Rimrock Biodigester Facility

Application to Alberta Environment and Parks for an Environmental Protection and Enhancement Act Industrial Approval

Prepared for:
Rimrock Renewables Ltd.

Prepared By:
EXP Energy Services Inc.
Calgary, Alberta

Date Submitted:
2022-06-09

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Table of Contents

List of Tables

List of Figures

Abbreviations and Key Terms

Abbreviation/Term	Definition
AAAQO	Alberta Ambient Air Quality Objectives
AAF	Alberta Agriculture and Forestry
ACIMS	Alberta Conservation Information Management System
ACO	Aboriginal Consultation Office
AEP	Alberta Environment and Parks
AER	Alberta Energy Regulator
AERMOD	AMS/EPA Regulatory Model
AGRASID	Agricultural Regions of Alberta Soil Inventory Database
ALSA	Alberta Land Stewardship Act
AMCSW	Alberta Ministry of Culture and Status and Women
AOPA	Agriculture Operations Practices Act
AQMG	Air Quality Model Guideline
ASSC	Alberta Stack Sampling Code
AUC	Alberta Utilities Commission
CaCO3	Calcium Carbonate
CEAA	Canadian Environmental Assessment Agency
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COSEWIC	Committee of the Status of Endangered Wildlife in Canada
CRAZ	Calgary Region Airshed Zone
Digestate	A benign solid or liquid biproduct formed from the anaerobic digestion of feedstock

Abbreviations and Key Terms, Cont'd

DVG	Dunvargan soil series
EC	Electrical Conductivity
EDI	Environmental Dynamics Inc.
EIA	Environmental Impact Assessment
ELC	Equivalent Land Capability
EPEA	Environmental Protection and Enhancement Act
ERIS	Environmental Risk Information Services
ESA	Environmentally Significant Area
ESAR	Environmental Site Assessment Repository
ESC	Erosion and Sediment Control
ESRD	Alberta Environment and Sustainable Resource Development
EXP	EXP Services Inc.
Feedstock	Livestock manure and off-farm organic resources used in anaerobic digestion
FWIMT	Fish and Wildlife Internet Mapping Tool
GHG	Greenhouse Gas
GIS	Geographic Information System
GJ/yr	Gigajoule per Year
GMS	Growth Management Strategy
GOA	Government of Alberta
H_2S	Hydrogen Sulfide
HDPE	High-Density Polyethylene
HRA	Historical Resources Act
IDP	Intermunicipal Development Plan
ISL	ISL Engineering and Land Services
kW	kilowatt

Abbreviations and Key Terms, Cont'd

L	Liter
LAT	Landscape Analysis Tool
LSRS	Land Suitability Rating System
Masl	Meters above sea level
mbar	millibar
MD	Municipal District
MDP	Municipal Development Plan
MFT	Maycroft soil series
Mg/kg	milligram per kilogram
MGLC	maximum off-site ground concentrations
MOU	Memorandum of Understanding
MW	Megawatt
N_2	Nitrogen
NH_3	Ammonia
Nm3	Normal cubic meter
NOx	Nitrogen Oxides
NO2	Nitrogen Dioxide
NRCB	Natural Resources Conservation Board
O_2	Oxygen
O_3	Ozone
PE	Polyethylene
$PM_{2.5}$	Fine Particulate Matter
PPM	Parts Per Million
Project	Rimrock Digester Facility
Project footprint	Limits of the Project development

Abbreviations and Key Terms, Cont'd

PSI	Pound per Square Inch
RCC	Rolled Compacted Concrete
Rimrock	Rimrock Renewables Ltd.
Rimrock Cattle Company	Rimrock Cattle Company Ltd. (confined feedlot operation)
RNG	Renewable Natural Gas
RRD	Required Replacement Depths
SAR	Sodium Adsorption Ratio
SARA	Species at Risk Act
SCR	Selective Catalytic Reduction
SCWG	Super Critical Water Gasification
SDS	Safety Data Sheets
SMP	Stormwater Management Plan
SO_x	Sulphur Oxides
SO_2	Sulphur Dioxide
SSRP	South Saskatchewan Regional Plan
TDS	Total Dissolved Solids
TDG	Transportation of Dangerous Goods
VOC	Volatile Organic Compounds

Introduction

EXP Services Inc. (EXP) was retained by Rimrock Renewables Ltd. (Rimrock) to complete an application to Alberta Environment and Parks (AEP) for an Environmental Protection and Enhancement Act (EPEA) Industrial Approval for the Rimrock Biodigester Facility (the Project).

Located approximately 5.5 kilometers (km) west of High River, Alberta, the Project will produce Renewable Natural Gas (RNG) through the upgrading of biogas produced by the anaerobic digestion of feedstock comprised of livestock manure and off-farm organic food resources.

The Project will be developed on privately-owned, cultivated land within a proposed footprint of approximately 39.82 hectares (ha).

Document Layout

This application was prepared in accordance with the Guide to Content for Industrial Approval Applications (the Guide) (GOA 2014). For ease of reference, the formatting of the application is consistent with the section (and subsection) numbering provided in the Guide, Part 1: New Plants and Facilities.

1 Applicant Identification

1.1 Authorization of Application for Approval by Owner/Agent

Provide the applicant's name using the Authorization of Application for Approval Form (Appendix A). If an agent is authorized to represent the person responsible, also provide this full name. If the person responsible or agent is a corporation, provide the full Alberta registered name of the corporation.

The applicant is Rimrock Renewables Ltd.

A signed Authorization of Application for Approval is included in Appendix A.

1.2 Applicant Mailing Address

Provide the mailing address of the person responsible, and the agent's office mailing address, if different.

The applicant's mailing address is:

Rimrock Renewables Ltd.
900, 222 3rd Avenue SW
Calgary, AB
T2P 0B4

Attention:

Scott McLean
Executive VP, Operations
Rimrock Renewables Ltd.

1.3 Facility Mailing Address

Provide the mailing address of the plant or facility where the activity is conducted, and the regional office of the person responsible, if different.

Correspondence concerning this application should be directed to the above address, to the attention of:

Scott McLean
Executive VP, Operations
Rimrock Renewables Ltd.

1.4 Additional Project Contacts

Correspondence regarding this application should be directed to the attention of:

Scott McLean
Executive VP, Operations
Rimrock Renewables Ltd.
900, 222 3rd Avenue SW
Calgary, AB T2P
Phone: (587) 475-0210
Email:smclean@tidewater-renewables.com

A signed Authorization of Application for Approval is included in Appendix A.

2 Plant or Facility Identification

2.1 Description of Primary Activities

Describe the main activities of the plant or facility with the most suitable classification referenced in the Activities
Designation Regulation. If additional activities proposed for the site are also classified as regulated activities, provide this description in addition.

Rimrock Renewables Ltd. (Rimrock) is proposing to construct and operate the Rimrock Biodigester Facility (the Project) to produce Renewable Natural Gas (RNG) through the upgrading of biogas produced by the anaerobic digestion of feedstock comprised of livestock manure and off-farm organic resources.

This proposed activity is defined under Schedule 1 Division 1 (c) of the Environmental Protection and Enhancement
Act Activities Designation Regulation as "the construction, operation or reclamation of a facility for the collection and processing of waste or recyclables to produce fuel, where more than 10 tonnes of waste or recyclables per month are used to produce the fuel" (GOA 2003).

2.2 Facility Location

Provide the location of the plant or facility using both:

- legal land description; and
- latitude and longitude coordinates.

The Project is located within Foothills County, approximately 5.5 km west of the Town of High River in NW 5-19-29 W4M and NE 6-19-29 W4M (Latitude: 50.582598° N, Longitude: -113.997265° W).

2.3 Overview Map

Provide a map showing the direction and distance of the plant or facility to nearby towns, cities, villages, or
residences and special areas (e.g., recreation areas, camps or protected areas), other plants and facilities, and wetlands and watercourses or other potential locations of receptors.

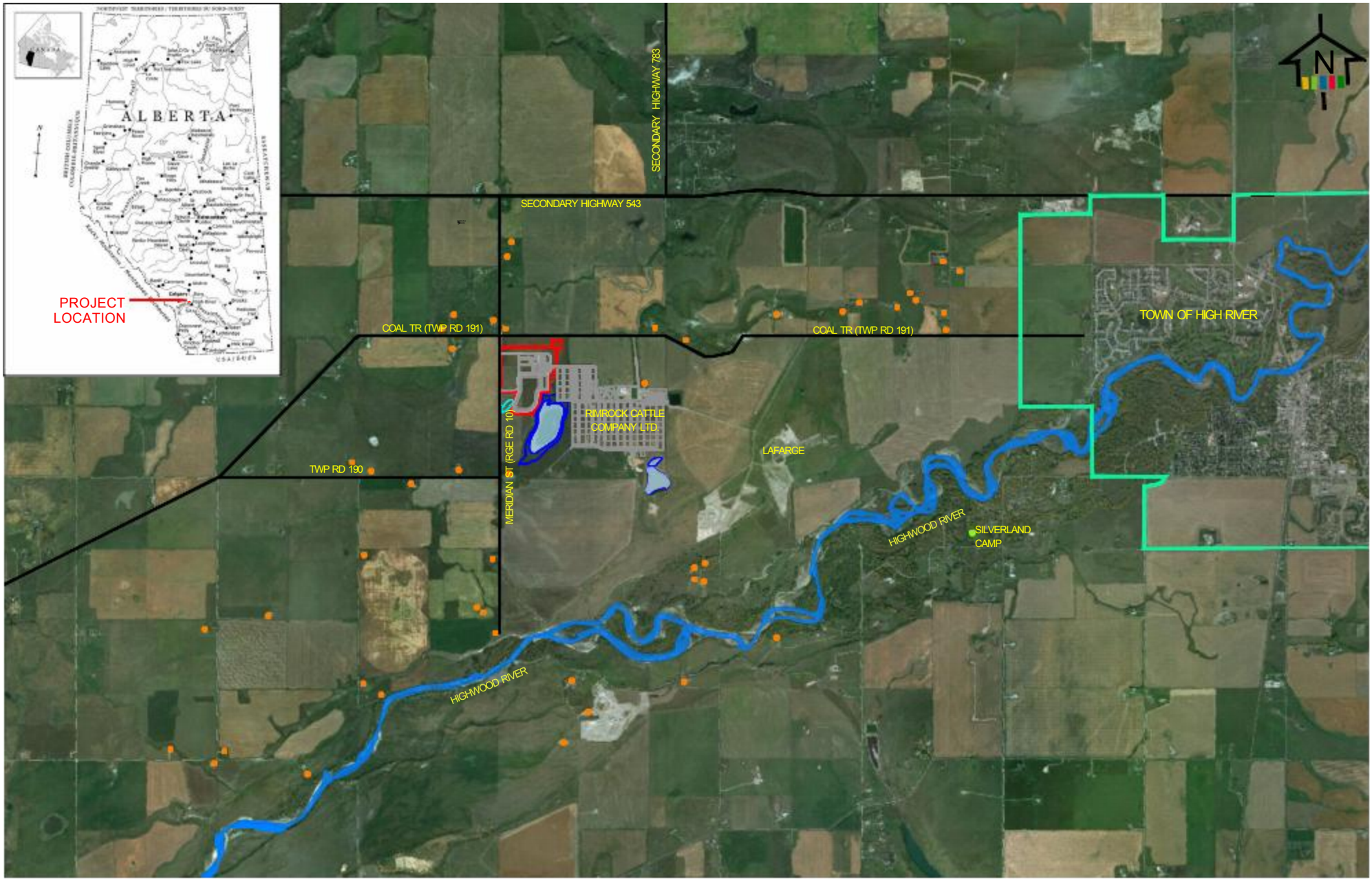
A regional map displaying the proximity of the Project to the Town of Higher River, the Highwood River and residences is provided in Figure 2-1. A Project location map is provided as Figure 2-2. The nearest residence is located approximately 200 m north of the Project footprint.

2.4 Facility Size

Provide information about the physical size and capacity of the plant or facility site, and the area with a reasonable potential to be affected by the activity. Provide maps and scaled diagrams.

The overall Project footprint is 39.82 hectares (ha). A facility site layout is provided as Figure 2-3 (Appendix B),
which illustrates the area with a reasonable potential to be affected by Project activity. Access to the Project
footprint requires the development of two proposed road approaches off of Range Road 10, see Figure 2-3. There is an existing road allowance adjoining the southeast quarter of fractional Section 6-19-29 W4M which currently
transects the Project footprint. Foothills County is in the process of making a determination on the sale of this road allowance, see Section 3.2 for further details.

The production capacity of the Project is 610,000 GJ/year of RNG.



ISL Engineering and Land Services

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PROJECT FOOTPRINT

TOWN OF HIGH RIVER BOUNDARY

HIGHWAYS / ROADS

CATCH BASIN

EPHEMERAL WATERBODY

APPROXIMATE RESIDENTIAL LOCATIONS (ABADATA)

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 2-1
Regional Map
June 2022

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ISL Engineering and Land Services

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PROJECT FOOTPRINT
CATCH BASIN
EPHEMERAL WATERBODY
HIGHWAY/ROADS
APPROXIMATE RESIDENTIAL LOCATIONS (ABADATA)

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 2-2
Location Map
June 2022

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3 Project Background

3.1 Regional Initiatives and Plans

Identify all government approved regional initiatives or plans that pertain to the area with requirements that relate to environment and resource management for the proposed activity, such as Land Use Framework Regional Plans and Management Frameworks, Integrated Resource Plans, Water Management Plans, or Municipal Development Plans.

3.1.1 Regional Plans

The Government of Alberta (GOA) provides direction and leadership for economic, environmental, and social objectives with respect to land use planning through the Alberta Land Stewardship Act (ALSA) (GOA 2009) and Land Use Framework (GOA 2008). ALSA provides the framework to create Regional Plans which address the vision, objectives, and policies for development in a particular region. The Project is located within the South Saskatchewan Regional Plan (SSRP) area of Alberta. The SSRP applies to both privately-owned and Crown-owned lands in the region (GOA 2018). On privately-owned land, the SSRP guides decision making, though decision making authority is generally governed by municipalities under the Municipal Government Act (GOA 2000).

The SSRP recognizes the natural advantage of the region for the development of renewable energy and recognizes the importance of bioenergy to the region and the province. Economic diversification and continued opportunities for renewable energy development are listed as part of the vision for the South Saskatchewan region (GOA 2018).

The environmental priorities of the SSRP include air quality management, landscapes, biodiversity and ecosystems, water and watersheds, and efficient land use (GOA 2018). To that end, GOA has implemented the South Saskatchewan Region Air Quality Management Framework for Nitrogen Dioxide (NO_2), Ozone (O_3), and Fine Particulate Matter ($PM_{2.5}$) (GOA 2014) and the South Saskatchewan Region Surface Water Quality Management Framework for the Mainstem Bow, Milk, Oldman and South Saskatchewan Rivers (Alberta) (GOA 2014) to support the overall goals of the SSRP and to adopt cumulative effects management at the regional level.

The Project is also located within the Calgary metropolitan region which falls within the Calgary Metropolitan Region Regional Growth Plan (Calgary Metropolitan Region Board 2021). This plan provides a framework for sustainable growth in the Calgary metropolitan region by coordinating integration and efficient use of regional infrastructure, protection of water quality and water conservation, and by encouraging growth of sustainable communities (Calgary Metropolitan Region Board 2021).

The Foothills County Growth Management Strategy is a high-level document that provides strategies for managing growth and development with the objective of reducing potential adverse effects of development on the County, to provide more certainty to landowners about what development will look like and provide direction to developers on where development is more likely to be supported (M.D. of Foothills No. 31 2013).

3.1.2 Sub-Regional Plans

The Project is not located within a provincial Integrated Resource Plan or Regional Integrated Decision area.

3.1.3 Municipal Development Plans

The Project is located in an area which is governed at the municipal level under the M.D. of Foothills Municipal Development Plan (MDP). The MDP puts provincial and regional objectives into the municipal context. The growth of industries that support agriculture and economic growth in the region are encouraged under the MDP (M.D. of Foothills No. 31 2010).

The Foothills County Growth Management Strategy (GMS) builds upon the vision of the MDP and provides strategies for managing growth and development within the County in areas where growth and development are the most appropriate. The Project is located within the South-Central District of the GMS. The GMS promotes

growth north of the Highwood River in this District, which aligns with the selection of the Project location (M.D. of Foothills No. 31 2013).

The Foothills County Land Use Bylaw No. 60/2014 also governs land use within Foothills County (M.D. of Foothills No. 31 2014). On November 30, 2020, Rimrock received a Development Permit waiver from Foothills County for the Project (see Section 3.2).

3.1.4 Water Management Plans

Water management in Alberta is governed by multiple nested planning documents. The Water for Life: Alberta's Strategy for Sustainability (the Strategy) provides the overarching vision for water management within the province. The key outcomes of the strategy are to maintain a healthy and sustainable water supply for our environment, communities, and for our economic wellbeing (GOA 2003). To support this overall strategy, Provincial Water Advisory Councils, Watershed Planning and Advisory Councils, and Watershed Stewardship Groups work in partnership with the GOA to achieve the outcomes of the Strategy.

The Project is located within the Upper Highwood sub basin of the Bow River Basin, which itself is a sub basin of the South Saskatchewan River Basin. Guidance for watershed management in this area is provided in the Approved Water Management Plan for the South Saskatchewan River Basin (Alberta) (Alberta Environment 2006), Bow Basin Watershed Management Plan (Bow Basin River Council 2012), and the Water Management Plan for the Watersheds of the Upper Highwood and Upper Little Bow Rivers (Alberta Environment 2008). The goals of these nesting policies are aligned, with a goal to protect watershed health. As a result of the Approved Water Management Plan for the South Saskatchewan River Basin, the province stopped accepting applications for new allocations of water in the Oldman, Bow, and South Saskatchewan sub-basins in southern Alberta. Water requirements for the Project will be met through Water Licence Transfers for the Highwood River, as further described in Section 3.5.

3.2 Hearing Results or Decisions

Related to this proposed project, identify any Hearing results or decisions by:

- the Alberta Energy Regulator (AER);
- the Alberta Utilities Commission (AUC);
- the Natural Resources Conservation Board (NRCB);
- the local Regional Authority or Municipality; or
- the Canadian Environmental Assessment Agency (CEAA);

and identify and reference any terms, conditions or commitments for this project that relate to the environment. Staff may request the submission of this information if it cannot be sourced from public records.

To date there have been no hearings or decisions for the Project from the Alberta Utilities Commission (AUC) or the Natural Resources Conservation Board (NRCB).

Two cogeneration units (less than 5 megawatts (MW) of combined power) will be used to generate heat and electricity to support facility operations for the Project (see Section 5.1.4). Rimrock will submit micro-generation notice application form along with all applicable documents to the Alberta Utilities Commission (AUC) to fulfill requirements under AUC Rule 024: Rules Respecting Micro-Generation (Alberta Utilities Commission 2019).

The Project qualifies for the Memorandum of Understanding (MOU) between Alberta Environment and Parks (AEP) and the NRBC regarding the storage and land application of digestate. Rimrock intends to participate in the MOU
and will comply with conditions contained therein. The MOU will progress through a standalone process from this application.

A Development Permit Waiver was received for the Project from Foothills County on November 30, 2020. Rimrock will continue to work with Foothills County regarding any additional relevant municipal requirements and will
comply with all other relevant County bylaws and requirements, as well as applicable provincial or federal

regulations or acts which may affect use of the land. Per Foothills County, there may be requirements for road use
agreement, addressing traffic, emergency management plans and fire safety plans, which Rimrock will comply with.

Foothills County is also in the process of making a determination on the sale of the existing road allowance adjoining the southeast quarter of fractional Section 6-19-29 W4M which currently transects the Project footprint. A Public Hearing was held on April 6, 2022 (Foothills County File No.: CS2022001). The Foothills County Council has been requested to grant first reading of bylaw ##/2022 to authorize the closure of the undeveloped statutory road allowance and sale of land to Rimrock. A decision is anticipated from the Foothills County council in Q2 2022.

This Project is not subject to regulation by the Alberta Energy Regulator (AER) and does not require a federal
Environmental Impact Assessment under the Impact Assessment Act (GOC 2019) (formerly the Canadian Environmental Assessment Act, 2012).

3.3 Environmental Impact Assessment Acceptance

Specify the date an Environmental Impact Assessment (EIA) report was accepted by the Director for the purposes of a Hearing identified in 3.2.

The Project is not listed as mandatory activity under the Environmental Assessment (Mandatory and Exempted Activities) Regulation (GOA 2017) under EPEA.

Rimrock submitted a Project Summary Table to Environmental Assessment branch of Alberta Environment and Parks (AEP) on June 7, 2022, to obtain an Environmental Impact Assessment (EIA) determination.

3.4 Authorizations Issued for the Proposed Project

Identify any authorizations related to this proposed project and their date of issuance such as Leases, Permits or Approvals and their amendments issued by:

- the Alberta Energy Regulator (AER);
- the Alberta Utilities Commission (AUC);
- the Natural Resources Conservation Board (NRCB);
- the local Regional Authority or Municipality; or
- Alberta Environment and Sustainable Resource Development (ESRD) for authorizations under the Environmental Protection and Enhancement Act (including on-site potable water treatment and use and stormwater runoff), the Water Act, the Climate Change and Emissions Management Act, the Public Lands Act and the Forests Act;

and identify and reference any terms, conditions or commitments for this project that relate to the environment. Staff may request the submission of this information if it cannot be sourced from public records.

Required authorizations for the Project and their current status are provided in Table 3-1.

Table 3-1 Required Authorizations

Regulating Body	Authorization	Approval Number	Date Granted	Conditions or Comments
Alberta Environment and Parks (AEP)	Environmental Protection and Enhancement Act (EPEA) Industrial Approval	TBD[1]	Application filed June 9, 2022	TBD

AEP	Water Licence Transfer(s) [2]	TBD	Pending (Water Licence Transfer in Water Act Public Notice phase)	TBD

Regulating Body	Authorization	Approval Number	Date Granted	Conditions or Comments
Alberta Ministry of Culture and Status of Women (AMCSW)	Historical Resources Act Approval	HRA No: 4515-21- 0007-002	May 19, 2022	The chance discovery of historical resources is to be reported to the contacts identified within Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources.
Aboriginal Consultation Office (ACO)	Adequacy Assessment Decision[3]	TBD	TBD	TBD
Alberta Utilities Commission (AUC)	Microgeneration Notice[4]		Anticipated submittal 2023	
MD of Foothills	Road Allowance Determination[5]	Bylaw ##/2022	Pending (Public Hearing held on April 6, 2022, Foothills County File No.: CS2022001).	TBD
MD of Foothills	Development Permit Waiver	N/A	November 30, 2020	Development Permit Waiver does not relieve the landowner(s) /proponent of the responsibility of complying with all other relevant County bylaws and requirements.
Natural Resources Conservation Board (NRCB) and AEP	Memorandum of Understanding (MOU) regarding the storage and land application of digestate[6]	TBD	TBD	TBD

Notes:
[1] TBD = to be determined.
[2] A Water Licence Transfer application has been submitted for the Project (167,000 m^3/year). The application is currently in the Public Notice phase and is expected to be approved prior to facility commissioning and start-up. An additional Water Licence Transfer application (167,000 m^3/year) is also anticipated for Q1 2023, to meet potential/forecasted water needs in Q1 2024. However, if liquid digestate reuse is deemed viable (see Section 5.1.2), the full 167,000 m^3/year of additional water may not be required.
[3] AEP will submit a request to the ACO regarding consultation adequacy for the EPEA Industrial Approvals Application.
[4] A Micro-generation Notice Application Form will be submitted per AUC Rule 024: Rules Respecting Micro-Generation (see Section 3.2).
[5] MD Foothills is in the process determining the sale of the existing road allowance that transects the Project footprint (see Section 3.2).
[6] The Project qualifies for the MOU between AEP and the NRCB (see Section 3.2).

3.5 Coordination of EPEA Applications

Identify any EPEA applications for other plants or facilities that may require coordination of the application process for this proposed activity.

There are no other EPEA applications for other plants or facilities that will require coordination of the application process for the Project.

3.6 Financial Security Calculation

If financial security is required, provide the calculation for it, and include the assumptions and justification for their
use in the calculation. For more information on determining if financial security is required and how to calculate the amount, refer to Appendix A (Guide to Content for Industrial Approval Applications).

The Project is subject to financial security. Refer to Appendix C for the financial security calculation.

3.7 Project Timeline

Provide proposed or estimated project timelines and major milestones. Highlight any significant schedule constraints or considerations. Include:

- project duration from initial site preparation through to estimated time of operations ceasing and final closure;
- proposed or actual dates for commencement and completion of construction;
- proposed or actual dates for commencement of operation; and
- proposed or actual dates for public consultation.

Table 3.2 provides a Project timeline and an outline of key milestones. The actual dates will depend on several factors, including when required approvals are received for the Project. It is intended for the Project to have an operational life of 50 years. Following operations, the Project will be decommissioned and then reclaimed as
approved by AEP.

Table 3-2 Key Project Milestones

Key Milestone	Approximate Date
Public Consultation	2020, ongoing
Submit Regulatory Applications	Q2 2022
Rough Grading[1]	July 2022
Obtain regulatory approvals, including EPEA Industrial (New Facility) Approval	February 2023
Construction Commencement	March 2023
Commissioning	September 2023
Operations	October 2023, onward

Notes:
[1]Rimrock understands commencement of rough grading can occur during the EPEA Industrial Approval Application review process (under appropriate municipal approvals) at its own risk.

3.8 Consultation and Stakeholder Engagement

If public consultation or stakeholder engagement has, or will be, conducted outside of this approval review process, provide the following information:

- target audience(s);
- type, purpose, and frequency of consultation or engagement; and
- identified environmental concerns and how they were, or will be, addressed in the project design.

Rimrock has been engaged with Foothills County, including the Reeve, since early 2020 regarding the Project (see Section 3.2); engagement with Foothills County is ongoing and is expected to continue during Project planning.
Letters of support have been received from both Foothills County and the Mayor of High River, in conjunction with the approved Emissions Reduction Alberta grant application for the Project.

As part of the AUC micro-generation process (see Section 3.2), Rimrock will prepare and distribute personal Project notifications to any occupants, residents, landowners, First Nation reserves and Métis settlements within 1,500 m of the Project boundary, as the circumstances require. Rimrock will continue to engage with the public (e.g.,

adjacent landowners) during Project planning to share information about the Project and respond to relevant questions and feedback.

AEP will submit a request to the ACO regarding consultation adequacy for the EPEA Industrial Approvals Application (see Table 3-2). AEP will also be the decision maker on proceeding with Indigenous consultation, if recommended by the ACO.

No environmental concerns have been identified through consultation or engagement to date.

4 Current Setting and Environmental Conditions

4.1 Environmental Setting

Describe the current setting and condition of the environment, including features of the local and regional landscape, drainage and surface watercourses, and groundwater. Identify existing land use and zoning for the site and adjacent lands.

To provide information on the current local and regional environmental setting of the Project, a review of publicly available databases was completed for the Project footprint plus a 1 km buffer. This information was supplemented by environmental field assessments completed in 2021. Additional on-site field assessments are planned for the 2022 spring/summer seasons.

4.1.1 Regional and Local Setting

The Project is located on privately-owned, cultivated land, within Foothills County. A map showing land use within and around the Project footprint is provided in Figure 4-1 (Appendix B). The Project footprint is currently zoned as agricultural land and surrounding land is predominantly agricultural.

The Town of High River is located approximately 5.5 km to the east of the Project footprint (see Figure 2-1). An existing confined feedlot operation (Rimrock Cattle Company Ltd.) is located immediately adjacent to the east. The closest public roadways to the Project footprint are Coal Trail (Township Road 191) to the north and Meridian Street (Range Road 10) to the west. A private road from the Rimrock Cattle Company operation to Meridian Street is located to the south of the Project footprint (see Figure 2-2).

The Project is located within Treaty 7, approximately 33 km northeast from the Eden Valley No. 216 First Nation, approximately 39 km southeast Tsuut'ina Nation No. 145, and within the Métis of Alberta Region 3. The Project is not located within an identified Environmentally Significant Area[1] (ESA) (Fiera Biological Consulting 2014). The Highwood River is located approximately 2.5 km to the southeast.

4.1.2 Terrain and Topography

The Project is located within the Foothills Fescue Natural Subregion of the Grassland Natural Region of Alberta (Natural Regions Committee 2006). Regional topography in the subregion is nearly level in the north with high-elevation grassy uplands along the mountain flanks to the south. Elevations range from approximately 800 masl in the north near Drumheller to over 1,500 masl on the east slopes of the Porcupine Hills. The average elevation of the subregion is 1,100 masl (Natural Regions Committee 2006). Further information on local topography and elevations is provided in Section 4.2.1.

4.1.3 Surficial and Bedrock Geology

The Project is located in an area of glaciolacustrine and moraine deposits (Environmental Risk Information Services 2021). Glaciolacustrine deposits are Pleistocene in age and defined as primarily fine-grained, distal sediments deposited in or along the margins of glacial lakes. Textures range from offshore sediments which are rhythmically laminated to massive fine sand, silt and clay, locally debris released from floating ice; and ~~littoral and nearshore sedim~~ents which are massive to stratified, well-sorted silty sand, pebbly sand and minor gravel (GOA 2021).

Moraine deposits are Pleistocene in age, characterized as diamicton (till) deposited directly by glacial ice. Textures of moraine deposits include till, a mixture of clay, silt, sand and minor pebbles, cobbles and boulders. Locally, this
unit may contain blocks of bedrock, pre-existing stratified sediment and till, and/or lenses of glaciolacustrine and/or glaciofluvial sediment (Environmental Risk Information Services 2021).

[1] Environmentally Significant Areas (ESAs) are defined as areas that are important to the long-term maintenance of biological diversity, physical landscape features and/ or other natural processes (Fiera Biological Consulting 2014).

The bedrock geology of the local area is classified as the Porcupine Hills Formation. This formation is Paleocene in age and consists of alluvial sandstone, siltstone, and mudstone (Environmental Risk Information Services 2021). Based on the geotechnical intrusive investigations completed within the Project footprint in 2021 and 2022, the stratigraphy within the footprint generally consists of topsoil followed primarily by a clay till overtop shallow bedrock with occasional sand layers. Siltstone bedrock was also observed in the north, west and south portions of the Project footprint in depths ranging from 2.0 m to 4.9 m below ground surface.

4.1.4 Groundwater

The Project is located in the Paskapoo/Porcupine Hills Formation. Paskapoo/Porcupine Hills hydro-stratigraphy is considered mixed aquifer/aquitard. The Paskapoo/Porcupine Hills Formation existing water supply wells (HSU C: Thickness (m) Water Supply Wells) average screen depth is between 5.1-10.0 m and 10.1 -25.0 m (or depth to potentiometric surface 5.1-20 m, i.e., level to which groundwater would rise if not confined within an aquifer). No Alberta springs have been identified in the Project area (Liggett 2016). Information regarding current local groundwater conditions is provided in Section 4.6.4.

4.1.5 Drainage and Surface Waterbodies and Watercourses

The Project footprint is located in the Highwood sub-basin of the Bow River Basin in the South Saskatchewan River Watershed (GOA 2014). The Highwood sub-basin drains an area of approximately 2,412 km^2 and extends eastward from the headwaters of the Highwood River in the Highwood range of the Rocky Mountains, eastward to the town of High River, and then northward to where the Highwood River joins the Bow River southeast of Calgary (Bow Basin River Council 2012). The Project footprint is located approximately 2.5 km north from the Highwood River and Pekisco Creek, a small creek which branches off the Highwood River to the south. The confluence of the Highwood River and the Bow River is approximately 30 km to the northeast of the Project footprint.

No wetlands, watercourses, or waterbodies have been identified within the Project footprint. One ephemeral waterbody[2] (approximately 1 ha in size) was identified adjacent to the southwest boundary of the Project footprint during a 2021 environmental field assessment (EDI 2021b). No wetland vegetation, soils or hydrologic indicators were identified in this area, supporting its classification as an ephemeral waterbody. The Project footprint has been designed to avoid any overlap with this feature. An existing catch basin[3], approximately 27.5 ha in size, is located immediately to the southeast of the Project footprint, and adjacent to the existing Rimrock Cattle Company confined feedlot operation (see Figure 2-2).

Based on available topographic data (Altalis 2022) and geotechnical investigations (Clifton Engineering Group Inc. 2021), the direction of surface and groundwater drainage across the Project footprint is generally from the northwest to the southeast towards the existing catch basin (Figure 2-2).

4.2 Ambient Air Quality

Describe the current ambient air quality and identify influences and environmental pressures within a 5-kilometre radius of the site. Include:

- topography and elevation;
- any ambient air environmental monitoring data (collected at or near the site which represents air quality prior to the influence of the proposed activity) and its collection location;
- the various environmental influences, effects and trends; and
- all constraints and limiting factors in the receiving environment.

[2] Ephemeral waterbody as defined under the Alberta Wetland Classification System (GOA 2015).

[3] This feature has been used as a catch basin for the feedlot since the 1990's, and its use as a catch basin was grandfathered under the (Deemed) Permit Determination for the feedlot issued on October 8, 2020, and updated on May 4, 2022, by the NRCB (see Appendix D).

4.2.1 Regional Topography and Elevation

Topography within a 5 km radius of the Project footprint generally slopes towards the Highwood River, located approximately 2.5 km to the southeast of the Project footprint. Elevations range from approximately 1,060 masl in the south-southeast along the Highwood River and 1,150 masl along the west-northwest boundary of the Project footprint. The Project footprint is level to slightly undulating with the elevation ranging from approximately 1,100 to 1,110 masl. Aspect is predominantly a south-facing slope with nearly level (Class 2: 0.5-2%) to very gentle slopes (Class 3: 2-5%) depending on location and slope position (EDI 2021c). The base elevation of the Project footprint is 1,108 masl. A topographical map of the Project footprint is provided in Figure 4-2 (Appendix B).

4.2.2 Ambient Conditions/Baseline Air Quality

The Project is located within the South Saskatchewan Region, monitored by the Calgary Region Airshed Zone (CRAZ). The nearest continuous ambient air monitoring station that contains publicly available data for NO_2 and SO_2, is the Calgary Southeast monitoring station. This monitoring station is located approximately 30 km north of the Project footprint (Horizon Compliance Group Inc. 2022).

Measured 1-Hour NO_2 and SO_2 data from February 1, 2019, to January 31, 2022, from this station were used to estimate the 90th percentile concentrations for each averaging period as per the Alberta AQMG (GOA 2021). The calculated 90th percentile baseline concentrations are shown in Table 4-1. Applicable ambient air quality criteria as per the Alberta Ambient Air Quality Objective (AAAQO) are provided in Table 4-2. Baseline concentrations of both NO_2 and SO_2 are below the AAAQO for each of these species.

Table 4-1 Baseline Air Quality at the Calgary SE Monitoring Station

Substance	Averaging Period	Baseline Concentration (µg/m^3)
NO_2	1-Hour	56.2
	Annual	18.0
SO_2	1 Hour	1.8

Table 4-2 Applicable Ambient Air Quality Criteria

Substance	Averaging Period	Percentile	Air Quality Criteria (µg/m^3)[1]
NO_2	1-Hour	99.9th (9th Highest)	300
	Annual	Overall Maximum Prediction	45
SO_2	1-Hour	99.9th (9th Highest)	450

Notes:
[1]Alberta Ambient Air Quality Objective (GOA 2011)

4.2.3 Environmental Influences and Constraints

Prevailing surface wind direction surrounding the Project footprint is from the west-southwest, with wind speeds between 0.5 and 2.1 m/s typical, based on the Weather Research Forecast Meteorological Dataset from AEP for

2015-2019, centered on the geographical point 50.58°N and -114.00°W, located just south of the Project footprint (Horizon Compliance Group Inc. 2022). Environmental influences in the Project area include industrial, primarily
agricultural, activities. The surrounding landscape consists of cultivated land and grazing pastures, see Figure 4-1 (Appendix B). The existing Rimrock Cattle Company confined feedlot operation is located immediately adjacent to the Project footprint. Three gravel pits are located within a 5 km radius of the Project. No significant neighboring

facilities emitting NO_x or SO_2 were identified on the National Pollutant Release Inventory within a 5 km radius of the Facility (Horizon Compliance Group Inc. 2022).

4.3 Soil or Land Survey

Provide a current soil or land survey and data for the site and surrounding lands, and assess:

- land capability class and rating(s);
- soil classification and distribution;
- Results of soil monitoring conducted at or near the site which is representative of soil quality prior to the influence of the proposed activity;
- anthropogenic effects on the soil, including previous disturbances, contamination issues, quality and quantity of soil;
- suitability for reclamation, of each topsoil and subsoil horizon including any constraints to future reclamation such as sensitive soils, chemical or physical characteristics, amounts (volume and depth of topsoil and subsoil). For mine sites include overburden characterization;
- local and regional vegetation types, include:
    - types of vegetation,
    - rare vegetation,
    - weeds (named under the Weed Control Act), and
    - health or anthropogenic effects on vegetation due to previous disturbances, air deposition, logging and clearing, etc.; and
- for mine sites and in-situ developments, estimate the volume and describe the type of timber.

4.3.1 Land Suitability

Land suitability classifications within the Project footprint are summarized in Table 4-3. The Land Suitability Rating System (LSRS) procedure was used to assess land suitability for agricultural spring seeded small grains (Agronomic Interpretatins Working Group 1995). The Project footprint was overlaid in GIS with provincial landform and soil series map layers from the Agricultural Regions of Alberta Soil Information Database (AGRASID 4.1) (GOA 2001) and the Canadian Soil Information System (Canadian Soil Information System 2000).

Table 4-3 Land Suitability Ratings and Descriptors

AGRASID Polygon ID	Land Suitability Rating			Descriptors
	Decil	Class	Subcla	
11880	10	2	H	Class 2H – Holds slight limitations to crop growth/ productivity. Limitations associated with climate due to (H) inadequate heat units.

4.3.2 Soils

The Project footprint is located in the Foothills Fescue Natural Subregion, soils in the subregion are dominated by Orthic Black Chernozems (Natural Regions Committee 2006). Topsoil in the subregion exhibits relatively high amounts of organic matter, while surficial material is dominated by moderately calcareous glacial till (Natural Regions Committee 2006).

The Project footprint is located within the AGRASID soil polygon #11880, which is composed of the Dunvargan (50%) and Maycroft soil series (50%) (Alberta Agriculture and Rural Development 2020). Landform and soil series occurring within the Project footprint are described in Table 4-4.

