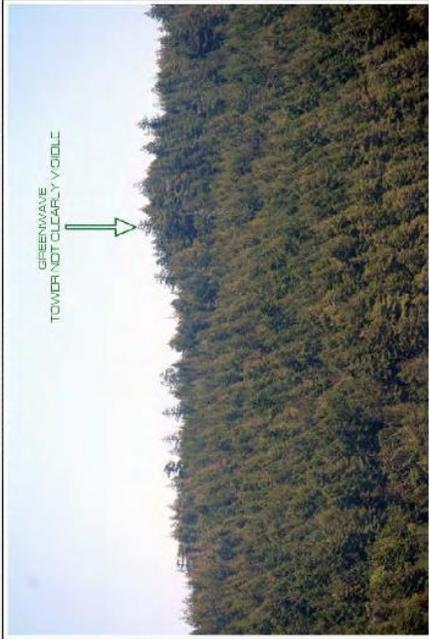
SITE LOCATION

 Greenwave Radio	 CORE ONE	PROJECT	MOUNT MAGUIRE VALENTINE HUALO	SCALE	1:100
		DRAWING TITLE	IDLEMORE ROAD	REVIEWED BY:	DA
<small>GREENWAVE RADIO IS A REGISTERED TRADEMARK OF GREENWAVE COMMUNICATIONS INC. © 2013. ALL RIGHTS RESERVED.</small>		DESIGNED BY:	ERTHIER COLAVEIRA	APPROVED BY:	LC
<small>CORE ONE IS A REGISTERED TRADEMARK OF CORE ONE CONSULTING INC. © 2013. ALL RIGHTS RESERVED.</small>		DRAWN BY:	JULIANNE KATZ	DATE:	JULY 2023
		CHECKED BY:	DAVID	CAD FILE:	20230727.DWG
		PROJECT NO.:	20230477	DRAWING NO.:	PM-1

EXISTING SITE PHOTO - WHIFFEN SPIT



PROPOSED SITE PHOTO - GREENWAVE TOWER BLOCKED BY TREES



ELEVATION PROFILE

U.S. COORDINATES
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 CAMERA: 48,359,610.9 -123,716,300.2 - Photo Level 5m
 CAMERA TO TOWER DISTANCE: 2,910.0m
 CAMERA TO TOWER BEARING: 274
 EFFECTIVE 35mm FOCAL LENGTH: 25mm



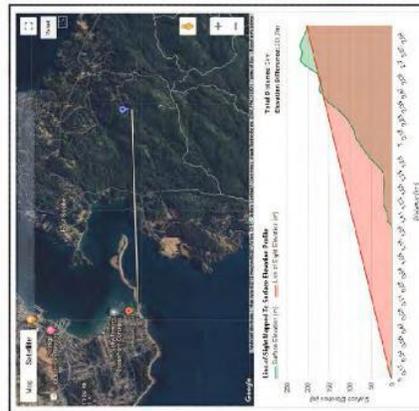
SITE LOCATION

 Greenwave Radio	 CORE ONE	PROJECT	DATE
		MOUNT MAGUIRE VALENTINE FLUAD	11/20/23
SUBJECT TITLE WHIFFEN SPIT		DESIGNED BY	DATE
		ERIK B. COLANEA	JULY 2023
		PROJECT NO.	20230477
		DRAWING NO.	PM-2

EXISTING SITE PHOTO - GOVERNMENT WHARF

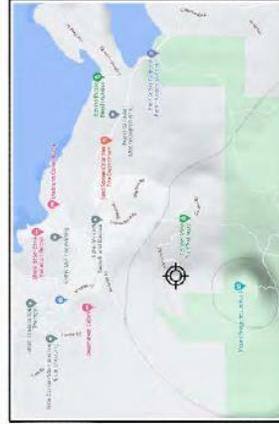


PROPOSED SITE PHOTO - GREENWAVE TOWER NOT CLEARLY VISIBLE



ELEVATION PROFILE

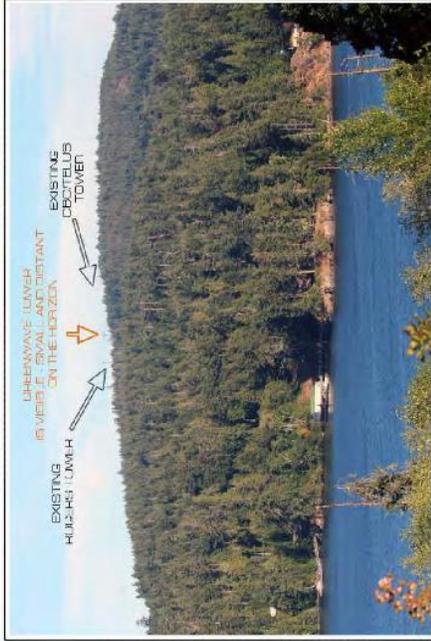
OS COORDINATES
 TOWER: 4836572677 -1237266892
 CAMERA: 483651850 -1237266892 - Photo Level 5m
 CAMERA TO TOWER DISTANCE: 3070m
 CAMERA TO TOWER BEARING: 272
 EFFECTIVE 35mm FOCAL LENGTH: 25mm



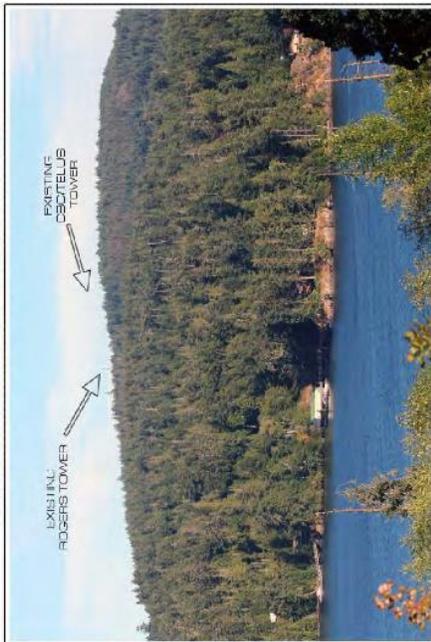
SITE LOCATION

 Greenwave Radio CORE ONE <small>SURVEY • CALCULATE • PROJECT</small> <small>1000 UNIVERSITY DRIVE, SUITE 100, VANCOUVER, BC V6L 1A8</small>	PROJECT MOUNT MAQUIRE VALENTINE FIJALO	SCALE 1:100 REVISIONS BY: EA APPROVED BY: LC DRAWN BY: AV DATE: JUNE 2023 CAD FILE: PM3 PROJECT NO.: 20230477 DRAWING NO.:
	DRAWING TITLE GOVERNMENT WHARF	PM-3

PROPOSED SITE PHOTO - TOWER VISIBLE - SMALL ON THE HORIZON

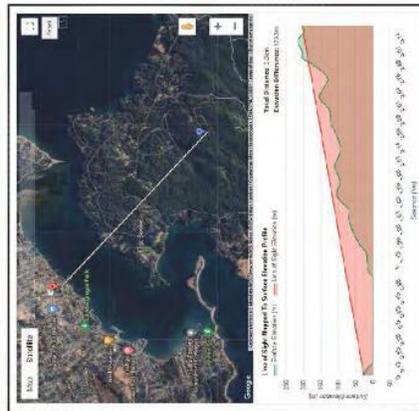


EXISTING SITE PHOTO - GOODWIRE ROAD



SITE LOCATION

OS COORDINATES
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 CAMERA: 48.9774488, -123.7185127 - Photo Level 281m
 CAMERA TO TOWER DISTANCE: 0.9100m
 CAMERA TO TOWER BEARING: 260
 EFFECTIVE 35mm FOCAL LENGTH: 25mm



ELEVATION PROFILE

 Greenwave Radio		 CORE ONE	
PROJECT: MOUNT MAGUIRE VALENTINE ROAD		DRAWING TITLE: GOODWIRE ROAD	
SCALE: 1:100		DRAWING NO: PM-4	
REVIEWED BY: DA		PROJECT NO: 20220477	
DRAWN BY: LC		DRAWING NO:	
DATE: JUNE 2022		PROJECT NO: 20220477	
DATE FILE: PM-4		DRAWING NO:	

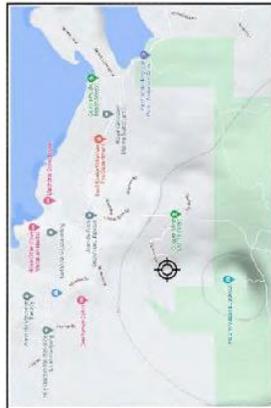
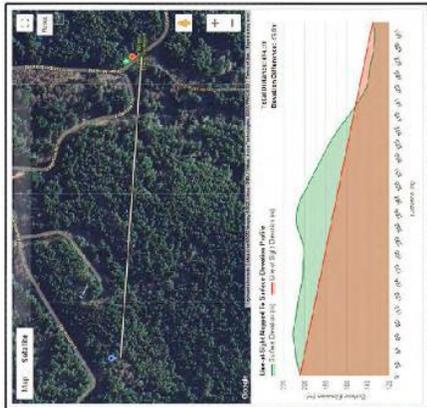
PROPOSED SITE PHOTO/GREENWAVE TOWER NOT VISIBLE



EXISTING SITE PHOTO - GORDON ROAD

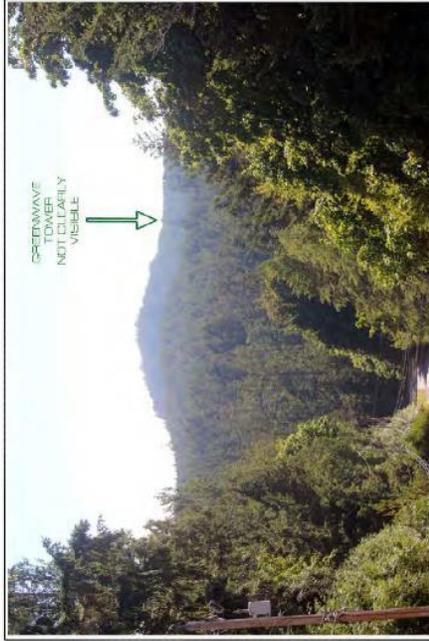


U.S. COORDINATES
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 CAMERA: 48,367,106.2, -123,67,801.55 - Photo Level 135m
 CAMERA TO TOWER DISTANCE - 494m
 CAMERA TO TOWER BEARING - 263°
 EFFECTIVE 35mm FOCAL LENGTH - 25mm

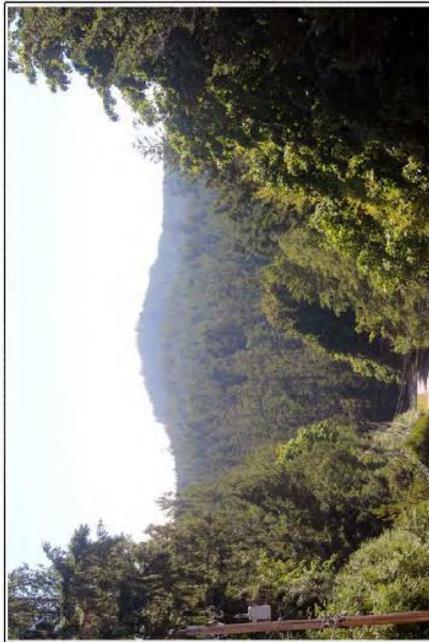


 Greenwave Radio		 CORE ONE	
SCALE: 1:100 REVIEWED BY: EA APPROVED BY: LC DRAWN BY: AV DATE: JUNE 2023 CADD FILE: P102 PROJECT NO: 20230477 DRAWING NO:		PROJECT: MOUNT MAGUIRE VALENTINE HUAO DRAWING TITLE: GORDON ROAD DRAWING NO: PM-5	

PROPOSED SITE PHOTO - GREENWAVE TOWER NOT CLEARLY VISIBLE

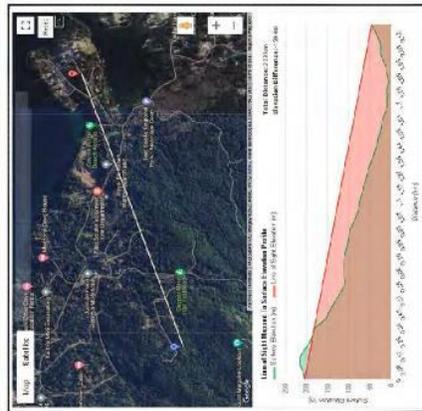


EXISTING SITE PHOTO - ANDERSON COVE ROAD



SITE LOCATION

OS COORDINATES
 TOWER: 483676877 -1236842870
 CAMERA: 483642370 -123688130 - Photo Level 37m
 CAMERA TO TOWER DISTANCE - 2790m
 CAMERA TO TOWER BEARING - 248°
 EFFECTIVE 35mm FOCAL LENGTH - 0.6mm



ELEVATION PROFILE



Greenwave Radio



CORE ONE
TELECOM • CABLE • BROADBAND

PROJECT
 MOUNT MAGUIRE
 VALENTINE FLUAD

DRAWING TITLE
 ANDERSON COVE
 ROAD

SCALE
 1:100

REVISIONS BY:
 DA

APPROVED BY:
 LC

DRAWN BY:
 AV

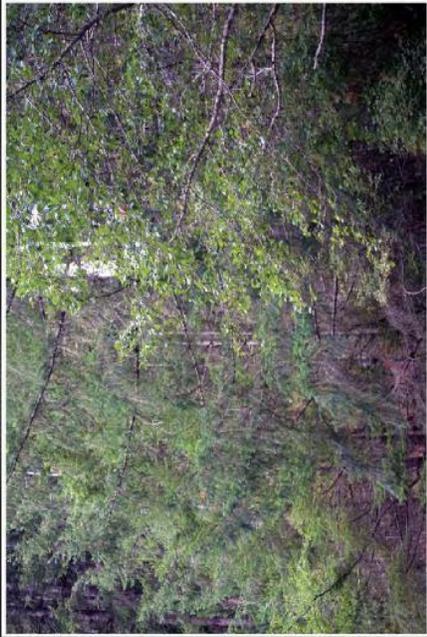
DATE:
 14/08/2023

CAD FILE:
 PM7

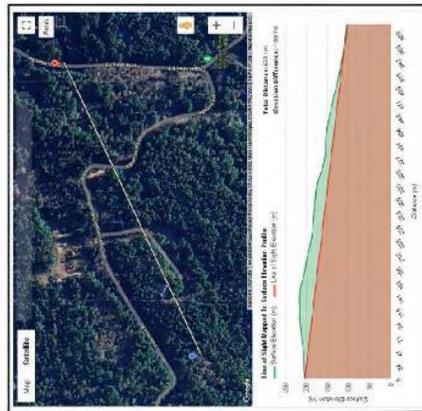
PROJECT NO.:
 D002477

DRAWING NO.:
 PM-7

PROPOSED SITE PHOTO - GREENWAVE TOWER NOT CLEARLY VISIBLE



EXISTING SITE PHOTO - COPPER MINE ROAD



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 CAMERA: 483600300 -123679320 - Photo Level 101m
 CAMERA TO TOWER DISTANCE - 603m
 CAMERA TO TOWER BEARING - 250
 EFFECTIVE 35mm FOCAL LENGTH - 26mm



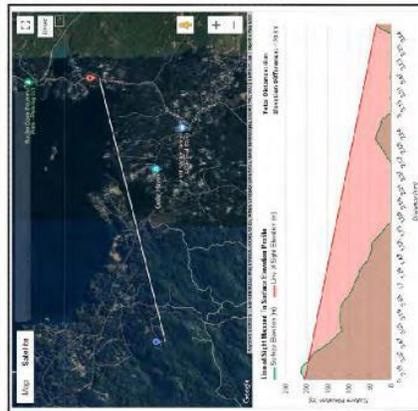
SITE LOCATION

 Greenwave Radio	 CORE ONE	PROJECT MOUNT MAGUIRE VALENTINE FIJALO	SCALE 1:100
		DRAWING TITLE COPPER MINE ROAD	REVIEWED BY DA
CORE ONE SURVEY • CALCULATE • MONITOR THE JORDON CONSTRUCTION GROUP 10000 148 STREET SE SUITE 100 CALGARY, ALBERTA T2C 0A8 CANADA		DRAWING NO. 0002477	DATE 2023/08/27
		DRAWING NO. 0002477	DATE 2023/08/27

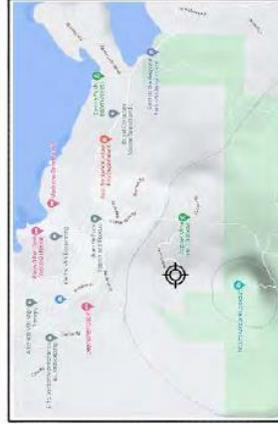
EXISTING SITE PHOTO - GILLESPIE ROAD



PROPOSED SITE PHOTO - GREENWAVE TOWER NOT CLEARLY VISIBLE



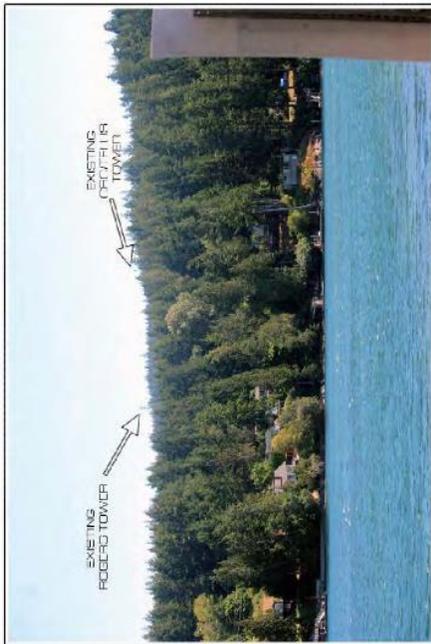
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 CAMERA TO TOWER BEARING: 29C
 EFFECTIVE 35mm FOCAL LENGTH: 26mm



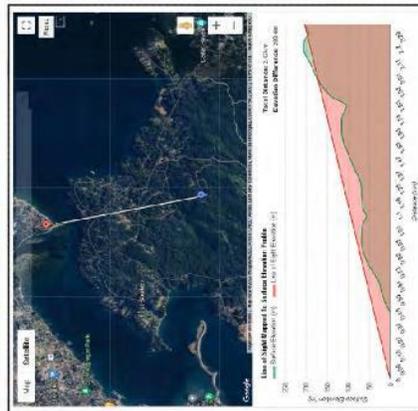
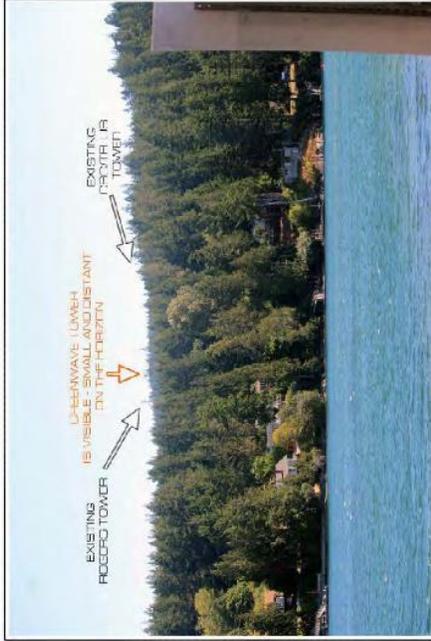
SITE LOCATION

 Greenwave Radio CORE ONE TEL: 604.273.1111 10000 148th Street, Surrey, BC V4N 1C9	PROJECT MOUNT MAGUIRE VALENTINE ROAD	SCALE 1:1000
	DATE 2023.11.21	REVISIONS DA DATE DESCRIPTION
DRAWING TITLE GILLESPIE ROAD	CLIENT BRITISH COLUMBIA POWER & LIGHTING	PROJECT NO. 20230477
DRAWING NO. PM-10	DATE 2023.11.21	PROJECT NO. 20230477

EXISTING SITE PHOTO - BILLINGS ROAD



PROPOSED SITE PHOTO - TOWER VISIBLE - SMALL ON THE HORIZON



OS COORDINATES:
 TOWER: 48.9576877 -123.6942870
 CAMERA: 48.9766010 -123.691251 - Photo Level 5m
 CAMERA TO TOWER DISTANCE - 242.0m
 CAMERA TO TOWER BEARING - 169
 EFFECTIVE 35mm FOCAL LENGTH - 0.6mm



SITE LOCATION

 Greenwave Radio CORE ONE SURVEY • CALCULATE • PROJECT 3000 W. 10TH AVENUE, SUITE 100 DENVER, CO 80202	PROJECT MOUNT MAGUIRE VALENTINE HUALO	SCALE 1:100
	DRAWING TITLE BILLINGS ROAD	REVISIONS: DATE: 11/21/2023 DRAWN BY: JUPITER CHECKED BY: JUPITER PROJECT NO: 20230477 DRAWING NO:

Viewpoints



0 - Mount Maguire Peak (as seen from Tower location)



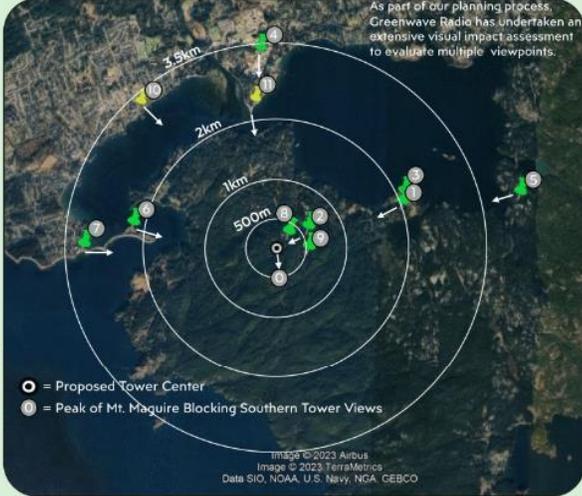
10 - Goodmere Road



9 - Gordon Road (Copper Mine Trailhead)



1 - Anderson Cove Road



As part of our planning process, Greenwave Radio has undertaken an extensive visual impact assessment to evaluate multiple viewpoints.