Table 4-4 Landforms and Soils Series

AGRASID Polygon ID	Map Unit	Landform	Soil Series
11880	DVMF1/U1h	Undulating High Relief	Dunvargan and Maycroft
Soi Series Descriptors			
DVG — Dunvargan soils (Orthic Black Chernozems) are well-drained and characterized by moderately fine textured clay loam topsoil followed by clay/clay loam subsoils and till (morainal) parent material; subsoils are characterized by moderately to very strongly calcareous materials (6-40% CaCO3 equivalent).			
MFT — Maycroft soils (Orthic Black Chernozems) are well-drained and characterized by moderately fine textured clay loam topsoil followed by clay/clay loam subsoils and glaciolacustrine parent material; subsoils may be characterized as weakly to moderately saline (i.e., conductivity > 4 dS/m).			

Pre-Disturbance Site Assessments (PDSA) were completed in 2021 and 2022 to comprehensively evaluate soil resources, including characterization of soil horizons, laboratory testing of physico-chemical parameters, determination of topsoil stripping depths, and identification of potential sensitivities and/or constraints (EDI 2021c, EDI 2022). The soils assessment was conducted in accordance with methods in the Canadian System of Soil Classification (Soil Classification Working Group 1998). A total of 110 sample points, including 'shallow digs', 'deep digs' and visual inspection sites, were surveyed according to a grid pattern best-fit to the Project footprint. The grid was situated 20 m within the Project footprint boundary and sample points were distributed at 80-100 m intervals.

The 2021 PDSA achieved a total survey intensity of 1 inspection site per 0.58 ha; the 2022 PDSA achieved 1 inspection site per 0.56 ha.

Soil profile information is presented in Table 4-5). Composite soil samples of the mineral A and B horizons were also submitted for laboratory textural analysis (i.e., organic matter content and particle size), determination of available nutrients, and salinity characteristics (see Table 4-6).

Table 4-5 Soil Profile Information

Soil Characteristics	Horizon	Depths (cm)	Texture	Structure	Colour (7.5YR)
Soil Profile	Ap/Apk	0-37	L	Weak	2.5/1 (Black) 3/1 (Very Dark Gray) 3/2 (Dark Brown)
	Bm/Bmk	15-65	SL, SC, SCL, CL	Weak	3/3 (Dark Brown) 4/3, 4/4, 5/4 (Brown
	BCk	37-75	SCL, CL	Moderate	5/3 (Brown)
	Cca	36-110	C	Structureless	5/2, 5/3, 5/4 (Brown) 6/4 (Light Brown) 6/2, 7/2 (Light Gray)

Notes: Ap = disturbed by human activity such as by ploughing in agricultural landscapes; Bm/Bmk = A horizon slightly altered by chemical weathering to give a change in colour and/or structure, including higher chromas and a redder hues

than the original parent material and removal of carbonates either partially (Bmk) or completely (Bm); BCk = a transitional layer than shows characteristics of both B and C
horizons; Cca = enriched with calcium carbonates (CaCO3) from the soil parent materials; C = Clay; CL = Clay Loam; SCL = Sandy Clay Loam.

Table 4-6 Soil Chemical Properties

Soil Chemical Properties[1]	
A Horizon	
Texture and Physical Properties	Loam
Sand	35.4%
Silt	44.3%
Clay	20.3
Organic Matter	12.6%
Available Nutrients	
Nitrate (N)	95.9 mg/kg
Sulfate (S)	95.4 mg/kg
Phosphate (P)	457 mg/kg
Potassium (K)	4580 mg/kg
Salinity Characteristics	
SAR[2]	0.3
EC	1.91 dS/M
Classification[3]	Non-Saline
B Horizon	
Texture and Physical Properties	Clay Loam
Sand	26.4%
Silt	44.5%
Clay	29.1%
Organic Matter	6.4%
Available Nutrients	
Nitrate (N)	51.3 mg/kg
Sulfate (S)	74.2 mg/kg
Phosphate (P)	87 mg/kg

Soil Chemical Properties[1]	
Potassium	87 mg/k
Salinity Characteristics	
SA	0.48
E	1.67 dS/m
Classificatio	Non-Saline

Notes:
[1]AGRASID Polygon: Poly_11880; Sample ID1: #10, 15, 21, 35, and 39 (soil sample locations from the Pre-Disturbance Site) Assessment (EDI 2021c).
[2]SAR = Sodium Adsorption Ratio; EC = Electrical Conductivity; dS/m = decisiemens per metre
[3]Based on Agri-Facts: Salt Tolerance of Plants (GOA 2001)

4.3.3 Anthropogenic Effects on Vegetation

The Project is situated on agricultural land adjacent to an existing confined feedlot operation and nearby intermittent rural residential and agricultural development. Current and ongoing agricultural land use(s) within the Project footprint and immediately adjacent lands (e.g., cultivation, manure spreading), are generally consistent
with good land management practices. Vegetation within the Project footprint is comprised of remnant cereal
(wheat) stubble; predominant soils within the Project footprint are arable (EDI 2021c). There are no indications of soil contamination issues (see Section 4.3.4).

4.3.4 Reclamation Suitability

All available topsoil will be salvaged and conserved on site for future reclamation. Subsoil will be used in a cut and
fill strategy to achieve specific grades within the Project footprint, with excess subsoil stockpiled on site for reclamation purposes. Based on the PDSAs, no soil/reclamation materials deficit is anticipated at the time of decommissioning and reclamation.

No sensitive soils have been identified within the Project footprint. Topsoil and subsoil horizons within the Project
footprint are suitable for reclamation, as per the physico-chemical properties described in Table 4-5. The land
capability (Class 2H) and predominant soils (Orthic Black Chernozems) are arable and hold only slight limitations to crop productivity associated with climate/temperature (EDI 2021c). Mitigation measures will be implemented to
minimize potential adverse effects on soil (see Table 6-2) and appropriate soil conservation practices will be applied, as such equivalent land capability is expected to be achieved following reclamation.

4.3.3 Vegetation

The Project footprint is located in the Delacour Plain ecodistrict of the Foothills Fescue Natural Subregion of the Grasslands Natural Region of Alberta. Lands in this area are predominantly used for agriculture, though remnant prairie areas which are dominated by mountain rough fescue plant communities are also present (Adams, et al.
2003) (Natural Regions Committee 2006). As per the Alberta Conservation Information Management System
(ACIMS) database, sensitive vegetation species, sensitive ecological communities, parks, protected areas, crown

reservations, or notation were not identified within the Project footprint (GOA, Alberta Conservation Management System (ACIMS). Alberta Environment and Parks. 2022a).

The Project footprint is situated on cultivated land and is located immediately adjacent to the existing Rimrock
Cattle Company confined feedlot operation. A vegetation assessment was completed in October 2021. At the time of the assessment, vegetation within the Project footprint was comprised of remnant cereal (wheat) stubble. No
Prohibited Noxious weeds listed under the Provincial Weed Control Act (GOA 2008) were observed during the

assessment. Canada thistle (Cirsium arvense), a Noxious weed, was observed sporadically within the Project
footprint and with patchy distribution within the ditch of the nearby roads (Meridian Street, Coal Trail East). The
Project footprint exhibits low potential for supporting sensitive vegetation or ecological communities given ongoing disturbance related to cultivation (EDI 2021b).

Although the Project footprint is located on cultivated lands, clubroot has not been previously confirmed within Foothills County (GOA 2021). As the Project is proposed entirely on land owned by Rimrock, with no planned
construction access through other cultivated lands under different ownership, the risk of introduction and/or spread of clubroot is considered low.

4.3.4 Limited Environmental Site Assessment

A limited Environmental Site Assessment (ESA) of the Project footprint was conducted in 2021 to determine the
historical presence of contamination within the Project footprint and surrounding 300 m. No evidence of historical contamination or known spills or releases within the Project footprint was discovered as a result of the ESA.

The ESA included the review of the following information sources, along with an interview with a knowledgeable person for the site and a site visit.

- Alberta Energy Regulator (AER) Abadata (Abacus Datagraphics 2022): There are no oil and gas infrastructure (pipelines, wellsites, facilities) within the Project footprint and surrounding 300 m.
- Environmental Site Assessment Repository (ESAR) (AEP 2017): There are no reported locations of
environmental concern (spills, contamination, etc.) within the Project footprint and surrounding 300 m.
- AEP Water Wells Database (GOA 2022): No concerns with respect to contamination appear in water well records in the vicinity of the Project footprint.
- Existing EPEA Approvals: Approvals have been granted to adjacent properties primarily related to confined feedlot operations.
- ERIS Database (ERIS Environmental Risk Information Services 2022): There are no locations of concern (potential contamination) within the Project footprint and surrounding 300 m identified through the ERIS Report.

4.4 Pre-Disturbance Setting and Environmental Condition

If previous development or disturbance has already occurred on the proposed location, what was the setting and environmental condition prior to this residential, commercial, or industrial development?

For the situations identified above, where the end land use is likely to return to a natural, agricultural or forested land, describe the soil and vegetation for the site prior to the previous development or disturbance considering the factors listed in 4.3. This information will guide efforts to monitor and salvage soil material for future reclamation of the site.

The Project footprint is located on cultivated land that has not been previously developed for industrial, commercial, or residential purposes. Baseline conditions for soils and vegetation within the Project footprint are provided in Section 4.3.

4.5 Wildlife

Describe the nature and condition of wildlife in the area, including the species and their habitats, and identify any sensitive species and special habitats.

The Project footprint is located within the Sensitive Raptor ranges for Prairie Falcon, Ferruginous Hawk, Golden
Eagle and Bald Eagle, as well as the Sharp-tailed Grouse survey area (GOA 2022), and is located in Nesting Zone 4B. The general nesting period in this area is from approximately mid-April to late-August (Environment and Climate

2018)

A search of the online Fish and Wildlife Internet Mapping Tool (FWMIT) (GOA n.d.) identified previous observations of four terrestrial species within a 5 km radius surrounding the Project footprint, none of which were identified within the Project footprint. These species and their conservation status are provided in Table 4-7. An additional eighteen aquatic species were also identified within a 5 km radius of the Project footprint, generally associated with the Highwood River (GOA n.d.). Watercourses are not present within the Project footprint, and therefore aquatic species are not anticipated to be impacted by the Project.

Table 4-7 Wildlife Species Historically Documented within 5 km of the Project Footprint

Common Name	Scientific Name	SARA Listing[1]	COSEWIC Status[1]	Alberta Status[2]	Alberta Wildlife Act Listing[3]
Bald Eagle	Haliaeetus leucocephalus	Not listed	Not at Risk	Sensitive	Not listed
Osprey	Pandion haliaetus	Not listed	Not listed	Secure	Not listed
Great Blue Heron	Ardea herodias	Not listed	Not listed	Sensitive	Not listed
Grizzly Bear	Ursus arctos	Special Concern	Special Concern	At Risk	Endangered

Notes:
[1]Species at Risk Act (SARA), Committee on the Status of Endangered Wildlife in Canada (COSEWIC); Species at Risk Public Registry (Government of Canada 2022)
[2]Alberta General Status (Alberta Environment and Parks 2022)
[3]Schedule 6 of the Alberta Wildlife Act, Wildlife Regulation (GOA 2022)

A field verification assessment was completed in 2021 to verify potential for wildlife features and habitat within 1 km of the Project footprint. Potential for wildlife features and habitat within and adjacent to the Project footprint was also verified during the PDSA completed in 2022. Lands within the Project footprint and surrounding area are highly modified and dominated by agricultural activities and intermittent rural residential development. Within 1 km of the Project footprint, small/discrete wildlife habitat patches were observed. However, these were highly fragmented (typically associated with single trees, shelterbelts, wetlands, dugouts, and drainages) and disturbed by ongoing agricultural operations. Habitat quality is generally low in the 1 km surrounding the Project footprint (EDI 2021b).

No wildlife features were observed within the Project footprint during the field assessment or during the 2022 PDSA. In 2021, one small uninhabited stick-nest (unidentified species) was observed approximately 900 m south of the Facility Site in a lone poplar along Meridian Street; however in May 2022 the nest was no longer present. Three Golden Eagles (Aquila chrysaetos) were observed in 2021, circling south of the adjacent Rimrock Cattle Company operation (>1.5 km southeast from the Project footprint) as well as near Highwood River (>2.5 km south from the Project footprint). In 2022, a stick-nest occupied by a red-tailed hawk was observed located 125 m east of the Project footprint in a tree along the northern fence boundary of the existing feedlot operation. Red-tailed hawk is not a listed species and do not have a species-specific setback requirement, however a 100 m setback is typically recommended. In the event that vegetation clearing, and site grading activities occur within the migratory bird breeding period of approximately mid-April to late-August, a wildlife/bird nest sweep of the Project footprint plus

100 m buffer will be conducted by a qualified biologist prior to these activities, in accordance with relevant guidelines.

4.6 Environmental Conditions (Water Resources)

Describe and evaluate the current environmental conditions, and characteristics and features within the area of both the site and proposed receiving watercourses for the area with reasonable potential to be affected by the activity. Include:

- associated geological considerations and other influences or environmental pressures;
- local area meteorology, including precipitation;
- runoff coefficients and infiltration rates;
- any collected water quality (characterization) data, which is representative of water quality prior to the influence of the proposed activity, and their collection location in the receiving watercourse, noting
  both the normal variability and any trends or elevated parameter levels as well as relationships to water quality guidelines for all potential uses;
- any collected water quantity data, which is representative of water quantity quality prior to the influence of the proposed activity, and their collection location in the receiving environment, noting both the normal variability and trends;
- any constraints or limiting factors in the receiving environment or area due to existing or potential
  water uses, such as protection of aquatic life, local drinking water (including groundwater), agriculture, recreation, and indicators for identified vulnerable ecosystems;
- any applicable setback distance requirements (e.g., flood plains, riparian zones, neighboring residential use);
- any constraints or limiting factors in the receiving environment or area in order to meet water quality objectives, address persistent or bioaccumulative substances, or to manage cumulative loading
  requirements;
- any frequency, season, or timing restrictions; and
- anthropogenic effects on the aquatic ecosystem due to previous disturbances and releases, including the various environmental influences, effects and trends to water quality in the area resulting from other industrial and municipal releases, increased water use and climate change.

4.6.1 Geological Considerations

Topography, surficial geology and bedrock geology are discussed in Sections 4.1.2 and 4.1.3.

4.6.2 Local Area Meteorology

Based on the interpolated weather data from Township 19 Range 29 W4 where the Project is located, between 2011 and 2021 the maximum average temperature per year was 24.4 °C and the minimum average temperature per year was -16.5 °C (GOA, Interpolated Weather Data Since 1961 for Alberta Townships. 2020). Historical precipitation data collected from the High River Meteorological station (station #3033240) from 1904-2006 indicates an average annual precipitation of 550 mm per year (Environment and Climate Change Canada 2022). The summer months of June - September tend to experience the greatest amount of precipitation due to the high amounts of rainfall. High River tends to have very dry fall and winter seasons where most of the runoff comes from melted snow and ice. The highest recorded amount of precipitation was 887 mm, recorded in 2005. The driest year had 235 mm of precipitation, recorded in 1909. The lowest, highest, and average monthly values of precipitation collected at the High River Meteorological Station (station #3033240) are presented below:

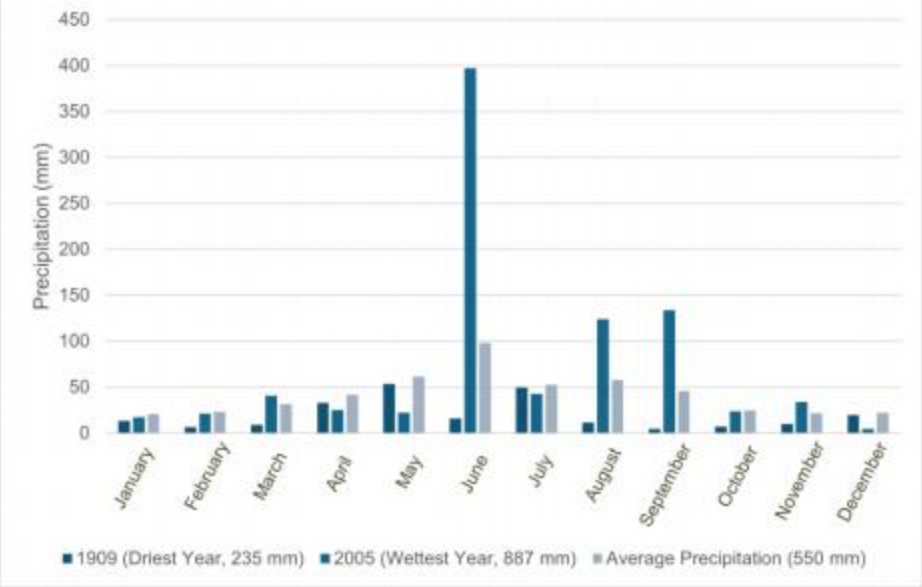

Figure 4-1 Historical Precipitation Data from the High River Meteorological Station

4.6.3 Surface Water

No wetlands, watercourses, or waterbodies have been identified within the Project footprint (see Section 4.1.5). Water will not be released directly from the Project footprint to the any watercourses or waterbodies (see Section 5.8). Based on modelling completed for the Project, the pre-development run-off coefficient for the Project footprint is estimated at 0.1 with an infiltration rate of 0.001 mm/hr (Dawes 2022).

4.6.4 Groundwater

A series of groundwater monitoring wells were installed within the Project footprint in 2021 in support of Project planning and to collect preliminary baseline information, see Figure 4-4 (Appendix B). In 2022 additional wells were drilled to provide an expanded baseline for the Project. Groundwater elevations are shown in Table 4-8. Many of these wells were found to be dry.

Table 4-8- Groundwater Elevations

Monitoring Well ID	Top of Pipe Elevation (masl[1])	Total Depth (mbtop[2])	Depth to Water (mbgs[3])	Water Elevation (masl)
BH101	1111.43	5.361	Dry well	N/A
BH102	1111.30	4.687	Dry well	N/A
BH103	1112.89	6.000	Dry well	N/A
BH104	1113.16	6.280	Dry well	N/A
BH105	1111.5	3.262	Dry well	N/A
BH106	1110.50	5.184	Dry well	N/A
BH107	1109.33	7.120	5.89	1102.54
BH108 (2021)	1107.73	8.225	5.72[4]	1101.06

Monitoring Well ID	Top of Pipe Elevation (masl[1])	Total Depth (mbtop[2])	Depth to Water (mbgs[3])	Water Elevation (masl)
BH108 (2022)	1107.73	7.97	Dry well	N/A
BH109 (2021)	1107.00	6.965	4.72[4]	1101.43
BH109 (2022)	1107.00	6.10	Dry well	N/A
BH110	1107.07	7.645	Dry well	N/A
BH111	1105.76	7.863	3.63	1101.22
BH201	1110.29	6.108	Dry well	N/A
BH202	1110.97	4.462	Dry well	N/A
BH203	1110.79	5.380	Dry well	N/A
BH204	1106.69	8.538	5.25	1100.47
BH205	1107.85	11.424	5.54	1101.30
BH301	1121.05	8.485	6.28	1113.72
BH302	1133.97	7.625	5.24	1127.76
BH303	1127.04	9.745	4.80	1121.20
BH401	To be surveyed	3.28	Dry well	N/A
BH402	To be surveyed	3.78	Dry well	N/A
BH403	To be surveyed	5.46	Dry well	N/A
BH404	To be surveyed	6.88	4.78	n/a[4]

Notes:
[1]Meters above sea level.
[2]Meters below top of pipe.
[3]Meters below ground surface.
[3]n/a = not available.

Preliminary groundwater quality testing was completed in October 2021 for three of the wells which contained water (BH108, BH109 and BH205). A follow-up monitoring and sampling program in June 2022 focused on the
newly installed wells (BH401, BH402, BH403 and BH404), as well as confirming the 2021 results for BH108 and BH109 which, at that time, indicated slight nitrate exceedances based on a single sampling event. In June 2022, BH108, BH109 and all but one of the newly installed 400-series wells

Project.

were found to be dry. BH404 had sufficient water and was sampled, and no nitrate exceedances were reported (see Table 4-9). At the time of application,
Rimrock is reviewing plans to complete another round of sampling to supplement the groundwater baseline for the

Project.

Table 4-9 - Groundwater Quality Sampling

	Hardness as	pH	Calcium	Chloride	Electric Conductivity	Magnesium	Nitrate (as (filtered	Nitrate (as (filtered	Nitrite (as N)	Nitrate + Nitrite as (filtered	Nitrite (as (filtered	Potassium	Sodium	Sulphate	TD	Sulphur (filtered
AEP (2019) Tier 1 Groundwater Guidelines - Agricultural Land Use and Fine-Grained Soil	NG	6.5-8.5	NG	100	1000	NG	3	NG	NG	100	NG	NG	200	218-429	500	NG
	mg/L	-	mg/L	mg/L	€S/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
October 2021																
BH108[1]	180	8.13	47	13	1,400[3]	14	6.7[3]	30	0.014	6.7	0.046	7.4	300[3]	190	880[3]	64
BH109[1]	420	7.96	100	17	1,200[3]	40	8.9[3]	39	0.019	8.9	0.063	9.5	140[1]	180	790[3]	56
BH205[1]	65	8.30	18	3.3	1,500[3]	4.7	0.042	0.19	0.015	0.057	0.048	4.5	370[3]	100	930[3]	33
June 2022																
BH108	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
BH109	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
BH401	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

	Hardness as	pH	Calcium	Chloride	Electric Conductivity	Magnesium	Nitrate (as (filtered	Nitrate (as (filtered	Nitrite (as N)	Nitrate + Nitrite as (filtered	Nitrite (as (filtered	Potassium	Sodium	Sulphate	TD	Sulphur (filtered
BH402	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
BH403	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
BH404[2]	150	8.28	30.4	5.1	1570[3]	17.9	2.39	10.6	<0.01	2.39	<0.05	5.9	328[3]	193	928[3]	74.7

Notes:
[1]Sampling date October 5, 2021 (Clifton Engineering Ltd).
[2]Sampling date June 3, 2022 (EXP Energy Services Inc.).
[3]Values at baseline exceeding the AEP (2019) Tier 1 Groundwater Guidelines – Agricultural Land Use and Fine-Grained Soil (GOA 2019). Rimrock is reviewing plans to complete another round of sampling to supplement the groundwater baseline for the Project.

4.6.5 Constraints or Limiting Factors in the Receiving Environment

Water will not be released from the Project footprint to the receiving environment.

4.6.6 Setback Requirements or Timing Restrictions

The Project is not located within or adjacent to flood plains or riparian zones and water will not be released from the Project footprint to the receiving environment. There are no applicable setback requirements.

4.6.7 Anthropogenic Effects on the Aquatic Ecosystem

Historical agricultural land use surrounding the Project footprint and, in the region, may have influenced the
aquatic ecosystem. However, water will not be released from the Project footprint to the receiving environment, as such the Project is not anticipated to contribute to any historical anthropogenic effects that may have occurred.

4.7 Suitability of Receiving Soil for Irrigation/Land Application

Describe and evaluate the current properties, and suitability of the receiving soil for irrigation/ land application using the appropriate guidance, which should include, but not be limited to:

- irrigation classification ratio;
- soil pH and texture;
- water holding field capacity; and
- soil analysis for existing, pre-application, soil concentrations for substances identified in the treated waste or wastewater stream (e.g., salts (EC and SAR), nutrients, metals and major ions).

The Project qualifies for the MOU between AEP and the NRCB regarding the storage and land application of
digestate (see Section 3.2). Rimrock intends to participate in the MOU process and will comply with conditions
contained therein, as well as the Agricultural Operations Act (AOPA) and the discretionary requirements of the NRCB, as related to digestate application on lands.

The Project will not be applying liquid digestate through irrigation (e.g., via pivots), rather digestate will be applied through a combination of pumped (similar to hog manure spreading), trucked and/or drag-lined means. Lands that have been identified for digestate application (see Section 4.8) are dry lands and do not have irrigation
infrastructure in place. Therefore, and as confirmed through consultation with AEP, information on the properties and suitability of receiving soils is not required for this application.

A Nutrient Management Plan will be developed for the Project to ensure land application and spreading satisfies
the requirements of the MOU. A comparison of nitrogen, phosphorous and potassium (NPK) for the liquid and solid digestate as compared to feedlot manure (i.e., that is currently being spread on lands) is presented in Table 4.10.
As illustrated, NPK concentrations are notably less for digestate (both liquid and solid), as compared to feedlot manure.

Table 4-10:Liquid and Solid Digestate and Manure NPK Parameters

NPK Parameters [1, 2]	Manure (%)	Liquid Digestate (%)	Solid Digestate (%)
Nitrogen (N)	1.6	0.29	0.87
Phosphorous (P)	0.39	0.06	0.31
Potassium (K)	0.76	0.09	1.08

Notes:
[1]These are approximate values. Values will vary based on the nature of the organic food resources feedstock.

[2]A full preliminary mass balance can be found in Appendix F.

4.8 Restrictions to Irrigation or Land Application

Describe and evaluate any restrictions to irrigation or land application of waste in the area due to:

- proximity to water wells or high water tables;
- proximity to water bodies, surface drainage areas, or springs;
- proximity to property lines;
- potential public use (e.g., recreational areas, residential developments) exposure;
- potential agricultural use (crop or cattle grazing food consumption) exposure;
- frequency, season, or timing of applications;
- any other identified issues in the area; and
- identify if waivers for setbacks are required and provide signed land owner consent release forms.

Rimrock has access to the full hectarage of land parcels required to support digestate application for the Project.
This includes quarter sections currently owned by the Rimrock Cattle Company, as well as a wide network of
neighboring land parcels. Parcels owned by the Rimrock Cattle Company identified for digestate application are provided for reference in Figures 4-5 to 4-9 (Appendix B), including proximities to water wells, waterbodies,
property lines, public use areas and topography. These lands are predominantly agricultural and located in close proximity to the Project footprint. Land application will also adhere to physical setbacks specified by AOPA. As a
base case, digestate land application will be scheduled in the spring (before seeding) and the fall (after harvest) and in accordance with the Nutrient Management Plan developed for the Project.

It is noted that the Rimrock Cattle Company parcels shown in Figures 4-5 to 4-9 represent only a portion (less than half) of the overall network of parcels available to the Project. Additionally, while specific consent release forms are not attached to this application, Rimrock has a formal relationship with Rimrock Cattle Company and will continue to work in cooperation with them regarding digestate application on these lands. Agreements are also in place or in progress regarding the larger network of land parcels available to the Project.

4.9 Current Setting Tabular Data and Site Maps

For 4.1 to 4.8, provide the information both aspatially (in tabular form) and spatially in scaled maps, diagrams or annotated aerial photographs. For each monitoring location, please identify the source of the information, for
example from an Airshed organization or Watershed Planning and Advisory Council, and the location from which the data is sourced.

Aspatial and spatial information (tables and figures) and related sources that respond to Sections 4.1 to 4.8 are summarized in Table 4-11.

Table 4-11 Aspatial and Spatial Information Sources

Table Section(s) or Figure Name		Information Source(s)
Numbe	Name	
Figure 2-	Regional Map	Facility Site footprint provided by Rimrock Renewables Ltd.
Figure 2-2	Location Map	Facility Site footprint provided by Rimrock Renewables Ltd.
Figure 2-3	Facility Site Layout	Facility Site footprint provided by Rimrock Renewables Ltd.
Figure 4-1	Land Use Map	Publicly available databases

Figure 4-2	Current Topographic Conditions	Publicly available databases

Table Section(s) or Figure Name		Information Source(s)
Numbe	Name	
Section 4.2	Ambient Air Quality	Air Quality Assessment Report, prepared by Horizon Compliance (Appendix E)
Section 4.3.1 – 4.3.2	Land Suitability and Soils	Field data completed by EDI Dynamics Inc.
Section 4.3.3	Vegetation	Field assessments completed by EDI Dynamics Inc.
Section 4.5	Wildlife	Fish and Wildlife Management Information System (FWIS) Field assessments completed by EDI Dynamics Inc.
Figure 4-3	Historical Precipitation Data from the High River Meteorological Station	High River Meteorological Station (station #3033240)
Section 4.1.3 and 4.6.4	Geology and Groundwater	Field data collected by Clifton Engineering Group Inc.
Figure 4-4	Existing & Proposed Groundwater Monitoring Well Locations	Well locations provided by Clifton Engineering Group Inc.
Figures 4-5 – 4-9	Land Parcels Identified for Digestate Application	Land parcels provided by Rimrock Renewables Ltd.

4.10 Regional Initiatives and Plans

In each of 4.1 to 4.8, identify and describe any pertinent terms, conditions or commitments that relate to the environment contained in government regional initiatives or plans identified in 3.1 (approved or under development). Describe the obligations or potential environmental obligations for the proposed plant or facility with respect to each initiative or plan.

Any pertinent terms, conditions or commitments that relate to the environment contained in government regional initiatives or plans identified in Section 3.1 are addressed in Sections 4.1 to 4.8, where applicable.

5 Facility Design

5.1 Facility Process

Describe the plant or facility's process and provide a process flow diagram of the specific industrial processes related to the proposed industrial activity. Include both the processing operations (e.g., reactors, distillation,
cooling towers, steam generation, compression, sulphur forming.) and the control processes (e.g., landfills, storage infrastructure, surface water runoff controls, industrial wastewater treatment facilities, particulate removal.).
Include:

- raw materials, products and by-products. Include maximum and normal operating and upset design quantities used or produced per unit of time. Provide all other pertinent capacity measurements for the site;
- major equipment and unit capacities; and
- mass balances.

5.1.1 Facility Process Overview

The Project will produce RNG through the upgrading of biogas produced by the anaerobic digestion of feedstock comprised of livestock manure and off-farm organic resources.

The main facility process areas and process flow lines are shown in Figure 5-1 (Appendix B) and further described in
Section 5.1.4. A facility site layout is provided in Figure 2-3 (Appendix B). A preliminary mass balance for the Project, based on current assumptions, is provided in Appendix F.

5.1.2 Feedstock, Water and Natural Gas Inputs

Feedstock for the anerobic digestion process will be comprised of combined livestock manure and off-farm organic food resources, at ratios in accordance with the MOU (i.e., 50% or greater livestock manure) (see Section 3.2). As a
base case, the Project will be designed to receive 80,000 tonnes per year of livestock manure from an adjacent confined feedlot operation (Rimrock Cattle Company) and 60,000 tonnes per year of off-farm organic food
resources from a local third-party. However, the digester tank and biogas upgrader design will have capacity to handle up to 100,000 tonnes peryear of livestock manure and up to 80,000 tonnes per year of off-farm organic food resources, pending the outcomes of ongoing liquid digestate reuse studies (see below).

Approximately 333,000 m^3 of water per year will be required for Project operations at baseline capacity (i.e., when
baseline RNG production is reached). Fresh water will be withdrawn from an existing adequately sized intake on Pekisko Creek on the Highwood River, that is currently in use for the feedlot. Water requirements for Project
commissioning are anticipated to be approximately 75,000m^3 (i.e., to fill the freshwater reservoir and manure blend tanks). Approximately 1,000 m3/day will then be required for the 90 -120 day facility onstream/ramp-up period between commissioning and full operational start-up.

Water will be sourced from the Highwood River under a Water Transfer Licence which is currently in progress. An additional Water Licence Transfer application (167,000 m3/year) is also anticipated for Q1 2023, to meet
potential/forecasted water needs in Q1 2024 (see Table 3-1). Additionally, ongoing studies are in progress
regarding the reuse of liquid digestate (upstream of the digestate pond) as process water. Opportunities to reuse liquid digestate upstream of the digestate pond for use as process water may result in a notable net reduction in the 333,000 m^3 per year of freshwater required for the Project.

The Project will receive natural gas from an existing ATCO pipeline to feed the onsite cogeneration units and heat medium boiler. The facility will also receive power through FORTIS from the existing distribution system via
underground power cable to a transformer onsite. The Project does not intend to use biogas or RNG to power the onsite cogeneration units or boiler.

5.1.3 Main Process Areas

Table 5-1 provides an overview of the main facility process areas under normal operations and upset conditions.

Process areas are numbered in accordance with the process areas identified in Figure 5-1 and Figure 5-2 (Appendix B). Proprietary, licenced process flow diagrams have been developed for the facility and are available upon request. However, have not been included in this application given their proprietary nature.

Table 5-1: Main Facility Process Areas

Process Area	Process Description
1: Freshwater Reservoir	The freshwater reservoir [1] is located in the southeastern portion of the Project footprint and will be constructed with a compacted clay liner and have a volumetric capacity of up to 25,000 m^3 (i.e., approximately four weeks of facility freshwater needs). Contents of the freshwater reservoir will be restricted to water from the Highwood River intake under approved water licence transfer(s) (see Table 3-2). No process water or runoff will be stored in the freshwater reservoir. Water from the reservoir will be supplied to a hot water cistern or directly to the manure blend tanks located within the manure storage building [2], to be blended with livestock manure prior to the anaerobic digestion process. Water will be supplied to site for facility processes via the water line shown in Figure 5-2 (Appendix B). Hydrants will be installed on the Project footprint for emergencies (i.e., cooling water in case of a fire).
2: Manure Storage/ Staging	Livestock manure, sourced from the adjacent confirmed feedlot operation (Rimrock Cattle Company), will be transported to the Project facility by end dump truck via the eastern gravel access road. The facility will operate 24 hours per day, 7 days per week; however, deliveries of feedstock will occur during the day only. End dump trucks will be weighed at the eastern entry weigh scale upon arriving at the facility and the volume of the livestock manure received will be recorded. The livestock manure will be received in a manure storage building which will be constructed as a drive through building to receive livestock manure from dump trucks. The building will contain four blend tanks on the west side and a staging area on the right where livestock manure can be temporarily staged and/or thawed during winter conditions. The four blend tanks will have a volumetric capacity of approximately 847 m^3 each and one hot water cistern with a volumetric capacity of approximately 1637 m^3. The livestock manure will be mixed in the blend tanks with water from the freshwater reservoir directly or from the hot water cistern should the livestock manure be frozen. The mixture will be diluted within each blend tank to create liquid manure that will be pumped into the digester pump house building and into digester tanks via an underground ancillary piping system (feedstock pressurized line). During normal operation, two of the four blend tanks will be filled with livestock manure and diluted with water while the other two blend tanks (which have already been filled with livestock manure and diluted with water) are being pumped into the digester tanks. This allows the digesters to be continuously fed and steady operation. The blend tank contents once filled will be used in a continuous process, therefore livestock manure will be used within a short duration of arriving onsite.

3: Organic Food Resource Storage/ Staging	Off-farm organic food resources will be trucked in from a local third-party source to the facility using the gravel access road located on the north side of the Project footprint. Trucks will be weighed at the north entry scale upon arriving at the facility and the volume of the organic food resources will be recorded. The trucks will enter an inward sloping receiving bay where the organic food resources will be discharged into three organic food resources tanks located immediately to the west of the manure storage building, within a sloped receiving bay. Each organic food resource tank will have a volumetric capacity of approximately 498 m^3. The organic food resources tanks will be kept half-full under normal supply scenarios, to allow for flexibility in delivery and supply conditions. Organic food resources will be used within three to four

Process Area	Process Description
	days of arriving onsite. In event of an interruption in supply, the organic food resources tanks have been sized to hold up to 7 days of feedstock for continued operations. The organic food resources will be pumped to the digester pump house building and into the digester tanks via underground ancillary piping systems (feedstock suction line). Under normal operation, the organic food resources will be delivered as pumpable (not requiring dilution from water). Should this not be the case, the organic food resource tanks will have the ability to dilute if necessary
4: Digester Tanks and Pumphouse	Six digester tanks are located directly south of the manure storage building and the off-farm organic food resource tanks. Each digester tank has a volumetric capacity of 7664 m^3. The digester tanks will accept the diluted livestock manure and off-farm organic food resources as a combined feedstock. On average, the combined feedstock will undergo anaerobic digestion for approximately 30 to 33 days. New feedstock will be added daily and digestate will be removed daily, in a semi-continuous operation (approximately up to 3% of material exchanged daily). Continuous mixing of the feedstock and digestate will be achieved via mixers installed on the tank. A pump house is included in the process and contains heat exchangers and pumps that are used to both circulate and heat the digestate to 36–38 °C to allow for mesophilic digestion. The pump house will also contain a heat manifold to distribute heat to concrete structures containing liquid (all concrete will be glycol tube heated, similar to in–floor heating) and other mechanical equipment such instrument air, valves, controls, etc. During anaerobic digestion, micro-organisms will break down the organic material within the diluted livestock manure and off-farm organic food resources, in the absence of oxygen, producing biogas. Biogas produced within the digester tanks will be collected above the liquid levels within a flexible double-layer membrane on the cover of the digester tank, referred to as the biogas storage membrane. The biogas storage membrane will expand and contract, allowing for storage of the biogas within. Digestate will be pumped from the digester tanks to the digestate nurse tank via underground ancillary piping systems (digestate pressure line).

5: Digestate Storage	The digestate storage area is located in the northwestern portion of the Facility. The digestate separation building contains a digestate nurse tank with a volumetric capacity of 950 m^3, a digestate separated liquids tank with a volumetric capacity of 600 m^3 and a solid digestate staging area with an area of 847 m^2. Outside the digestate storage building, to the west on a RCC pad, there is an area for digestate storage with an area of 19,349 m^2 Digestate removed from the digester tanks will be pumped into the digestate nurse tank within the digestate storage building as a holding area. From the digestate nurse tank, the digestate will be pumped through up to four screw presses that will separate the liquid digestate from the solid digestate. The liquid digestate will be contained within the digestate separated liquids tank, to be diverted to the digestate pond via an underground ancillary piping system (digestate pressure line) for storage. There will be no reuse of liquid digestate from the digestate pond in process; however, ongoing studies (see Section 5.1.2) may provide an opportunity to reuse a portion of the liquid digestate upstream of the digestate pond to supply the manure blend tanks, depending on its characterization. If deemed possible, any reuse will be directly from the nurse tank, to be transferred into the blend tanks via a separate nozzle. Once the liquid digestate enters the digestate pond, it will be held temporarily until it is extracted through a wet well for application to land parcels as a fertilizer alternative, in accordance with the MOU. No irrigation is planned for the Project (see Section 4.7). The solid digestate will be stored in the designated solid digestate storage area in bulk storage piles, underlain by Rolled Compacted Concrete (RCC), until it is loaded onto trucks and hauled offsite for application to land parcels as a fertilizer alternative, in accordance with the MOU.