○ = Proposed Tower Center
 ● = Peak of Mt. Maguire Blocking Southern Tower Views

Images © 2023 Airbus
 Image © 2023 TerraMetrics
 Data SIO, NOAA, U.S. Navy, NGA, CEBCO



8 - Yellow Gate (Valentine Road)



2 - Copper Mine Road



7 - Government Wharf



3 - Pim Head Road



11 - Billings Road



6 - Whiffen Spit



4 - Idlemore Road



5 - Gillespie Road

**Annex D: Community Engagement
Material from Public Open House**

Greenwave Radio Public Open House
East Sooke Community Hall - Sept 13th, 2023
Attendance: 80+



Faces have been covered for privacy purposes

Greenwave Radio Public Open House
East Sooke Community Hall - Sept 13th, 2023
Attendance: 80+



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Faces have been covered for privacy purposes

Welcome

Greenwave Radio



REDUCE > Transmit Power
REUSE > Old Frequency Bands
RECYCLE > Legacy Radio Technology

Thank you for coming to our Open House.

Through this exhibition,
Greenwave Radio seeks to show a:

- Comprehensive approach to the Juan de Fuca planning & application process
- Deep community engagement before submitting the new application
- Focus on safety and visual impact
- Meaningful and sincere response to the concerns expressed by local residents

Please seek out and talk to our professional experts wearing the **Greenwave Radio name tags**. They will provide information and answer questions about health & safety, visual impact, engineering, land use, and community benefits.

Who is Greenwave Radio?

Greenwave Radio (1291956 BC ULC) is an **infrastructure business** registered in Vancouver, B.C. We construct and operate private, point-to-point data transmission between business operations locations.

We are **not associated** with government, military, mobile operators/5G, or any new wireless or mobile technology. We do not collect, monitor, or store personal data.

Most of our company data is transmitted over terrestrial and subsea fiber networks. We are developing wireless networks in Canada to create **alternative routes** which will be supplemental to existing infrastructure while also reducing risk when one or more network circuits fail.

Greenwave Radio works with **established and proven technologies** such as fiber optics and shortwave radio and strictly complies with Canada's Safety Code 6 regulations.

Our Values

- Respect the communities in which we operate by harmonizing our visual impact.
- Operate with fair and ethical business practices.
- Cooperate with local planning authorities in accordance with national planning and licensing policy frameworks.
- Partner with local experts to ensure we meet the highest standards of safety and sustainable development.

Our Objectives



REDUCE > Transmit Power

We use focused point-to-point transmission between towers, sophisticated receive antennas, and advanced digital modulation all of which reduce transmit power significantly.

REUSE > Old Frequency Bands

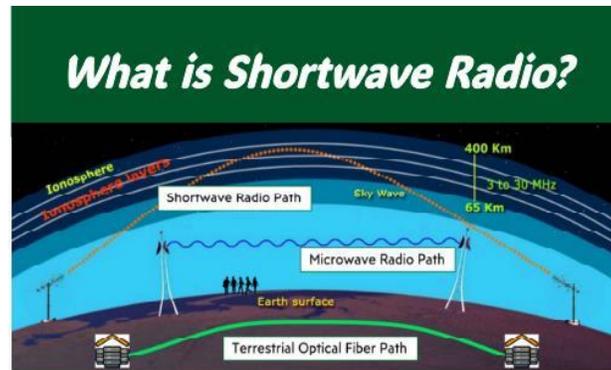
We use old frequency bands some of which have been abandoned by companies like CBC Radio when they moved to digital broadcasting.

RECYCLE > Legacy Radio Technology

We recycle legacy shortwave transmission methods to improve them for modern use in long-distance data transmission networks.



Greenwave Radio
1291956 B.C. ULC
contact@greenwaveradio.net



Shortwave radio is a form of radio transmission using spectrum between 3MHz and 30MHz. Radio waves in the shortwave band can be reflected back from the atmosphere. Therefore, shortwaves directed at an angle into the sky can be reflected back to Earth at great distances, beyond the horizon. This is called skywave propagation.

Shortwave broadcasts of radio programs played an important role in the early days of radio history; however, few broadcasters continue to use shortwave today due to the availability of newer audio streaming technologies.

The first trans-Atlantic shortwave radio transmission was achieved in 1921 and the same method continues to be used by Greenwave Radio today, with improvements to equipment, channel selection techniques and modulation. It is estimated that there are over 600 million shortwave radio receivers in use worldwide, including throughout East Sooke/Sooke, and Vancouver Island.



Existing Greenwave Radio shortwave towers in other locations.

Greenwave Radio is a licensee of shortwave and microwave radio frequencies with existing operations in Canada. Our long-distance shortwave radio transmission towers are often connected to our business data network via commercially standard point-to-point microwave radio links that operate at low power, using less transmit power than that of a lightbulb. Microwave radio has been in use since the 1930's.

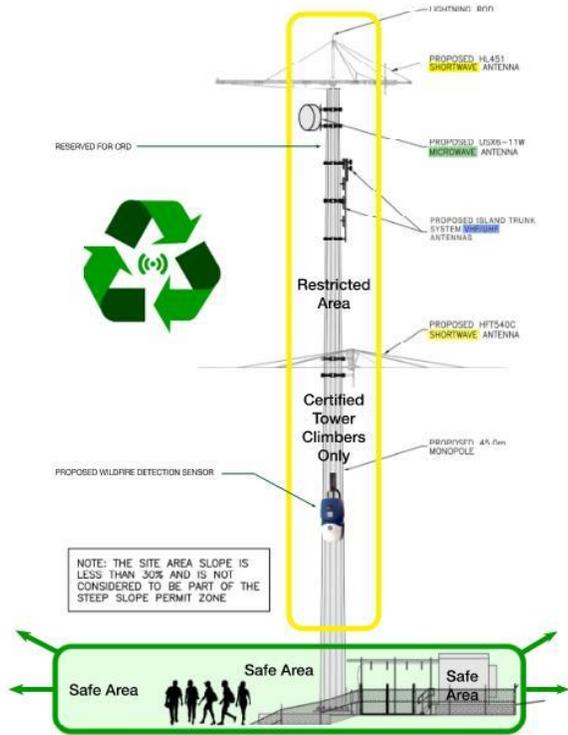
This proposed site will be an extension of our developmental activities in pursuit of further advancement in reliability and throughput of shortwave radio.

The maximum power used is 1000 Watts at transmitter output (less than a kitchen toaster) and over 90% of the time the transmitter power is in the range of 400 Watts to 600 Watts. As an example, commercial FM radio stations can transmit at up to 80,000 Watts of power - our shortwave transmissions are orders of magnitude lower.



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1291956 B.C. ULC
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Health & Safety



All areas below the tower and all around the Sooke Basin are safe for humans & animals and are below Safety Code 6 limits

In compliance with Canada's extremely strict Safety Code 6 standards, there is no unsafe area near the tower that a human can access, even if they trespass into the compound and walk beneath the tower. This is because our shortwave antennas are low-powered and pointed at distant receivers over the horizon. Our Safety Code 6 compliance requires periodic safety testing after tower installation to ensure long-term compliance.

There are no cellular antennas on this tower, nor do we have any plans to ever collocate cellular antennas of any type on our tower (including 5G). Furthermore, there is no room for cellular antennas at the heights they would require. Greenwave Radio is exempt from mandatory tower sharing pursuant to Industry Canada CPC-2-0-17 as we are a private company and not defined as a common telecommunications carrier.



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Health & Safety

- ✓ Does not pose any health impact on the surrounding community
- ✓ Complies with all local and international guidelines and standards.
- ✓ Committed to the highest levels of long-term health and safety.

This is not an experimental cell tower. This is a shortwave radio tower that also incorporates emergency response support systems and wildfire detection technology. Greenwave Radio has a developmental license because we are recycling and improving old shortwave technology to create alternative network routes which will be supplemental to existing infrastructure while also reducing risk when one or more network circuits fail.



Emissions are well within Health Canada SC 6 limits right below the tower.



Greenwave Radio's tower has received NAV Canada land use approval file #22-4607.



Greenwave Radio's tower has received Transport Canada approval file #ATS-22-23-00044520.

There are no new antenna or radio technologies coming into the area via our tower. These same 3 antenna types have existed in East Sooke for decades

Microwave antennas on Rogers tower beside Greenwave site.

VHF/UHF antennas at East Sooke Fire Dept. Same antennas as Greenwave Tower.

<https://www.sookeinews.com/news/home-operators-stand-ready-in-case-of-disaster-165754>

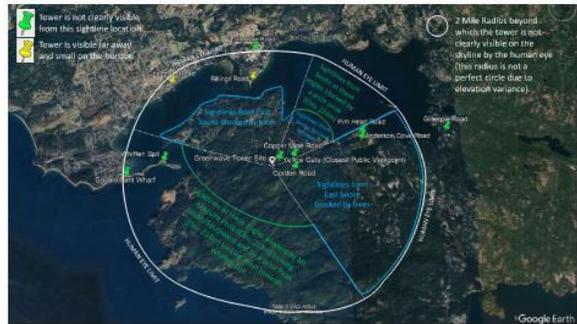
Shortwave antennas on amateur radio operator's home in Saanich. Same shortwave technology as Greenwave Tower. Identical antennas are installed in residential areas in both Sooke & E. Sooke.



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Visual Impact Assessment

As part of our planning process, Greenwave Radio has undertaken an extensive visual impact assessment performed by professional surveyors and experienced engineers.



Pictures were taken from the locations listed below, many of which were also identified by residents through the JDF land use public consultation process.

#	TIME	LOCATION	LATITUDE	LONGITUDE	BEARING (MAGNETIC)	REMARKS
1	1230	Idemore Road	48.3862206	-123.6908150	253	Greenwave tower not clearly visible
2	1255	Whiffen Spit	48.3596103	-123.7163002	274	Greenwave tower blocked by trees
3	1320	Government Wharf	48.3561800	-123.7766882	272	Greenwave tower blocked by trees
4	1340	Goodmire Road	48.3774458	-123.7165327	260	Greenwave tower small & distant on the horizon
5	1405	Gordon Road (near Copper Mine Trailhead)	48.3571082	-123.6780156	263	Greenwave tower blocked by trees
7	1440	Yellow Gate (Valentine Road)	48.3591277	-123.6824262	145	Greenwave tower blocked by trees
9a	1000	Anderson Cove Road	48.3642310	-123.658130	249	Greenwave tower not clearly visible
10a	1010	Pain Head Road	48.3657700	-123.657810	263	Greenwave tower not clearly visible
11a	1040	Copper Mine Road	48.3600300	-123.678520	250	Greenwave tower blocked by trees
12a	1110	Collesse Road	48.3662300	-123.623551	250	Greenwave tower not clearly visible
13a	1245	Bellingh Road	48.3786010	-123.691251	359	Greenwave tower small & distant on the horizon

In addition to meeting technical requirements, the proposed location was chosen to minimize the impact on the community by situating the site immediately adjacent to an existing Rogers tower on Valentine Road, sharing the same infrastructure including power lines and access road.

The proposed location of the tower site is also ideal from a visual impact perspective since it is blocked by Mount Maguire to the South so as not to be visible from East Sooke Regional Park. Additionally, this location is not visible from most viewpoints in East Sooke due to the dense tree cover and is far enough away from Sooke across the water so as not to materially impact the Mount Maguire skyline.

The tower structure will be painted with non-reflective paint to promote visual integration into the natural tree line. The tower has been designed as a slimline monopole which is the least visible type of tower for this area because it is uniform, thin, and blends into surroundings better than latticed towers.



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Community Benefits

As a benefit to the local East Sooke community and the JDF district, Greenwave Radio has provided collocation space on the tower to the Island Trunk VHF/UHF Radio System (ITS). This will extend coverage to the East Sooke area, Southern Vancouver Island and the Gulf Islands to improve RCMP search & rescue radio coverage when the Crest network or mobile networks are unavailable.



The ITS is one of the emergency radio communications resources under the Emergency Planning and Response area of the Ministry of Emergency Management and Climate Readiness (EMCR). Currently the ITS system has little to no coverage south of the Malahat mountains. This system has been used in numerous emergency response situations on the rest of Vancouver Island but has not been available to the Sooke area due to lack of a local tower host. These are the same type of VHF/UHF radio antennas installed on the roof of the East Sooke Fire Hall.

Wildfire Prevention



Greenwave Radio is extremely concerned about wildfire prevention, both for the protection of our proposed infrastructure, and for the wellbeing of the local community. We plan to install advanced wildfire detection technology as part of our proposed project to assist with early wildfire detection and response. We have engaged the local volunteer fire department and JDF fire services officials to coordinate efforts. Any other community benefit proposals are welcome, please seek out our community engagement representative to discuss further or fill out our feedback form.



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Tower Area Map

- 1 Proposed Greenwave Radio Tower Site near Valentine Road (not on Gordon Rd. - Tower is on private property, restricted access)
- 2 Existing Rogers Mobile Tower Adjacent to Site (existing access road and infrastructure sharing promotes preservation. Private property, restricted access)
- 3 Existing Telus Mobile/CBC Radio Tower
- 4 Copper Mine Trail Head (tower not visible)
- 5 Closest Residence 6246 Gordon Road 370 meters from tower (tower not visible)
- 6 Second Closest Residence 410 meters from tower (tower not visible)
- 7 Third Closest Residence 419 meters from tower (tower not visible)

Annex E: Community Benefits

Community Benefits

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**Greenwave Radio
Community Benefits**



**Early Fire Detection and
Real-Time Air Quality Stats**

N5SHIELD™ - Wildfire Detection System

Powered by



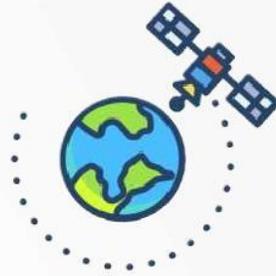
N5 Sensors

Challenges in Early and Accurate Wildfire Detection



911 Call

Human-Based Reporting is Unpredictable and often too slow



Satellite

Not Effective for Early Detection – Too Slow and Low-Resolution



Camera

Requires expensive Infrastructure and maintenance, Can miss fires based on terrain and cloud cover.



N5SHIELD™ – Fire Detection Nodes

Ruggedized, All Weather Construction
Survive wind, snow, rain, hail, etc.

Seamless Cloud-Connectivity
Data Uploads to Secure Cloud Every 20 seconds

Software Managed Communication
LTE (Multicarrier/Worldwide)/Lora, Satellite

Solar Powered
Power-Efficient System Allows 24/7 Operation

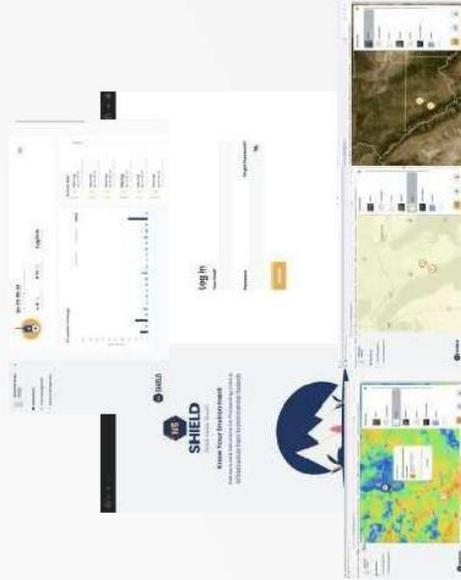
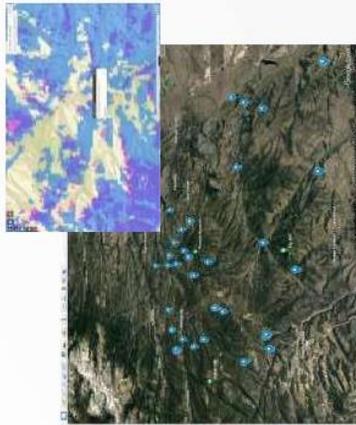
Multimodal Sensor Fusion Engine

1. Fire Gas and Chemical Measurement Module
2. Smoke and Particulate Measurement Module
3. IR Heat Mapping Sensor

N5 Sensors | N5 Sensors, Proprietary

Page | 3

N5SHIELD™ – Community Wide Protection



Identify

N5 Works with Stakeholders to Identify Locations for Highest Protection

Install

Units are Solar-Powered and Can be Mounted On Any Existing Infrastructure or on A Pole. Box-to-Pole Solution!

Protect

Web-Based Tools for Monitoring and Analyzing and Automatic Text and Email Capability

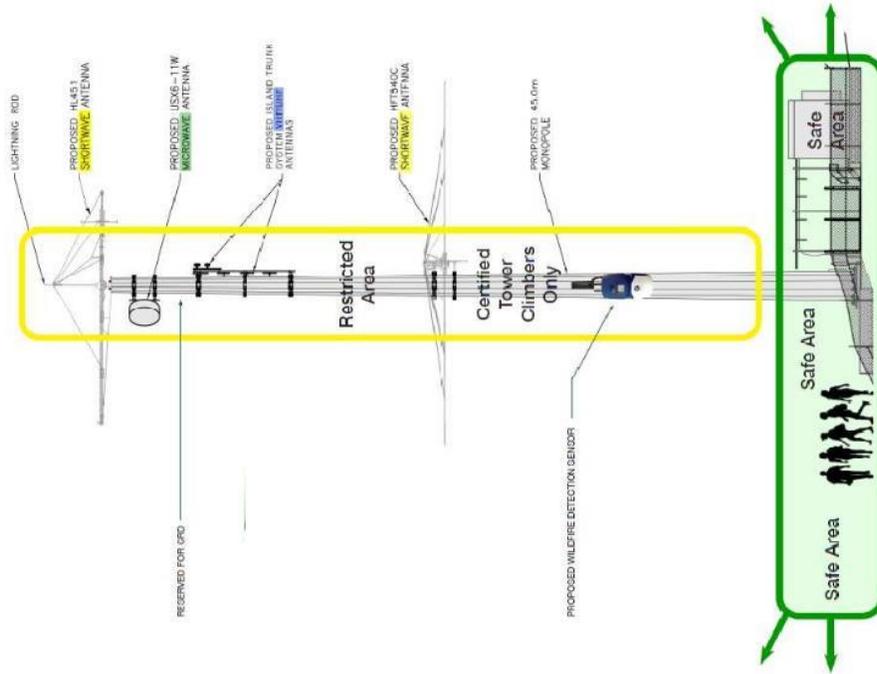


N5 Sensors

N5 Sensors, Proprietary

N5 Sensor Installed on Tower

Automatic Call-Out
to East Sooke Fire
Rescue Dispatch



The N5 Shield particle sensor that will be installed on Greenwave's tower will add significant early fire detection capabilities to the East Sooke community that were not previously available. On average, N5 sensors report fires 36 minutes before detection by humans.

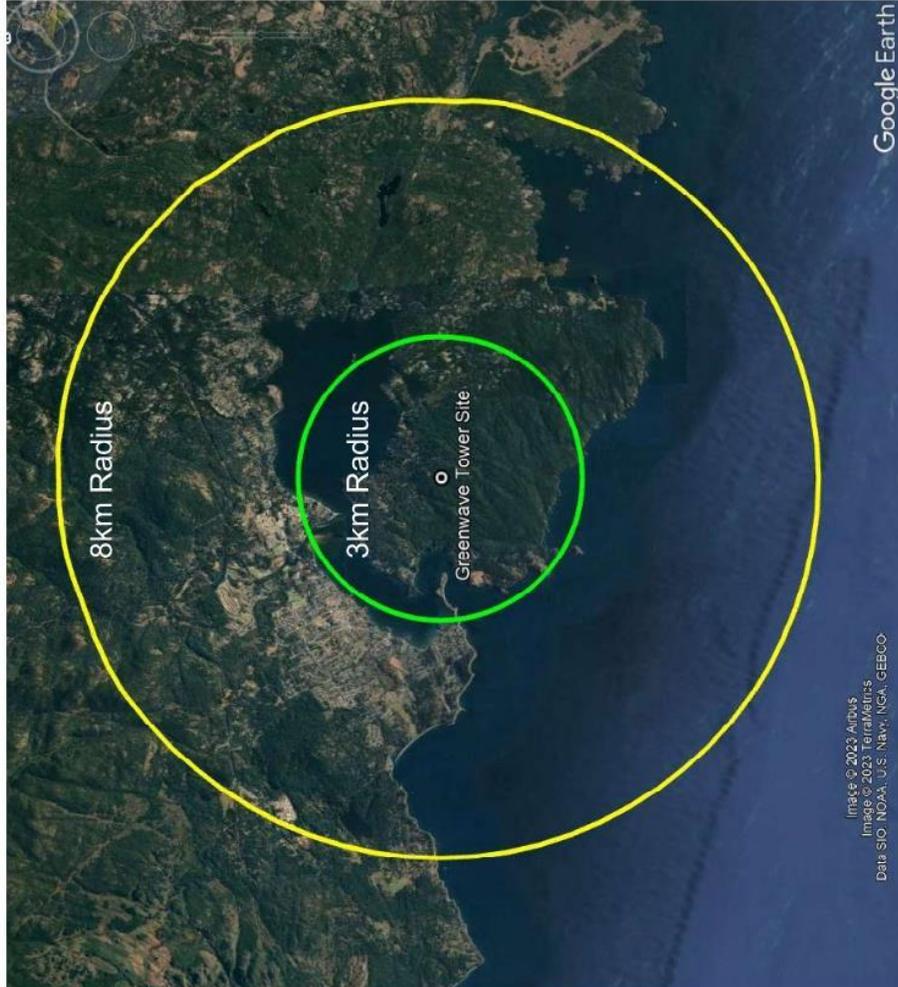
N5 Sensor Detection Range

3km Radius of Fire Detection:

- 3km is the guaranteed product specification for early fire detection of a single N5 Shield advanced particle sensor.
- This primary detection area covers East Sooke.

8km Radius of Fire Detection:

- 8km is the maximum operational detection range experienced by N5 in the field.
- This expanded detection area covers both Sooke and East Sooke.



Real-Time Air Quality Data Stream



East Sooke currently receives delayed air quality information, and this may cause confusion and frustration for residents when there is smoke in the air. The N5 Shield Sensor can help mitigate this problem by providing real-time air quality data that can be integrated onto the East Sooke Fire Department Web Page for real-time public viewing.



East Sooke Fire Department

East Sooke Fire is a highly dedicated volunteer organization of women and men who provide fire and rescue services to our community of 1700 residents and businesses. It has been in continuous operation since 1985.

In addition to emergency response, we provide education, activities and community events to encourage resident participation.