Process Area	Process Description
6: Digestate Pond	The digestate pond is located in the southern portion of the Project footprint between the freshwater reservoir and the soil berms and will occupy an area of approximately 23.94 acres (9.69 hectares) and have a volumetric capacity up to of 237,339 m^3 . The digestate pond will be constructed of a High-Density Polyethylene (HDPE) liner (with fabric or sand sub-liner for gas transfer), which will fully cover berms within the pond (e.g., the berm between the primary cell and digestate pond). Equalization pipes (penetrations) within the berms will be equipped with collar seals which will ensure a firm seal to the liner. The liquid digestate will be directed to the digestate pond from the digestate separated liquids tank. Stormwater collected from the Project footprint will also be directed to the digestate pond (see Section 5.1.6). The liquid digestate and any stormwater held within the digestate pond will be extracted through a wet well located on the west side of the pond, for transport and application on land parcels within the same water basin as the Project footprint, and in accordance with the MOU. The digestate pond has been sized to hold 7 months of liquid digestate and stormwater at 90% capacity with zero discharge. Application of digestate to lands is proposed in the spring and fall, based on local area demand. The 7-month storage volume has been established in the event of an early fall spread and late spring spread occurring. Further discussion on the digestate pond is provided in Section 5.8.
7: Biogas Upgrading and Cogeneration	The biogas upgrading and cogeneration area is located centrally in the northern portion of the Project footprint, directly to the west of the off-farm organic food resource tanks. This area will include a boiler house with one heat medium boiler unit, two containers, each with one 1,095 KW cogeneration unit, and biogas upgrading equipment. Biogas produced within the digester tanks will be collected above the liquid levels in the biogas storage membrane and conveyed via a blower system to the biogas upgrading and cogeneration area through an underground ancillary piping system (biogas line). The biogas will be sent through activated carbon filters that will trap volatile organic compounds (VOCs), ammonia and H2S as part of upgrading. The separation of CH4 and CO2 occurs in the membrane container and CO2 will be captured and vented through an exhaust stack. The resulting pipeline quality RNG will be injected into the local ATCO distribution system. An emergency flare system will burn biogas in the unlikely event that the biogas storage membranes are full and exceed the permissible pressure within the digester tanks, or in the unlikely event that any upgraded biogas does not meet the RNG specifications for injection into the local distribution system (e.g., activated carbon filter is unable to process the gas as required). Biogas will also be sent to the emergency flare during start-up of the biogas upgrading equipment. The two cogeneration units, , will be installed onsite to produce 90-95% of the electricity and 70-75% of the heat needed to support Project operations. The remainder of the electrical demand will be sourced from Fortis grid power and the remainder of the thermal heat demand will be sourced from a heat medium boiler. Heat recovered from the cogeneration units and boiler will be used to heat a closed-loop glycol solution (to 75°C to 90°C). The closed loop glycol system, referred to as heat medium line, will be used for process heat (tank heating) and maintain building temperatures (passive heating of the concrete pad). Both the cogeneration units and heat medium boiler will be fired with natural gas supplied to site by ATCO, not biogas or RNG.

5.1.4 Product Outputs and Capacities

Product output and design capacities (typical operations and maximum design capacity) are provided in Table 5-2. The Project will produce up to 610,000 GJ/year of RNG per year through the upgrading of biogas produced by the anaerobic digestion process. The pipeline quality RNG will be injected into the local ATCO distribution system.

The anaerobic digestion process will also produce digestate, which will be used as a fertilizer alternative for
application to land parcels in accordance with the MOU. Electricity and heat will be produced through two co- generation units in combination with a heat medium boiler unit, to meet facility electricity and heating

requirements. It is currently anticipated that the Project will produce up to approximately 2 MW of onsite power to meet the majority of site requirements. There is no plan to sell power back to the grid.

Table 5-2: Product Outputs and Design Capacities

Product	Source	Typical Operating Quantities	Maximum Design Capacity
Biogas	Digester Tanks	450,000GJ/yr	610,000 GJ/yr
Solid Digestate	Digester Tanks, Separator	36,026 tonnes/yr	46,000 tonnes/yr
Liquid Digestate	Digester Tanks, Separator	412, 195 tonnes/yr	520,000 tonnes/yr
Electricity	Cogeneration Unit	2 x 950 kW	2 x 1095 kW
Heat	Cogeneration Unit, Boiler Unit	Cogen: 2 x 950 kW Boiler: 1208 kW	Cogen: 2 x 1095 kW Boiler: 3638 kW
RNG	Biogas Upgrading Equipment	450,000 GJ/yr	610,000 GJ/yr

5.1.5 Major Process Equipment

Refer to Section 5.6 for details of facility tanks and storage areas, including their capacities. Major facility process equipment and nominal capacities are provided in Table 5-3.

Table 5-3: Major Process Equipment Nominal Capacity

Major Equipment	Unit Capacities	Pressure Rating (psi)	Material	Quantity
Biogas Upgrader Membrane Skid (3 Stage)	1500 Nm^3/hr	<160	Various	2
Hydrogen Sulfide (H2S) Removal Vessels (Active Carbon)	6 m^3	<15	316SS or HDPE	4
Volatile Organic Compounds (VOC) Removal Vessels - Active Carbon	6 m^3	<15	316SS or HDPE	10
Ammonia Removal Scrubbing Tower (Sulfuric Acid [H2SO4])	3000 Nm^3/hr	<15	316SS	1
Cogeneration Unit	1 MW	-	-	2
Biogas Compressor	400 kW	<160	-	2
Biogas Blower	1500 Nm^3/hr	<15	-	2
Heat Medium Boiler	3638 kW	N/A	Various	1

Ancillary piping systems associated with the facility are presented in Table 5-4.

Table 5-4: Ancillary Piping Systems

Process Service	Material	Design Pressure (psig)	Design Temperature (°F)
Feedstock Suction Line[1]	PP DR11	150	-29/203
Feedstock Pressure Line[2]	HDPE 4710 DR11	200	-29/140
Digestate Pressure Line[3]	HDPE 4710 DR11	200	-29/140
Nozzle Piping	HDPE 4710 DR11	200	-29/140
Digestate Pond	HDPE 4710 DR11	200	-29/140
Pump House Lines	Stainless Steel, Sch 10	150	-29/140
Heat Medium Return/Supply Line			
Glycol Above Grade	Carbon Steel	150	-49/250
Glycol Below Grade	Pre-insulated cross linked polyethylene (PEX)[4]	150	-29/250
Biogas Pipe			
Biogas Above Grade	Stainless Steel, Sch 40	200	-29/140
Biogas Below Grade	HDPE	200	-29/140
Natural Gas / RNG Pipeline (ATCO)			
Fuel Gas Above Grade	HDPE[5]	150	-29/129
Fuel Gas Below Grade	HDPE[5]	150	-29/129
Raw Water Line	PVC	150	-29/129

Notes:
[1]From organic food resource tank to digester pump house building.
[2]Livestock manure blend tanks to digester pump house building.
[3]From digester pump house building to the digestate nurse tank and to the digestate pond.
[4]Pre-insulated PEX system is insulated for heat retention and wrapped in a leak-proof membrane. No need to corrosion mitigation
[5]Fuel gas design will match ATCO piping system design. Above grade portions may require insulation.

The dimensions of buildings and containers (steel framed skidded equipment enclosures) onsite are provided in Table 5-5.

Table 5-5: Building and Container Dimensions

Building	Height Above Grade (m)	Length (m)	Width (m)
Manure Storage Building	9.2	87.2	46.3
Digester Pump House Building	7.4	100.3	8.5
Office Building	3.7	21.4	9.1
Digestate Separation Building	7.4	41.1	18.9
Boiler Building	3.7	4.9	3.7
Membrane Container	3.7	12.2	2.5

Building	Height Above Grade (m)	Length (m)	Width (m)
Screw Compressor Container (two total)	3.7	12.2	2.5
Biogas Pre-treatment Container (two total)	3.7	12.2	2.5
Co-gen Container (two total)	3.7	12.2	5.5

5.1.6 Stormwater Collection Infrastructure

The stormwater collection infrastructure for the Project is shown in Figure 5-3 (Appendix B). Further details on
stormwater collection infrastructure and management, including the digestate pond, are provided in Section 5.8.2.

All stormwater will be contained within the Project footprint, runoff will be conveyed through a series of drainage ditches, culverts, and pipes to the digestate pond. Culverts will convey the stormwater collected in drainage ditches and swales around the site to two stormwater catch basins located south of the digester tanks. The stormwater
catch basins will be connected to an underground stormwater collection pipe which will release the stormwater
into the primary cell of the digestate pond. The collected stormwater, in combination with the liquid digestate, will be temporarily stored in the digestate pond and applied to land parcels within the same water basin as the Project footprint and in accordance with the MOU. Stormwater will not be reused for facility operations.

5.2 Substances Generated

Describe the substances that will be generated in a typical operating day at the plant or facility.

- For each process stream, examine the substances contained within and:
  - their characterization, including their nature, fate and transport (physical, chemical or biological properties or characteristics), and potential effects on the environment,
  - their quantity used or generated (note range variation in production or due to upsets).
    Tables in Appendix D and Appendix E can be used as examples for the types of sources of substances,
  - their source of introduction, and
  - the process streams' range of variation due to production changes or upsets.
- From on-site operations, identify the types and quantities of waste that will be generated during operation including the type and nature of the waste (including designated hazardous waste) and potential effects on the environment.
- For waste that will be accepted at this site, identify:
  - the type and nature of the waste (including designated hazardous waste) and potential effects on the environment,
  - the origin of the waste (i.e., in or out of the province), the sector (domestic, commercial, or industrial), and
  - the anticipated quantity and duration of the storage.

5.2.1 Generated Substances

Substances generated from a typical operating day at the facility are described in Table 5-6. Refer also to Section 5.1.4 (Product Outputs and Capacities) regarding products and by-products generated at the facility.

Table 5-6 Summary of Substances Generated

Process Stream	Substance Generated	Frequency	Average Volume	Substance Source of Introduction	Characteristics (nature, fate and transport)	Potential Environmental Effect		
						Soil	Water	Air
Natural gas combustion (cogeneration unit no. 1 exhaust)	Air emissions	Continuous	84.54 (e3m3/d)	Natural gas combustion	NO_x, SO_2, CO, and particulates	N/A	N/A	Changes to ambient air quality
Natural gas combustion (cogeneration unit no. 2 exhaust)	Air emissions	Continuous	84.54 (e3m3/d)	Natural gas combustion	NO_x, SO_2, CO, and particulates	N/A	N/A	Changes to ambient air quality
Natural gas combustion (boiler exhaust)	Air emissions	Continuous	198.37 (e3m3/d)	Natural gas combustion	NO_x, SO_2, CO, and particulates.	N/A	N/A	Changes to ambient air quality
Produced gas from upset flaring	Air emissions	Occurring rarely	n/a[1]	Combustion	SO_2	N/A	N/A	Changes to ambient air quality
Released from biogas upgrading equipment (exhaust stack)	Air emissions	Continuous	1,182 Nm^3/h	Gas separation membrane; vented to stack	CO_2	N/A	N/A	Changes to ambient air quality
Anaerobic digester process and digestate separation	Liquid digestate	Applied to land parcels in spring and fall, in accordance with the MOU[2]	412,195 tonnes/yr	Anaerobic digestion; Land application[2]	N: 0.29%; P: 0.06%; K: 0.09%	Change to soil quality[2]	Change to water quality[2]	N/A
Anaerobic digester process and digestate separation	Solid digestate	Applied to land parcels in spring and fall, in accordance with the MOU[2]	36,026 tonnes/yr	Anaerobic digestion; Land application[2]	N: 0.87%; P: 0.31%; K: 1.08%	Change to soil quality[2]	Change to water quality[2]	N/A

Notes:

[1] n/a not available, refer to Appendix F, the Alberta Energy Regulator (AER) flare spreadsheet was used to determine emergency flare exit parameters for the air quality emergency flare modelling cases.

[2]See Sections 4.7 and 4.8, digestate will be applied to land parcels spring and fall, in accordance with the MOU. No adverse environmental effects are anticipated.

5.2.2 Waste Generated from On-Site Operations

The Project will identify, characterize, and classify any waste generated per relevant requirements (e.g., Alberta Environment's Industrial Waste Identification and Management Options (Alberta Environmental Protection 1996)
and the Alberta User Guide for Waste Managers (Alberta Environmental Protection 1996)).
Anticipated waste streams generated from the facility include:

- General construction debris
- General operation waste (e.g., membranes, filters, sieves, used oil [as applicable]).

All waste generated will be temporarily stored and contained onsite using proper siting and containment after which it will be transferred and disposed of off-site at an approved waste disposal facility.

5.2.3 Waste Accepted at Facility Site

The Project will accept both livestock manure and off-farm organic food resources at the facility that, combined,
will form the feedstock for the anaerobic digestion process. As a base case, the Project will be designed to receive 80,000 tonnes per year of livestock manure from an adjacent confined feedlot operation (Rimrock Cattle Company)
and 60,000 tonnes per year of off-farm organic food resources from a local third-party (see Section 5.1.2).

Livestock manure will be temporarily staged within the manure storage building and will be used within a short
duration of arriving onsite. Off-farm organic food resources will be temporarily stored within three off-farm organic food resource tanks and will be used within a short duration of arriving onsite. Refer also to Section 7.15.

5.3 Alternative Options Examined for Facility Processes

Describe any alternative options examined in the proposed overall plant or facility processes to optimize efficiency
and minimize anticipated substance releases and/or waste generation and discuss criteria used in selecting an option. Include any supporting mass or energy balances.

The overall purpose of the Project is to optimize efficiency and minimize emissions through the reduction of fossil fuels via the production of RNG from agricultural feedstock.

The low Carbon Intensity for the Project is between -25 and -20 grams of carbon dioxide equivalent per megajoule of energy (g Co2eq/MJ), and is a direct result of carefully considered design and operational process options.

Additionally:

- The combined livestock manure and off-farm organic food resources feedstock will be diverted to digester tanks which are closed systems, resulting in a net reduction in potential emissions from feedstock in the area (i.e., instead of use at the facility).
- The digestate will be applied to lands as a fertilizer alternative, therefore, it is anticipated that the Project's production of digestate will also offset the need for synthetic fertilizers and reduce energy consumption and emissions associated with synthetic fertilizer manufacturing,
- As described in Section 5.1.2, ongoing studies regarding the reuse of liquid digestate (upstream of the digestate pond) as process water may result in a net reduction in the volume of fresh water required for the Project, and
- As part of upgrading, biogas will be sent through activated carbon filters that will trap VOCs and H_2S.

5.4 Project Footprint Minimization

Describe how the proposed project's footprint on the land will be minimized (e.g., shared infrastructure and right-
of ways, and /or collaborative land management practices, especially on the boundary of the site and/or waste minimization).

The Project is located on privately-owned, cultivated land adjacent to existing roadways, with access off Range Road 10, and near shared infrastructure and rights-of-way for receiving natural gas and electricity to support

facility operations. The Project footprint has been minimized to only the required operating footprint for facility infrastructure (see Figure 2-3, Appendix B), and has been optimized for space efficiency. Additionally:

- Vehicle transport of livestock manure will be minimized due to proximity to the adjacent confined feedlot operations (Rimrock Cattle Company),
- Modularization will be utilized to reduce in-field construction activity,
- Pipeline quality RNG, produced from upgrading biogas, will be returned the local natural gas distribution via injection into the local ATCO distribution system.
- Topsoil and subsoil stripped during earthworks (site grading and excavations of the digestate pond and freshwater reservoir) will be stockpiled in windrows located onsite for future reclamation, and
- Ongoing studies regarding the potential reuse of liquid digestate (upstream of the digestate pond) as process water may result in a net reduction in the area required for the digestate pond over the life of the facility.

5.5 Facility Scale Diagrams

Provide scale diagrams of the proposed plant or facility site. On the diagrams, identify pollution prevention and control infrastructure and equipment associated with collection and storage of product or feedstock, hazardous materials, waste, wastewater, or runoff or permanent disposal (e.g., landfill). Include:

- types of buildings and their locations;
- names and locations of all equipment used in manufacturing, processing, storage, and other units;
- location of all aboveground or underground tanks and type of service (e.g., product, feedstock, or waste);
- location of any equipment (e.g., piping) that will be installed subsurface;
- location of all waste management areas (e.g., containment, transfer and acceptance, and processing or treatment areas); and
- location of all wastewater or runoff collection control infrastructure, pre-treatment and post- treatment storage areas.

A facility site layout is provided in Figure 2-3 (Appendix B).

A map showing the flow lines for water, feedstock, and digestate for main facility process areas within the Project footprint is provided in Figure 5-1 (Appendix B).

A facility plot plan is provided in Figure 5-2 (Appendix B) showing the locations, buildings, equipment, tanks, and storage areas.

The stormwater collection infrastructure for the Project is provided in Figure 5-3 (Appendix B).

5.6 Material Storage and Proposed Control Systems

Provide design and specification details (not engineering blueprints) of the proposed control systems.

- For each materials storage, waste management, transfer, or disposal area, include:
  - primary containment method (e.g., tanks, containers),
  - berms, dykes and/or other secondary containment structures (e.g., waste storage liners),
  - special handling or storage methods for hazardous materials,
  - run on/run off controls, and
  - leak detection systems;

and assess the suitability for the quantity and characterization of waste, and identify any design features to manage incompatibility of substances, such as segregation.

- For all aboveground and underground tanks, complete Appendix C Form, and identify:

- tank locations,
- type of service (e.g., produced water),
- capacity (m3),
- material type,
- type of corrosion protection,
- foundation or basepad preparation,
- type and capacity of secondary containment,
- measures planned to prevent overfilling of tanks (e.g., automatic shutoff valves, or high- level alarms), and
- method of leak detection;

and assess the suitability of each tank and associated control systems for its content.

- For each runoff or wastewater management system, identify:
  - collection and control berms, dykes and/or piping and any lining systems,
  - primary containment method (e.g., tanks, ponds),
  - secondary containment structures such as liners, and
  - leak detection systems;

and assess the suitability for the volume and rate of each wastewater generated during normal and upset conditions (or runoff events), as well as the suitability for each wastewater stream's characterization.

5.6.1 Storage Tanks

The Project will involve material handling, staging and storage onsite, including belowground tanks. Storage and containment details for each tank are presented in Table 5-7.

The secondary containment approach and design detail for all facility tanks is provided as Appendix G. All tanks will have a primary containment in the form of "engineered liners" formed as concrete walls designed to the
appropriate building codes and will be constructed of concrete of the correct strength and chemical resistance for the purpose for which they are designed. Tanks will also be designed such that any in leakage from the concrete portion of the tank will be contained by the secondary synthetic liner.

All tanks will have a perforated tile system and an observation well (dry well) installed beneath the base of the tanks as a leak detection system. Any unexpected leak will migrate to the bottom of the liner where it will enter into monitoring tile and will become visible within the connected monitoring well.

This is a conservative containment approach as site preconstruction geotechnical investigations show that the soil
conductivity on site is suitable to provide containment of the material without risk of contaminating any groundwater (see Appendix G).

Table 5-7 Storage Tank Summary

Tank Description	Location	Contents	Tank Size (m^3)	Placement	Material Type	Corrosion Control	Secondary Containment[1]	Overfill Protection	Method of Leak Detection	Type of Vents	Max True Vapour Pressure	Fugitive Emission Controls
Manure Blend Tanks (four total)	Located inside manure storage building	Mixture of livestock manure and water or liquid digestate	847	Both below and above ground	Concrete	Internal spray on epoxy coating [2]	LLPDE liner installed below and surrounding	Floor around the blend tanks will be sloped towards tank	Detected via tile in footing to observation dry well[3, 6]	No venting	N/A	N/A
Water Cistern (one total)	Located inside manure storage building	Water from freshwater reservoir	847	Both below and above ground	Concrete	Internal spray on epoxy coating [2]	No containment is proposed	Floor around the water cistern will be sloped towards tank	No containment is proposed	No venting	N/A	N/A
Organic Food Resource Tanks (three total)	Located beside manure storage building	Off-farm organic food resources	498	Both below and above ground	Concrete	Internal spray on epoxy coating [2]	LLPDE liner installed below and surrounding	Level detection and steel lips around top of the tanks to prevent effects of spillage or foaming	Detected via tile in footing to observation dry well[3]	No venting	N/A	N/A
Digester Tanks (six total)	North of freshwater reservoir; south of manure storage building	Feedstock and digestate	7,664	Both below and above ground	Concrete	Concrete crystalline admixtures	LLPDE liner installed below and surrounding	Level detection with automatic feed shutoffs[4]	Detected via tile in footing to observation dry well[3, 5]	Emergency pressure relief valve	4.5 mbar	Biogas storage membranes (primary control)
Digestate Nurse Tank (one total)	Located inside of the digestate storage area	Digestate	847	Both below and above ground	Concrete	Internal spray on epoxy coating [2] or concrete	LLPDE liner installed below and surrounding	In the event of release, clay ditches onsite will act as a	Detected via tile in footing to observation dry well[3, 6]	No venting	N/A	N/A

								conveyance				

Tank Description	Location	Contents	Tank Size (m^3)	Placement	Material Type	Corrosion Control	Secondary Containment[1]	Overfill Protection	Method of Leak Detection	Type of Vents	Max True Vapour Pressure	Fugitive Emission Controls
						crystalline admixtures		to the digestate pond.				
Digestate Separated Liquids Tank (one total)	Located inside the digestate separation building	Liquid digestate	600	At grade	Concrete	Internal spray on epoxy coating [2] or concrete crystalline admixtures	LLPDE liner installed below and surrounding	In the event of release, clay ditches onsite will act as a conveyance to the	Detected via tile in footing to observation dry well[3]	No venting	N/A	N/A

Notes:
[1] See Appendix G for detail.
[2]Coatings intended to resist low pH feedstocks.
[3] Leaks may also be detected via proposed groundwater monitoring well network to be installed onsite.
[4]In the event of an aboveground digestate tank release, clay ditches onsite will act as a conveyance to the digestate pond.
[5]Digester tanks will be emptied every 5 years to conduct visual inspections of the concrete, structure, and membrane.
[6]Manure blend tanks and the nurse tank will be empty periodically during normal operations and will be visually inspected more frequently.

5.6.2 Materials Staging and Storage

The location, contents, capacity, placement, and material for containment for material staging and storage areas is summarized in Table 5-8.

Table 5-8: Summary of Material Staging Areas and Storage

Description	Location	Contents	Capacity	Placement	Material for Containment
Freshwater Reservoir	Located west of digestate pond	Water diverted from Highwood River	25,000 m^3	Below ground	Compacted clay liner
Manure Storage Area	In the manure storage building	Livestock manure	1,500 m^2	At grade	Concrete slab on- grade pad
Digestate Pond	Located east of the freshwater reservoir	Liquid digestate and stormwater	237,339 m^3	Below ground	HDPE liner
Solid Digestate Staging	Located inside digestate separation building	Solid digestate	225 m^2	At grade	Concrete slab on- grade pad
Digestate Storage Area	Located west of the digestate separation building	Solid digestate	7,000 m^2	At grade	RCC pad

In the event of an aboveground releases or loss of containment from staging or storage areas, clay ditches onsite will act as a conveyance to the digestate pond. Any leaks from the material staging or storage area will be detected via the groundwater monitoring program proposed for the site (see Section 7.12).

5.6.3 Runoff Management System

Stormwater will be collected in the drainage ditches and swales around the site and diverted into the digestate pond as described in Sections 5.1.6 and 5.8.2.

The Project footprint is graded such that any above ground releases from any tank will also be captured via the stormwater collection infrastructure and diverted into the digestate pond. In the event of a digestate tank failure, or other aboveground release, clay ditches (in situ clay) onsite will act as a conveyance to the digestate pond, in effect adding another level of containment. The digestate pond will be sized with the capacity to hold the combined volume of the six digestate tanks as well as the blend and nurse tanks.

5.7 Monitoring Program

Describe the proposed monitoring to evaluate the performance of collection and storage elements, and any leak detection systems, that will be used for each containment area or tank identified in 5.6, and their associated loading or transfer areas.

Should a leak occur in one of the tanks summarized in Table 5-7, the perforated tile system will catch any releases and divert them to the observation (dry) well. During operations, the observation (dry) wells will be monitored and checked regularly for leaks. Above ground portions of tanks will be inspected visually for integrity and leaks. In the event a leak or release from a tank is suspected, the tank will be drained of all contents, walls of the tank

examined, and the leak will be repaired. Rimrock will comply with any release reporting requirements that govern the release.

The groundwater monitoring program implemented for the Project will include upgradient and downgradient wells across the Project footprint (see Section 7.12). Upgradient monitoring wells will be used to assess background
conditions. Downgradient monitoring wells may be compared to the upgradient monitoring wells to assess any significant parameter changes, which may indicate a release from tanks located on the Project footprint.

5.8 Wastewater and Runoff Treatment and Release Control Systems

Describe and provide process flow diagrams for the proposed treatment and release control systems for the substances identified in each wastewater stream, along with mass balances and flow directions. Include:

- wastewater reuse or minimization opportunities;
- anticipated volumes, rates, and amounts of each wastewater or runoff stream during:
  - predicted normal conditions (average daily/monthly volumes) and upset conditions,
  - predicted rainfall events (maximum daily/monthly volumes),
  - substances for each wastewater stream, their normal and maximum concentrations per unit of time and per unit of production, and the predicted duration of maximum concentrations,
  - substance fate and transport (physical, chemical or biological properties or characteristics), and potential effects on the environment;
- description of the physical size, location, and capacity of wastewater treatment systems along with;
  - explored alternatives and proposed method of treatment (including batch or continuous) and considerations for both normal and upset conditions, and
  - proposed location and method of release (batch or continuous), and control of release (e.g., valves, diffusers, irrigators).

No wastewater or runoff will be released directly from the Project footprint to a receiving watercourse or waterbody.

5.8.1 Liquid Digestate

Digestate resulting from the anaerobic digestion process will be separated into liquid digestate and solid digestate (see Sections 5.1.3 and 5.1.4). The liquid digestate (which is not considered wastewater) will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff (see Section 5.8.2), until it is transported offsite for application to land parcels within the same water basin as the Project footprint, and accordance with the MOU.

As described in Section 5.1.2, ongoing studies are in progress regarding the reuse of liquid digestate (upstream of the digestate pond) as process water. If deemed viable, a portion of the liquid digestate resulting from the solid and liquid digestate separation process may be reused to supply the manure blend tanks, depending on its characterization. No water from the digestate pond will be reused in process.

5.8.2 Stormwater Management

A full description of local area meteorology, including precipitation, is described in Section 4.6.2. The average annual precipitation recorded at the High River Meteorological Station (Station #3033240) is 550 mm per year (Environment and Climate Change Canada 2022).

Total annual evaporation data for the Town of High River is not available currently. The total annual evaporation value for shallow lakes in the City of Calgary, the closest municipality, is 728 mm/year. This is greater than the annual precipitation value recorded at the High River Meteorological Station (550 mm/year). Therefore, the runoff collected on site due to precipitation was accounted for with shallow lake evaporation when modelling the sizing of the stormwater management infrastructure (ISL Engineering April 2022).

The stormwater collection infrastructure for the Project is shown in Figure 5-3 (Appendix B). Stormwater will be contained within the Project footprint, runoff will be collected by drainage ditches and swales and directed to the
digestate pond onsite until it is applied in combination with liquid digestate to adjacent land parcels in same water basin and in accordance with the MOU. Stormwater will not be used for facility operations.

The stormwater collection infrastructure has been designed to accommodate a 1:100-year flooding event, based on statistical analysis of continuous rainfall of the maximum precipitation event recorded at High River, AB (ISL

Engineering April 2022). According to the Government of Alberta, Alberta Floods Map, a 1:100-year flood is unlikely to impact the Project footprint (GOA 2020).

The 9.69 ha digestate pond has a volumetric capacity up to of 237,339 m^3 and utilizes a maximum storage depth of 3 m deep, plus a 1 m freeboard (enough freeboard to contain >1:500 year event), satisfying zero discharge requirements. Sizing of the digestate pond also exceeds the Agricultural Operation Practices Act (AOPA) guidelines for analogous sizing criteria (1:30 year event).

The stormwater catchment area for the Project footprint includes approximately 8.62 ha of 85% impervious industrial area. A conservative continuous simulation model was performed to demonstrate the adequate sizing of the digestate pond to capture stormwater generated from the 8.62 ha industrial area, in addition to liquid digestate over a 50 year period. The model results indicate that based on the surface footprint of the digestate pond evaporation of the stormwater portion is sufficient and that no allocation to combined stormwater and liquid digestate land application was required. Model results indicate that a 9 ha, 3 m deep digestate pond will experience a negligible rise and fall under constant digestate production at high water level, with no long-term trend in volume or elevation up or down. This indicates that the digestate pond sizing is conservative and sustainable long term.

The digestate pond has been sized to hold 7 months of liquid digestate and stormwater at 90% capacity with zero discharge. As a base case, the application of digestate to lands is proposed in the spring and fall, based on local area demand. The 7-month storage volume has been established in the event of an early fall spread and late spring land application occurring.

The interaction of precipitation with livestock manure and digestate may occur at the manure storage and the solid digestate storage areas, resulting in livestock manure or digestate entering the stormwater collection system. However, all precipitation and runoff from the industrial area will be diverted to the digestate pond, as such there will be no livestock manure or digestate leaving the Project footprint, except as part of the liquid digestate transported offsite for application to land parcels within the same water basin as the Project footprint.

5.8.3 Domestic Wastewater

There will be facilities for personnel onsite in the office building, with all potable water being transported to the site and domestic wastewater being transported offsite to a licensed disposal facility by qualified service providers.

5.9 Suitability and Capacity of Proposed Treatment and Release Control Systems

Assess the suitability and capacity of the proposed treatment and release control systems for the substances identified in each wastewater stream, and for each proposed disposal alternative:

a) For releases to watercourses,
- use approved models to evaluate the potential effects in the environment for the following watercourse scenarios:
  - normal and maximum concentrations of substances in, and volumes of, wastewater to be released,
  - low and normal watercourse flow conditions, and normal and maximum background concentrations of substances as identified in Section 4,

- if runoff or wastewater re-use is proposed, model the effect of the reduced return flow on the quantity and quality of the receiving environment, and
- use benchmark or bench scale testing to establish the anticipated chronic and acute whole effluent toxicity for normal and maximum resulting modelled concentrations;

- discuss proposed responses to consideration of potential implications identified in Section 4:
  - of all substances of concern in the area, and/or identify any needs for conditional limits (e.g., for low flows or upset conditions),

- to upstream and downstream releases (effects due to cumulative loads), potential impacts on the nearest water users, and implications to any identified areas of ecological sensitivity or public concern,
- any additional research, ambient or biological monitoring, treatment optimization, or modifications to the release location, that are necessary to ensure that environmental objectives can be met, and
- propose contingency plans for treated wastewater streams that do not meet applicable receiving environment condition requirements;

and describe how compliance with the applicable technology benchmarks and methods for watercourse policies, criteria, objectives, restrictions, environmental guidelines and any applicable regional outcomes will be achieved.

b) For wastewater, runoff or sludge releases to land,
   - using the treated wastewater or sludge characterization, calculate the required application rates and describe the technologies to manage considerations identified in Section 4 in accordance with applicable policy and soil criteria; and
   - assess how locations will be rotated to achieve application frequency restrictions.

c) For wastewater or runoff disposal by deepwell injection,
   - assess wastewater treatment alternatives, and specify reasons for selecting deepwell injection; and
   - identify the proposed deepwell disposal receiving site and confirm they are authorized to receive this type of wastewater.

d) For wastewater or runoff release to municipal facilities or sludges to landfills
   - provide information regarding the proposed receiving municipal wastewater or stormwater system or landfill, including:
     - their acceptance letter and any requirements imposed,
     - their EPEA approval number, and
     - a screening assessment of their treatment system's ability to treat and monitor for the substances identified in the proposed industrial activity.

No wastewater will be released directly from the Project footprint to a receiving watercourse or waterbody. Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels within the same water basin as the Project footprint, and in accordance with the MOU (see Section 5.8).

5.10 Proposed Treatment Facilities and Disposal Locations Map

For the systems identified in 5.8 and 5.9, provide a scale diagram, showing the location of proposed treatment facilities and disposal locations (latitude and longitude coordinates) with considerations identified in Section 4.

No wastewater will be released directly from the Project footprint to a receiving watercourse or waterbody. Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels in accordance with the MOU. See Sections 4.7 and 4.8 regarding land application locations and Section 5.8 regarding stormwater management. No industrial wastewater treatment facilities are anticipated for the Project.

5.11 Performance Evaluation Monitoring for Treatment, Reuse, and Wastewater Minimization

For the systems identified in 5.8 and 5.9, describe proposed monitoring for performance evaluation of the treatment, reuse, and wastewater minimization elements.

See Section 5.8, Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels within the same water basin, and in accordance with the MOU. As described in Sections 5.1.2 and 5.1.3, there will be no reuse of liquid digestate from the digestate pond in process; however, ongoing studies may provide an opportunity to reuse a portion of the

liquid digestate upstream of the digestate pond to supply the manure blend tanks, depending on its characterization. If deemed possible, any reuse will be directly from the nurse tank, to be transferred into the blend tanks via a separate nozzle without any treatment other than mechanical separation of liquids and solids.

5.12 Proposed Monitoring and Evaluation of the Quality, Quantity and Whole Effluent Toxicity of Treated Wastewater

For 5.8 to 5.10, identify locations and describe proposed monitoring and evaluation of the quality, quantity (rates/volumes/amounts) and whole effluent toxicity, for the release of treated wastewater.

See Sections 5.8 to 5.10, Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels within the same water basin, and in accordance with the MOU.

5.13 Ambient Monitoring Associated with the Release of Treated Wastewater

Identify and describe any proposed ambient monitoring (ambient water quality, biological, or soil), associated with the release of treated wastewater.

See Sections 5.8 and 5.9, Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels within the same water basin, and in accordance with the MOU.

5.14 Data Support for Wastewater Stream Releases

For the systems identified in 5.8 and 5.9, provide data, calculations, models, and reliable literature sources for each wastewater stream proposed for release, and the associated release or disposal method.

See Sections 5.8 and 5.9, Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels within the same water basin, and in accordance with the MOU.

5.15 Air Treatment and Control of Released Substances

Referencing 5.1 and 5.2, describe the substances that will be directly or indirectly released to the air in a typical operating day at the plant or facility, and include:

- the source of each substance, and its quantity, to any component streams that will contribute to the air emission streams, including auxiliary or standby process equipment;
- each substances physical, chemical or biological characteristics, fate and transport and potential environmental effect(s); and
- the proposed method of treatment or control, and method of release.

An Air Quality Assessment has been prepared for the Project and is provided as Appendix E (Horizon Compliance Group Inc. 2022). Refer to Table 5-6 regarding process streams, volumes, characteristics and potential environmental effects for air emissions. Air emissions point sources for the Project are shown in Table 5-9, along with substances released.

Table 5-9: Substances Released from Emission Sources

Method of Release	Source Type	Substance Source of Introduction	Substances Released to Air	Proposed Treatment or Control
Cogeneration Units	Point source	Natural gas combustion	NO_x, SO_x, CO and particulates	High efficiency performance cogeneration units
Heat Medium Boilers	Point source	Natural gas combustion	NO_x, SO_x, CO and particulates	Will meet the low NOx emission standards
Emergency Flare	Point source	Biogas	SO_x and H_2S	Minimize frequency and duration to extent possible
Biogas Upgrading Equipment	Point source	Venting to atmosphere	CO_2	Gas separation membrane; vented to stack[1]

Note: [1] See also Section 5.17.

5.16 Air Emission Stream Information

For each air emission stream, identify:

- the volume(s) and concentrations generated, per unit time, of the release substance;
- normal and maximum emission rate per unit time and per unit of production based on the design and throughput of the industrial site;
- whether the emissions are continuous or intermittent, and the frequency (if intermittent); and
- estimates of seasonal and/or monthly variability for each stream.

Air emission sources (streams) and substances released are described in Section 5.15. Project emissions for each stream (i.e., cogeneration units, heat medium boiler, and emergency flare) under normal operating conditions are summarized in Table 5-10. Stack 5, which is associated with the biogas upgrading equipment (Figure 5-2, Appendix B) is not considered an air emission point source, as CO_2 is the not a contaminant of concern with a regulated emission rate or AAAQO that must be met (GOA 2019).

Table 5-10: Project Emissions Under Normal Operating Conditions

Source	Source ID	Frequency	Emission Factor (g/kWh)	Emission Rate (g/s)[1]
Cogeneration Units	Stack 2 and 3 (Cogen 1 and Cogen 2)	Continuous	0.0012	NO_x: 0.40
Heat Medium Boiler,	Stack 4 (H-701)	Continuous	0.0223	NO_x: 0.02
Emergency Flare	Stack 1	Occurring rarely	-	SO_2 (Qavg): 0.086

5.17 Management Practices to Minimize Substance Releases

Describe the application of process technology, environmental control systems, and management practices that will be used to minimize substance release to the environment, and include:

- description of the physical size, location, and capacity of environmental control units/operations (e.g., air pollution control units);
- diagram(s) of the processes, flows, or operation units including engineered drawings;

- alternative processes and technologies for the release of substances that have been evaluated, and a rationale for their exclusion;

- all applicable industry standards, guidelines, and practices, as well as the manner in which the design and operation will achieve these.

All process technology, control systems, equipment and infrastructure will be designed to applicable codes and standards and stamped by a Professional Engineer with a permit to practice in Alberta. Maintenance, turnaround and inspection of equipment and vessels will be conducted in accordance with relevant code requirements.

The Project will utilize state of the art, high efficiency performance cogeneration units, at a high standard of design which will reduce emissions compared to other cogeneration options. The proposed heat medium boiler will meet the low NOx emission standards. The emergency flare will be designed to a federal standard and flaring of biogas will be under upset or emergency conditions only. The emergency flare will be equipped with a pilot light that consumes a small amount of low-pressure natural gas continuously. The pilot light (flame) will be checked for flame presence during operations, by temperature measurement (thermocouple), ionization rod, or a UV sensor, to ensure emergency biogas upset conditions are dealt with if they arise.

Biogas generated in the digester tanks will contain H_2S at concentrations of up to 2,000 parts per million (ppm) and will vary depending on the sulphur content of the feedstock. The biogas storage membrane within the digester tanks contains sulfur-reducing bacteria which will reduce H_2S concentrations to less than 200 ppm. The sulphur content in the biogas will be reduced to very low concentrations to pipeline spec prior to any injection into the ATCO distribution system.

Additionally, as described in Sections 5.1.2 ongoing studies are in progress regarding an opportunity to reuse a portion of the liquid digestate upstream of the digestate pond to supply the manure blend tanks, depending on its characterization.

5.18 Equipment Specifications of Emission Sources

Using tables as required, provide the following details for any:

- reciprocating or turbine engines;
- all fired heaters (including space heaters), treaters, and boilers;
- incinerators; and
- flare stacks.

Detailed equipment specifications and emission source parameters for the cogeneration units, boiler, and emergency flare are provided in Table 5-11. Buildings will not have furnaces or space heaters; heating will be supplied via in-floor glycol heating tubes installed in the concrete.

Table 5-11: Equipment Description, Stack Parameters, and Emission Rates for the Project

Source	Cogeneration Units Stack 2 and 3 (Cogen 1, Cogen 2)	Heat Medium Boiler Stack 4 (H-701)	Emergency Flare Stack 1[2]
Make and Model	ECOMAX 10, reciprocating engine	TBD	TBD
Fuel Type	Natural gas	Natural gas	Biogas
Power Rating (kW)	1036	3638	-
Net Heating Value (kW)	-	-	18,500
Stack Locations			

Northing	5607874.9472 / 5607870.3392	5607874.6123	5607880.9484

Source	Cogeneration Units Stack 2 and 3 (Cogen 1, Cogen 2)	Heat Medium Boiler Stack 4 (H-701)	Emergency Flare Stack 1[2]
Easting	287928.5135 / 287928.3292	287936.2182	288148.2801
Stack Parameters			
Stack Diameter (m)	0.35	0.60	2.80
Stack Height (m)	10.0	10.0	12.0
Exit Temperature (°C)	200[1]	250	876
Exit Velocity (m/s)	17	15	20
Emission Rate (g/s)	NO_x: 0.40	NO_x: 0.02	SO_2(Qavg): 0.086

Notes:
[1]The exhaust gas temperature of the cogeneration units is dependent on the amount of waste heat that can be utilized on site a nd seasonal operations, ranging from approximately 180°C during winter operations, approximately 330°C during summer operations, and approximately 513°C without heat recovery. For modelling purposes, an exit temperature of 200°C was used.
[2]Pseudo parameters were used for emergency flare modelling as per AER Directive 060 (Alberta Energy Regulator 2022).

5.19 Flare Pits

Provide the following details for any flare pits on site:

- under what conditions is it used;
- type of proposed liner;
- frequency of use, and what goes into the pit; and
- type of flare design (e.g., igniter, pilot).

There will be no flare pits associated with the Project.

5.20 Fugitive Emissions

Describe all fugitive emissions related to the site. Include:

- types of substances released;
- source identification;
- measured and estimated volumes;
- method of measuring and estimating fugitive emissions; and
- management approach.

Fugitive emissions have the potential to result from fittings, connections, or seals on facility equipment an d
ancillary piping systems. The fugitive emissions would be negligible as the gas processing capacity and amount of pressurized equipment for the Project is negligible. Facility equipment will be inspected daily to ensure that there
are no visible leaks and that all equipment is operating optimally. If any leaks or issues are identified necessary repairs will be made in accordance with applicable requirements.

5.21 Non-Point Emission Sources

Describe all significant area, or non-point, emission sources related to the industrial site (e.g., vehicle fleets, ponds, or onsite incineration). Include:

- types of substance released;
- source identification;
- measured and estimated volumes;
- method of measuring and estimating associated emissions; and

- management approach.

Non-point source emissions may result from feedstock (i.e., off gassing from livestock manure and the natural decomposition of off-farm organic food resources). Estimated volumes have not been quantified, however given operational practices which will be implemented to mitigate the decomposition of feedstock (e.g., feedstock delivery schedule to minimize required storage capacity, minimized handling, and storage primarily in enclosed tanks), they are expected to be negligible. Notably, the feedstock will be diverted to the digester tanks which are closed systems, resulting in a net reduction in potential area sources.

Exhaust from mobile vehicles and equipment will be released during Project construction and operations. These emission streams are expected to be intermittent and negligible.

5.22 Suitability and Capacity of Proposed Treatment and Release Control Systems

Assess the suitability and capacity of the proposed treatment and release control systems using a dispersion- modelling run to show the maximum ground level concentration:

- for substances of concern under both normal operating conditions, and upset conditions;
- for emergency flaring scenarios, including:
  - rates and composition of flared streams (i.e., inlet stream, acid gas before sulphur recovery unit, tail gas after sulphur recovery unit, reactor over pressure); and
  - dispersion-modelling run depicting the maximum ground level concentration.

And describe any temporary or permanent environmental effect(s) that may, or will, result from the substances being released to air, include:

- consideration of any unique situations arising from the plant location, size, or capacity; and
- comparison to applicable ambient objectives, guidelines, or standards.

An air quality assessment was prepared for the Project (Appendix E). The modelling was completed utilizing AERMOD in accordance with the requirements outlined within the AEP's Air Quality Model Guideline (GOA 2021). The results are summarized in Table 5-12 for NO_2 from the natural gas fired equipment (cogeneration units and heat medium boiler) and in Table 5-13 for SO_2 from emergency flaring of biogas, when required. The maximum off- site ground-level concentrations (MGLC) of NO_2 and SO_2 for the Project are predicted to comply with and be well below the AAAQO (GOA 2011).

Table 5-12: NO_2 Dispersion Modelling Results

Substance	Averaging Period	MGLC ($\mu g/m^3$)	AAAQO ($\mu g/m^3$)
NO_2	1-hour	103.1	300
	Annual	20.1	45

Table 5-13: SO_2 Dispersion Modelling Results

Substance	Averaging Period	MGLC (µg/m3)	AAAQO (µg/m3)
SO_2	1-hour	30.4	450

5.23 Air Emission Diagrams

Provide scale diagrams of the plant, plant site, and the surrounding area with regard to air emissions, and include the location and distance between all:

- air emission point sources, including stacks, exhaust stacks, all other discharge points; and
- monitoring and sampling equipment.

Figure 5-2 (Appendix B) identifies all buildings and major equipment on site, including air emissions point sources (exhaust stack locations). Exhaust stacks will be equipped with sampling ports in accordance with the Alberta Stack Sampling Code (Alberta Environmental Protection 1995).

5.24 Proposed Monitoring for Performance Evaluation of Treatment and Control Equipment Systems

For 5.18 to 5.23, describe proposed monitoring for performance evaluation of the treatment and control equipment (source) systems.

Annual source emission surveys for NO_x, flow, and temperature will be conducted to ensure that mass emissions rates of NO_x are within the emission limits specified by AEP in the EPEA Approval issued for the Project. The
exhaust stack will be designed with sampling ports that comply with the Alberta Stack Sampling Code (ASSC) (Alberta Environmental Protection 1995).

5.25 Monitoring and Evaluation of Ambient Air Quality

Identify the location and describe proposed monitoring and evaluation of the ambient air quality.

As maximum predicted ambient concentrations of emissions associated with the Project are well below the
AAAQO, no on-site monitoring stations are proposed. See Sections 7.3 and 7.4 regarding the Project and ambient air monitoring conducted by the Calgary Regional Airshed Zone (CRAZ).

5.26 Waste Stream Emission Information

For air emissions, provide data, calculations, models, and reliable literature sources for each waste stream proposed for release, and the associated release or disposal method. Include:

- the volume(s), generated per unit of time, of the release substance;
- concentration of substance(s), and their physical or biological characteristics;
- fate and transport and potential environmental effect(s)of the substance(s);
- discharge rate per unit of time and per unit of production;
- maximum emission rates based on the design of the industrial site;
- typical emission rates based on current operations and throughput of the industrial site;
- whether the discharge or emissions are continuous or intermittent, and the frequency (if intermittent); and
- estimates of seasonal and/or monthly variability for each stream.

Air emission data, models, and literature sources, are provided in ful in the Air Quality Assessment Report (Appendix E).

6 Construction

6.1 Construction Schedule

Provide a brief table or outline of the schedule for construction, including major milestones.

A high-level proposed construction schedule with major milestones is provided in Table 6-1. Construction dates are subject to change based on the timing of regulatory approvals.

Table 6-1 Proposed Construction Schedule

Key Milestone	Approximate Date
Rough Grading[1]	July 2022
Construction Commencement	March 2023
Site preparation finalization	April 2023
Concrete and structural construction	Q2 – Q3 2023
Equipment installation and connections	Q3 2023
Commissioning	September 2023
Operational start-up/operations	October 2023, onward

Notes:
[1]Rimrock understands commencement of rough grading can occur during the EPEA Industrial Approval Application review process (under appropriate municipal approvals) at its own risk.

6.2 Construction Site Set Up and Identification of Sensitive Areas

Describe and map the location on the site where the construction site will be located, how it will be laid out, and how it will affect sensitive areas, sensitive soils, and rare vegetation (identified under the Section 4) and how such effects will be avoided and/or mitigated.

The Project construction site layout is provided as Figure 6-1 (Appendix B). All construction activities will be contained within the Project footprint.

Construction staging/laydown will be located in the northeast corner of the Project footprint, with a temporary waste and recycling storage location and construction vehicle parking located in the western portion of the Project footprint. Topsoil stockpiles will be located on the north and west sides of the Project, within the Project footprint (see Figure 6-1).

There are no wetlands, waterbodies, sensitive soils, or rare vegetation located within the Project footprint (Figure 2-2). No wildlife nest/niche sites have been identified within the Project footprint. All relevant regulatory requirements, authorizations and approvals required for construction will be received, and conditions complied with during construction. Where specific approvals are not required, Rimrock will ensure that relevant requirements under the Wildlife Act, Weed Control Act, and federal Migratory Birds Convention Act and Species at Risk Act are met, as applicable.

An Environmental Protection Plan will be developed and finalized prior to construction. Environmental mitigation measures proposed to mitigate potential environmental effects during the construction phase are provided in Table 6-2.

Table 6-2 Environmental Mitigation Measures for Potential Construction Phase Effects

Environmental Elements	Potential Environmental Effects	Proposed Mitigation Measures
Soils and Terrain	• Soil compaction, rutting and admixing	• Stake the Project footprint/work areas prior to clearing to avoid inadvertent trespass. Limit construction activities to the staked boundaries. • Limit vehicle and equipment traffic to areas that have been stripped of topsoil or are matted (construction matting/rig matting) to prevent compaction, erosion, or contamination of topsoil. • In the event of adverse weather that could result in rutting and compaction (e.g., wet conditions), halt work until wet conditions improve. • Strip topsoil and subsoil separately. Strip topsoil in accordance with recommended topsoil stripping depths (see Section 6.4). • Monitor soil stripping activities to verify that soil is stripped to the correct depths, topsoil and subsoil are not mixed, and that soils are placed in the appropriate stockpiles. • Locate temporary stockpiles of different materials (e.g., topsoil and subsoil) with a minimum separation of 1m to prevent admixing of materials. • Implement erosion and sediment control (ESC) measures on/around topsoil and subsoil stockpiles and revegetate as soon as practicable. • In the unlikely event that problem soils are identified, delineate the spoil, and remove, and place in a separate spoil stockpile.

Soils and Terrain	• Soil erosion by water and/or wind	• Stabilize exposed topsoil where the potential for erosion exists. • Install ESC measures (e.g., silt fencing, etc.) if required to prevent movement of soils and other materials/debris off site during construction. • Ensure ESC measures are properly installed and monitored regularly, especially after significant precipitation events. • Repair or replace ESC measures in the event they become damaged or ineffective at any point during construction. • Temporary ESC measures will remain in place until vegetation has established and/or permanent ESC measures are installed, as practical. • Revegetate topsoil and subsoil stockpiles as soon as practicable following stripping.

Environmental Elements	Potential Environmental Effects	Proposed Mitigation Measures
Soils and Terrain	• Inadvertent spills/releases from construction vehicles and equipment	• Ensure that vehicles and equipment arrive on site in a clean condition, are well maintained, and free of fluid leaks. Check vehicles and equipment daily for leaks/spills. Remove from service if maintenance issues are identified that may result in leaks or spills. • Place drip trays underneath equipment if parked overnight or longer. Check drip trays for leaked material. • Complete routine vehicle and equipment maintenance offsite, as per manufacturers specifications. In the event emergency repairs are required to be completed onsite, place impermeable liners (e.g., tarpaulins, spill trays) beneath vehicles/equipment to contain any drips, leaks, or spills. • Establish and implement a re-fueling procedure, to be followed throughout construction activities (e.g., drip tray will be placed beneath the fueling ports to catch any potential spills or releases, do not leave fuel nozzle when fueling). • Store hydraulic oils, solvents, or potentially hazardous fluids within appropriately sized secondary containment trays while not in use. • In the event fuel is stored onsite, ensure an impermeable and adequately sized drip tray/container is placed underneath at all times. • Implement a spill response and Reporting plan prior to construction start. Train all on-site personnel in the prevention and cleanup of spills. • Ensure appropriate spill kits are available in construction vehicles and major mobile and/or stationary equipment on site. • Emergency access to the site will be maintained at all times for emergency response traffic. • Follow Transportation of Dangerous Goods (TDG) requirements as applicable (e.g., during delivery of fuel). • Construction wastes and hazardous materials (e.g., gasoline, diesel, etc.) will be stored within a secured, designated area on site with proper labelling per Workplace Hazardous Materials Information System (WHMIS) requirements. Ensure Safety Data Sheets (SDS) will be readily available. • Report spills as required by the Spill Response and Reporting Plan, including reportable spills to AEP as required.

Soils and Terrain	• Unexpected discovery of contamination	• Should historic contamination (e.g., stained earth, odors, oily residues, buried debris, etc) be identified on site, pause work immediately Where the

Environmental Elements	Potential Environmental Effects	Proposed Mitigation Measures
		identity/source of the contamination is not immediately obvious, coordinate with a qualified professional to identify and delineate the historical contamination and to develop a procedure for remediating and monitoring the contamination, as appropriate. • Dispose of contamination clean up materials as directed by a qualified professional, and in accordance with regulatory requirements. • Should the situation represent an emergency, comply with the requests of HAZMAT and County Fire Department. As required, report discovered contamination per the AEP Release Reporting Guidelines.
Groundwater	• Change in groundwater quantity	• Ensure any required municipal and provincial permits and/or approvals are obtained and adhered to if dewatering of groundwater or accumulated surface water in excavated areas is required.
Vegetation	• Introduction or spread of weeds listed in the Alberta Weed Control Act	• All equipment must arrive at the project site clean and free of soil and vegetative debris. • Ensure access or rig matting that may be required for construction arrive at the project site clean and free of soil and vegetative debris. • Access construction work areas from approved access roads/trails. • Monitor topsoil piles for weed growth during construction and implement corrective actions as required (i.e., spraying, mowing, hand pulling) to avoid spread and infestation. • Document instances of found or suspected Prohibited Noxious and Noxious weeds in the Project footprint prior to initiating weed control. • Use mechanical methods for weed control within 100 m of the adjacent ephemeral waterbody or catch basin, where possible. • Stake the Project footprint/work areas prior to clearing to avoid inadvertent trespass. Limit construction activities to the staked boundaries.

Wildlife	• Potential disturbance to wildlife (sensory disturbance) and wildlife habitat. Potential change in wildlife health/mortality.	• Stake the Project footprint/work areas prior to clearing to avoid inadvertent trespass. Limit construction activities to the staked boundaries. • Where possible, schedule construction activities outside of the general migratory nesting period (approximately mid-April to late -August). • In the event that vegetation clearing and site grading activities occur within the migratory bird breeding period, conduct a wildlife/bird nest sweep of the Project

Environmental Elements	Potential Environmental Effects	Proposed Mitigation Measures
		footprint plus 100 m buffer by a qualified biologist prior to these activities, in accordance with relevant guidelines. • If active nest or niche sites are found, pause work in the area and consult with a qualified wildlife biologist to determine appropriate mitigation measures, in consultation with AEP as required. • Adhere to posted speed limits and road/traffics rules to prevent accidental wildlife collisions. • Maintain noise abatement equipment on machinery in good working order. • Do not harass or feed wildlife. Communicate this requirement during the Project orientation. • All food and garbage will be stored in containers that can be secured from wildlife. • Store construction and domestic waste within wildlife-proof containers. Remove waste from site frequently to avoid attracting wildlife.
Historical Resources	• Incidental discovery of historical resources	• Report any incidental discovery of historical resources under the guidance of the Historical Resource Act: Reporting the Discovery of Historic Resources (GOA 2021) document.
Atmospheric and Acoustic Environment	• Air emissions • Increased noise levels	• Maintain vehicles and equipment per manufacturer's specifications. • Maintain noise abatement equipment on machinery in good working order. • Schedule high noise construction activities for daytime hours (e.g., 7:00 am to 9:00 pm (weekdays) and 9:00 am to 9:00 pm (weekends), in accordance with Foothills County Community Standards Bylaw (M.D. of Foothills No. 31 2013). • Ensure construction vehicles follow posted speed limits. • Turn off construction equipment when not in use, where practical. Avoid idling of vehicles. • Appy appropriate dust suppressant to access routes, if required. • Postpone dust generating activities during periods of high winds, where practical. • Stabilize worksite entrances to minimize the tracking of onsite material offsite and onto public roadways, as practical.

6.3 Construction Site Diagrams

Provide scale diagrams of the site and surrounding area identifying locations of construction activities. Include:

- location of construction activities; and
- locations of areas designated for infrastructure and equipment, waste storage, control, treatment, incineration, and disposal during construction.

All construction activities and areas will be limited to the Project footprint. The Project construction site layout is provided as Figure 6-1 (Appendix B).

6.4 Salvage and Handling of Reclamation Materials

Describe how reclamation materials will be salvaged and handled during construction. Include:

- protocols and equipment that will be used to ensure optimal soil salvage during construction (e.g., suspending and recommencing topsoil salvage when field conditions will result in the mixing, loss, degradation, or compaction of topsoil);
- depths and horizons of soil planned for salvage;
- special procedures that will be used to address any problem soils/subsoil/spoil;
- quality control measures that will be employed during construction (An example might be the use of Professional Agrologists or Foresters); and
- confirm that "as-built" details for soil materials will be permanently kept on record.

Topsoil salvage and handling will be conducted following the relevant mitigation measures in Table 6-2. Variable depth excavation equipment will be used to minimize admixing between topsoil and subsoil. Soil stripping activities will be monitored to verify that soil is stripped to the correct depths, topsoil and subsoil are not mixed, and that soils are placed in the appropriate stockpiles.

All available topsoil and subsoil stripped from the Project footprint will be salvaged and conserved in stockpiles on site for future reclamation, see Figure 6-1 (Appendix B). Excavated common material will be used in a cut and fill strategy to achieve specific grades within the Project footprint, with excess material also stockpiled on site for reclamation purposes.

Based on the 2022 PDSA, mean and median topsoil depths (A horizon, rounded) are 21 cm and 22 cm respectively (EDI 2022). The topsoil from this depth interval will be stripped and salvaged for reclamation. Where designated as good the colour change between the topsoil (A horizon) and the subsoil (AB horizon or B horizon) will be used as a stripping guide.

There were no problem soils or subsoils identified within the Project footprint during the pre-disturbance soil assessment. In the event adverse or wet conditions are encountered during soil stripping and salvage activities, rig matting, the use of low pressure/tracked equipment, or the postponement of stripping activities may be necessary to avoid or reduce mixing, loss, degradation, or compaction of topsoil (see Table 6-2).

As built details for soil materials will be permanently kept on record.

6.5 Storage of Reclamation Materials

Identify the location and describe the method by which reclamation materials will be stored during and after construction. Include:

- storage methods (e.g., direct placement, stockpiles, or windrows);
- storage locations provided on a map;
- method for maintaining access (e.g., separation distances from other objects and stockpiles (preventing encroachment by future activities));

- types of material (e.g., topsoil, subsoil, or spoil); and
- methods to control erosion and prevent degradation of the stored material (e.g., seeding, vegetation, and weed control).

All topsoil and subsoil will be stockpiled onsite, stockpile locations are shown in (Figure 6-1 (Appendix B). Salvaged topsoil will be piled within two storage stockpiles along the north and west sides of the Project footprint. One
subsoil stockpile will be placed on west side of the Project footprint between the facility and the west topsoil stockpile, providing a mitigating feature between Project industrial operations and the topsoil piles.

A minimum 1 m separation distance will be maintained between the stockpiles to prevent admixing. The stockpiles will be placed to allow direct access to reclamation materials and to avoid rehandling (i.e., subsoil stockpiles placed closest to the facility as it will be placed first during reclamation, topsoil stockpiles placed furthest as topsoil will be replaced last).

No problem soils (spoil) have been identified at the Project footprint . It is not anticipated that spoil stockpiles will be required; however, if problem soils are discovered during construction, spoil piles will be stockpiled separately from topsoil and subsoil.

Erosion and sediment control measures for stockpiles will be implemented as described in Table 6-2. Seeding and
revegetation will occur as a control measure to mitigate erosion and sediment transport as well as to prevent
establishment of weed species. Temporary, erosion and sediment control measures will also be implemented, as required. Weeds will be managed as per the Weed Control Act (see Table 6-2).

6.6 Timber Salvage and Woody Debris Management

Describe how timber will be salvaged and non-merchantable timber and woody debris will be managed prior to and during construction.

There is no merchantable timber within the Project footprint.

6.7 Contamination Identification, Assessment, Remediation, and Risk Management

For construction on contaminated or potentially contaminated land, describe how contamination will be identified, assessed, and remediated before construction, and/or how it will be risk managed through the construction period.

No evidence of historical contamination on the Project footprint has been found (see Section 4.3.4). In the event of unexpected discovery of contamination, the relevant mitigation measures in Table 6-2 will be implemented.

6.8 Contamination Avoidance, Minimization, or Management

Describe and assess how contamination of the soil, groundwater, surface water, and air will be avoided, minimized, or managed during construction using approaches identified in Section 5. Include:

- construction and use of temporary sites for handling, recycling, storage, and/or disposal of waste, include:
  - berms, liners, tankage and other secondary containment;
  - control systems for runoff collection, treatment, and re-use;
  - method of leak detection; and
  - control and management of fugitive emissions and dust.

Mitigation measures to avoid and minimize potential contamination to soil, groundwater, surface water, and air
during construction are outlined in Table 6.2. A construction site layout showing the temporary waste and recycling storage location is provided as Figure 6-1 (Appendix B).

6.9 Construction Releases and Disposal Methods

For releases during the construction phase, provide process flow diagrams with mass balances and flow directions, as well as pertinent calculations, models, and reliable literature sources for each air emission or wastewater stream you propose to release, as well as the release or disposal method. Include:

- identified substances of concern and how their potential effects on the environment will be prevented or mitigated;
- their anticipated volumes, rates, and amounts during normal and upset conditions; and

- proposed monitoring for performance evaluation of the treatment and release system.

No air emissions or wastewater stream releases are planned during the construction phase.

6.10 Environmental Release Monitoring

Describe how environmental releases will be monitored and identify the location of existing and planned infrastructure for environmental monitoring during construction.

No air emissions or wastewater stream releases are planned during the construction phase. However, environmental monitoring during construction will be completed as per the Environmental Protection Plan which will be prepared prior to construction.

6.11 Ambient Monitoring

Identify and describe the location of all equipment that will be used for ambient monitoring at the site during construction.

No ambient monitoring is proposed during the construction phase.

7 Operation

7.1 Record Keeping

Describe the record keeping procedures to maintain copies of the application and correspondence with Alberta Environment and Sustainable Resource Development.

Records related to the EPEA application, approval and AEP correspondence will be stored and managed electronically, with hard copies of the EPEA approval being stored onsite during operational activities. Prior to commencing operations, Rimrock will develop Standard Operating Procedures (SOPs) for record keeping and management for the Project.

7.2 Maintenance and Quality Management

Further to 5.12 and 5.24, describe the maintenance and quality management (operating procedures) proposed for release monitoring and performance evaluation.

Prior to commencing operations, Rimrock will develop SOPs for equipment maintenance, release monitoring and performance evaluation to meet EPEA approval conditions, as required.

7.3 Joint Delivery of Monitoring Program

For 7.4 and 7.5, if this monitoring is proposed to be jointly delivered, identify the agency or group that will be performing the work (e.g., an airshed zone) and provide the pertinent information regarding their monitoring network.

The Project is located within the Calgary Regional Airshed Zone (CRAZ). SO_2, NO_2, and O_3 monitoring stations exist to the north, northwest, south and southwest of the Project footprint (CRAZ 2022). Ambient air quality monitoring conducted by CRAZ at the Calgary Southeast monitoring station will be used to provide representative ambient air quality information for the Project.

7.4 Ambient Air-Monitoring Network and Associated Operating Procedures

Further to 5.25, describe and assess the suitability of proposed ambient air- monitoring network and associated operating procedures to meet requirements. Include:

- the parameters to be monitored;
- the monitoring frequency;
- the monitoring methodology;
- quality assurance processes for the equipment; and
- the rationale for selecting these monitoring locations.

As maximum predicted ambient concentrations of emissions associated with the Project are well below the
AAAQO, no on-site monitoring stations are proposed. As described in Section 7.3, ambient air quality monitoring conducted by CRAZ at the Calgary Southeast monitoring station will be used to provide representative ambient air quality information for the Project.

7.5 Ambient Water Quality Monitoring

Further to 5.13, describe and assess the suitability of proposed ambient monitoring of the receiving environment (e.g., watercourse) and operating procedures to meet requirements. Include:

- proposed confirmatory ambient water quality sampling and analysis recommendations, including frequency;
- proposed toxicity, biologic, or sediment quality monitoring and analysis recommendations, including frequency;
- quality assurance processes;
- the rationale for selecting the monitoring locations; and

- proposed notification and contingency plans in the event access becomes restricted.

See Section 5.8, no wastewater will be released directly from the Project footprint to a receiving watercourse or waterbody. Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels in accordance with the MOU.

7.6 Periodic Wastewater Characterization Testing

Further to 7.2 and 7.5 submit a proposal for a periodic wastewater characterization testing, with comparison to existing data.

See Section 5.8, no wastewater will be released directly from the Project footprint to a receiving watercourse or waterbody. Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff until it is transported offsite for application to land parcels in accordance with the MOU. A
Nutrient Management Plan will be developed for the Project to ensure land application and spreading satisfies the requirements of the MOU, including periodic digestate characterization.

7.7 Record Keeping Procedures

For 7.2 to 7.6 describe the record keeping procedures to meet applicable requirements.

Recordkeeping procedures for the Project will be developed to meet the retention and security requirements of the EPEA approval, as well as the requirements of other relevant agencies (e.g., NRCB).

7.8 Reporting Procedures

For 7.2 to 7.6 describe the reporting procedures to meet applicable requirements.

Reporting procedures for the Project will be developed to meet the reporting requirements of the EPEA approval, as well as the requirements of other relevant agencies (e.g., NRCB).

7.9 Spill Response and Reporting Plan

Confirm in writing that a spill response and reporting plan for the plant or facility has been developed.

A preliminary Spill Response and Reporting Plan has been developed for the Project. The preliminary Spill Response
and Reporting Plan will be updated prior to construction and operation of the Project and periodically during operations, as required.

7.10 Storage, Treatment, and Monitoring Systems Related to Wastewater, Runoff, and Sludge

Confirm in writing that procedures and plans for storage, treatment, and monitoring systems related to wastewater, runoff, and sludge have been developed. In particular:

- operation and maintenance procedures; and
- contingency plans for upset, repair, and maintenance periods.

No wastewater will be released directly from the Project footprint to a receiving watercourse or waterbody. Liquid digestate will be diverted to the digestate pond where it will be held temporarily along with stormwater runoff
until it is transported offsite for application to land parcels in accordance with the MOU. Sections 5.6 to 5.8 outline
materials storage and runoff control measures, including installation of secondary containment and stormwater collection infrastructure.

7.11 Air Emission Control Equipment Maintenance Surveillance and Repair Plans

Further to Section 5, confirm in writing that scheduled air emission control equipment maintenance surveillance and repair plans have been developed.

Emission control equipment maintenance will be conducted in accordance with relevant vendor manuals and SOPs created for the Project, and in accordance with relevant EPEA approval conditions.

7.12 Monitoring Substance Releases to Groundwater and Reporting Requirements

Describe how substance releases to groundwater will be monitored, managed and reported. Provide the rationale for why groundwater monitoring will not be conducted if the activity is not listed in Appendix B.

A groundwater monitoring program will be implemented for the Project to establish baseline conditions prior to operations and to monitor groundwater during operations.

Nine groundwater monitoring wells are proposed to be installed and surveyed to establish a groundwater elevation and baseline groundwater quality, see Figure 4-3 (Appendix B).

Hydraulic gradient will be calculated for applicable wells, and representative groundwater samples will be taken by a qualified professional to be analyzed for:

- pH
- Salinity
- Nutrients
- Electrical Conductivity
- Major Ions
- Dissolved Metals
- Total Dissolved Solids

Groundwater samples will be sent to a licensed environmental laboratory for analysis.

Quarterly g roundwater sampling frequency is proposed during the first two full operating years to assess high and low seasonal groundwater fluctuations and groundwater quality and quantity, after which the sampling frequency is proposed be semi-annual (to assess groundwater quality).

Groundwater monitoring results will be recorded and reported to AEP in accordance with requirements specified in the EPEA Approval. Records of the groundwater monitoring program will be maintained electronically.

7.13 Other Monitoring Programs for Substance Releases to Groundwater

In addition to the monitoring programs referred to above, describe how any other programs will identify, control, manage, monitor, and report on points of known and potential substance release to the groundwater.

As described in Section 5.6, shallow observation (dry) well will be connected to a perforated tile system that will be
constructed beneath belowground storage tanks. During operations, the observation well will be monitored and checked for leaks. The assessment frequency for the inspecting the shallow observation well will be included in SOPs developed for the Project.

7.14 Monitoring Substance Releases to Soil

Describe how releases from other media to soil will be monitored, managed, and reported, for example:

- air deposition, such as acid deposition (if any monitoring has been completed under the Air Monitoring Directive, provide a summary of the results); and
- groundwater discharge.

Acid deposition is not expected to result from Project operations. In the unlikely event of a media discharge or
accidental release to the environment, the response, mitigation and reporting measures in the project-specific Spill
Response and Reporting Plan will be implemented. In the event remedial activities and/or monitoring are determined to be required as a result of a discharge or release, an appropriate plan will be established and implemented by a qualified professional.

7.15 Third-Party Waste

If the plant or facility will accept third-party waste, describe the procedures for:

- acceptance of waste;

- safe waste transfer at the plant or facility, including procedures for tank hook up, loading, and unloading;

- labelling of waste drums and prevention of incompatible wastes mixing;
- completing and tracking storage volumes with respect to capacity (maintaining waste inventory);
- inspecting secondary containment (leaks), tank integrity, and liner integrity, including a description of the contingency plan for corrective actions.
- control of contaminants, dust, odours, noise, vectors, vibration, and truck traffic to protect offsite neighbours; and
- control of site access for the safety of staff and potential trespassers.

A description of livestock manure and off-farm organic food resources acceptance, handling and tracking at the facility is provided in Section 5.1.3. Relevant material storage and secondary containment design, and monitoring measures are described in Sections 5.6 and 5.7.

Onsite staging of livestock manure and off-farm organic food resources will be limited in duration, given the continuous nature of facility operations. As described in Section 5.1.3, livestock manure and off-farm organic food resources will be diverted to the digester tanks which are a closed system. This will result in a net reduction in potential area odour sources, especially given the resulting digestate is a notably less odourous product.

Additionally, SOPs for the acceptance of livestock manure and organic food resources will be developed the Project, including:

- Trucks will be weighed upon arrival and the volume of the livestock manure or off-farm organic resource food received will be recorded. An inventory of acceptance will be kept within the operational office building onsite.
- Livestock manure blend tanks and off-farm organic food resource tanks will be clearly labelled.
- Procedures will be implemented to minimize the frequency and durations that off-farm organic food resource tanks will be open, to avoid or reduce odours. Livestock manure will be staged within a building (underlain by concrete) to minimize odours.

Access to the facility will be granted to operational personnel and approved third-party personnel only. Restricted access to the facility off RR10 south of Coal Trail will be maintained through a controlled entry point. Access to the site from the east (i.e., for livestock manure from the adjacent Rimrock Cattle Company) will be private access.
Truck traffic will abide by posted speed limits and traffic regulations. Delivery of livestock manure and organic food resources will be during the day only. Dust and noise mitigation measures described in Table 6-2 will be implemented as practical.

7.16 Classification and Characterization of Wastes

Confirm in writing that the applicable methods for classifying and characterizing waste will be used.

All waste generated by the Project (e.g., general construction debris and general operation waste (e.g., active carbon, membranes, filters, sieves, used oil [as applicable]) will be properly classified and characterized as per the Industrial Waste Identification and Management Options (Alberta Environmental Protection 1996), and Alberta User Guide for Waste Managers (Alberta Environmental Protection 1996).

7.17 Contamination and Erosion Protection for Soil Storage Locations

For soil storage locations, describe how ongoing protection from contamination and erosion will be provided.

Soil stockpile locations are shown in Figure 6-1 (Appendix B). Contamination and erosion protection for soil storage locations is described in Section 6.2.

7.18 Operator Certification

If operator certification is required by legislation for an activity taking place on the site (e.g., landfill operator), or by an industry standard, provide evidence how that requirement is met.

Operator training and related certificates will be implemented in accordance with legislated and safety requirements, to be vetted as a condition of employment or assignment to the Project. All third-party contractors will be qualified within their respected field, and relevant tickets will be confirmed prior to individuals having
access to the site. All personnel working onsite will have received and will maintain appropriate legislative training and all other training necessary to perform their work in a safe manner.

8 Reclamation

8.1 End Land-Use and Land Capability Ratings

Identify and describe the end land-use and land capability ratings. Include:

- the long-term, end land-use for the site and the surrounding lands, and where applicable, the municipal zoning category (note: where the long term land use is proposed to be restricted and different than the long term land-use in the area, for example, restricting to a commercial or industrial use, the applicant must obtain a written acceptance of the restriction from the municipality before finalizing the reclamation plans);
- how the land capability ratings of the reclaimed site will be made equivalent to that of the preconstruction state; and
- implications to wildlife and/or fish habitat.

The Project footprint is situated on A (Agricultural) land adjacent to an existing confined feedlot operation, consistent with Foothills County municipal zoning. End land-use for the Project footprint will be (A) agricultural given that the adjacent/surrounding land will continue to be managed for agricultural purposes. No major foreseeable land use changes are anticipated for the land parcels surrounding the Project footprint.

Land suitability classifications within the Project footprint correspond with AGRASID Polygon ID 11880, Decile 10, Class 2, Subclass H, see Section 4.3.1, Table 4-3. The land capability (Class 2H) and predominant soils (Orthic Black Chernozems) are arable and hold only slight limitations to crop productivity associated with climate/temperature (EDI 2021c).

Soil suitability for reclamation is expected to be good based on soil salvage potential and soil physico-chemical properties (texture, organic matter, and nutrient content) (Section 4.3.2, Table 4-5). Appropriate soil conservation practices will be applied (see Sections 6.4 and 6.5), as such end land-use capability (ELC) is expected to be achieved following reclamation of the Project.

No waterbodies or watercourses occur within the Project footprint and there were no indicators of wildlife nest/niche features and/or habitat observed within or adjacent to the Project footprint during field assessments (see Section 4.5). Reclamation of the Project footprint is not expected to result in any adverse effects on fish, wildlife and/or fish/wildlife habitat.

8.2 Reclamation of Landform, Drainage, and Watercourses

Describe the proposed reclamation of landform, drainage, and watercourse(s). Include:

- how they will be integrated with adjacent land use;
- a plan for re-contouring (post-reclamation topography and landform design); and
- the stability of slopes and lakes;

No waterbodies or watercourses occur within the Project footprint; therefore, no reclamation of waterbodies or watercourses is anticipated.

The Project footprint is located on level terrain with small micro-topographical undulations. The Project footprint and surrounding area have been deemed stable with low to moderate potential for erosion (EDI 2021c). During decommissioning, all equipment and facilities (including piles and support infrastructure) will be dismantled, and Project-related debris and waste materials will be removed from the Project footprint to an approved waste facility.

During reclamation earthworks, reclamation material (i.e., soils salvaged during construction and stockpiled or used in cut-and-fill development of the Project) will be used for backfilling of the digestate pond and freshwater
reservoir, and for re-grading and re-contouring the Project footprint to be consistent with the predominant
topography and surface drainage patterns, and to tie into the existing elevation of adjacent lands. The movement and management of reclamation materials will be conducted in a manner and sequence that minimizes

transportation and handling, and in accordance with a Project-specific reclamation plan to be developed closer to decommissioning. Soil erosion, compaction and rutting will be minimized to avoid adverse effects on soils and their future growing capability.

8.3 Replacement of Reclaimed Soil

Provide a plan for replacing reclaimed soil that is compatible with the end land use. Include:

- the practices and principles that will be used;
- method to achieve acceptable soil quantity;
- depth and volume of the replaced soil, and the soil/materials balance, required to achieve reclamation goals;
- method to achieve acceptable chemical and physical soil quality;
- how and where de-compaction will occur (e.g., roads); and
- erosion control methods.

The practices and principles that will be used for reclamation will reflect relevant directives, standards, and best management practices at the time, and will be identified in a Project-specific reclamation plan to be developed at a time closer to decommissioning. The following reclamation benchmarks identify land use objectives, minimum standards and requirements related to the replacement of reclaimed soil which will be used to inform the Project-specific reclamation plan and facilitate re-instatement of ELC (EDI 2021d):

- Following reclamation earthworks, salvaged topsoil will be replaced and redistributed in a manner that meets minimum requirements for soil quality and quantity (i.e., in relation to the pre-disturbance condition).
- Topsoil must have similar characteristics (i.e., texture) to pre-disturbance conditions and meet Required Replacement Depths (RRD) referring to a minimum of 80% of the average pre-disturbance A horizon values.
- Admixing will be minimized.
- Subsoil will have an average bulk density less than 120% of the adjacent/control values.

All available topsoil and subsoil stripped from the Project footprint will be salvaged and conserved in stockpiles on site for future reclamation, see Section 6.4. Excavated common material will be used in a cut and fill strategy to achieve specific grades within the Project footprint, with excess material also stockpiled on site for reclamation purposes. No soil material is proposed to be hauled offsite (i.e., all conserved for reclamation purposes), and measures to control erosion and prevent degradation of the stored material will be implemented (see Section 6.5).

A preliminary reclamation balance is provided in Table 8-1. All materials are proposed to remain on site for use in reclamation, so any deviations these volumes as a result of actual conditions during construction will not impact the final reclamation balance for the Project footprint.

Table 8-1: Preliminary Reclamation Balance

Reclamation Balance[1]	Approximate Volume (m^3)
Cut	361,000
Fill	167,000
Topsoil Stockpile	61,000
Subsoil Stockpile	56,000

Common (used for site grading)	117,000
Common Material Stockpile	85,000

Notes:
[1]Approximately 10,000 m3 has been estimated for import, to create the required road structure.