Our training evenings are on Thursday nights at 6:30 pm at our Fire Hall at 6071 East Sooke Road. We welcome and encourage new recruits.

Contact us

Emergencies: 911
 Non-Emergency Dispatch: 250-478-7770
 Fire Chief: 250-562-4208

6071 East Sooke Road, East Sooke, BC
 Phone: (250) 642-4411




[FireSmart Guides & Manuals](#)
[FireSmart Home Owner Manual](#)

[East Sooke Fire Commission Website](#)

Open Burning in East Sooke

Hazard Rating

Extreme

Current Permit Requirements

Category 1: No Burning Allowed

Category 2: No Burning Allowed

Category 3: No Burning Allowed

ATTENTION: Burning is only allowed when venting index is GOOD.

Ventilation Index Forecast:

Zone name	South Vancouver Island
Date issued	2023-09-19
Today	GOOD
Tomorrow	POOR

ATTENTION: Please check the BCWS Fire Bans and Prohibitions page before carrying out open burning activities. Learn more about the Ventilation Index and burning requirements under the Open Burning Smoke Control Regulation.



ⓘ This Ventilation Index Forecast (BEVA) is provided by the Ministry of Environment and Climate Change Strategy, Province of British Columbia.

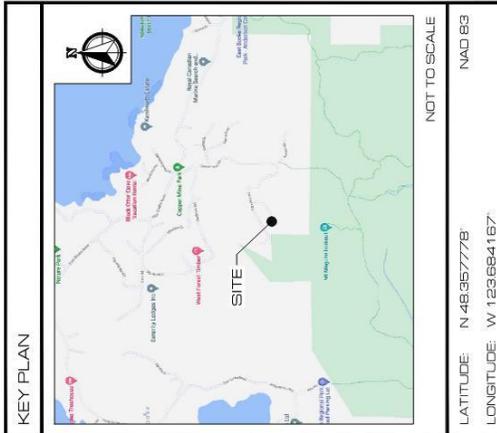


Add N5 Air Quality Index Here



Annex F: Site Plans

DRAWING INDEX		REV
DWG NO	DRAWING TITLE	
T-1	TITLE SHEET	E
A-1	ANTENNA DETAILS	E
A-2	ANTENNA LOADING CHARTS	E
A-3	SITE PLAN	E
A-4	ENLARGED SITE PLAN	E
A-5	ANTENNA LAYOUTS	E
A-6	EAST ELEVATION	E



SITE INFORMATION

SITE ID: BC00142

SITE NAME: MOUNT MAGUIRE (EAST SOOKE)

SITE ADDRESS: VALENTINE ROAD, 863 METRES UPHILL FROM ITS JUNCTION WITH GORDON ROAD SOOKE, BC

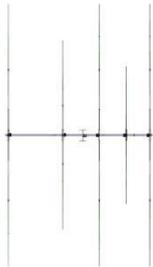
LEGAL DESCRIPTION: PID: 001-500-139 LOT 2, DISTRICT LOTS 143 AND 200, AND SECTION 154, SOOKE DISTRICT, PLAN 42290

SITE CONFIGURATION: MONOPOLE

APPLICANT: GREENWAVE RADIO - 1291291956 BC ULC

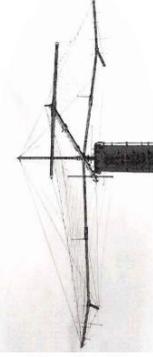
PERMIT TO PRACTICE # 1000380 ENGINEERING SEAL	 <p>TEL: (778) 809-3186 WEB: WWW.COREONECONSULTING.COM CONTACT: INFO@COREONECONSULTING.COM</p>	PROJECT: BC00142 MOUNT MAGUIRE (EAST SOOKE) BRITISH COLUMBIA	SCALE: N/A REVIEWED BY: LC APPROVED BY: CA DRAWN BY: AD DATE: JUN 26/22 CAD FILE: T-1 PROJECT NO: 2828477 DRAWING NO: T-1
		DRAWING TITLE	TITLE SHEET

REV	DESCRIPTION	DATE	BY
E	REVISED PER COMMENTS	AUG 28/23	WT
D	REVISED PER COMMENTS	AUG 16/23	WT
C	REVISED PER COMMENTS	AUG 09/23	WT
B	REVISED PER COMMENTS	JUL 17/23	WT
A	ISSUED FOR REVIEW	JUN 26/22	AD



1 ANTIENNA DETAIL
N.T.S.

MANUFACTURER: STEPPIR
ANTENNA MODEL: 1569M
ELEMENT LENGTH: (3) 21.79m/ (1) 11.33m
BOOM TYPE/LENGTH: 10.16cm ALUMINUM TUBE BY 12.19m LONG
WEIGHT: 220kg



2 ANTIENNA DETAIL
N.T.S.

MANUFACTURER: HF ANTENNAS R&S
ANTENNA MODEL: HL-451



3 ANTIENNA DETAIL
N.T.S.

MANUFACTURER: PASTERNAK
ANTENNA MODEL: PEANED1007
OVERALL LENGTH: 1692.3mm
ELEMENT LENGTH: 1692.3mm
HEIGHT: 60.96mm
WEIGHT: 48.99kg



5 MICROWAVE DETAIL
N.T.S.

MANUFACTURER: COMMSCOPE
ANTENNA MODEL: USX6-11W
DIAMETER: 1800mm
WEIGHT: 90kg



4 ANTIENNA DETAIL
N.T.S.

MANUFACTURER: SINCLAIR
ANTENNA MODEL: SD214E-SF2P2
WIDTH: 1080mm
DEPTH: 6096mm
LENGTH/HEIGHT: 25.88kg

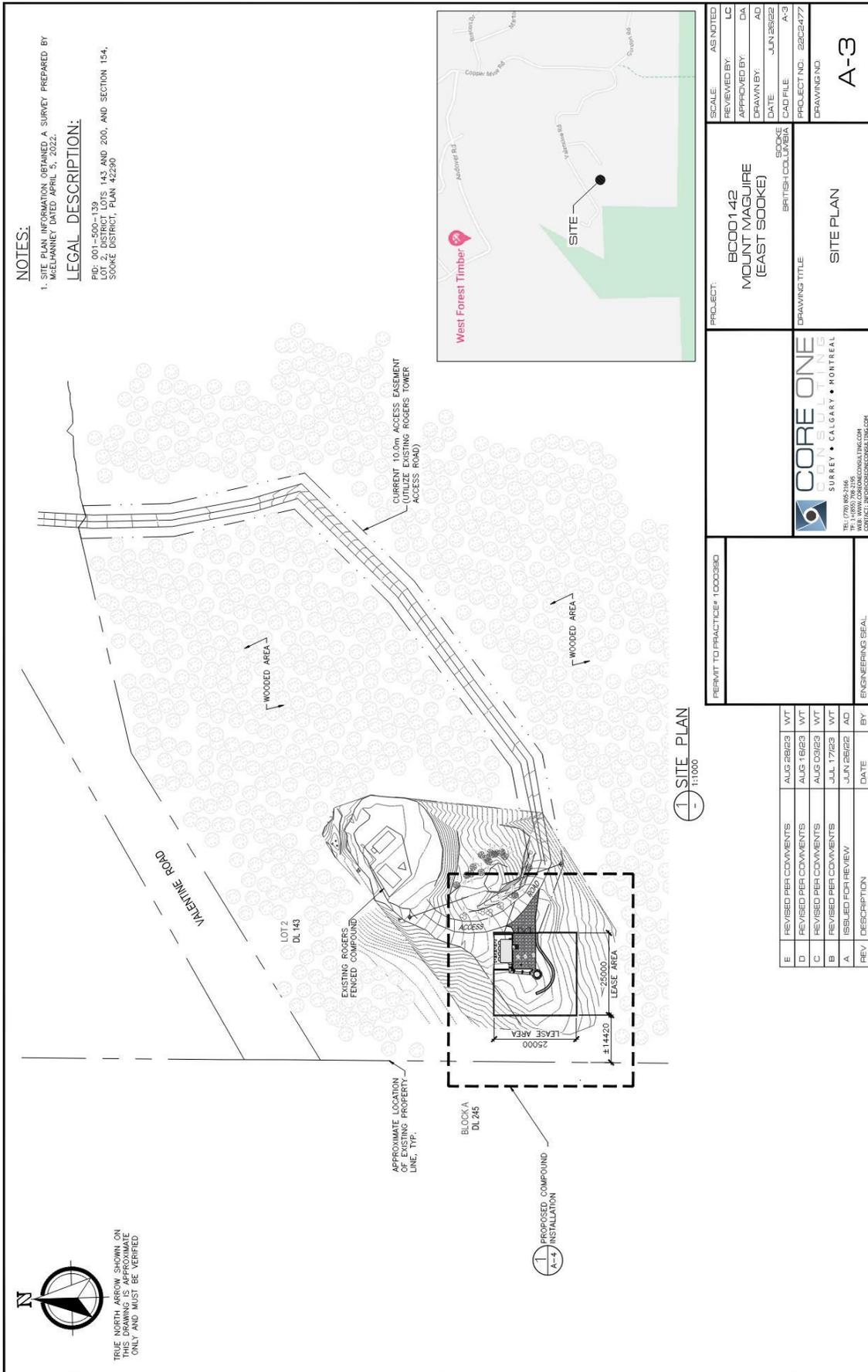
REV	DESCRIPTION	DATE	BY
E	REVISED PER COMMENTS	AUG 28/23	WT
D	REVISED PER COMMENTS	AUG 16/23	WT
C	REVISED PER COMMENTS	AUG 09/23	WT
B	REVISED PER COMMENTS	JUL 17/23	WT
A	ISSUED FOR REVIEW	JUN 26/22	AD

PERMIT TO PRACTICE # 1000380		PROJECT: B000142 MOUNT MIAJUJIRE (EAST SOOKE)	SCALE: N/A REVIEWED BY: LC APPROVED BY: CA DRAWN BY: AD DATE: JUN 26/22 CAD FILE: A-1
 <p>TEL: (778) 892-3186 WEB: WWW.COREONECONSULTING.COM CONTACT: INFO@COREONECONSULTING.COM</p>		DRAWING TITLE ANTENNA DETAILS	PROJECT NO: 2828477 DRAWING NO: A-1

ANTENNA LOADING CHART					
#	ANTENNA ID	ANTENNA TYPE	HEIGHT (AGL)	AZMUTH (°)	STATUS
1	TOP MONOPOLE	HF ANTENNAS R&S HL451	±45.0m	TOP TONER	INITIAL
2	TOP MONOPOLE	COMSCOPE US30-11W 11GHz MW	±43.0m	±180°	INITIAL
3	FACING CLOSEST TOWER IN THE WALKHAT MOUNTAINS; N46.900534, W123.846414	PERNEE 1007 UHF COPLANAR ANTENNA	±40.0m	±350°	INITIAL ISLAND TRUNK SYSTEM, (CO-LOCATION)
4	FACING CLOSEST TOWER IN THE WALKHAT MOUNTAINS; N46.900534, W123.846414	SD214E VHF COPLANAR ANTENNA	±40.0m	±350°	INITIAL ISLAND TRUNK SYSTEM, (CO-LOCATION)
5	MID MONOPOLE	STEPPER HT540C	±25.0m	MID TONER	INITIAL

REV	DESCRIPTION	DATE	BY
E	REVISED PER COMMENTS	AUG 28/23	WT
D	REVISED PER COMMENTS	AUG 16/23	WT
C	REVISED PER COMMENTS	AUG 09/23	WT
B	REVISED PER COMMENTS	JUL 17/23	WT
A	ISSUED FOR REVIEW	JUN 26/22	AD

PROJECT: BCO0142 MOUNT NIAGUIRE (EAST SOOKE)	SCALE: N/A REVIEWED BY: LC APPROVED BY: CA DRAWN BY: AD DATE: JUN 26/22 CAD FILE: A-2 PROJECT NO: 2828477 DRAWING NO: A-2
DRAWING TITLE: ANTENNA LOADING CHART	SOOKE BRITISH COLUMBIA
 CORE ONE CONSULTING SURREY • CALGARY • MONTREAL TEL: (778) 809-3186 WEB: WWW.COREONECONSULTING.COM CONTACT: INFO@COREONECONSULTING.COM	
PERMIT TO PRACTICE # 1000380 ENGINEERING SEAL	



NOTES:
 1. SITE PLAN INFORMATION OBTAINED FROM A SURVEY PREPARED BY MELHANNET DATED APRIL 5, 2022.
LEGAL DESCRIPTION:
 PD: 001-500-139 LOTS 143 AND 200, AND SECTION 154, SOOKÉ DISTRICT, PLAN 42230

SCALE: AS NOTED
 REVIEWED BY: LC
 APPROVED BY: DA
 DRAWN BY: AD
 DATE: JUN 26/22
 PROJECT NO: 2828477
 DRAWING NO: A-3

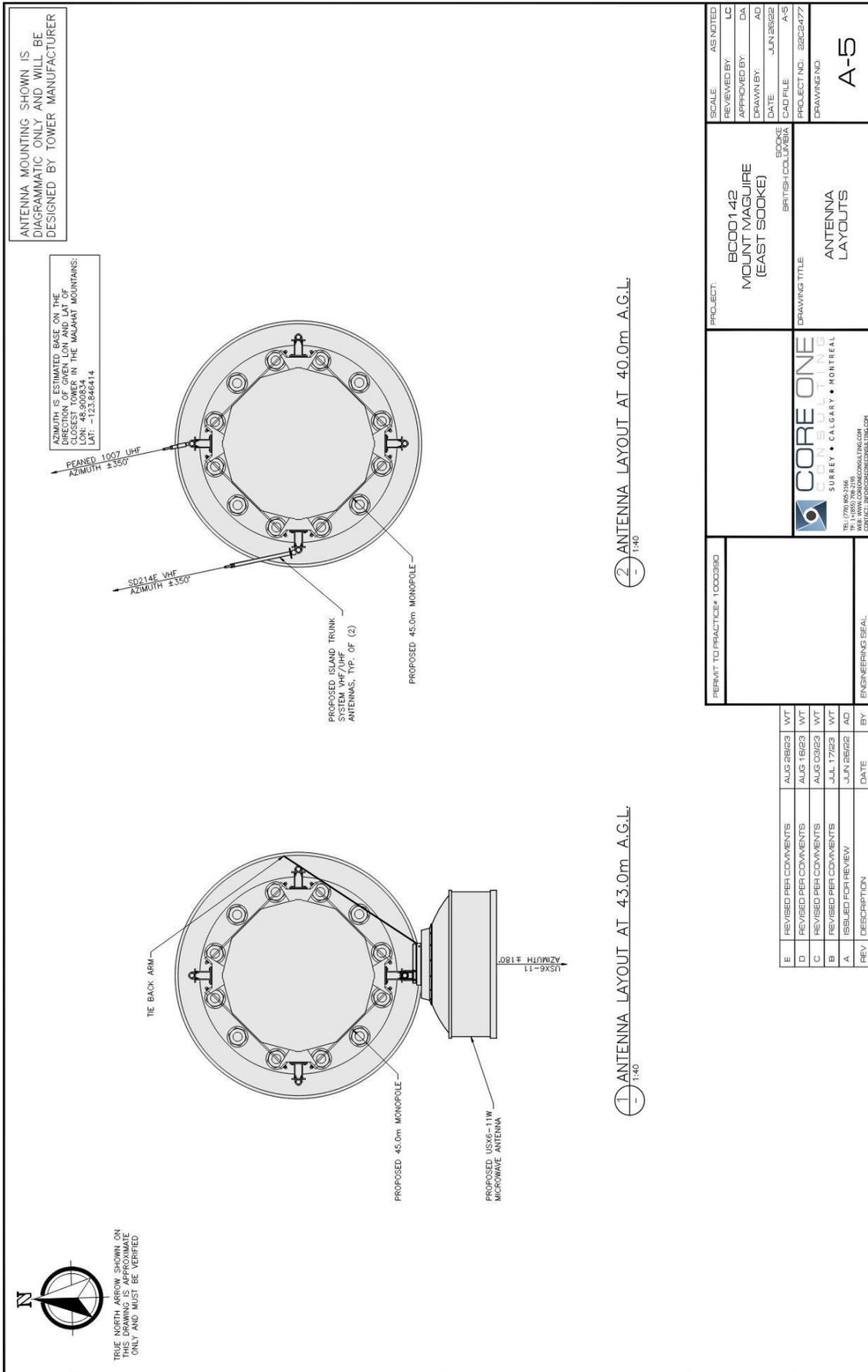
PROJECT: BCO0142
 MOUNT MAGUIRE (EAST SOOKE)
 BRITISH COLUMBIA
 DRAWING TITLE: SITE PLAN

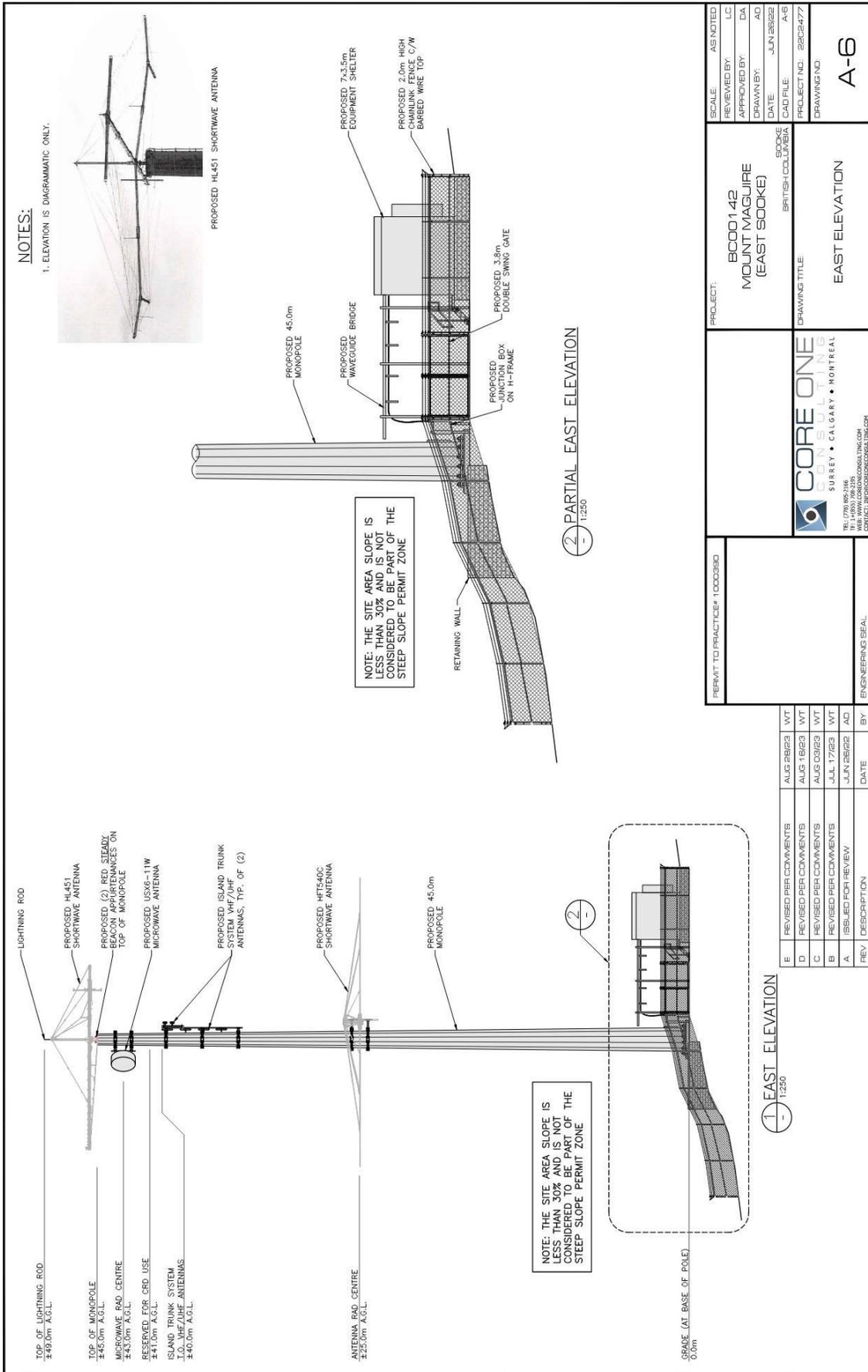
CORE ONE CONSULTING
 SURREY • CALGARY • MONTREAL
 TEL: (778) 802-2186
 WWW.COREONECONSULTING.COM
 CONTACT: INFO@COREONECONSULTING.COM

PERMIT TO PRACTICE # 1000380

REV	DESCRIPTION	DATE	BY
E	REVISED PER COMMENTS	AUG 28/23	WT
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ENGINEERING SEAL



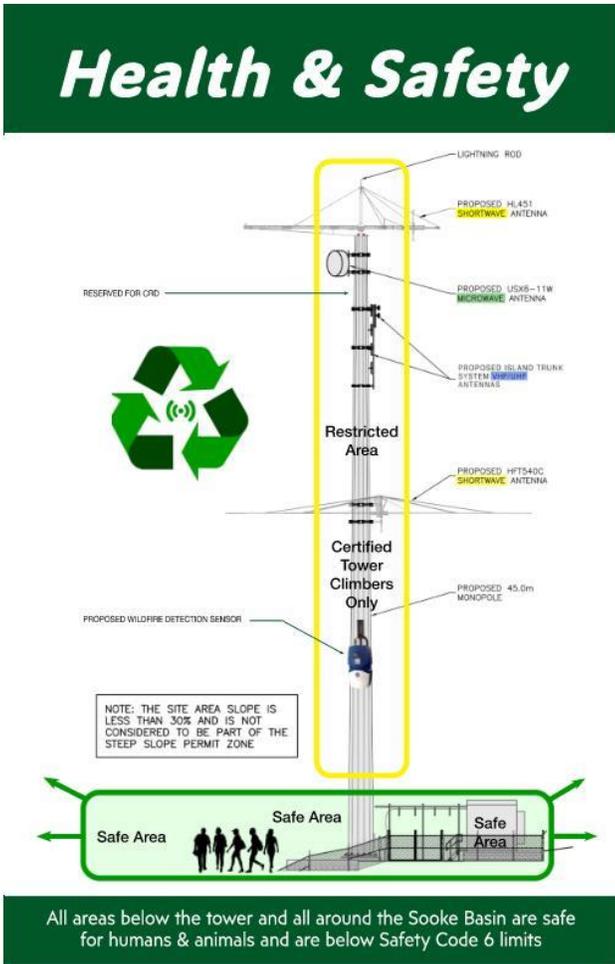


Annex G: Health & Safety

Greenwave Radio has commissioned an updated and expanded Safety Code 6 Compliance Review for our proposed tower. The calculations included in this report were performed by a professional engineering firm, Yves R. Hamel and Associates. They used worst-case parameters, the highest frequency, power output and antenna factor, for the safest results. In all cases, that is to say at all distances outside of the perimeter security fence, and at all frequencies and utilized power levels, this proposed antenna system is below the safe threshold of risk to human health allowed by Health Canada under Safety Code 6.