The predominant soils within the Project footprint (Orthic Black Chernozems) are arable and compatible with and suitable for achieving the end land-use (EDI 2021c). Soil suitability for reclamation is expected to be good based on soil salvage potential and physico-chemical properties (texture, organic matter and nutrient content). It is anticipated that equivalent land capability can be achieved following reclamation of the Project footprint without intensive management inputs (e.g., supplementary soil, intensive fertilizer/organic matter amendment) (EDI 2021d).

Once excavated features have been backfilled and the final landscape grade and contours re-instated (see Section 8.2), topsoil and remaining subsoil will be replaced according to their original soil horizon order. Based on the 2022 PDSA, the average required post-construction minimum replacement depth for topsoil is 16.3 cm (EDI 2022). Prior to topsoil replacement, features prone to compaction (e.g., roads, high-traffic areas and lay-downs) will be de-compacted using a 'subsoil ripper', 'chisel plow' or equivalent to promote subsoil aeration and water infiltration.
Topsoil will then be appropriately redistributed across the Project footprint in preparation for seeding. Erosion and sediment control measures will be installed where required to mitigate water and wind erosion. Soil replacement and inspection of erosion and sediment control measures will be guided by the construction standard at the time of reclamation.

8.4 Revegetation

Provide a plan for revegetating the site. Include:

- type of vegetation and species list;
- seed/seedling source and quality;
- seeding rates, stocking rates (reforestation), and methods;
- weed management;
- fertilization rates and methods;
- wetlands (e.g., establishment of riparian species);
- wildlife habitat;
- time to achieve revegetation; and
- method for measuring revegetation success.

The Project footprint is located on privately-owned cultivated land. It is expected that this land use (or a similar agricultural land use) will be continued following decommissioning and reclamation; however, the final revegetation objective will be decided in consultation with the landowner including selection of seed mixtures, vegetation management, and reclamation timelines.

The following considerations will be incorporated into a revegetation plan, which will be included in the Project- specific reclamation plan to be developed at a time closer to decommissioning:

- After major earthworks and topsoil replacement, the Project footprint will be revegetated as soon as practicable in a manner that aligns with end land-use and land management objectives.
- Given that post-closure agricultural land-use (e.g., cultivated cropland vs. hayland or tame pasture) has yet to be determined, the Project footprint specific revegetation plan (i.e., comprising intended seed mix (source and quality/grade), seeding application method and rate (broadcast vs. drill seeding), fertilization application method and rate) will be developed in consultation with a vegetation specialist and the landowner.

- Fertilization application method and rate will be developed in consultation with a vegetation specialist and the landowner, and will be integrated in the revegetation plan at a time closer to Project
  decommissioning.
- Construction equipment will be visually inspected prior to earthworks for any vegetative debris, as not to introduce weeds or invasive species to the reclaimed lands.

Depending on post-closure agricultural land-use and vegetation cover type, the anticipated timeline for revegetation to achieve a productive and vigorous crop or vegetation cover will be approximately 2 to 3 years post- reclamation followed by an additional/contingency period (1 year) for potential maintenance and aftercare. During this timeframe, weeds will be managed (e.g., using a combination of pre-emergent and /or broadleaf herbicide application and mowing/mechanical removal) in a manner that aligns with end land-use and land management objectives.

No waterbodies or watercourses occur within the Project footprint and there were no indicators of wildlife features or habitat observed within or adjacent to the Project footprint during field surveys. Provisions for wetland vegetation or specific wildlife habitat are not expected within the final revegetation plan.

8.5 Wastewater and Runoff Management

For releases of wastewater and runoff during and after the reclamation phase, provide the following, as applicable:

- substances of concern and how their potential effects on the environment will be prevented or limited;
- method of release or disposal;
- process flow diagrams with mass balances and flow directions
- anticipated volumes, rates, and amounts during both normal and upset conditions;
- pertinent calculations and models used;
- support from the literature for innovative treatment systems; and
- monitoring programs for evaluating the performance of the treatment and release systems.

No wastewater will be released from the Project footprint directly to waterbodies or watercourses during the reclamation phase. Stormwater collection infrastructure installed during Project construction will be retained during reclamation until any system elements (berms, ditches or ponds) need to be filled and contoured. Once the Project footprint is regraded to natural contours, runoff will likely infiltrate the soil or flow southerly towards the existing catch basin located adjacent to the southeast corner of the Project footprint. Substances of concern are not anticipated in the runoff from the Project footprint during or after the reclamation phase.

8.6 Waste Management

Describe how all wastes generated during reclamation will be managed.

The waste management programs implemented during Project construction and operations will be adapted to suit the requirements of the reclamation phase (see Sections 6.2 and 7.16).

8.7 Dust, Odor, Contaminants, and Noise Control and Monitoring

Describe how dust, odours, contaminants, and noise will be controlled and monitored to protect offsite neighbours.

Industry standard practices, such as those listed in Table 6-2 will be utilized to avoid or reduce the dust, odours, contaminants, and noise during reclamation activities.

8.8 Vapour Control and Monitoring

Describe how vapours from any remedial treatment systems will be controlled and monitored.

Remedial treatment systems are not expected to be part of the reclamation plan. If, during decommissioning, remediation of a contaminated site using a remedial treatment system is required, a remediation proposal will be provided to the AEP for approval, as appropriate.

8.9 Environmental Monitoring Infrastructure

Identify the location of existing and planned infrastructure for environmental monitoring during reclamation.

The groundwater monitoring wells discussed in Section 7.12 will be sampled during reclamation activities, where practical.

8.10 Stakeholder Involvement

Describe stakeholder involvement, including who will be involved, at what point(s), and in what manner.

Stakeholder involvement during decommissioning and reclamation of the Project may include:

- Landowners, governmental and municipal agencies, and other parties potentially affected by the reclamation of the Project will be notified prior to the commencement of the reclamation works.
- Given that the Project will remain zoned as agricultural lands following decommissioning and reclamation, the revegetation plan for the property will be completed in conjunction with the landowner.
- Landowners, governmental agencies, and other parties potentially affected by the reclamation of the Project will be notified upon completion of the reclamation works.

8.11 Contact Information

Provide the contact information and means for which questions or concerns may be directed to the facility prior to and during reclamation activities.

The current contact information for the Project is:

Scott McLean
Executive VP, Operations
Rimrock Renewables Ltd.
900, 222 3rd Avenue SW
Calgary, AB T2P
Email:smclean@tidewater-renewables.com

Prior to the start of reclamation activities, updated contact information will be provided to AEP.

8.12 Engineered Watercourses/Waterbodies

Describe and assess the effectiveness of alternatives for any proposed "engineered" watercourses (e.g., streams, lakes, wetlands). Include:

- applicable policy or regulatory requirements;
- prevention or mitigation of interactions between material with adverse chemical properties and proposed watercourse (e.g., leaching into the subsurface, lined ponds);
- flow regimes;
- contingencies for failures;
- contingency treatment;
- monitoring systems; and
- the viability of a sustained healthy aquatic ecosystem if proposed as a "compensation" watercourse.

There are no watercourses or waterbodies within the Project footprint; reclamation of the Project will not involve any engineered waterbodies or watercourses.

8.13 Effects of Reclamation and Recontouring to Watercourses/Waterbodies

Evaluate the short and long-term effects of reclamation and recontouring to watercourses. Include:

- onsite surface water quality and quantity and the viability of sustained healthy aquatic ecosystem if proposed as a "compensation" watercourse;
- nearby watercourses (quality and quantity);
- onsite and offsite groundwater quality and quantity; and
- implications to people and ecology in the area.

There are no watercourses or waterbodies within the Project footprint; there will be no effects of reclamation and
recontouring to watercourses.

8.14 Progressive Reclamation Diagram

Provide a plan that shows the footprint of disturbed land, presenting each proposed reclamation footprint section,
and highlighting its phase of reclamation. Note: on large sites it can be helpful to divide the site into different geographic areas and undertake a phased approach.

The facility site layout (see Figure 2-3) has been designed to an optimal size/area to facilitate safe construction, operations, and maintenance activities during all Project phases; no progressive reclamation is anticipated.
Reclamation of the Project footprint will occur pending decommissioning, abandonment, and closure of the facility of the facility.

8.15 Reclamation Timeline

Provide an approximate timeline for each phase of reclamation.

Reclamation will occur pending decommissioning, abandonment, and closure of the facility, which is expected to occur after approximately 50 years of operation.

8.16 Efforts to Reduce Cumulative Impacts to the Site, Adjacent Lands, and Other Associated Environmental Media

Describe how progressive reclamation will be maximized to reduce cumulative impact to the site, adjacent lands, and other associated environmental media.

No progressive reclamation is anticipated (see Section 8.14). However, final reclamation of the Project footprint to equivalent end land use will minimize the contribution of the Project to cumulative impacts.

8.17 Salvage and Handling of Reclamation Materials

Identify and describe how reclamation materials will be salvaged and handled during progressive reclamation. Include:

- protocols and equipment that will be used to ensure optimal soil salvage during construction (e.g., suspending and recommencing topsoil salvage when field conditions will result in the mixing, loss, degradation, or compaction of topsoil);
- depths and horizons of soil planned for salvage;
- special procedures that will be used to address any problem soils, subsoil, and spoil; and
- quality control measures that will be employed during construction. An example might be the use of Professional Agrologists or Foresters.

No progressive reclamation is anticipated. Salvage and handling of reclamation materials is described in Sections 6.4 and 6.5.

8.18 Storage of Reclamation Materials

Identify and describe how reclamation materials will be stored. Include:

- storage methods (e.g., direct placement, stockpiles, or windrows);
- storage locations, provided on a map;
- method for maintaining access (e.g., separation distances from other objects and stockpiles (preventing encroachment by future activities));
- types of material (e.g., topsoil, subsoil, or spoil); and
- methods to control erosion and prevent degradation of the stored material (e.g., seeding, vegetation, and weed control).

Reclamation material storage is described in Section 6.5.

8.19 Progressive Reclamation Conceptual Plan

Address 8.1 to 8.13 for progressive reclamation.

No progressive reclamation is anticipated (see Section 8.14).

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Appendix A – Authorization of Application for Approval

Alberta Government

Forms

Authorization of Application for Approval By Owner/Agent

This application must be submitted in accordance with the Environmental Protection and Enhancement Act.

An application for an Approval shall not be deemed to be filed until all the information, documents, and authorizations referenced in the application submission, and, the appropriate fee has been received by the Regulatory Approvals Centre, Alberta Environment and Sustainable Resource Development.

The application must be complete before review and processing of the application takes place.

The application **MUST** be signed by the owner or his agent, using the following signature block.

June 9, 2022

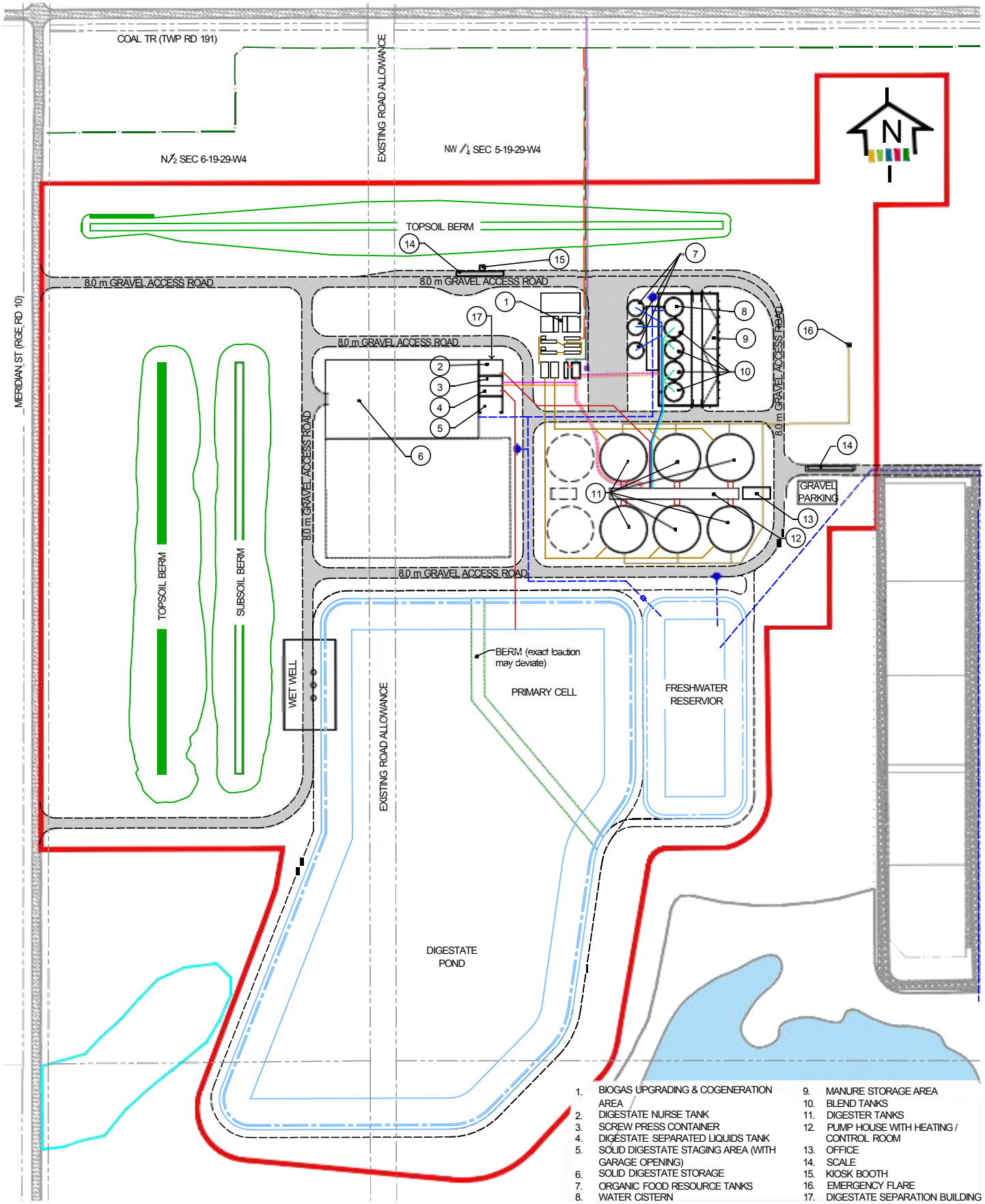
(Date)

(Signature)

EVP, Operations

(Title of Applicant)

Appendix B – Figures



ISL Engineering and Land Services

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PROJECT FOOTPRINT
WATERLINE
HEAT MEDIUM RETURN LINE
HEAT MEDIUM SUPPLY LINE
CATCH BASIN
EPHEMERAL WATERBODY
TRANSFORMER
HYDRANT
FEEDSTOCK PRESSURE LINE
DIGESTATE PRESSURE LINE
FEEDSTOCK SUCTION LINE
BIOGAS PIPE
NATURAL GAS PIPELINE
RNG PIPELINE
POWERLINE

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 2-3

Facility Site Layout

June 2022

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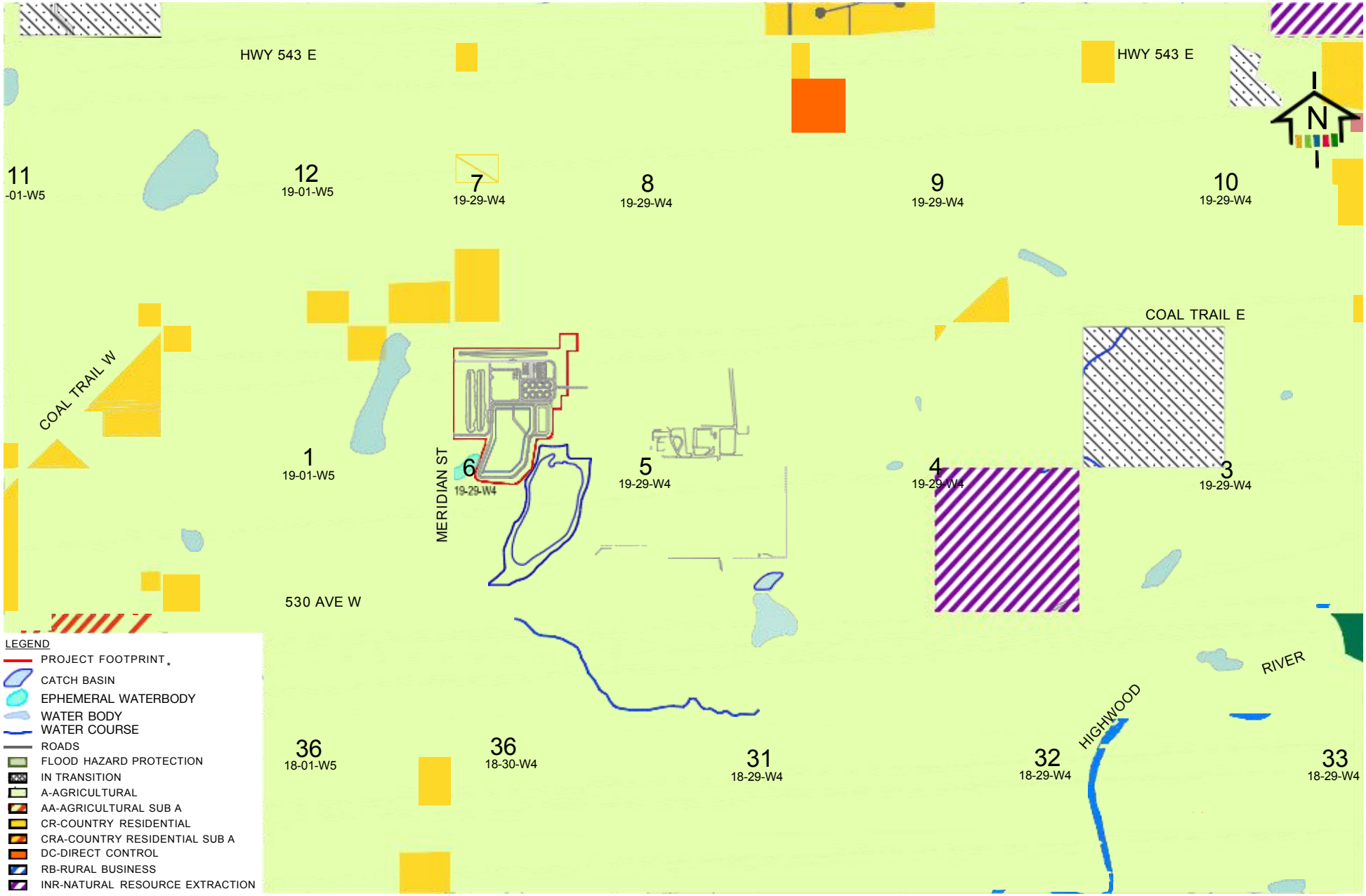

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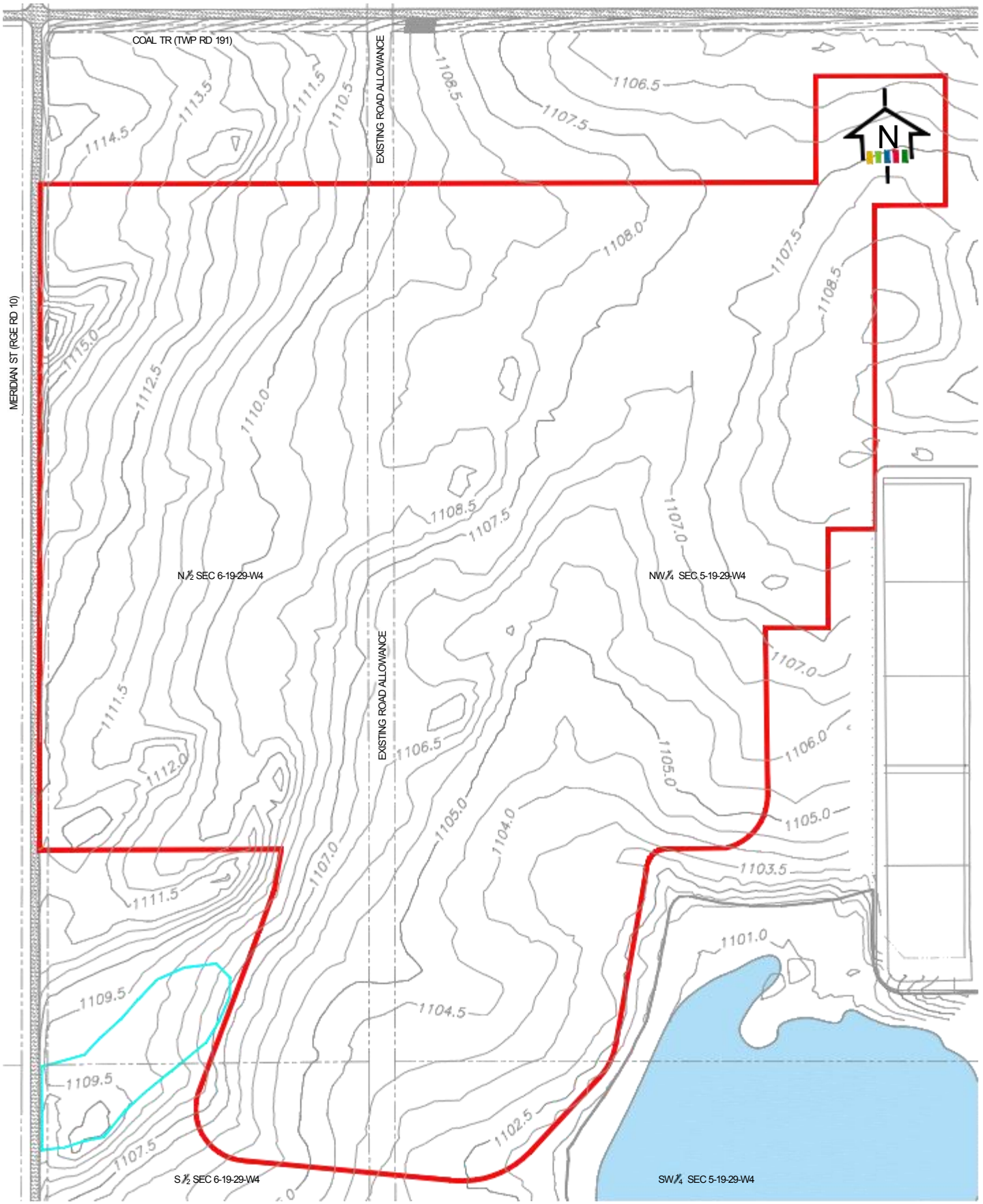
Rimrock Biodigester Facility
Foothills County, Alberta

Figure 4.1

Land Use Bylaw Map

June 2022



PROJECT FOOTPRINT
CATCH BASIN
EPHEMERAL WATERBODY

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Rimrock Biodigester Facility
Foothills County, Alberta

Figure 4-2

Current Topographic Conditions

June 2022

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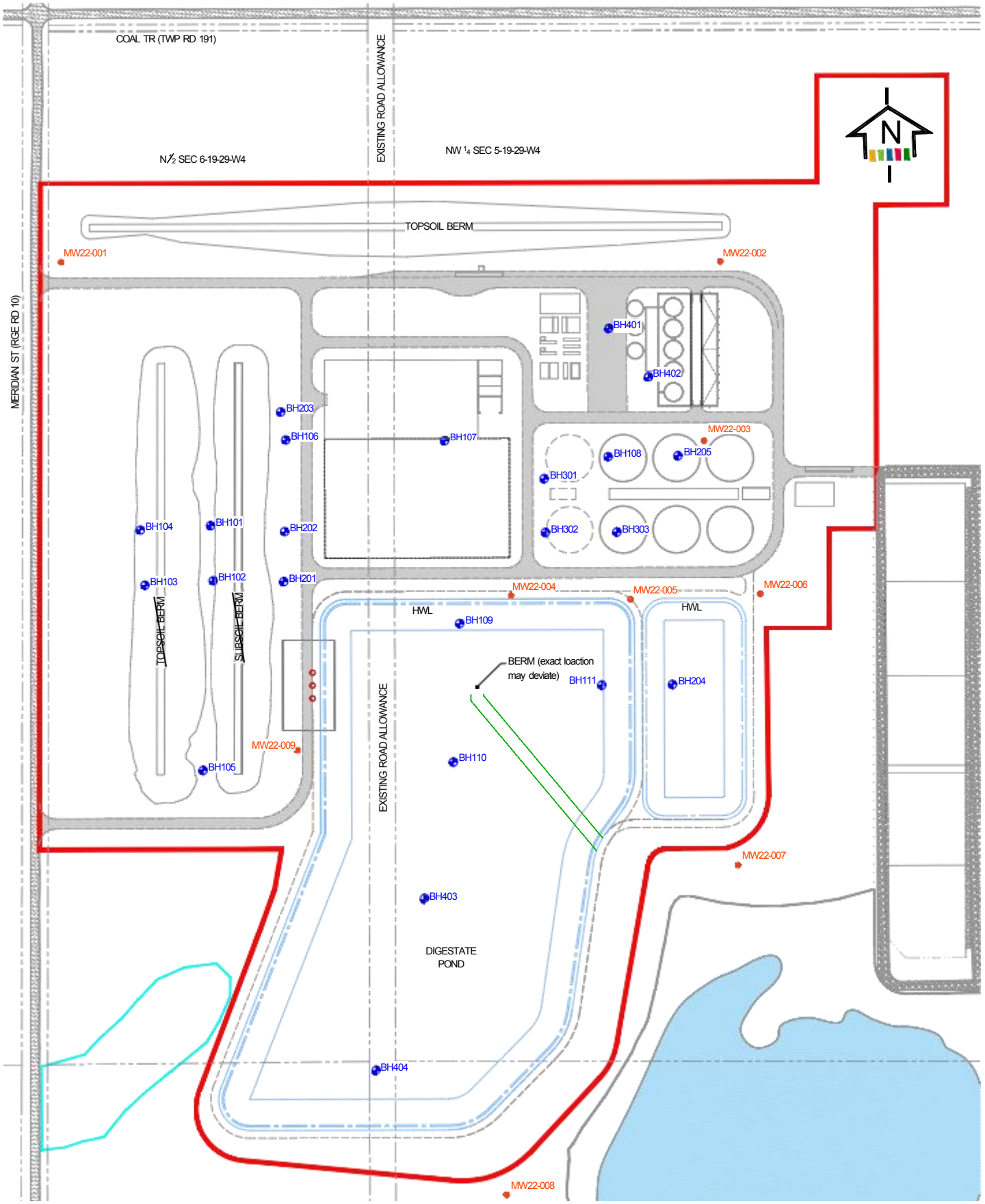

ISL Engineering and Land Services

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PROJECT FOOTPRINT
CATCH BASIN
EPHEMERAL WATERBODY
EXISTING BASELINE MONITORING WELLS
PROPOSED MONITORING WELLS

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 4-4

Existing & Proposed Groundwater Monitoring Well Locations

June 2022

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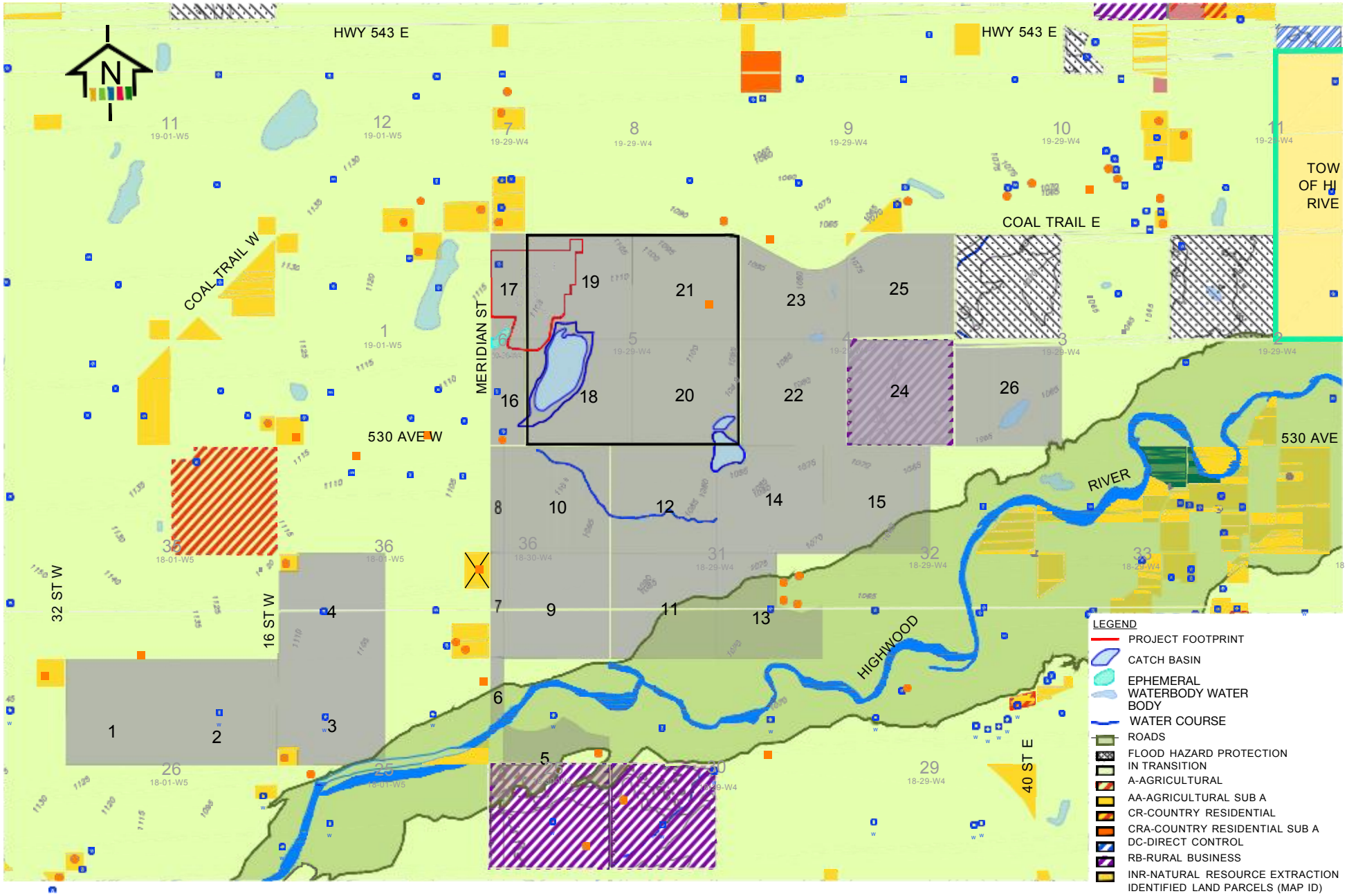

ISL Engineering and Land Services

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Rimrock Biodigester Facility
Foothills County, Alberta

Figure 4-5

Digestate Application Lands Overview:
Rimrock Cattle Company Ltd.

June 2022

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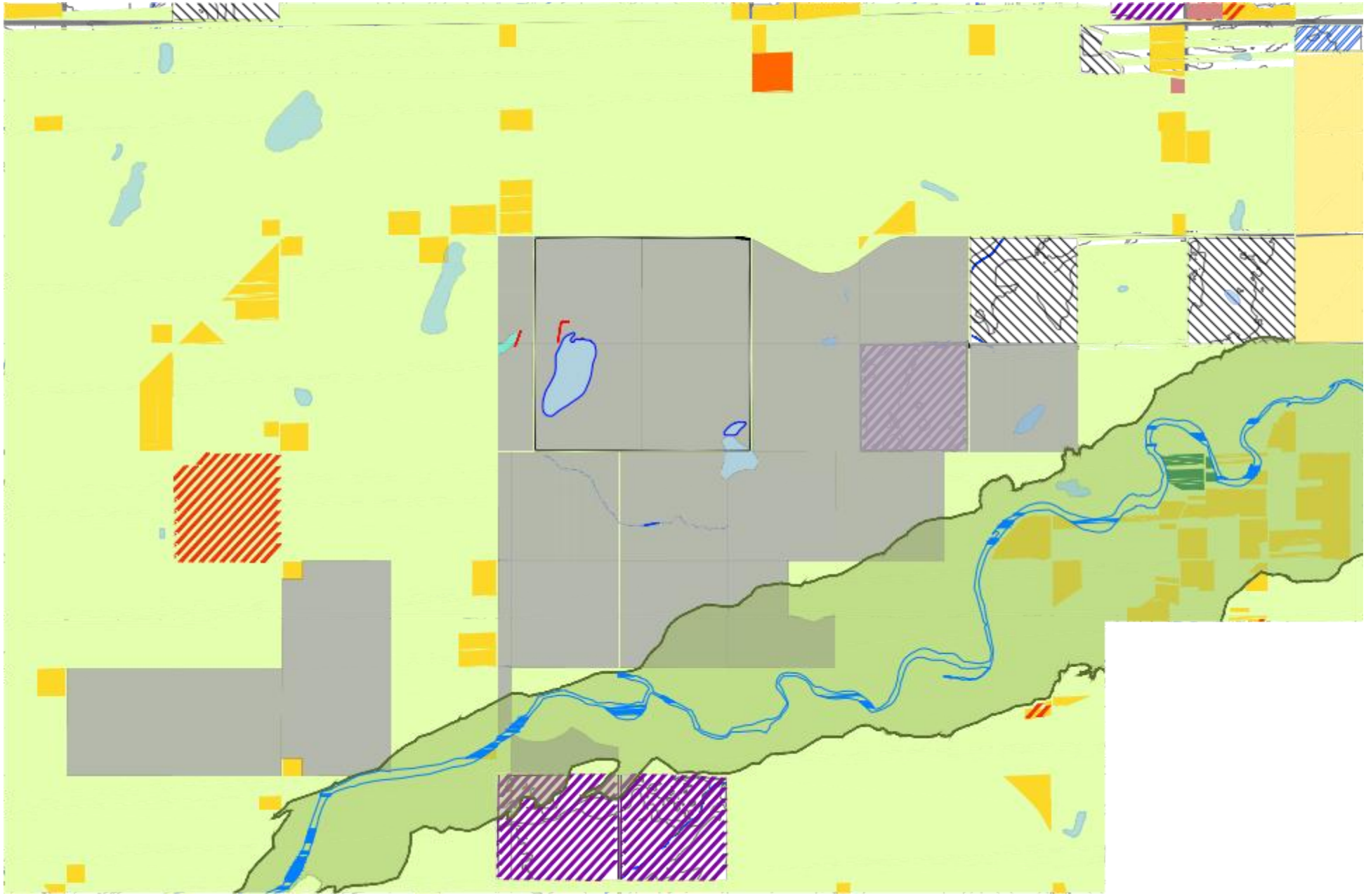

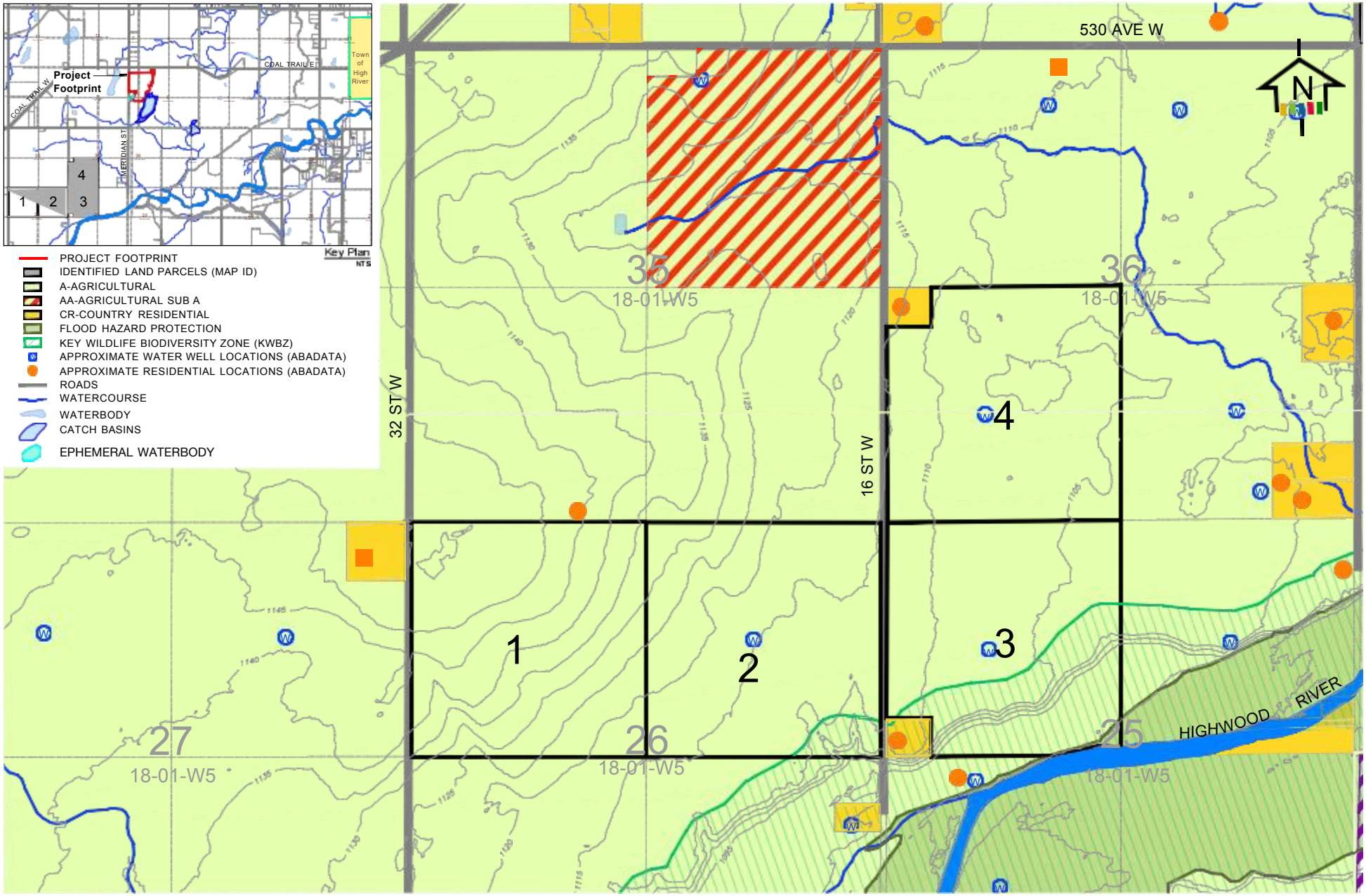

Map ID	Land Location	Description	Acres	Zone
1	NW-26-18-1-W5	West Block East 1/2	160	A
2	NE-26-18-1-W5	West Block East 1/2	159	A
3	NW-25-18-1-W5	West Block West 1/2	155	A
4	SW-36-18-1-W5	West Block West 1/2	155	A

NOTE: Acreage from 2020 Property Assessment

ISL Engineering and Land Services

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Rimrock Biodigester Facility
Foothills County, Alberta

Figure 4-6

Digestate Application Lands:
Rimrock Cattle Company Ltd. Map 1

June 2022

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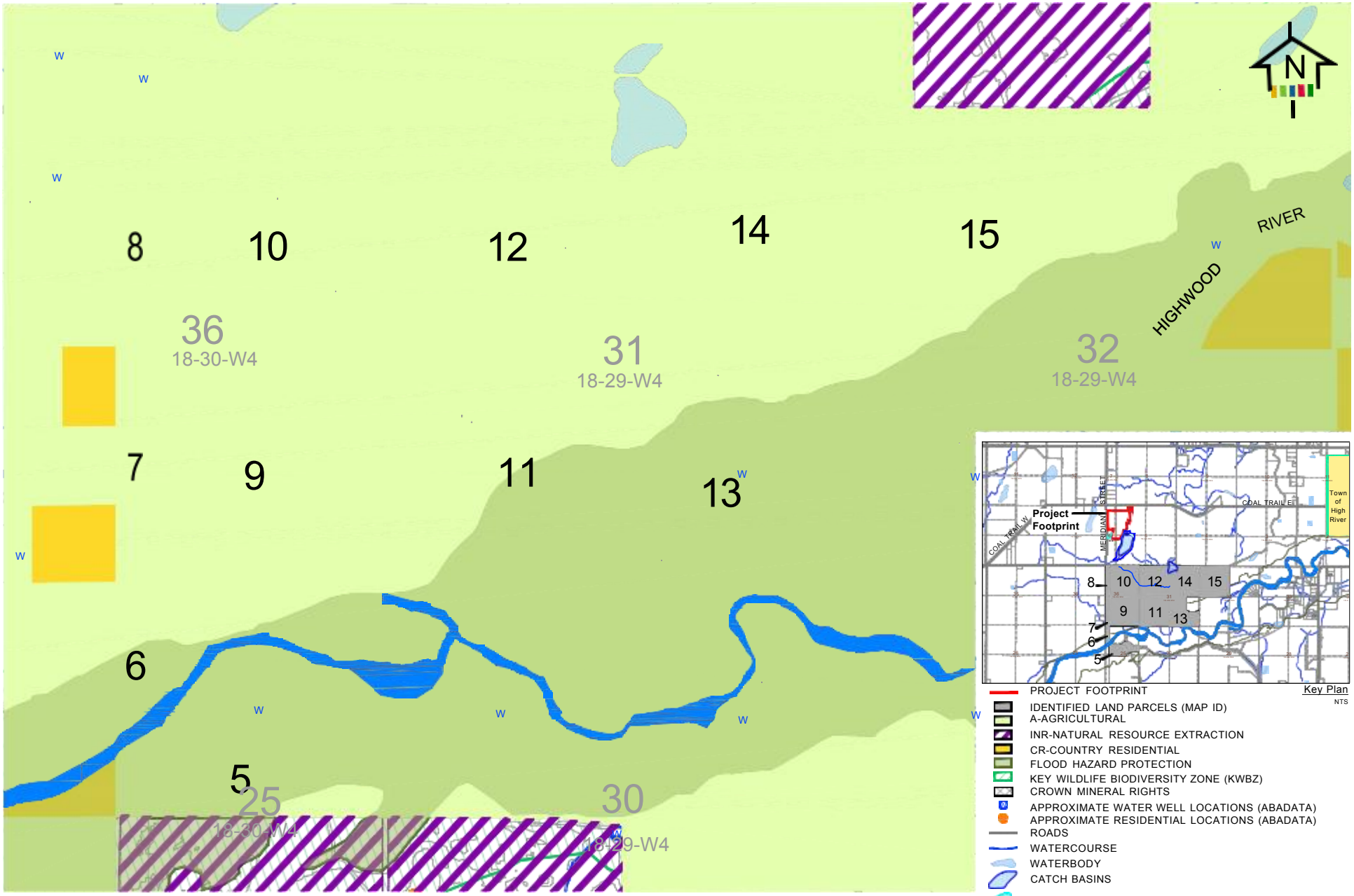

ISL Engineering and Land Services

0 200 400 m

Map ID	Land Location	Description	Acres	Zone
5	NE-25-18-30-W4	Southwest Block	42.7	A
6	NW-25-18-30-W4	Southwest Block	9.3	A
7	SW-36-18-30-W4	Southwest Block	18.9	A
8	NW-36-18-30-W4	Southwest Block	18.7	A
9	SE-36-18-30-W4	Southwest Block	160	A

NOTE: Acreage from 2020 Property Assessment

Map ID	Land Location	Description	Acres	Zone
10	NE-36-18-30-W4	Southwest Block	160.7	A
11	SW-31-18-29-W4	Lease at Rimrock	160	A
12	NW-31-18-29-W4	Southwest Block	160.7	A
13	SE-31-18-29-W4	Lease at Rimrock	122.5	A
14	NE-31-18-29-W4	Lease at Rimrock	160	A
15	NW-32-18-29-W4	Rimrock Cattle Co. Ltd	160.8	A

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 4-7

Digestate Application Lands:
Rimrock Cattle Company Ltd. Map 2

June 2022

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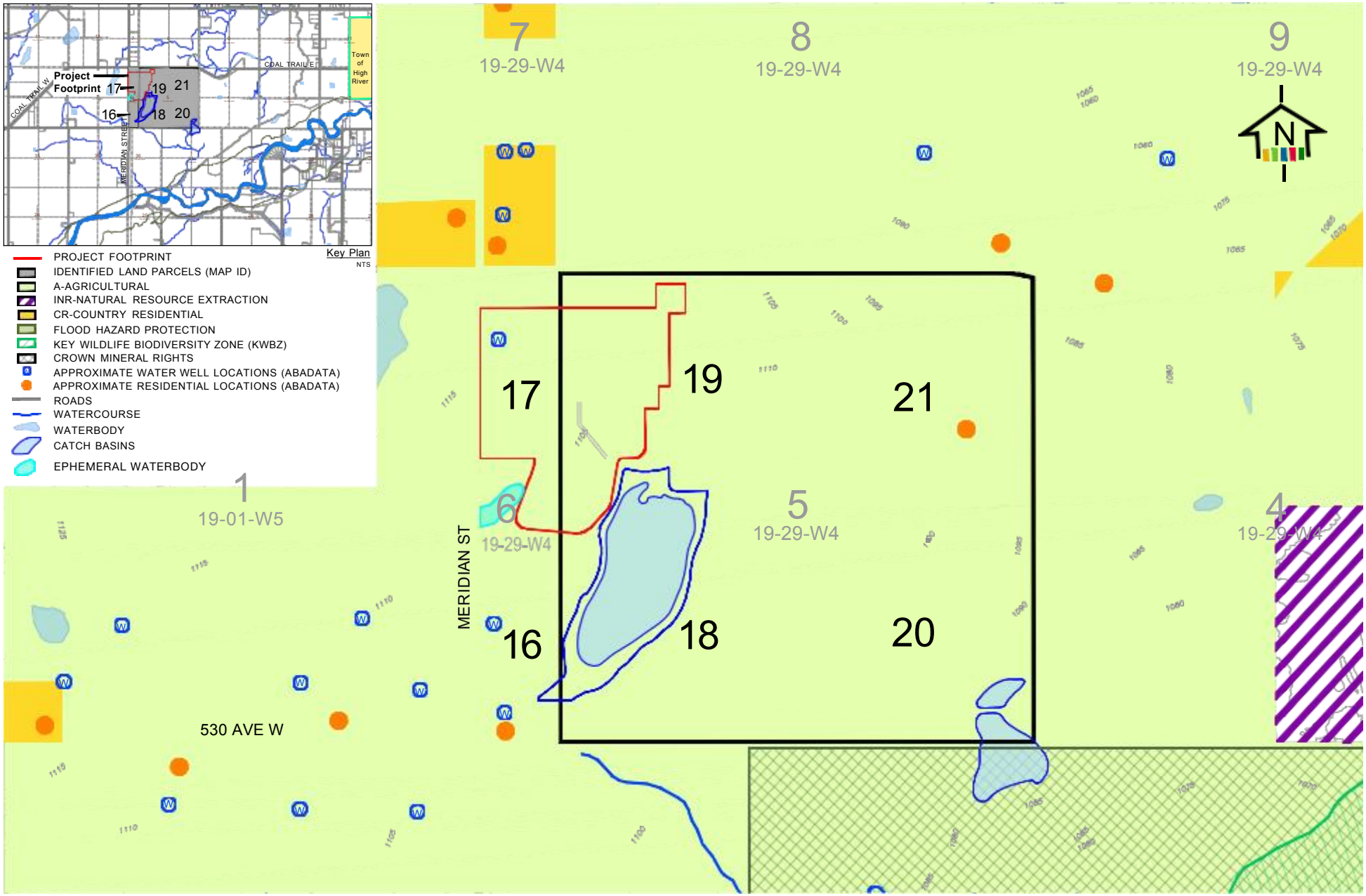

ISL Engineering and Land Services

0 200 400 m

Map ID	Land Location	Description	Acres	Zone
16	S 1/2-6-19-29-W4	Rimrock Cattle Co. Ltd	49.6	A
17	N 1/2-6-19-29-W4	Rimrock Cattle Co. Ltd	50.4	A
18	SW-5-19-29-W4	Rimrock Cattle Co. Ltd	160.2	A

NOTE: Acreage from 2020 Property Assessment

Map ID	Land Location	Description	Acres	Zone
19	NW-5-19-29-W4	Rimrock Cattle Co. Ltd	160.2	A
20	SE-5-19-29-W4	Rimrock Cattle Co. Ltd	160.2	A
21	NE-5-19-29-W4	Rimrock Cattle Co. Ltd	160.2	A

Rimrock Biodigester Facility
Foothills County, Alberta
Figure 4-8
Digestate Application Lands:
Rimrock Cattle Company Ltd. Map 3
June 2022

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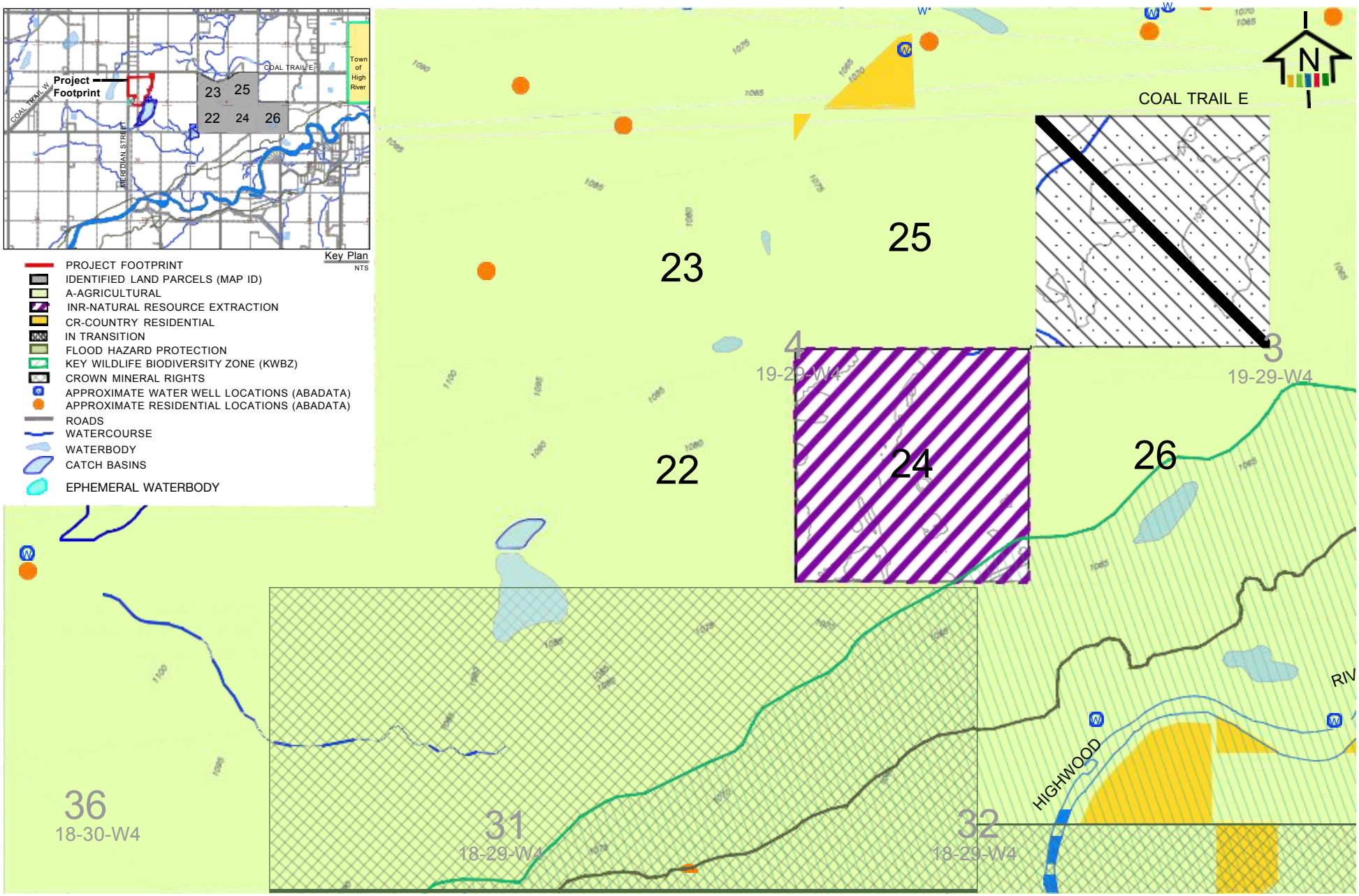

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Map ID	Land Location	Description	Acres	Zone
22	SW-4-19-29-W4	Rimrock Cattle Co. Ltd	162.1	A
23	NW-4-19-29-W4	Rimrock Cattle Co. Ltd	126.4	A
24	SE-4-19-29-W4	Rimrock Cattle Co. Ltd	161.5	INR

Map ID	Land Location	Description	Acres	Zone
25	NE-4-19-29-W4	Rimrock Cattle Co. Ltd	158.6	A
26	SW-3-19-29-W4	Rimrock Cattle Co. Ltd	162.2	A

NOTE: Acreage from 2020 Property Assessment

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 4-9

Digestate Application Lands:
Rimrock Cattle Company Ltd. Map 4

June 2022

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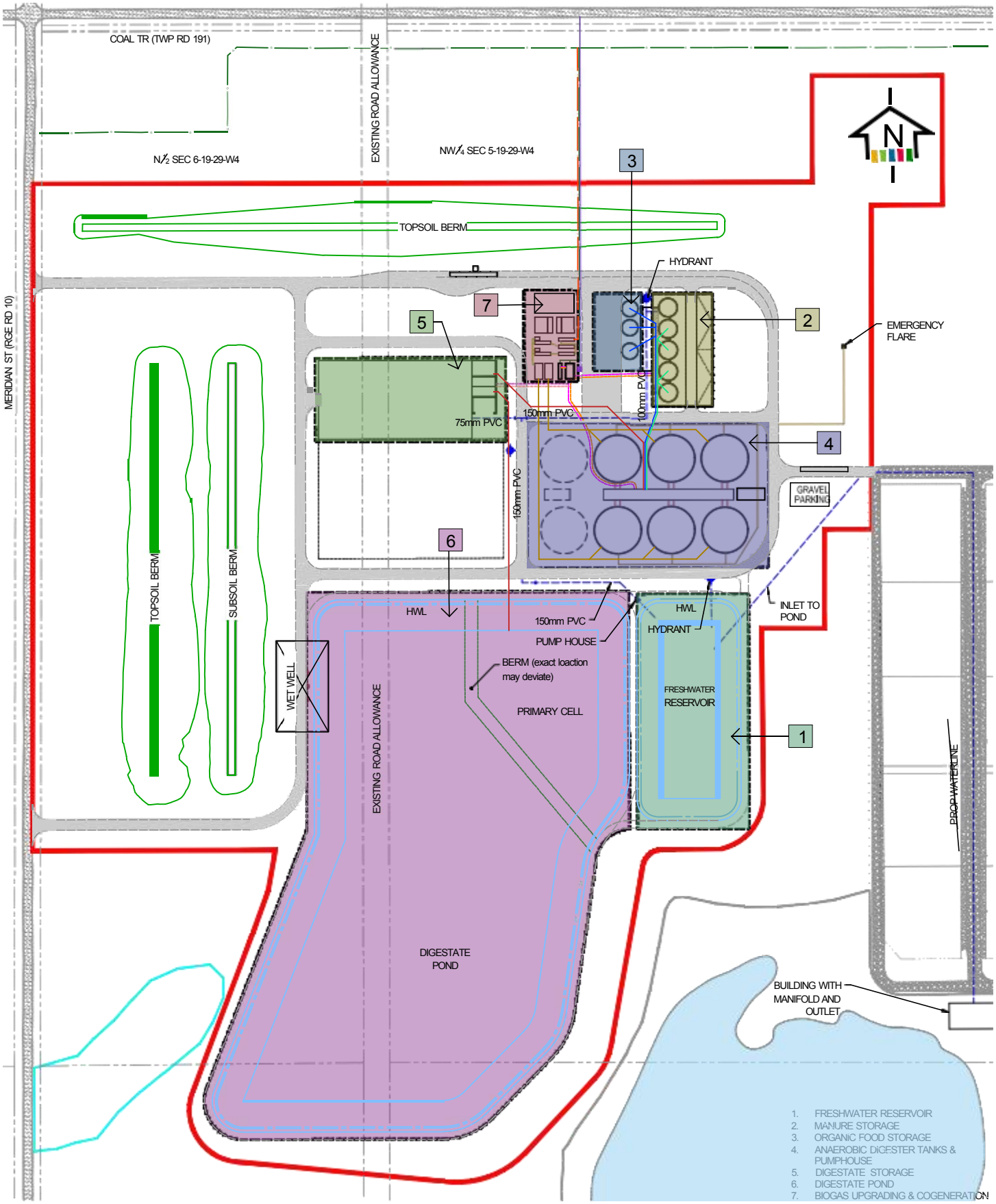

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PROJECT FOOTPRINT
WATERLINE
HEAT MEDIUM RETURN LINE
HEAT MEDIUM SUPPLY LINE
CATCH BASIN
EPHEMERAL WATERBODY
TRANSFORMER
HYDRANT
FEEDSTOCK PRESSURE LINE
DIGESTATE PRESSURE LINE
FEEDSTOCK SUCTION LINE
BIOGAS PIPE
NATURAL GAS PIPELINE
RNG PIPELINE
POWERLINE

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 5-1

Main Process Areas

June 2022

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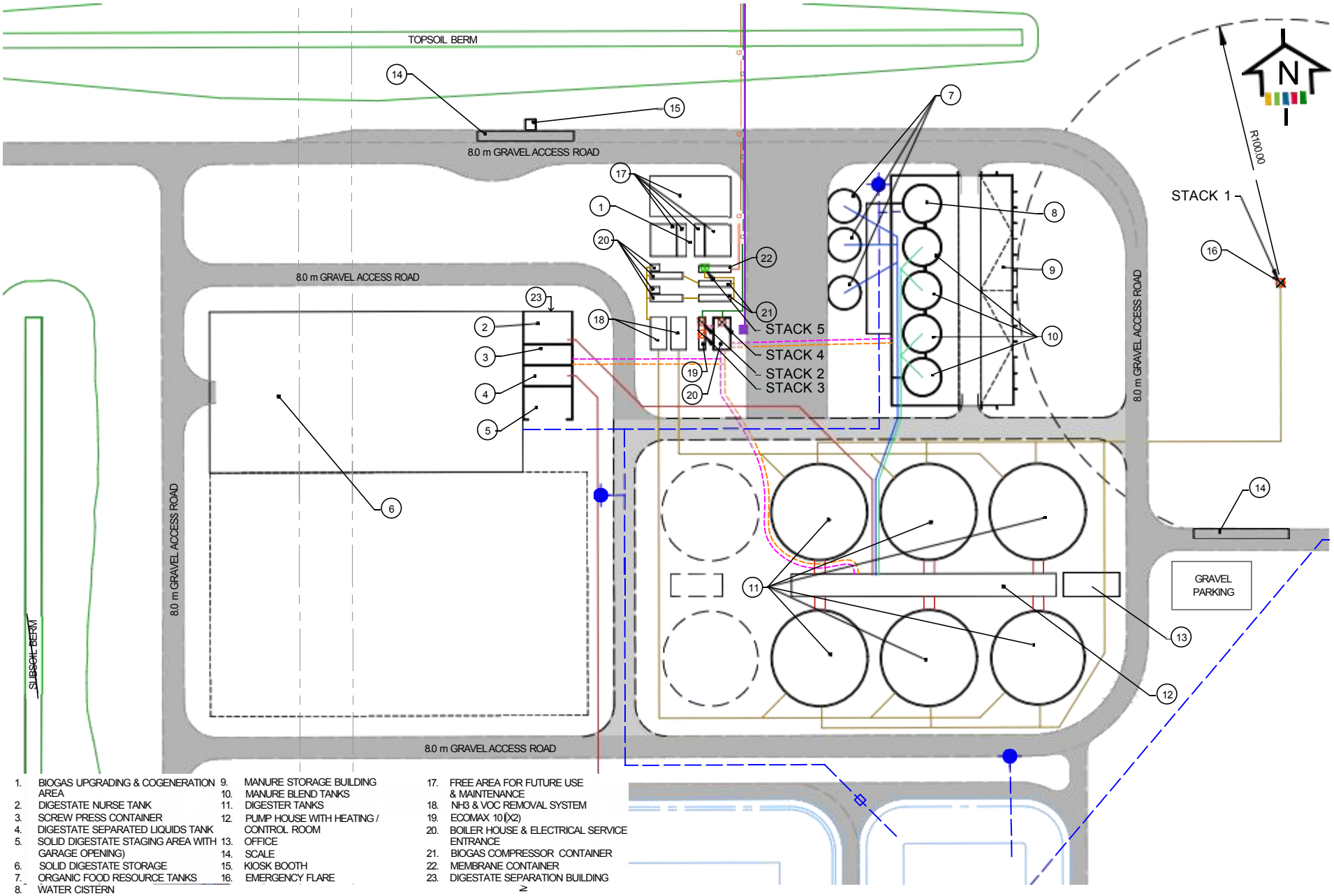

1. BIOGAS UPGRADING & COGENERATION AREA
2. DIGESTATE NURSE TANK
3. SCREW PRESS CONTAINER
4. DIGESTATE SEPARATED LIQUIDS TANK
5. SOLID DIGESTATE STAGING AREA WITH GARAGE OPENING)
6. SOLID DIGESTATE STORAGE
7. ORGANIC FOOD RESOURCE TANKS
8. WATER CISTERN
9. MANURE STORAGE BUILDING
10. MANURE BLEND TANKS
11. DIGESTER TANKS
12. PUMP HOUSE WITH HEATING / CONTROL ROOM
13. OFFICE
14. SCALE
15. KIOSK BOOTH
16. EMERGENCY FLARE
17. FREE AREA FOR FUTURE USE & MAINTENANCE
18. NH3 & VOC REMOVAL SYSTEM
19. ECOMAX 10 (X2)
20. BOILER HOUSE & ELECTRICAL SERVICE ENTRANCE
21. BIOGAS COMPRESSOR CONTAINER
22. MEMBRANE CONTAINER
23. DIGESTATE SEPARATION BUILDING

WATERLINE
HEAT MEDIUM RETURN LINE
HEAT MEDIUM SUPPLY LINE
TRANSFORMER
HYDRANT
AIR EMISSION POINT SOURCE
EXHAUST STACK
FEEDSTOCK PRESSURE LINE
DIGESTATE PRESSURE LINE
FEEDSTOCK SUCTION LINE
BIOGAS PIPE
NATURAL GAS PIPELINE
RNG PIPELINE
POWERLINE

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Rimrock Biodigester Facility
Foothills County, Alberta

Figure 5-2
Facility Plot Plan
June 2022

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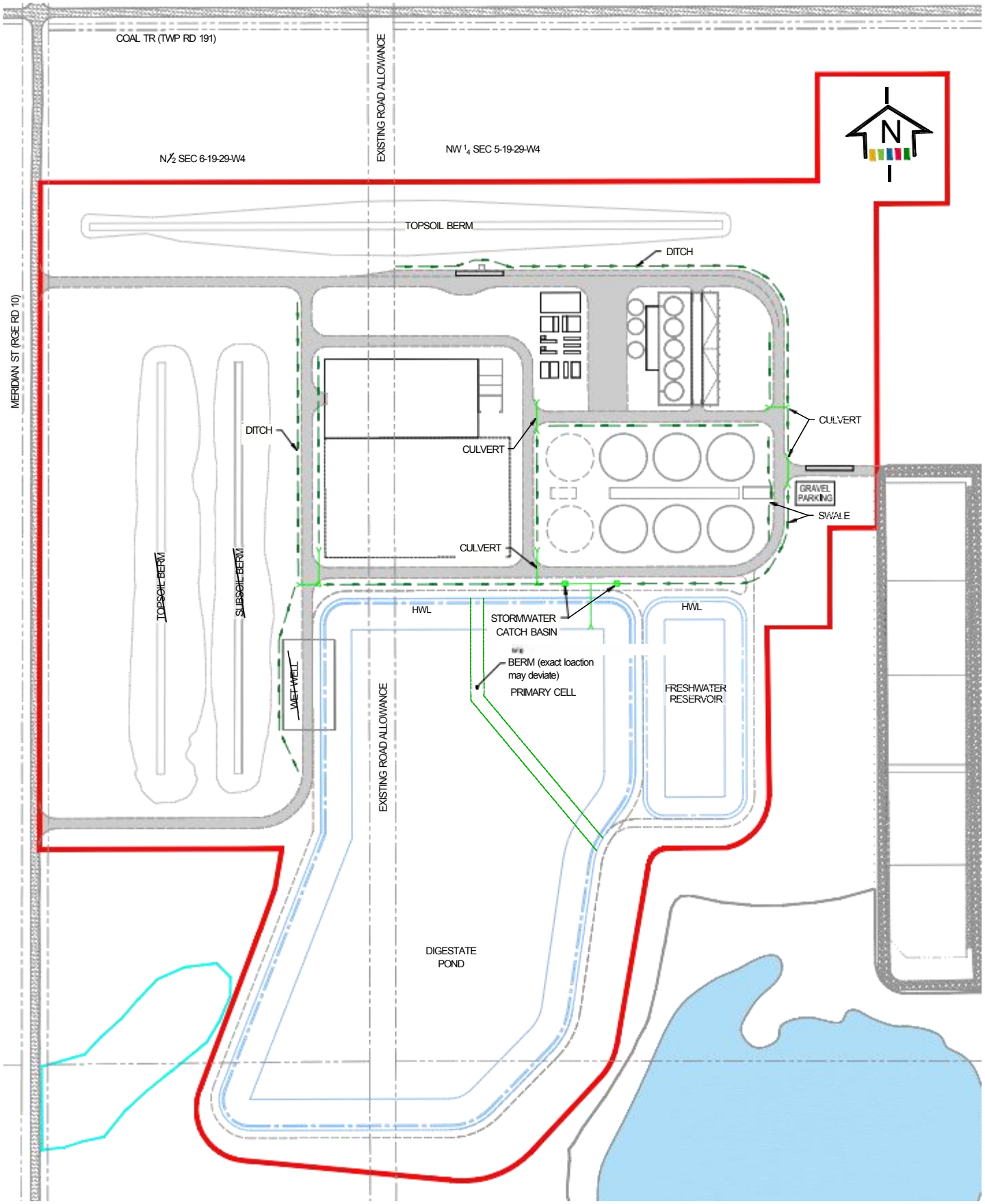

PROJECT FOOTPRINT
CATCH BASIN
EPHEMERAL WATERBODY
STORMWATER COLLECTION PIPE
STORMWATER CONVEYANCE

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Rimrock Biodigester Facility
Foothills County, Alberta

Figure 5-3
Stormwater Collection Infrastructure
June 2022

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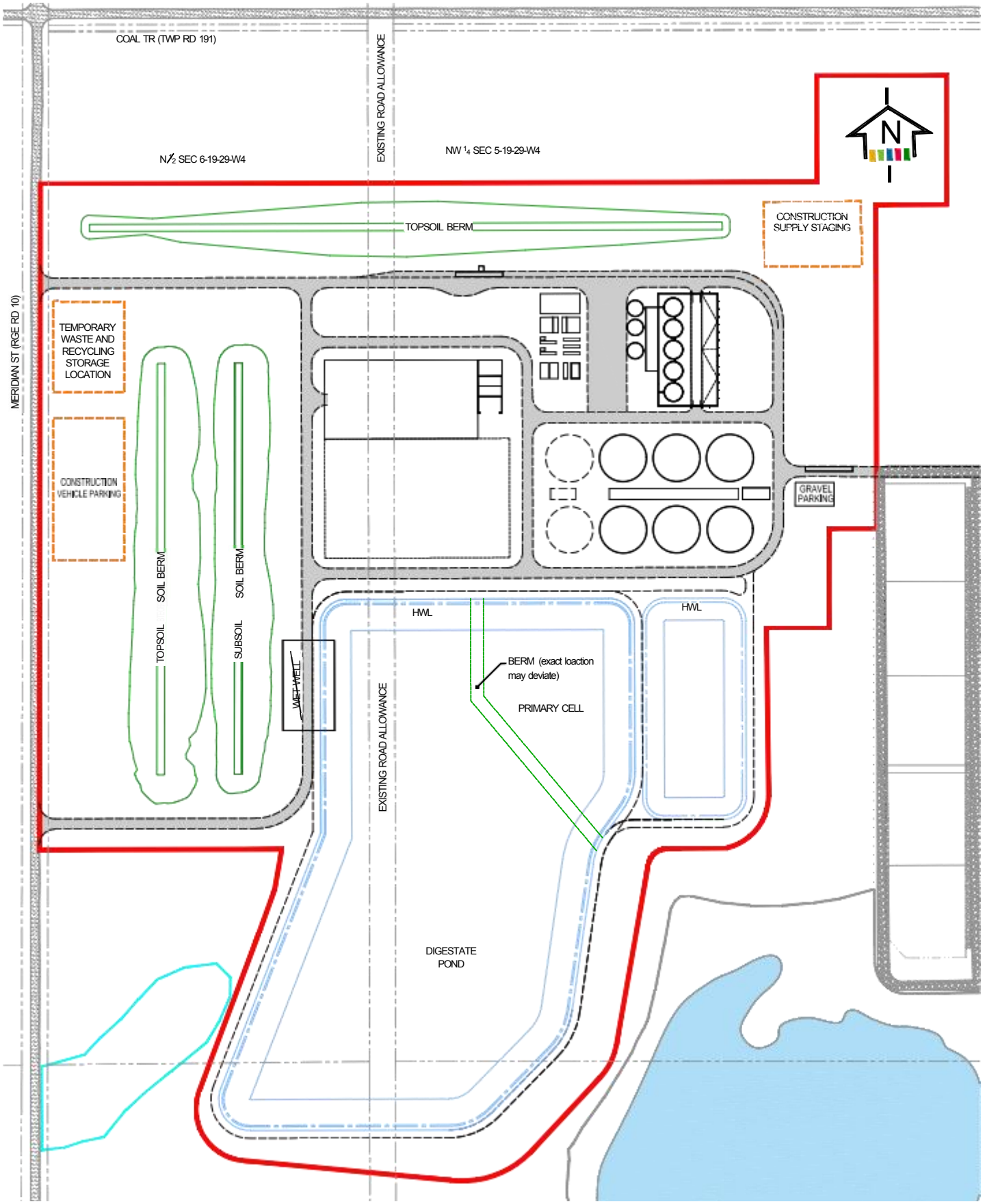

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PROJECT FOOTPRINT
CATCH BASIN
EPHEMERAL WATERBODY
CONSTRUCTION LAYDOWN AREAS

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Rimrock Biodigester Facility
Foothills County, Alberta

Figure 6-1

Construction Site Layout & Storage Locations

June 2022

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Appendix C - Financial Security Calculation

Rimrock Biodigester Facility
Financial Security

Task No.	Task	Description	Waste Type	Estimated Quantity	Unit	Unit Rate	Estimated Cost
	Inventory Removal and Disposal						
1.01	Disposal of Digestate Pond (solids)	Transportation and Disposal	Raw Sewage/Septic	2,300	m3	$10	$23,000.00
1.02	Disposal of Digestate Pond (sludge)	Removal	Raw Sewage/Septic	4,160	m3	$12	$49,920.00
1.03	Disposal of Digestate Pond (sludge)	Transportation	Raw Sewage/Septic	4,160	m3	$5	$20,800.00
1.04	Disposal of Digestate Pond (sludge)	Disposal	Raw Sewage/Septic	4,160	m3	$10	$41,600.00
1.05	Analytical	Test Digestate Pond	Raw Sewage/Septic	3	test	$200	$600.00
	Infrastructure Removal						
2.01	Primary Digester Tanks	Demolition	Concrete/Rebar	5,610	m3	$10	$56,100.00
2.02	Blend Tanks	Demolition	Concrete/Rebar	680	m3	$10	$6,800.00
2.03	Off Farm Tanks	Demolition	Concrete/Rebar	375	m3	$10	$3,750.00
2.04	Nurse Tank	Demolition	Concrete/Rebar	285	m3	$10	$2,850.00
2.05	Digestate Separated Liquids Tanks	Demolition	Concrete/Rebar	285	m3	$10	$2,850.00
2.06	Primary Digester Tanks	Transportation	Concrete/Rebar	5,610	m3	$25	$140,250.00
2.07	Blend Tanks	Transportation	Concrete/Rebar	680	m3	$25	$17,000.00
2.08	Off Farm Tanks	Transportation	Concrete/Rebar	375	m3	$25	$9,375.00
2.09	Nurse Tank	Transportation	Concrete/Rebar	285	m3	$25	$7,125.00
2.10	Digestate Separated Liquids Tanks	Transportation	Concrete/Rebar	285	m3	$25	$7,125.00
2.11	Primary Digester Tanks	Disposal	Concrete/Rebar	5,610	m3	$5	$28,050.00
2.12	Blend Tanks	Disposal	Concrete/Rebar	680	m3	$5	$3,400.00
2.13	Off Farm Tanks	Disposal	Concrete/Rebar	375	m3	$5	$1,875.00
2.14	Nurse Tank	Disposal	Concrete/Rebar	285	m3	$5	$1,425.00
2.15	Digestate Separated Liquids Tanks	Disposal	Concrete/Rebar	285	m3	$5	$1,425.00
2.16	Buildings/Kiosk and Scale	Decommisioning Equipment	Equipment	0.2	ea	$10,000	$2,000.00
2.17	Buildings/Kiosk and Scale	Demolition	Concrete/Rebar	16	m2	$10	$160.00
2.18	Buildings/Kiosk and Scale	Transportation	Concrete/Rebar	15	m3	$25	$375.00
2.19	Buildings/Kiosk and Scale	Disposal	Concrete/Rebar	15	m3	$5	$75.00
2.20	Buildings/Manure Handling Building	Decommisioning Equipment	Equipment	2	ea	$10,000	$20,000.00
2.21	Buildings/Manure Handling Building	Dismantling	Concrete/Rebar	4,510	m2	$10	$45,100.00
2.22	Buildings/Manure Handling Building	Transportation	Concrete/Rebar	1,570	m3	$25	$39,250.00
2.23	Buildings/Manure Handling Building	Disposal	Concrete/Rebar	1,570	m3	$5	$7,850.00
2.24	Buildings/Digestate separation building	Decommisioning Equipment	Equipment	0.5	ea	$10,000	$5,000.00
2.25	Buildings/Digestate separation building	Dismantling	Concrete/Rebar	240	m2	$10	$2,400.00
2.26	Buildings/Digestate separation building	Transportation	Concrete/Rebar	120	m3	$25	$3,000.00
2.27	Buildings/Digestate separation building	Disposal	Concrete/Rebar	120	m3	$5	$600.00
2.28	Buildings/Digester pump building	Decommisioning Equipment	Equipment	0	ea	$10,000	$0.00
2.29	Buildings/Digester pump building	Dismantling	Concrete/Rebar	860	m2	$10	$8,600.00
2.30	Buildings/Digester pump building	Transportation	Concrete/Rebar	1,215	m3	$25	$30,375.00
2.31	Buildings/Digester pump building	Disposal	Concrete/Rebar	1,215	m3	$5	$6,075.00
2.32	Buildings/Office building	Decommisioning Equipment	Equipment	1	ea	$10,000	$10,000.00
2.33	Buildings/Office building	Dismantling	Concrete/Rebar	195	m2	$10	$1,950.00
2.34	Buildings/Office building	Transportation	Concrete/Rebar	390	m3	$25	$9,750.00

Rimrock Biodigester Facility
Financial Security

2.35	Buildings/Office building	Disposal	Concrete/Rebar	390	m3	$5	$1,950.00
2.36	Buildings/Flare Stack	Decommisioning Equipment	Equipment	0.2	ea	$10,000	$2,000.00
2.40	Buildings/Boiler building	Decommisioning Equipment	Equipment	0.2	ea	$10,000	$2,000.00
2.41	Buildings/Boiler building	Dismantling	Concrete/Rebar	115	m2	$10	$1,150.00
2.42	Buildings/Boiler building	Transportation	Concrete/Rebar	65	m3	$25	$1,625.00
2.43	Buildings/Boiler building	Disposal	Concrete/Rebar	65	m3	$5	$325.00
2.44	Buildings/Biogas Upgrading	Decommisioning Equipment	Equipment	0	ea	$10,000	$0.00
2.45	Buildings/Biogas Upgrading	Dismantling	Concrete/Rebar	260	m2	$10	$2,600.00
2.46	Buildings/Biogas Upgrading	Transportation	Concrete/Rebar	170	m3	$25	$4,250.00
2.47	Buildings/Biogas Upgrading	Disposal	Concrete/Rebar	170	m3	$5	$850.00
2.48	Equipment/Gas upgrading equipment	Decommisioning Equipment	Equipment	0.5	ea	$10,000	$5,000.00
2.49	Equipment/Gas upgrading equipment	Transportation	Equipment	0	m3	$25	$0.00
2.50	Equipment/Gas upgrading equipment	Disposal	Equipment	0	m3	$5	$0.00
2.51	Electrical Equipment & Pumps	Decommisioning Equipment	Equipment	0.5	ea	$10,000	$5,000.00
2.52	Electrical Equipment & Pumps	Transportation	Equipment	0	m3	$25	$0.00
2.53	Electrical Equipment & Pumps	Disposal	Equipment	0	m3	$5	$0.00
2.54	Piping (deeps)	Demolition	Gravels and Plastic	1,770	lm	$50	$88,500.00
2.55	Piping (shallows)	Demolition	Gravels and Plastic	1,880	lm	$25	$47,000.00
2.56	Piping	Transportation	Gravels and Plastic	6,480	m3	$5	$32,400.00
2.57	Piping	Disposal	Gravels and Plastic	6,480	m3	$5	$32,400.00
2.58	Lift Station	Removal	Equipment/Backfill	2	ea	$5,000	$10,000.00
2.59	Lagoon Liner	Removal	HDPE Liner	96,890	m2	$2	$193,780.00
2.60	Lagoon Liner	Transportation	HDPE Liner	200	m3	$5	$1,000.00
2.61	Lagoon Liner	Disposal	HDPE Liner	200	m3	$5	$1,000.00
2.62	Roads and gravel parking	Demolition	Gravels	36,000	m2	$2	$72,000.00
2.63	Roads and gravel parking	Transportation and Disposal	Gravels	25,365	m3	$5	$126,825.00
2.64	RCC areas	Demolition	RCC and fabric	38,900	m2	$2	$77,800.00
2.65	RCC areas	Transportation and Disposal	RCC and fabric	11,670	m3	$5	$58,350.00
	Site Assessment & Remediation						
3.01	Common Material Placement (Stockpile and Industrial Area)	Relocation	N/A	333,000	m3	$3	$999,000.00
3.02	Browns Stockpile Spread	Relocation	N/A	62,000	m3	$3	$186,000.00
3.03	Topsoil	Topsoil Placement	N/A	57,000	m3	$3	$171,000.00
3.04	Site Seeding	Seeding	N/A	1	ea	$50,000	$50,000.00
3.05	Weed Control	Weed Control	N/A	1	ea	$25,000	$25,000.00
3.06	Phase 1 & 2 ESA	Study	N/A	2	ea	$25,000	$50,000.00

SUB TOTAL	$2,866,685.00
10% Contingency	$286,668.50
TOTAL	$3,153,353.50

Appendix D – NRCB Grandfathering Letter (Catch Basin)

NRCB Natural Resources Conservation Board

Agriculture Centre, 100, 5401 1 Avenue S
Lethbridge, Alberta T1J 4V6
T 403-381-5166
Toll Free 310.0000 www.nrcb.ca

May 4, 2022 sent by email

Rimrock Feeders Ltd.
Box 5279
High River AB T1V1M4

Attn: Kendra Donnelly

Dear Kendra:

Re: Grandfathered (Deemed) Permit Status of Current Catch Basins
Rimrock Feeders Ltd.
Section 5-19-29 W4M

I have been advised that you have asked the NRCB as to the permit status of the catch basins located at the Rimrock Feeders CFO at Sec. 5-19-29-W4. Furthermore, I understand you have asked if the Grandfathered (Deemed) Permit Determination issued on October 8, 2020, included these catch basins as well.