Greenwave Radio also commissioned a review and presentation of our Safety Code 6 Compliance by an independent radiofrequency safety expert and East Sooke resident named Jay Vinden. Jay's assignment was to convert the Safety Code 6 report into common language and to explain it to residents at our open house and at our upcoming land use committee meeting. Jay has concluded that he is safe living just below the tower in East Sooke and that his fellow neighbours are also safe, as he explained to them at our recent open house (see Health & Safety Banners from the open house below).

The Safety Code 6 Compliance report is attached hereto and, in the pages following the report, per the CRD Staff's request, we have converted the measurements and numbers into a diagram showing the absolute physical separation between the nearby residential areas and any restricted areas on or near the proposed tower.



In compliance with Canada's extremely strict Safety Code 6 standards, there is no unsafe area near the tower that a human can access, even if they trespass into the compound and walk beneath the tower. This is because our shortwave antennas are low-powered and pointed at distant receivers over the horizon. Our Safety Code 6 compliance requires periodic safety testing after tower installation to ensure long-term compliance.

There are no cellular antennas on this tower, nor do we have any plans to ever collocate cellular antennas of any type on our tower (including 5G). Furthermore, there is no room for cellular antennas at the heights they would require. Greenwave Radio is exempt from mandatory tower sharing pursuant to Industry Canada CPC-2-0-17 as we are a private company and not defined as a common telecommunications carrier.



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Greenwave Radio's tower has received NAV Canada land use approval file #22-4607.



Greenwave Radio's tower has received Transport Canada approval file #ATS-22-23-00044520.

There are no new antenna or radio technologies coming into the area via our tower. These same 3 antenna types have existed in East Sooke for decades

Microwave antennas on Rogers tower beside Greenwave site.

VHF/UHF antennas at East Sooke Fire Dept. Same antennas as Greenwave Tower.

<https://www.sooke-news.com/news/ham-operators-stand-ready-in-case-of-disaster-165754>

Shortwave antennas on amateur radio operator's home in Saanich. Same shortwave technology as Greenwave Tower. Identical antennas are installed in residential areas in both Sooke & E. Sooke.



Greenwave Radio
1291956 B.C. ULC
contact@greenwaveradio.net

Safety Code 6 – BC00142 – Sooke, BC

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Analysis prepared by:

A handwritten signature in blue ink, appearing to read "A. Zubek", written over a horizontal line.

Agnieszka Zubek, ing.
(OIQ# 120194 – 2023-09-07)
Yves R. Hamel & Associés Inc.



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Introduction

YRH Inc. was mandated by Core One Consulting to evaluate the levels of RF energy near a HF installation located near Sooke, BC. The purpose of this evaluation is to verify compliance with Safety Code 6 limits and to recommend corrective measures if necessary.

Site Description

The site is located at the following coordinates:

Latitude :	48.357778 North
Longitude :	123.684167 West
Address :	6246 Gordon Rd, Sooke, BC

The site consists of a 45 m monopole where several antennas are located

Systems description

The main contributors of RF energy at this site are two HF band antennas. The table below contains the list of the relevant characteristics for these antennas.

	Model	Height (m AGL)	Frequency (MHz)	P _{TX} (W)	Gain (dBi)
1	HL451	45	7.5 to 23.5	1 000	6 to 12
2	HFT540C	25	7.5 to 23.5	1 000	13.5 to 16.6

Besides the two antennas listed above, several microwave link antennas are also located on this tower.

N. Ant.	Antenna Model	Aperture (ft)	Antenna height (m)	Az. (°)
MW1	USX6-11W	6	43	180°
MW2	AF60-XR	2.5	41	TBD
MW3	AF60-XR	2.5	41	TBD

They will not be included in this analysis as the energy for this type of antennas is concentrated in the main beam and does not contribute to exposure incurred at ground level.

Two other radiocommunication antennas are also located on this tower, as described below. Their contribution will be evaluated using EMF Visual simulation software

Site ID.:	BC00142	Lat:	48.35778		Long:	-123.68417		
Site name:	Sooke	Address:	Sooke, BC					
N. Ant.	Tech	Operator	Antenna Model	Antenna height (m)	Az. (°)	tilt E/M (°)	Freq. (MHz)	P _{TX} (W)
1	UHF	Island Trunk	Peaned 1007	40	350°	0°/0°	380-470	5
2	VHF	Island Trunk	SD214E	40	350°	0°/0°	138-174	20



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There is a Rogers cellular base station located some 50 m North-East of the site. A summary analysis of the contribution shows that it will generate at most 2% of the UE limit, in the vicinity of this installation. This contribution will be added to the results obtained for this site to evaluate total exposure levels on the ground.

No broadcasting facilities are located within 1 km of this site.

The analysis will use uncontrolled environment limits since the area around the tower is publicly accessible, with the exception of a 25 m x 25 m fence around the tower base.



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Health Canada’s Safety Code 6

Health Canada publishes a document called “Safety Code 6” where the limits of human exposure to RF energy are detailed, for frequencies between 3 kHz and 300 GHz. The exposure limits specified in Safety Code 6 have been established based upon a thorough evaluation of scientific literature related to thermal and non-thermal effects of RF fields, using a weight-of-evidence approach. The limits in Safety Code 6 are based on the lowest exposure levels at which any scientifically established adverse health effect occur. Furthermore, safety margins are incorporated into these exposure limits to ensure that even the worst-case exposure remain far below the established thresholds. Finally, the scientific approach used to establish the exposure limits in Safety Code 6 is comparable to that employed by other science-based international bodies such as the World Health Organisation (WHO) or the International Commission for Non Ionising Radiation Protection (ICNIRP)

Safety Code 6 limits are set for two types of environments, called Controlled and Uncontrolled environment. These two types of environments are defined as follows:

- **Controlled Environment:** An area where the RF field intensities have been adequately characterised by means of measurements or calculations and exposure is incurred by persons who are: aware of the potential for RF field exposure, cognizant of the intensity of the RF fields in their environment, aware of the potential health risks associated with RF field exposure and able to control their risk using mitigation strategies.
- **Uncontrolled Environment:** An area where any of the criteria defining the controlled environment are not met.

The standard used to perform this survey is based on the most recent Safety Code 6 2015 recommendations. The figure below illustrates the power density limits for Controlled and Uncontrolled Environments for the 2015 standards.

Furthermore, all our results are expressed as a percentage of Safety Code 6 limit, which is the usual representation for multi-frequency environments. In this representation, all values below 100% represent exposures compliant with Safety Code 6 limits while values above 100% represent exposures exceeding those limits.



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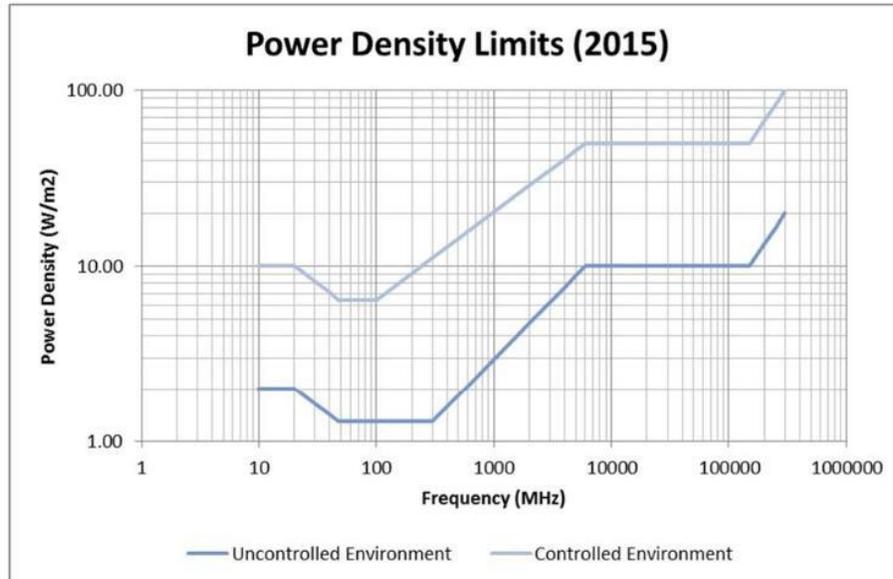


Figure 1 – Safety Code 6 Power Density Limits (2015)

References

The survey and the resulting document have been prepared in compliance with the applicable reference documents:

- Safety Code 6 (2015) « Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz » Health Canada
- GL-01 « Guidelines for the Measurement of Radio Frequency Fields at Frequencies from 3 kHz to 300 GHz » Industry Canada
- GL-08 « Guidelines for the Preparation of Radio Frequency (RF) Exposure Compliance Reports for Radiocommunication and Broadcasting Antenna Systems » Industry Canada
- CPC-2-0-20 « Radio Frequency (RF) Fields — Signs and Access Control » Industry Canada

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Methodology

HF antennas

The commercially available simulation tools are not well suited for the evaluation of Safety Code 6 compliance at HF frequencies. We will therefore execute simplified analysis that will evaluate the levels of RF energy in the worst azimuth, using maximum parameters. This will allow us to estimate a worst-case situation for exposure at ground level.

Our analysis will assume both antennas operating simultaneously, at the highest of the frequency range. The highest frequency was chosen because it both has the highest gain for both antennas, resulting in higher radiated power, but also the Safety Code 6 limits are strictest at the higher end of the frequency band.

We will therefore use the following characteristics:

	Model	Height (m AGL)	Frequency (MHz)	P _{TX} (W)	Gain (dBi)	EIRP (W)
1	HL451	45	23.5	1 000	12.0	15 848
2	HFT540C	25	23.5	1 000	16.6	45 708

The calculation will use the parameters above to calculate the exposure at ground level, individually for each antenna. The resulting power density level will be compared to the Safety Code 6 maximum permitted exposure for uncontrolled environment. The contributions of both antennas will be summed up and expressed in terms of percentage of this limit. In this format, any value below 100% represents an acceptable level of exposure while any value exceeding 100% represents exposure exceeding Safety Code 6 limits.

The calculation will use the following equation:

$$PD_{\%} = \frac{EIRP * AF}{4\pi r^2} * \frac{100\%}{PD_{max}}$$

Where;

- PD_%** is Resulting exposure in terms of Power Density (% of Safety Code 6 Limit)
- EIRP** is Effective Isotropic Radiated Power (W)
- AF** is Antenna Pattern Factor
- r** is Distance to the antenna (m)
- PD_{max}** is Maximum permitted exposure in terms of Power Density (W/m²)



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UHF and VHF Antennas

The analysis of the effect of the VHF/UHF antennas has been completed using the Visual EMF software. This software simulates the distribution of energy in the near and far field of the antenna and gives with great precision the area of exposure by the standards of Health Canada (Safety Code 6) levels.