Historically, Municipal Development Permit 3053 was issued to Western Feedlots Ltd. to construct a beef feedlot at this location by the then Municipal District Foothills in 1980. This permit required the construction of a catch basin at a designated location at the SE corner of the feedlot facility. Subsequent development of the additional CFO facilities prior to January 1, 2002, involved the construction of a second, slough-like catch basin area located directly west of the CFO. The NRCB has no records on file expressly permiting the construction of the second catch basin, either by the muncipality or the NRCB. Nonetheless, these catch basins were in existence prior to January 1, 2002, as evident by the satellite imagery in Appendix E of the Grandfathered (Deemed) Permit Determination of October 8, 2020.

The Grandfathered (Deemed) Permit Determination of Livestock Type of October 8, 2020, did not specifically address the grandfathered status of the two catch basins in question. I have no doubt that these two catch basins were in existence prior to January 1, 2002, and were operated as catch basins for the existing CFO at this location.

Should you have any questions in this matter please conact me atkarl.ivarson@nrcb.caor by phone at 403-331-8952.

With regards,

Karl Ivarson, B.Sc.
Inspector, NRCB

APPENDIX E

Google Earth July 2002 Imagery

Appendix E – Air Quality Assessment Report

Tidewater Renewables Ltd. Rimrock Biodigester Facility Air Quality Assessment

Prepared By: Horizon Compliance Group Inc.

Author: Cody Halleran, B.Sc., EP

Date: April 2022

HORIZON COMPLIANCE

Executive Summary

Tidewater Renewables Ltd. (Tidewater Renewables) is applying under the Environmental Protection and Enhancement Act (EPEA) to construct and operate the Rimrock Biodigester Facility (the Facility), a 1.0 million standard cubic feet per day (MMSCFD) or 28.25 e^3 m^3/d natural gas processing Facility that is to be located within LSD 13-05-019-29 W4M. The Plant is designed to generate sales specification natural gas by recovering methane from waste manure and organic products, which are provided by the adjacent Rimrock Feeders Facility. The Facility will operate two (2) cogeneration units, one (1) heat medium heater, and one (1) flare stack for emergency flaring of the digester gasses. All compression will have electric motors.

At the request of Tidewater Renewables, Horizon Compliance Group Inc. (Horizon Compliance) has completed an Air Quality Assessment (the Assessment) for the Facility. The purpose of the Assessment is to ensure ground-level concentrations of nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) resulting from routine and non-routine operations of the Facility comply with the current Alberta Ambient Air Quality Objectives (AAAQOs; AEP, 2019).

Dispersion modelling was performed utilizing AERMOD in accordance with the requirements outlined within the Alberta Environment and Parks (AEP) Air Quality Model Guideline (AQMG; AEP, 2021a). The results of the dispersion modelling, summarized in Tables 1 and 2, indicate that the maximum off-site ground-level concentrations (MGLC) of NO_2 and SO_2 are predicted to comply with the applicable AAAQOs.

Table 1 NO_2 (Point Source) Dispersion Modelling Results

Averaging Period	Predicted ($\mu g/m^3$)	Background ($\mu g/m^3$)	MGLC ($\mu g/m^3$)	AAAQO ($\mu g/m^3$)
1-Hour	46.9	56.2	103.1	300
Annual	2.0	18.0	20.1	45

Table 2 SO_2 (Digester Emergency Flaring) Dispersion Modelling Results

Averaging Period	Predicted ($\mu g/m^3$)	Background ($\mu g/m^3$)	MGLC ($\mu g/m^3$)	AAAQO ($\mu g/m^3$)
1-Hour	28.6	1.8	30.4	450

List of Tables

List of Figures

List of Appendices

1 INTRODUCTION

Tidewater Renewables Ltd. (Tidewater Renewables) is applying under the Environmental Protection and Enhancement Act (EPEA) to construct and operate the Rimrock Biodigester Facility (the Facility), a 1.0 million standard cubic feet per day (MMSCFD) or 28.25 e^3 m^3/d natural gas processing Facility that is to be located within LSD 13-05-019-29 W4M. The Plant is designed to generate sales specification natural gas by recovering methane from waste manure and organic products, which are provided by the adjacent Rimrock Feeders Facility. The Facility will operate two (2) cogeneration units, one (1) heat medium heater, and one (1) flare stack for emergency flaring of the digester gasses. All compression will have electric motors.

At the request of Tidewater Renewables, Horizon Compliance Group Inc. (Horizon Compliance) has completed an Air Quality Assessment (the Assessment) for the Facility. The purpose of the Assessment is to ensure ground-level concentrations of nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) resulting from routine and non-routine operations of the Facility comply with the current Alberta Ambient Air Quality Objectives (AAAQOs; AEP, 2019).

The Facility has surface coordinates of 50.584° and -113.993°, latitude and longitude, respectfully. The Facility is located on private land, approximately 5.2 km west of High River, Alberta, accessed via Coal Trail East (Abacus Datagraphics Ltd., 2022). A Project Area Map is included on Figure 1 within Appendix A.

1.1 Topography

The Facility is located within the Bow River Basin Council watershed and lies within the Foothills Fescue Natural Subregion of the Grassland Natural Region of Alberta. Elevations range from approximately 800 m above sea level (masl) in the north near Drumheller to over 1,500 masl on the east slopes of the Porcupine Hills. The average elevation of the subregion is 1,100 masl (Downing & Pettapiece, 2006).

Within the modelled domain, elevations range from approximately 1,060 masl in the south-southeast along Highwood River and 1,150 masl along the west-northwest boundary. The base elevation of the Facility is 1,108 masl. A Topographical Map is included on Figure 2 within Appendix A.

1.2 Vegetation

Reference vegetation in the Foothills Fescue Natural Subregion is characterized by nearly level cultivated plains in the north and cool, high-elevation grassy uplands along the mountains to the south. Fifty percent of the subregion is cultivated, with approximately 80 percent native prairie in the south at higher elevations. Mountain rough fescue and bluebunch fescue are the dominant grasses on lightly grazed native range. Grasslands in the subregion have a diverse herb species such as sticky purple geranium and silvery perennial lupine (Downing & Pettapiece, 2006).


HORIZON
COMPLIANCE

1.3 Climatology

The Foothills Fescue Natural Subregion is characterized by cooler summers and shorter growing seasons, but warmer winters and more precipitation than other grassland subregions. Proximity to the mountains and a greater incidence of Chinooks are responsible for these characteristics. The month of maximum precipitation is June, but the subregion also receives significant precipitation in May (Downing & Pettapiece, 2006).

The mean annual precipitation is 470 mm. The mean date of the first fall frost is September 5, and the mean date of the last spring frost is June 1. On average, the frost-free period spans 97 days. The mean annual temperature ranges from 16.3°C at the warmest and -9.7°C at the coldest. The mean annual temperature is 3.9°C (Downing & Pettapiece, 2006).

1.4 Land Use and Population

Agriculture is the principal land use in the Foothills Fescue Natural Subregion with cultivation being variable and ranging from 80 percent in the plains to less than 20 percent in the hilly uplands where grazing predominates. Significant oil and gas activities occur in the foothills, and the subregion is popular for recreation (Downing & Pettapiece, 2006).

The town of High River, which is located approximately 5.2 km east of the Facility, has a population of 14,324 people (Statistics Canada, 2022).

2 DISPERSION MODELLING APPROACH

Dispersion modelling was performed using AERMOD dispersion model (V21112) in accordance with the requirements outlined within the Alberta Environment and Parks (AEP) Air Quality Model Guideline (AQMG; AEP, 2021a). Descriptions of the model, meteorological data and elevated terrain are presented in the following sections.

The Assessment recognizes that emissions from the Facility, can interact with those from other industrial activities in the vicinity. Therefore, information is provided on air quality associated with the emissions from nearby existing and approved industrial developments (background sources) in combination with emissions from the Facility. Additionally, potential contributions from natural sources or emission sources outside of the modelling domain are accounted for by the addition of baseline concentrations (ambient baseline) to the model predictions. Details on the background sources and the ambient baseline are presented in Sections 3.2 and 3.3.

2.1 Refined Model

The latest version of the AERMOD dispersion model (V21112) was used in the Assessment. The AERMOD is a multi-source, steady state plume model that was developed by the United States Environmental Protection Agency (US EPA) in collaboration with the American Meteorological Society. It uses hourly meteorological data to estimate pollutant concentrations at specified computational points. It is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases.


HORIZON
COMPLIANCE

AERMOD consists of two pre-processors as well as the dispersion model. The meteorological pre-processor (AERMET) is a stand-alone program which provides AERMOD with the information required to characterize the planetary boundary layer. The mapping program (AERMAP) is a stand-alone terrain pre-processor, which is used to both characterize terrain and generate receptor grids for AERMOD.

AERMOD also integrates the Building Profile Input Program Plume Rise Model Enhancements (BPIP-PRIME), allowing it to consider the wake (turbulence) effect caused by the presence of buildings on point source emissions.

All default AERMOD options were used for the modelling in accordance with the AQMG (AEP, 2021a). Therefore, the building wake effects and the calm wind options were retained for the execution of the AERMOD program.

2.2 Meteorological Data

Five years of meteorological data were extracted from the Weather Research Forecast (WRF) V4.2.1 Meteorological Dataset from Alberta Environment and Parks for 2015-2019, using Multi-model Extraction Utility 2 (MMEU2; AEP, 2021b). The extracted WRF subdomain is centred on the geographical point 50.58° N and -114.00° W.

The meteorological data was prepared for AERMOD using AERMET module (version 21112) from US EPA. The AERMET model creates a meteorological file format which is compatible with the AERMOD program by combining the surface and upper air meteorological data.

A wind class frequency distribution and a wind rose for the data used in the dispersion modelling are presented in Figures 3 and 4 within Appendix A. The wind rose plot indicates that the prevailing surface wind direction in this region is from the west-southwest. Wind speeds between 0.5 and 2.1 m/s occurred for 51.9% of all 43,824 observations. Calm wind speeds (i.e., when values are less than 0.5 m/s) were reported 3.59% of the time.

2.3 Terrain Data

Terrain data in USGS DEM type data for a 1:50,000 scale maps (NAD83) were downloaded from the Government of Canada, Department of Natural Resources Geobase online portal (NRC, 2022c), which provides public access to a base of quality geospatial data for all of Canada. The domain used for this assessment incorporates topographic data from map tiles identified as 082J09 and 082J12. The data were processed by AERMAP, the terrain pre-processor for the AERMOD model. Figure 2 in Appendix A presents the terrain elevations above sea-level for the modelling domain.

2.4 Modelling Receptor

The following minimum receptor grids were used in the modelling as per the latest revision of the AQMG (AEP, 2021a):


HORIZON
COMPLIANCE

- 20 m receptor spacing in the general area of maximum impact and the Facility boundary;
- 50 m receptor spacing within 0.5 km from the centroid of sources;
- 250 m receptor spacing within 2 km from the centroid of sources;
- 500 m spacing within 5 km from the centroid of sources; and,
- 1,000 m spacing beyond 5 km.

2.5 Building Downwash

The U.S. EPA Building Profile Input Program (BPIP) was used to determine the effects of building downwash on dispersion of emissions from the Facility. The dimensions for the various buildings are provided in Table 3. A Plot Plan of the Rimrock Biodigester Facility indicating the source and building locations is provided in Appendix B.

Table 3 Building Dimensions

Building ID	Height (m)	Length (m)	Width (m)
Manure Processing Building	9.2	87.2	46.3
Digestate Pump Building	7.4	100.3	8.5
Office Building	3.7	21.4	9.1
Digestate Separation Building	7.4	41.1	18.9
Heat Medium Building	3.7	4.9	3.7
Membrane Container (x1)	3.7	12.2	2.5
Screw Compressor Container (x2)	3.7	12.2	2.5
Biogas Treatment Container (x2)	3.7	12.2	2.5
Ecomax 10 Container (x2)	3.7	12.2	5.5

2.6 Air Quality Criteria

Emissions can have direct and indirect effects on humans, animals, vegetation, soil, and water. For this reason, environmental regulatory agencies have established maximum ambient air concentration limits. An overview of the relevant air quality criteria for this assessment is provided in Table 4.

Table 4 Applicable Ambient Air Quality Criteria

Substance	Averaging Period	Percentile	Air Quality Criteria ($\mu g/m^3$)[(a)]
NO_2	1-Hour	99.9th (9th Highest)	300
	Annual	Overall Maximum Prediction	45
SO_2	1-Hour	99.9th (9th Highest)	450

[(a)] Alberta Ambient Air Quality Objective (AEP, 2019).

2.7 NO_x to NO_2 Conversion Method

In accordance with the AQMG, the conversion of NO_x to NO_2 in the atmosphere must be considered in all NO_2 modelling. The Alberta AQMG recommends four methods for converting NO_x to NO_2, including the total conversion method (TCM), the ambient ratio method (ARM/ARM2), the plume volume molar ratio method (PVMRM) and the ozone limiting method (OLM). The results from the TCM must be


HORIZON
COMPLIANCE

presented as part of the assessment (AEP, 2021a). The NO_2 concentrations presented in this assessment were assessed using the TCM.

TCM assumes that NO_x emissions are converted entirely to NO_2 in the atmosphere. In reality, the quantity of NO_x converted to NO_2 in an equilibrium state is dependent on numerous factors, including Ozone (O_3) concentrations, baseline NO_2 concentrations, and more. This method will provide a conservative estimate of predicted NO_2 concentrations and often serve as an initial screening approach.

3 EMISSIONS

The Facility will produce 1.0 MMSCFD (28.25 $e^3 m^3/d$) of renewable natural gas from manure feedstock. The Facility will be located within LSD 13-05-019-29 W4M. The Facility will include two (2) cogeneration units, one (1) heat medium heater, and one (1) flare stack for emergency flaring (digester emergency flaring). The following sections detail the potential emissions sources within the modelled domain.

3.1 Facility Emission Sources

The natural gas fired equipment at the Facility, including the two cogeneration units and heat medium heater, have the potential to release NO_X to the atmosphere under normal, continuous operating conditions.

Table 5 lists the release parameters for the emissions sources.

Table 5 NO_X Emissions Source Parameters

Source Description	Source ID	Power Rating	Emission Factor	Stack Height	Stack Diameter	Exit Velocity	Exit Temp	NO_X Emission Rate	
		kW	g/kWh	m	m	m/s	K	g/s	kg/h
Cogeneration Unit 1	Cogen1	1,095	0.0012	10.0	0.35	17.0	473	0.40	1.44
Cogeneration Unit 2	Cogen2	1,095	0.0012	10.0	0.35	17.0	473	0.40	1.44
Heat Medium Heater	H-701	2,930	0.0223	10.0	0.60	15.0	523	0.02	0.07

Dispersion modelling was also performed for the assessment of SO_2 concentrations associated with digester emergency flaring. Stack and emission parameters associated with digester gas emergency flaring are presented in Table 6, noting that these flaring scenarios represent non-routine flaring.

The Alberta Energy Regulator (AER) flare spreadsheet was used to determine flare exit parameters for the flare modelling cases. Input and output pages from the AER spreadsheet are provided in Appendix C.


HORIZON
COMPLIANCE

Table 6 SO_2 Emission Source Parameters – Digester Emergency Flaring

Parameter	SO_2		
	Qmax	Qave	Qmin
Effective Height (m)[(a)]	12.466	12.146	11.853
Pseudo Diameter (m)[(a)]	2.826	2.805	1.479
Pseudo Velocity (m/s)[(a)]	0.281	0.140	0.100
Exit Temperature (K)[(a)]	1152.15	1150.61	1150.61
Emission Rate (g/s)	0.172	0.086	0.022
Mole Frac	Digester Offgas		
H_2	0.0000		
He	0.0000		
N_2	0.0040		
CO_2	0.4000		
H_2S	0.0022		
CH_4	0.5938		
C_2H_6	0.0000		
C_3H_8	0.0000		
i-C_4H_{10}	0.0000		
n-C_4H_{10}	0.0000		
i-C_5H_{12}	0.0000		
n-C_5H_{12}	0.0000		
n-C_6H_{14}	0.0000		
C_7^+	0.0000		
Total	1.000		

3.2 Regional Industrial Emission Sources

In accordance with the AQMG, the cumulative air quality conditions expected to result from the existing and approved industrial developments, especially those near the Facility, should be assessed at the same time with the Facility for a more accurate representation of predicted impacts within the modelling domain (AEP, 2021a). No significant neighbouring facilities emitting NO_x or SO_2 were found within a 5 km radius of the Facility (National Pollutant Release Inventory, 2020).

3.3 Baseline Concentrations

In accordance with the AQMG, baseline concentrations are added to the concentrations predicted by the model for a more accurate representation of cumulative effects. Baseline concentrations are assumed to represent the air quality contribution of both natural and human-caused sources that are not included in the modelling. Baseline concentrations are taken from representative ambient monitoring data.

The Facility is located within the South Saskatchewan Region, monitored by the Calgary Region Airshed Zone (CRAZ) airshed. The nearest continuous ambient air monitoring station that contains publicly available data for NO_2 and SO_2 is the Calgary SE monitoring station. This monitoring station is located approximately 30 km north of the Facility. Measured 1-Hour NO_2 and SO_2 data from February 1st, 2019,


HORIZON
COMPLIANCE

to January 31st, 2022, from this station were used to estimate the 90th percentile concentrations for each averaging period as per the Alberta AQMG (AEP, 2021a). The calculated 90th percentile baseline concentrations shown in Table 7 were added to the ground-level concentrations predicted by the dispersion modelling to calculate the MGLC.

Table 7 Baseline Concentrations

Substance	Averaging Period	Baseline Concentration ($\mu g/m^3$)
NO_2	1-Hour	56.2
	Annual	18.0
SO_2	1-Hour	1.8

4 DISPERSION MODELLING RESULTS

The following section presents the modelling results. The modelled concentrations are added to the ambient baseline concentrations and compared with the standards. The isopleths depict the maximum concentration obtained at each receptor, for the period specified, over the 5-year meteorological sample considered.

4.1 NO_2 Modelling Results

Dispersion modelling results for NO_x emissions sources at the Facility, as well as baseline sources, are provided in Table 8. As discussed in Section 2.6, dispersion modelling was firstly performed using the TCM for NO_x to NO_2. As indicated, the predicted 1-hour and annual MGLC of NO_2 comply with their respective AAAQO using the TCM method. Associated isopleths are presented on Figures 5 and 6 within Appendix A, while the U.S. EPA AERMOD input and output files for this modelling are provided in Appendix C.

Table 8 Maximum Predicted Ground-level NO_2 Concentrations using TCM

Averaging Period	Predicted ($\mu g/m^3$)	Background ($\mu g/m^3$)	MGLC ($\mu g/m^3$)	AAAQO ($\mu g/m^3$)
1-Hour	46.9	56.2	103.1	300
Annual	2.0	18.0	20.1	45

4.2 SO_2 Modelling Results

The MGLC of SO_2 associated with digester emergency flaring at the Facility are provided in Table 9, noting that the dispersion modelling of non-routine flaring does not require baseline concentrations to be added to modelled predictions. As indicated, the MGLC of SO_2 for all associated flowrates are predicted to comply with the AAAQOs. The isopleth presenting the SO_2 modelling results are presented on Figure 7 within Appendix A and the U.S. EPA AERMOD input and output files for this modelling are provided in Appendix C.

Table 9 Maximum Predicted Ground-level SO_2 Concentrations

Averaging Period	Predicted ($\mu g/m^3$)	Background ($\mu g/m^3$)	MGLC ($\mu g/m^3$)	AAAQO ($\mu g/m^3$)
1-Hour	28.6	1.8	30.4	450

5 CONCLUSION

At the request of Tidewater Renewables, Horizon Compliance Group Inc. (Horizon Compliance) has completed an Air Quality Assessment (the Assessment) for the Facility. The purpose of the Assessment is to verify that predicted NO_2 and SO_2 concentrations resulting from the operations of the Facility comply with the current AAAQOs (AEP, 2019).

The results of the dispersion modelling indicate that the maximum off-site ground-level concentrations of NO_2 associated with emissions sources at the Facility, as well as baseline concentrations, are predicted to comply with the applicable AAAQOs. In addition, the maximum off-site ground-level concentrations of SO_2 associated with digester emergency flaring are predicted to comply with AAAQOs.

Horizon Compliance appreciated the opportunity to work on this project. If we can provide clarification on any part of this report, please contact the undersigned at (587) 885-0863.

This report was prepared by:

Marnie Christensen, B.Sc., EP
Regulatory Specialist

Cody Halleran, B.Sc., EP Manager
Co-Founder & Managing Partner
Air Quality & Regulatory Services

Reviewed By:

Hillary Yeung, B.A.Sc., P.Eng.
Co-Founder & Managing Partner
Emissions & Sustainability

6 REFERENCES

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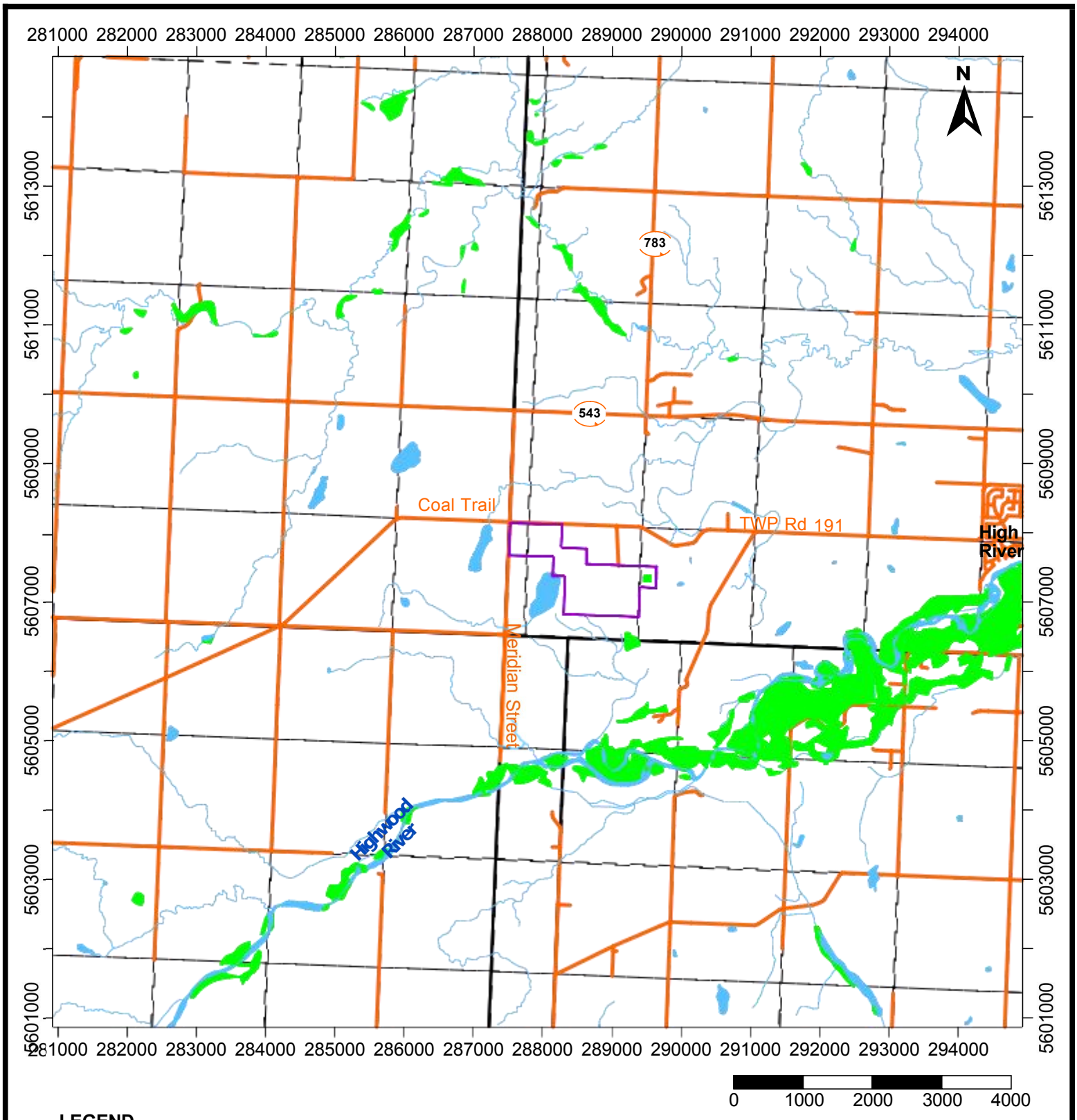
APPENDIX A

FIGURES



LEGEND

- Rimrock Biodigester Facility Boundary
- Water Body
- Roads
- Wooded Area
- Township
- Section

PROJECT

Tidewater Renewables Ltd.
Rimrock Biodigester Facility

TITLE

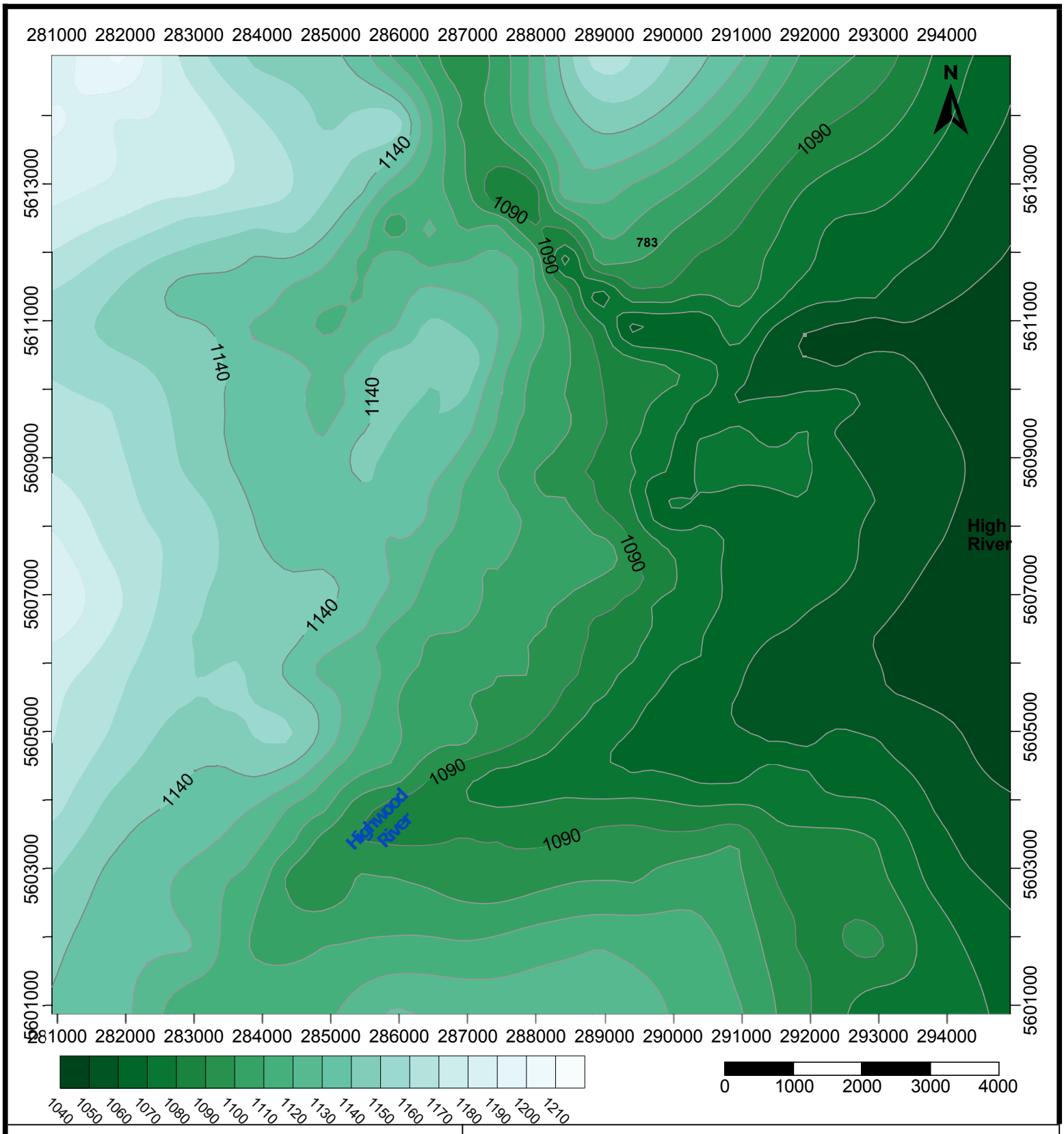
Project Area Map

HORIZON COMPLIANCE

DATE

March 31, 2022

FIGURE 1



LEGEND

- Rimrock Biodigester Facility
- Water Body

PROJECT

Tidewater Renewables Ltd.
Rimrock Biodigester Facility

TITLE

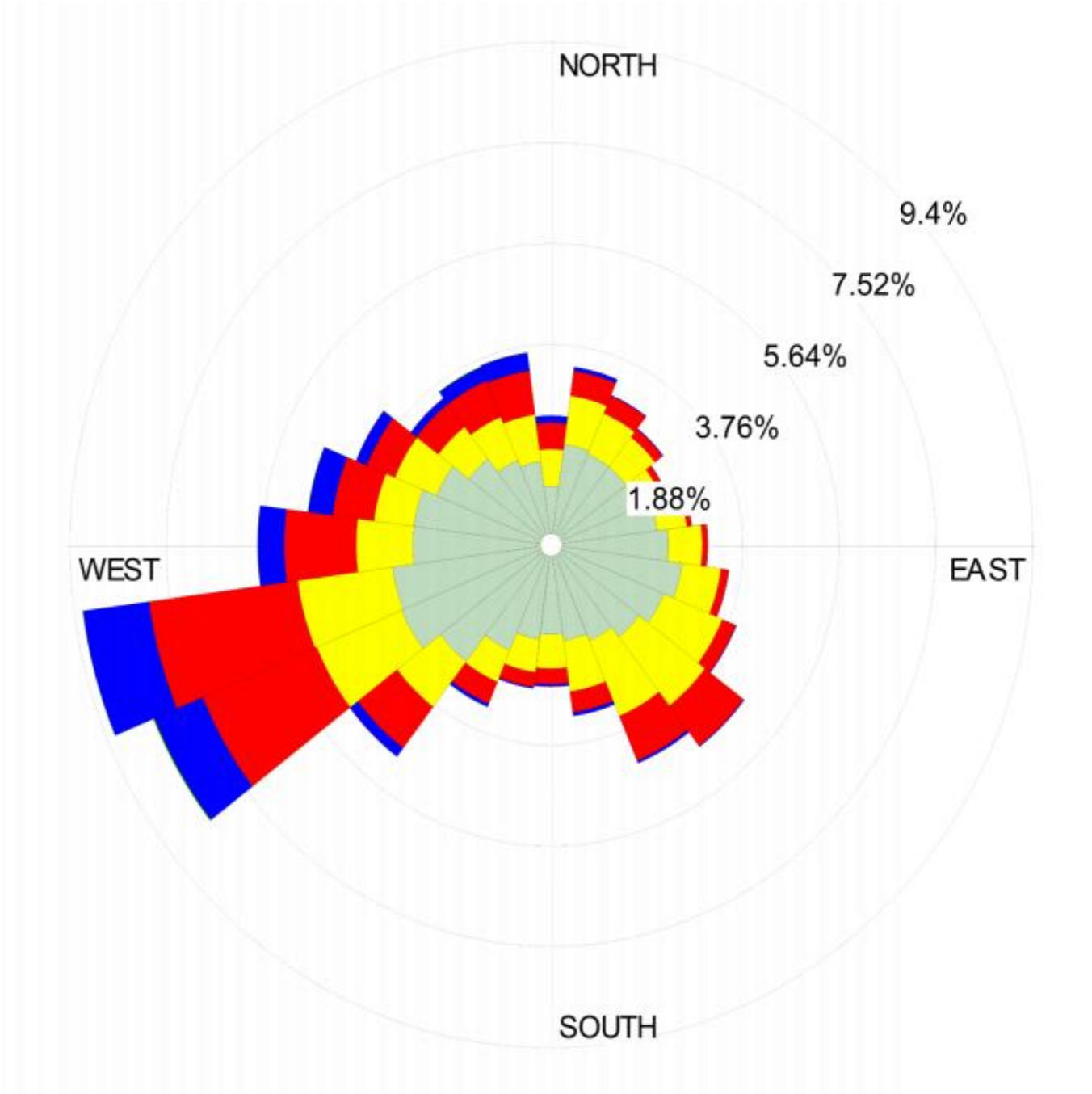
Topographical Map

HORIZON COMPLIANCE

DATE

March 31, 2022

FIGURE 1

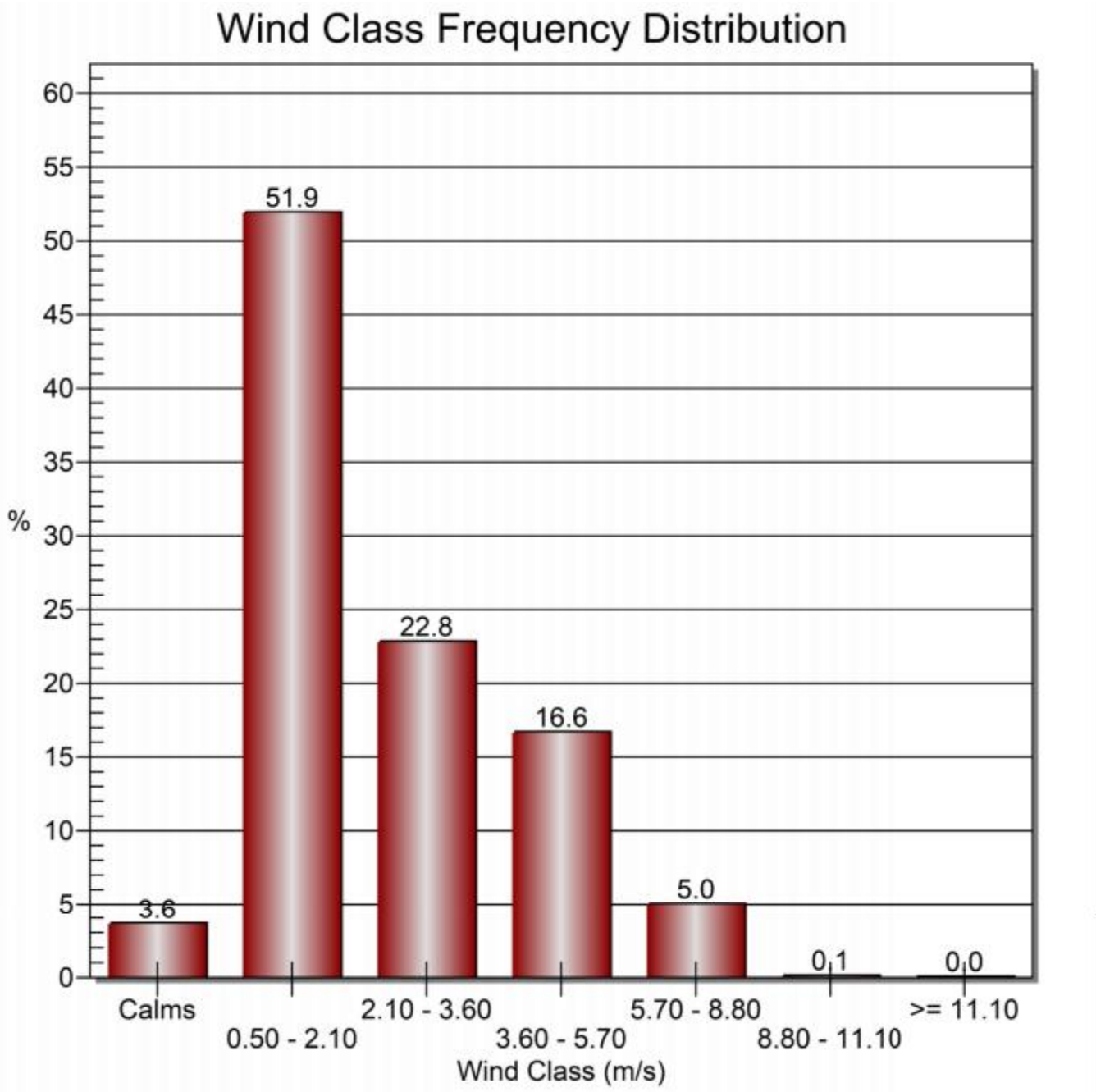


WIND SPEED
(m/s)