Figure 2 - EMF Visual

The simulation is performed by constructing a three-dimensional model of the site and then adding all transmitting antennas. Some antenna models are provided with the software, others had to be created from the radiation patterns that may be available on Industry Canada or on manufacturers' web sites. Antenna characteristics, such as frequency, radiated power and position are then entered into the software. The simulation then gives a representation of the radiation for each antenna and the size of the zones which require restricted access.

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Results

HF Antennas

The figures below shows the levels of RF energy along a line moving away from the tower. This represents the levels in the maximum azimuth of the antennas, at 2 m and 3 m above ground respectively.

At 2 m above ground, the antenna HL451, because of its location at the top of the tower and because of its lower gain, contributes at most 8% of the SC6 limit for Uncontrolled environment. Antenna HFT540C, located closer to the ground, contributes up to 81%. When both antennas operate simultaneously, exposure levels will reach up to 88% of the Safety Code 6 maximum permitted exposure for uncontrolled environment. This maximum value of 88% occurs at a distance of approximately 17 m from the base of the tower.

When evaluated 3 m above ground, antenna HL451 contributes approximately 8.5% of the SC6 limit for Uncontrolled environment. Antenna HFT540C contributes up to 88%. When both antennas operate simultaneously, exposure levels will reach up to 95% of the Safety Code 6 maximum permitted exposure for uncontrolled environment. This maximum value of 95% occurs at a distance of approximately 18 m from the base of the tower.

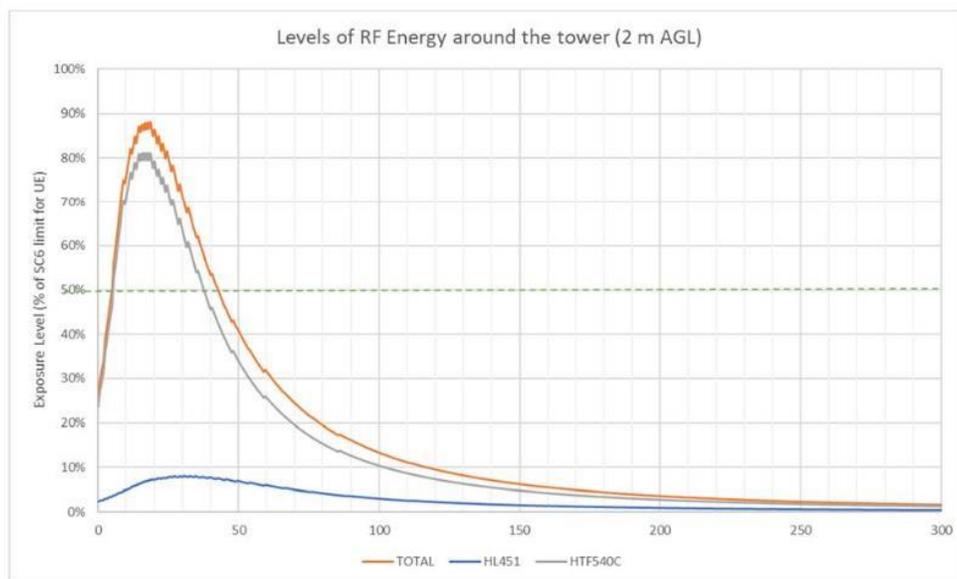
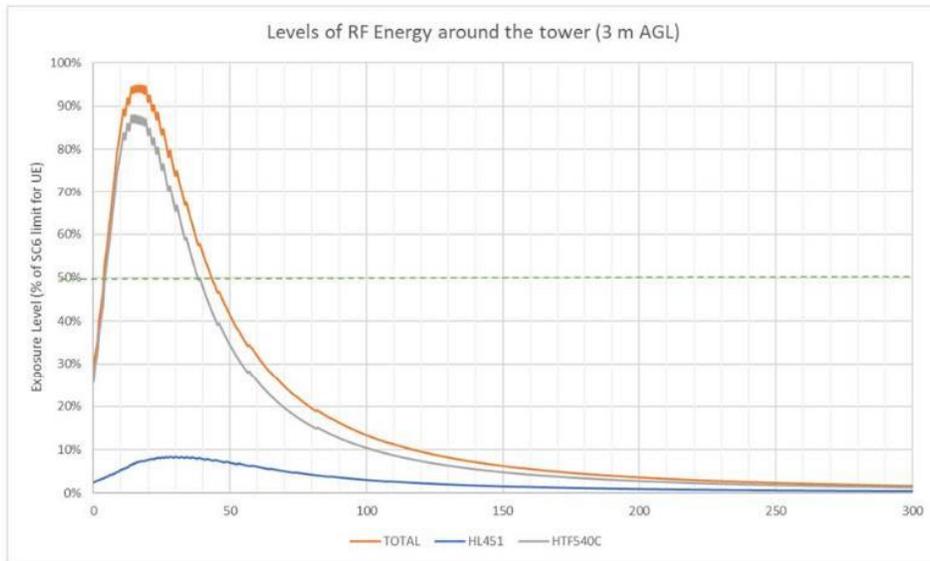


Figure 3 - Energy Levels at 2 m above the ground (as % of Safety Code 6 limit for UE)

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UHF and VHF Antennas

The figures below show the levels of RF energy at 2 m and 3 m above ground. In both cases, the levels are extremely low, not exceeding 0.03% (or 3/10000th) of the permitted exposure for uncontrolled environments.

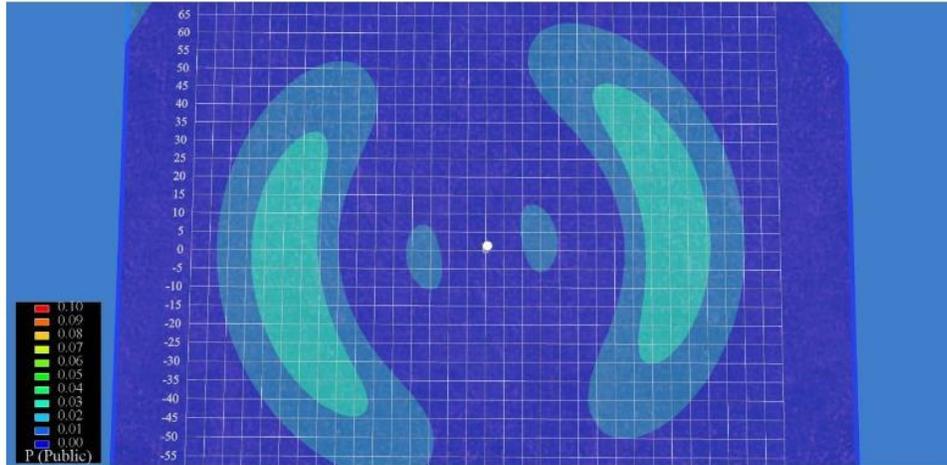


Figure 4 - Levels of R Energy from UHF and VHF antennas at 2 m above ground (as % of Safety Code 6 limit for UE)

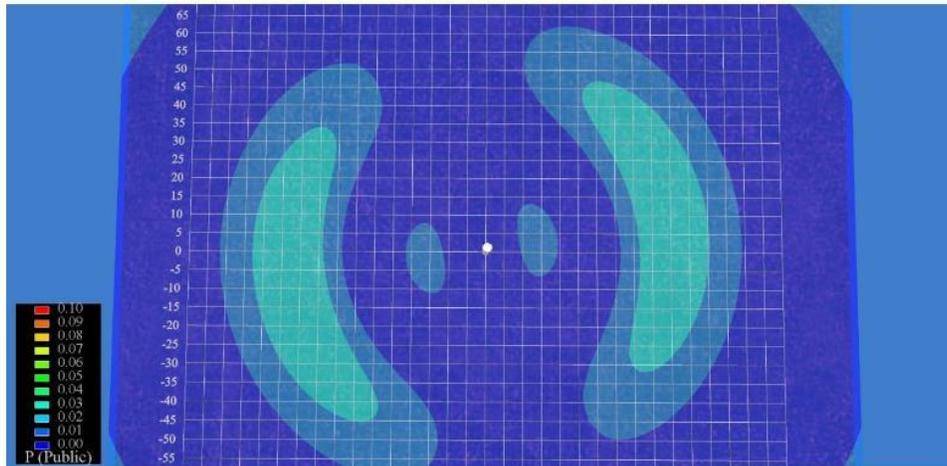


Figure 5 - Levels of R Energy from UHF and VHF antennas at 3 m above ground (as % of Safety Code 6 limit for UE)

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Conclusion and recommendations

When all the sources are taken into account their contributions at ground level can be summarised as follows:

Source	Contribution 2 m AGL	Contribution 3 m AGL
HL451	8.1%	8.5%
HFT540C	81.1%	88.0%
VHF and UHF	0.03%	0.03%
Microwave	0.0%	0.0%
Rogers	2.0%	2.0%
TOTAL	91.23%	98.53%

Figure 6 - Contributions from various sources to the total exposure levels (% of Safety Code 6 limit for UE)

Our analysis shows that no location will exceed 100% of the limit, and the entire area around the tower is compliant.

However, when theoretically evaluated exposure exceeds 50% of the limit for Uncontrolled Environment in areas accessible to the general public, ISED may request a confirmation by on site measurements. Measurements are likely to yield a lower value since this theoretical evaluation made several assumptions for the purpose of obtaining a worst-case result.

The area where exposure exceeds 50% extends up to 43 m from the tower. Since the proposed fence around the compound is planned to be approximately 25 m by 25 m, it will not be sufficient to enclose all locations exceeding 50%. Measurements would not be required if the fence extended to at least 45 m from the base of the tower, to account for the contribution from Rogers antennas.



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END OF SAFETY CODE 6 COMPLIANCE REVIEW DOCUMENT

The RF Energy graph below from our Safety Code 6 (SC6) Compliance report illustrates the progressive decline in RF Energy while moving away from the antenna system. An important conclusion that can be drawn from analyzing this graph, is that there is nowhere at ground level that RF Energy exceeds SC6 limits. As of 100 meters away from the tower, the levels start to quickly drop towards 0%.

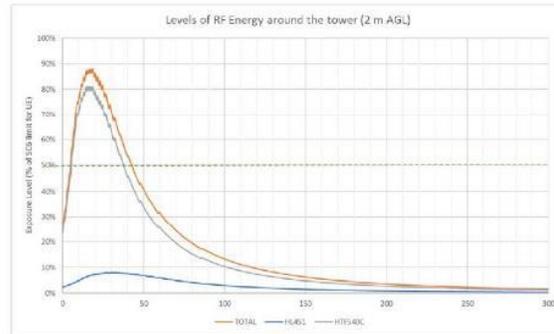


Figure 3 - Energy Levels at 2 m above the ground (as % of Safety Code 6 limit for UE)

We have created a visual map of this graph below. Please note that **all areas at ground level around the tower are within SC6 limits**, the concentric rings are only illustrating the **small percentage** of the limits the calculation yields for each distance threshold. As illustrated above, RF energy steadily approaches 0% after 100 meters away, therefore at 300 meters away, the residual RF energy is lower than ambient and household generated signals. Furthermore, please note in the below image that the closest residences all exceed 300 meters from the proposed site.