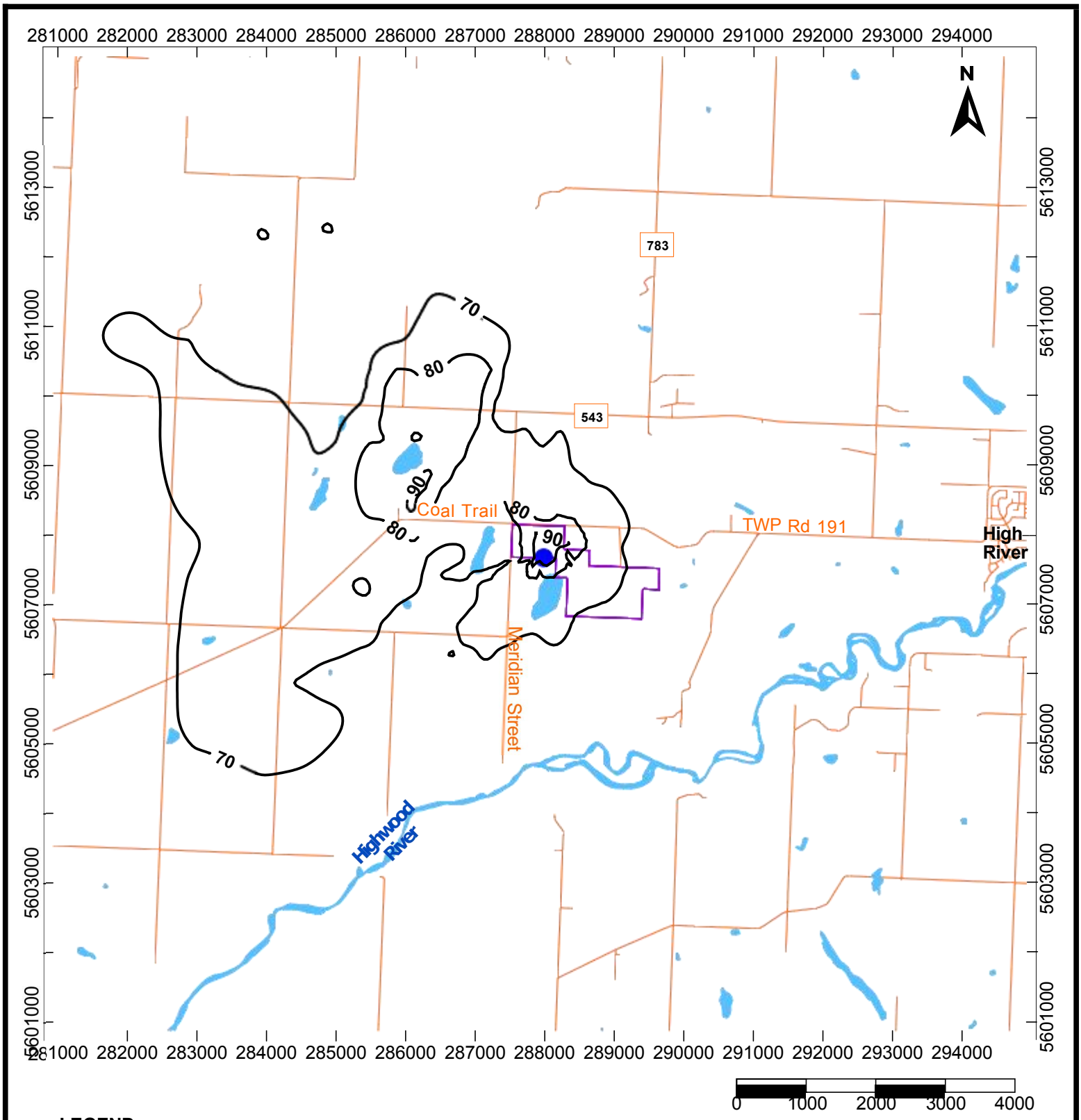
- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calms: 3.59%

PROJECT Tidewater Renewables Ltd. Rimrock Biodigester Facility		
TITLE **Wind Rose Plot at the Project Area (2015 to 2019)**		
HORIZON COMPLIANCE	DATE March 31, 2022	**FIGURE 3**



	PROJECT Tidewater Renewables Ltd. Rimrock Biodigester Facility	
	TITLE **Wind Class Frequency Distribution at the Project Area (2015 to 2019)**	
	DATE March 31, 2022	**FIGURE 4**



LEGEND

- Maximum Ground-Level Concentration (MGLC)
- Rimrock Biodigester Facility Boundary
- Water Body
- Roads

PROJECT

Tidewater Renewables Ltd.
Rimrock Biodigester Facility

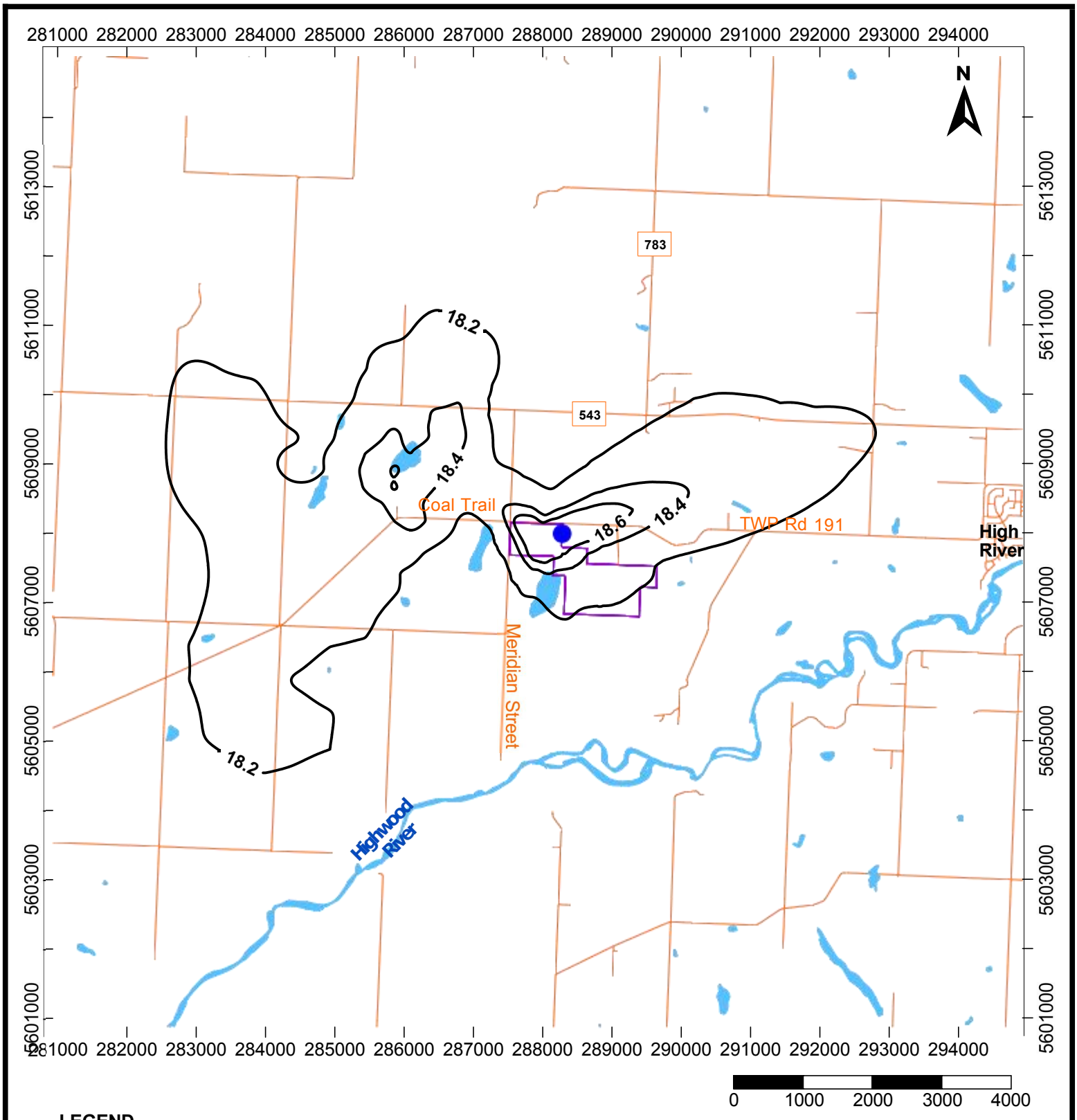
TITLE

99.9th Percentile of Predicted 1-Hour Average NO_2 Concentrations (µg/m³)

HORIZON COMPLIANCE

MGLC: NO_2 = 103.1 (g/m³)

FIGURE 5



LEGEND

- Maximum Ground-Level Concentration (MGLC)
- Rimrock Biodigester Facility Boundary
- Water Body
- Roads

PROJECT

Tidewater Renewables Ltd.
Rimrock Biodigester Facility

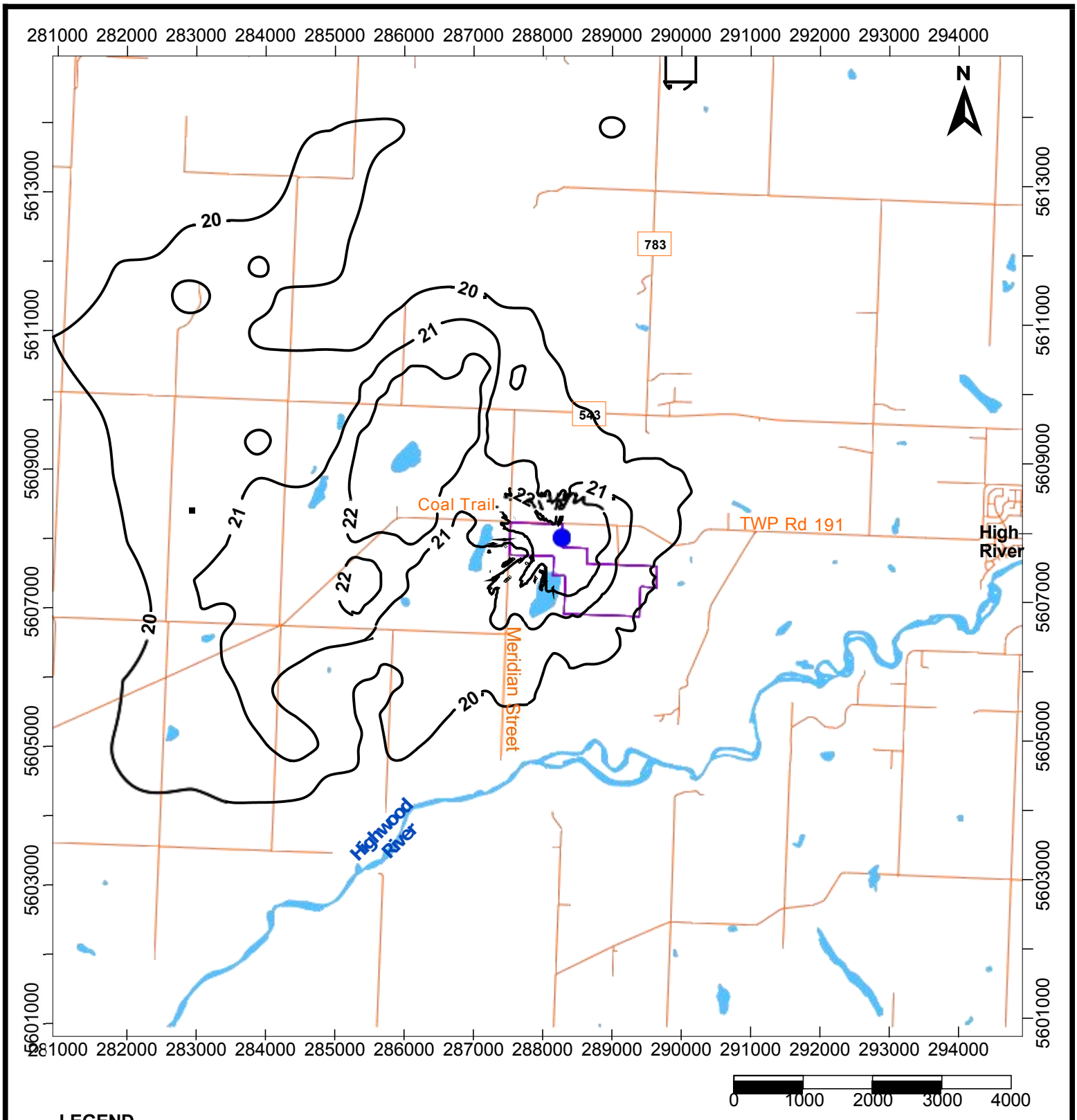
TITLE

Maximum Predicted Annual NO_2 Concentrations (µg/m³)

HORIZON COMPLIANCE

MGLC: NO_2 = 20.1(g/m³)

FIGURE 6



LEGEND

- Maximum Ground-Level Concentration (MGLC)
- Rimrock Biodigester Facility Boundary
- Water Body
- Roads

PROJECT

Tidewater Renewables Ltd.
Rimrock Biodigester Facility

TITLE

99.9th Percentile of Predicted 1-Hour Average SO_2 Concentrations (µg/m³)

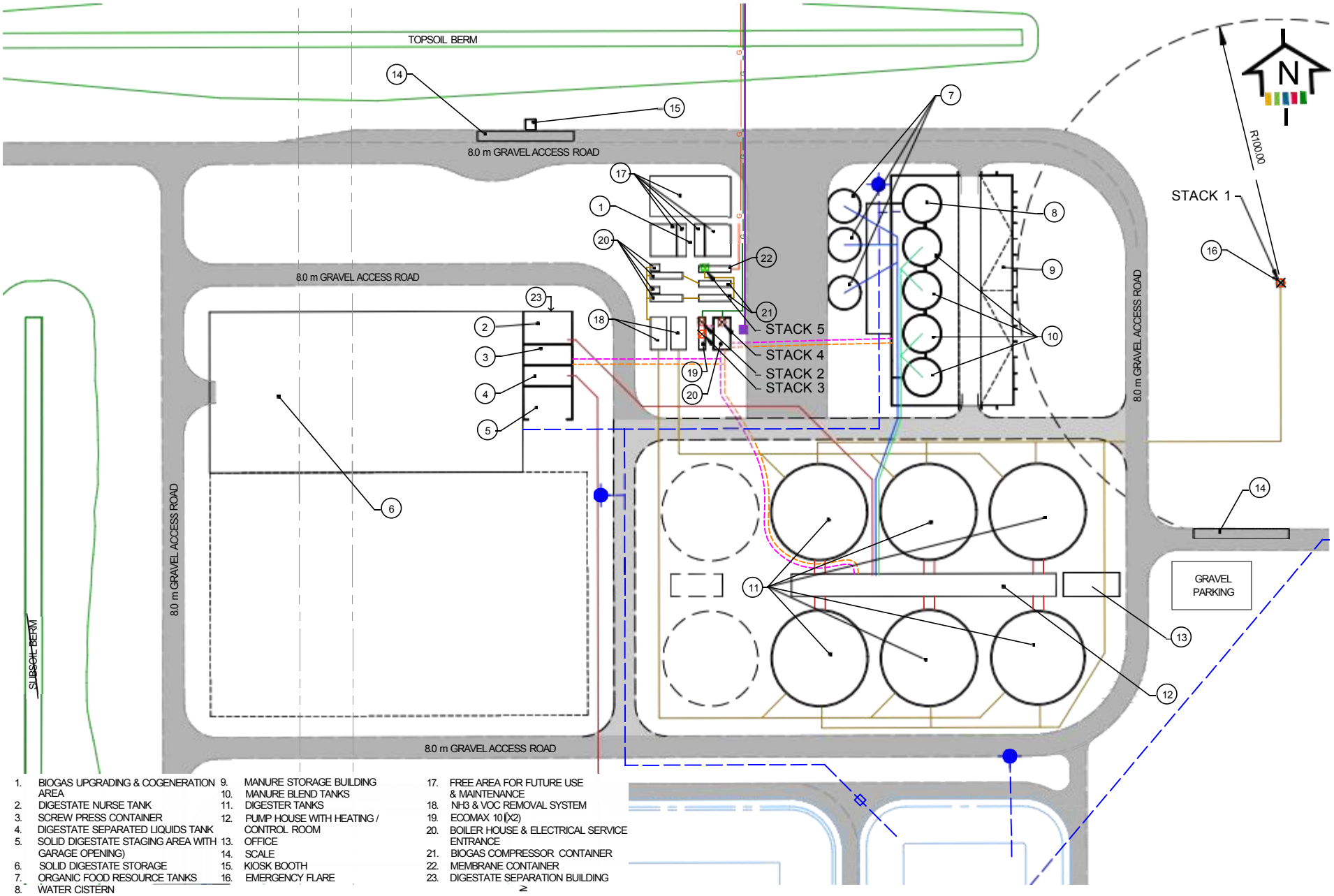
HORIZON COMPLIANCE

MGLC: SO_2 = 30.4(g/m³)

FIGURE 7

APPENDIX B

PLOT PLAN



ISL Engineering and Land Services

Rimrock Biodigester Facility
Foothills County, Alberta

Figure 5-2
Facility Plot Plan
June 2022

G:\Projects\28000\28000\28028_Rimrock_Civil_Struct_Prelim_Eng\02_CADD\20_Drafting\204_Figures\28028_Site_Plan.dwg

APPENDIX C

MODELLING INPUT AND OUTPUT FILES

NO_2 DISPERSION MODELLING INPUT

```
**
**********************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 10.2.1
** Lakes Environmental Software Inc.
** Date: 2022-03-30
** File: E:\Modelling\Rimrock\Rimrock2015\2015\2015.ADI
**
**********************************************
**
**
**********************************************
** AERMOD Control Pathway
**********************************************
**
**
CO STARTING
  TITLEONE C:\Lakes\AERMOD View\Rimrock2022\Rimrock2022.isc
  MODELOPT DFAULT CONC
  AVERTIME 1 ANNUAL
  POLLUTID NO2 H1H
  RUNORNOT RUN
  ERRORFIL 2015.err
CO FINISHED
**
**********************************************
** AERMOD Source Pathway
**********************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
  LOCATION COGEN1      POINT     287933.000  5607874.000     1108.000
** DESCRSRC Cogen Unit 1
  LOCATION COGEN2      POINT     287926.000  5607874.000     1108.000
** DESCRSRC Cogen Unit 2
  LOCATION H701        POINT     287941.000  5607875.000     1108.000
** DESCRSRC Heat Medium Heater
** Source Parameters **
  SRCPARAM                0.4    10.000   473.000            0.350
  COGEN1                  17.00000
  SRCPARAM                0.4    10.000   473.000            0.350
  COGEN2                  17.00000
  SRCPARAM H701    0.01815    10.000   523.000             0.60
                   15.00000                                    0


** Building Downwash **
  BUILDHGT COGEN1         3.70     3.70     3.70     4.90     4.90     4.90
  BUILDHGT              4.90   4.90   4.90   4.90   4.90   3.7
  COGEN1                                                     0
  BUILDHGT              3.70   3.70   3.70   3.70   3.70   3.7
  COGEN1                                                     0
  BUILDHGT              3.70   3.70   3.70   4.90   4.90   4.9
  COGEN1                                                     0
```

APPENDIX C-2

BUILDHGT COGEN1 4.90 3.70 3.70 4.90 4.90 3.70
BUILDHGT COGEN1 3.70 3.70 3.70 3.70 3.70 3.70

BUILDHGT COGEN2 4.90 4.90 4.90 4.90 4.90 4.90
BUILDHGT COGEN2 4.90 4.90 4.90 4.90 4.90 4.90
BUILDHGT COGEN2 4.90 4.90 3.70 3.70 3.70 3.70
BUILDHGT COGEN2 4.90 4.90 4.90 4.90 4.90 4.90
BUILDHGT COGEN2 4.90 4.90 4.90 4.90 4.90 4.90
BUILDHGT COGEN2 4.90 4.90 3.70 3.70 3.70 3.70

BUILDHGT H701 3.70 3.70 3.70 3.70 3.70 4.90
BUILDHGT H701 4.90 4.90 4.90 4.90 3.70 3.70
BUILDHGT H701 3.70 3.70 3.70 3.70 3.70 3.70
BUILDHGT H701 3.70 3.70 3.70 3.70 3.70 3.70
BUILDHGT H701 3.70 3.70 3.70 3.70 3.70 3.70
BUILDHGT H701 3.70 3.70 3.70 3.70 3.70 3.70

BUILDWID COGEN1 13.48 14.35 14.79 12.95 13.82 14.26
BUILDWID COGEN1 14.27 13.84 13.00 13.84 14.27 8.27
BUILDWID COGEN1 9.76 10.95 14.79 12.32 12.45 12.20
BUILDWID COGEN1 12.45 12.32 11.82 12.95 13.82 14.26
BUILDWID COGEN1 14.27 12.97 12.20 13.84 14.27 13.32
BUILDWID COGEN1 12.88 14.77 14.79 14.35 13.48 5.50

BUILDWID COGEN2 8.17 10.08 11.70 12.95 13.82 14.26
BUILDWID COGEN2 14.27 13.84 13.00 13.84 14.27 14.26
BUILDWID COGEN2 13.82 12.95 11.82 12.32 12.45 12.20
BUILDWID COGEN2 8.17 10.08 11.70 12.95 13.82 14.26
BUILDWID COGEN2 14.27 13.84 13.00 13.84 14.27 14.26
BUILDWID COGEN2 13.82 12.95 10.86 9.34 7.53 5.50

BUILDWID H701 22.60 9.34 10.86 12.06 12.88 14.26
BUILDWID H701 14.27 13.84 13.00 13.84 13.35 13.41
BUILDWID H701 9.76 10.95 11.82 12.32 12.45 12.20
BUILDWID H701 22.60 9.34 10.86 12.06 12.88 13.32
BUILDWID H701 13.35 12.97 12.20 12.97 13.35 13.41
BUILDWID H701 14.31 14.77 14.79 14.35 13.48 12.20

BUILDLEN COGEN1 10.43 12.10 13.41 13.82 12.95 11.70
BUILDLEN 10.0 8.17 6.00 8.17 10.08 11.82

COGEN1	8					
BUILDLEN	10.9	9.76	13.41	6.52	4.58	2.50
COGEN1	5					
BUILDLEN	4.58	6.52	8.27	13.82	12.95	11.70
COGEN1						
BUILDLEN	10.0	7.53	5.50	8.17	10.08	10.86
COGEN1	8					
BUILDLEN	12.0	14.3	13.4	12.1	10.4	12.2
COGEN1	6	1	1	0	3	0
BUILDLEN	13.8	14.2	14.2	13.8	12.9	11.7
COGEN2	4	7	6	2	5	0
BUILDLEN	10.0	8.17	6.00	8.17	10.08	11.70
COGEN2	8					
BUILDLEN	12.9	13.8	8.27	6.52	4.58	2.50
COGEN2	5	2				
BUILDLEN	13.8	14.2	14.2	13.8	12.9	11.7
COGEN2	4	7	6	2	5	0
BUILDLEN	10.0	8.17	6.00	8.17	10.08	11.70
COGEN2	8					
BUILDLEN	12.9	13.8	13.3	13.3	12.9	12.2
COGEN2	5	2	2	5	7	0

BUILDLEN H701 16.41 13.35 13.32 12.88 12.06 11.70
BUILDLEN H701 10.08 8.17 6.00 8.17 9.34 14.79
BUILDLEN H701 10.95 9.76 8.27 6.52 4.58 2.50
BUILDLEN H701 16.41 13.35 13.32 12.88 12.06 10.86
BUILDLEN H701 9.34 7.53 5.50 7.53 9.34 14.79
BUILDLEN H701 14.77 14.31 13.41 12.10 10.43 8.44

XBAD COGEN1 6.99 5.71 4.26 -19.30 -20.08 -20.25
XBAD COGEN1 -19.80 -18.76 -17.14 -17.26 -16.86 -26.23
XBAD COGEN1 -25.47 -23.94 -17.01 -17.37 -17.20 -16.50
XBAD COGEN1 -17.42 -17.81 -17.66 5.48 7.13 8.55
XBAD COGEN1 9.72 -3.17 4.03 9.09 6.77 -1.91
XBAD COGEN1 -3.86 1.84 3.61 5.27 6.77 -10.81

XBAD COGEN2 -12.41 -13.63 -14.43 -14.80 -14.72 -14.19
XBAD COGEN2 -13.23 -11.86 -10.14 -10.37 -10.28 -9.88
XBAD COGEN2 -9.18 -8.20 -25.91 -24.75 -22.84 -16.50
XBAD COGEN2 -1.44 -0.64 0.17 0.98 1.76 2.49
XBAD COGEN2 3.14 3.70 4.14 2.20 0.19 -1.82
XBAD COGEN2 -3.78 -5.62 -10.85 -11.17 -11.16 -10.81

XBAD H701 -14.67 -14.70 -15.49 -20.32 -21.02 -27.68
XBAD H701 -27.66 -26.81 -25.14 -24.96 -10.03 -19.40
XBAD H701 -20.27 -20.52 -20.15 -19.17 -17.60 -15.50
XBAD H701 -1.74 1.35 2.18 2.93 3.60 4.16
XBADJ H701 4.59 4.89 5.03 2.90 0.69 4.61
XBADJ H701 5.50 6.21 6.74 7.06 7.17 7.06

YBAD COGEN1 1.49 3.59 5.58 8.06 5.79 3.34
YBAD COGEN1 0.79 -1.79 -4.31 -6.70 -8.89 -0.12
YBAD COGEN1 -3.65 -7.06 6.70 5.83 3.29 0.65
YBAD COGEN1 -2.01 -4.61 -7.06 -8.06 -5.79 -3.34
YBAD COGEN1 -0.79 4.68 4.71 6.70 8.89 7.47
YBAD COGEN1 7.97 -8.39 -6.70 -4.81 -2.77 -0.22

YBAD COGEN2 6.28 5.24 4.03 2.70 1.29 -0.16
YBAD COGEN2 -1.61 -3.00 -4.31 -5.48 -6.49 -7.30

```
  YBAD   COGEN2      -7.89  -8.24   0.26   -3.52  -7.20
J                                                 7.65
  YBAD   COGEN2      -6.28  -5.24  -4.03   -2.70  -1.29
J                                                 0.16
  YBAD   COGEN2       1.61   3.00   4.31    5.48   6.49
J                                                 7.30
  YBAD   COGEN2       7.89   8.24   2.16    1.40   0.60   -
J                                                 0.22

  YBAD   H701        6.03   5.36   3.88    7.65   5.13   6.47
J
  YBAD   H701        2.58  -1.38  -5.31   -9.07  -8.03   6.0
J                                                       9
  YBAD   H701        6.19   3.53   0.76   -2.03  -4.76   -
J                                                       7.35
  YBAD   H701       -6.03  -5.36  -3.88   -2.29  -0.63   1.0
J                                                       6
  YBAD   H701        2.70   4.27   5.71    6.97   8.03  -6.09
J
  YBAD   H701       -3.92  -1.62   0.73    3.05   5.28   7.35
J

  SRCGROUP ALL
SO FINISHED
**
```

```
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
  INCLUDED 2015.rou
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
  SURFFILE AERMET.SFC
  PROFFILE AERMET.PFL
  SURFDATA 12345 2015
  UAIRDATA 12345678 2015
  PROFBASE 1090.0 METERS
  STARTEND 2015 1 1 1 2015 12 31 24
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
  RECTABLE ALLAVE 9TH
  RECTABLE 1 9TH
** Maximum Annual Average POST files for Each Met Year
  POSTFILE ANNUAL ALL PLOT 2015.AD\ANNUAL_G001.PLT 31
** Auto-Generated Plotfiles
  PLOTFILE 1 ALL 9TH 2015.AD\01H9GALL.PLT 32
  PLOTFILE ANNUAL ALL 2015.AD\AN00GALL.PLT 33
  SUMMFILE 2015.sum
OU FINISHED
**
****************************************
** Project Parameters
****************************************
** PROJCTN  CoordinateSystemUTM
** DESCPTN  UTM: Universal Transverse Mercator
** DATUM    North American Datum 1983
** DTMRGN   CONUS
** UNITS    m
** ZONE     12
** ZONEINX  0
**
```

SO_2 DISPERSION MODELLING INPUT

```
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**********************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 10.2.1
**  Lakes Environmental Software Inc.
** Date: 2022-03-30
**  File: E:\Modelling\Rimrock\RimrockS02Main\2018\2018.ADI
**
**********************************************
**
**
**********************************************
** AERMOD Control Pathway
**********************************************
**
**
CO STARTING
  TITLEONE C:\Lakes\AERMOD View\Rimrock2022\Rimrock2022.isc
  MODELOPT DFAULT CONC
  AVERTIME 1 ANNUAL
  POLLUTID SO2 H2H
  RUNORNOT RUN
  ERRORFIL 2018.err
CO FINISHED
**
**********************************************
** AERMOD Source Pathway
**********************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
  LOCATION COGEN1      POINT     287933.000  5607874.000     1108.000
** DESCRSRC Cogen Unit 1
  LOCATION COGEN2      POINT     287926.000  5607874.000     1108.000
** DESCRSRC Cogen Unit 2
  LOCATION H701        POINT     287941.000  5607875.000     1108.000
** DESCRSRC Heat Medium Heater
  LOCATION FL          POINT     288148.280  5607880.950     1108.000
** DESCRSRC Flare Stack
  LOCATION FLQAVE      POINT     288148.280  5607880.950     1108.000
** DESCRSRC Flare Stack
  LOCATION FLMIN       POINT     288148.280  5607880.950     1108.000
** DESCRSRC Flare Stack
** Source Parameters **
  SRCPARAM             0.0    10.000   473.000  17.00000
  COGEN1               0.350
  SRCPARAM             0.0    10.000   473.000  17.00000
  COGEN2               0.350
```

```
 SRCPARAM H701      0.0    10.000   523.000  15.00000     0.600
 SRCPARAM FL      0.172    12.466  1152.150   0.28100     2.826
 SRCPARAM           0.086    12.146  1150.610   0.14000     2.805
 FLQAVE          0.0022    11.853  1150.610   0.10000     1.479
 SRCPARAM
 FLMIN


** Building Downwash **
 BUILDHGT COGEN1        3.70    3.70    3.70    4.90    4.90    4.90
 BUILDHGT             4.90    4.90    4.90    4.90    4.90    3.7
 COGEN1                                                       0
 BUILDHGT             3.70    3.70    3.70    3.70    3.70    3.7
 COGEN1                                                       0
 BUILDHGT             3.70    3.70    3.70    4.90    4.90    4.9
 COGEN1                                                       0
 BUILDHGT             4.90    3.70    3.70    4.90    4.90    3.7
 COGEN1                                                       0
 BUILDHGT             3.70    3.70    3.70    3.70    3.70    3.7
 COGEN1                                                       0

 BUILDHGT             4.90    4.90    4.90    4.90    4.90    4.9
 COGEN2                                                       0
 BUILDHGT             4.90    4.90    4.90    4.90    4.90    4.9
 COGEN2                                                       0
 BUILDHGT             4.90    4.90    3.70    3.70    3.70    3.7
 COGEN2                                                       0
 BUILDHGT             4.90    4.90    4.90    4.90    4.90    4.9
 COGEN2                                                       0
 BUILDHGT             4.90    4.90    4.90    4.90    4.90    4.9
 COGEN2                                                       0
 BUILDHGT             4.90    4.90    3.70    3.70    3.70    3.7
 COGEN2                                                       0

 BUILDHGT H701      3.70    3.70    3.70    3.70    3.70    4.9
                                                             0
 BUILDHGT H701      4.90    4.90    4.90    4.90    3.70    3.7
                                                             0
 BUILDHGT H701      3.70    3.70    3.70    3.70    3.70    3.7
                                                             0
 BUILDHGT H701      3.70    3.70    3.70    3.70    3.70    3.7
                                                             0
 BUILDHGT H701      3.70    3.70    3.70    3.70    3.70    3.7
                                                             0
 BUILDHGT H701      3.70    3.70    3.70    3.70    3.70    3.7
                                                             0

 BUILDHGT FL      0.00    0.00    0.00    0.00    0.00    0.0
                                                           0
 BUILDHGT FL      0.00    0.00    0.00    0.00    0.00    0.0
                                                           0
 BUILDHGT FL      0.00    0.00    0.00    0.00    0.00    0.0
                                                           0
 BUILDHGT FL      0.00    0.00    0.00    0.00    0.00    0.0
                                                           0
 BUILDHGT FL      0.00    0.00    0.00    0.00    0.00    0.0
                                                           0
 BUILDHGT FL      0.00    0.00    0.00    0.00    0.00    0.0
                                                           0

 BUILDHGT           0.00    0.00    0.00    0.00    0.00    0.0
 FLQAVE                                                    0
 BUILDHGT           0.00    0.00    0.00    0.00    0.00    0.0
 FLQAVE                                                    0
 BUILDHGT           0.00    0.00    0.00    0.00    0.00    0.0
 FLQAVE                                                    0
 BUILDHGT           0.00    0.00    0.00    0.00    0.00    0.0
 FLQAVE                                                    0
```

BUILDHGT FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00

BUILDHGT FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT FLMIN	0.00	0.00	0.00	0.00	0.00	0.00

BUILDWID COGEN1	13.48	14.35	14.79	12.95	13.82	14.26
BUILDWID COGEN1	14.27	13.84	13.00	13.84	14.27	8.27
BUILDWID COGEN1	9.76	10.95	14.79	12.32	12.45	12.20
BUILDWID COGEN1	12.45	12.32	11.82	12.95	13.82	14.26

```
BUILDWID COGEN1     14.27  12.97  12.20  13.84  14.27  13.32
BUILDWID COGEN1     12.88  14.77  14.79  14.35  13.48   5.50

BUILDWID COGEN2      8.17  10.08  11.70  12.95  13.82  14.26
BUILDWID COGEN2     14.27  13.84  13.00  13.84  14.27  14.26
BUILDWID COGEN2     13.82  12.95  11.82  12.32  12.45  12.20
BUILDWID COGEN2      8.17  10.08  11.70  12.95  13.82  14.26
BUILDWID COGEN2     14.27  13.84  13.00  13.84  14.27  14.26
BUILDWID COGEN2     13.82  12.95  10.86   9.34   7.53   5.50

BUILDWID H701       22.60   9.34  10.86  12.06  12.88  14.26
BUILDWID H701       14.27  13.84  13.00  13.84  13.35  13.41
BUILDWID H701        9.76  10.95  11.82  12.32  12.45  12.20
BUILDWID H701       22.60   9.34  10.86  12.06  12.88  13.32
BUILDWID H701       13.35  12.97  12.20  12.97  13.35  13.41
BUILDWID H701       14.31  14.77  14.79  14.35  13.48  12.20

BUILDWID FL          0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FL          0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FL          0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FL          0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FL          0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FL          0.00   0.00   0.00   0.00   0.00   0.00

BUILDWID FLQAVE      0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLQAVE      0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLQAVE      0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLQAVE      0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLQAVE      0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLQAVE      0.00   0.00   0.00   0.00   0.00   0.00

BUILDWID FLMIN       0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLMIN       0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLMIN       0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLMIN       0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLMIN       0.00   0.00   0.00   0.00   0.00   0.00
BUILDWID FLMIN       0.00   0.00   0.00   0.00   0.00   0.00

BUILDLEN COGEN1     10.43  12.10  13.41  13.82  12.95  11.70
BUILDLEN COGEN1     10.08   8.17   6.00   8.17  10.08  11.82
BUILDLEN COGEN1     10.95   9.76  13.41   6.52   4.58   2.50
```

BUILDLEN COGEN1	4.58	6.52	8.27	13.82	12.95	11.70
BUILDLEN COGEN1	10.08	7.53	5.50	8.17	10.08	10.86
BUILDLEN COGEN1	12.06	14.31	13.41	12.10	10.43	12.20
BUILDLEN COGEN2	13.84	14.27	14.26	13.82	12.95	11.70
BUILDLEN COGEN2	10.08	8.17	6.00	8.17	10.08	11.70
BUILDLEN COGEN2	12.95	13.82	8.27	6.52	4.58	2.50
BUILDLEN COGEN2	13.84	14.27	14.26	13.82	12.95	11.70
BUILDLEN COGEN2	10.08	8.17	6.00	8.17	10.08	11.70
BUILDLEN COGEN2	12.95	13.82	13.32	13.35	12.97	12.20

BUILDLEN H701 16.41 13.35 13.32 12.88 12.06 11.70
BUILDLEN H701 10.08 8.17 6.00 8.17 9.34 14.79
BUILDLEN H701 10.95 9.76 8.27 6.52 4.58 2.50
BUILDLEN H701 16.41 13.35 13.32 12.88 12.06 10.86
BUILDLEN H701 9.34 7.53 5.50 7.53 9.34 14.79
BUILDLEN H701 14.77 14.31 13.41 12.10 10.43 8.44

BUILDLEN FL 0.00 0.00 0.00 0.00 0.00 0.00
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BUILDLEN FLQAVE 0.00 0.00 0.00 0.00 0.00 0.00
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BUILDLEN FLMIN 0.00 0.00 0.00 0.00 0.00 0.00
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XBADJ COGEN1 6.99 5.71 4.26 -19.30 -20.08 -20.25
XBADJ COGEN1 -19.80 -18.76 -17.14 -17.26 -16.86 -26.23
XBADJ COGEN1 -25.47 -23.94 -17.01 -17.37 -17.20 -16.50
XBADJ COGEN1 -17.42 -17.81 -17.66 5.48 7.13 8.55
XBADJ COGEN1 9.72 -3.17 4.03 9.09 6.77 -1.91
XBADJ COGEN1 -3.86 1.84 3.61 5.27 6.77 -10.81

XBADJ COGEN2 -12.41 -13.63 -14.43 -14.80 -14.72 -14.19
XBADJ COGEN2 -13.23 -11.86 -10.14 -10.37 -10.28 -9.88

XBADJ	COGEN2	-9.18	-8.20	-25.91	-24.75	-22.84	-16.50
XBADJ	COGEN2	-1.44	-0.64	0.17	0.98	1.76	2.49
XBADJ	COGEN2	3.14	3.70	4.14	2.20	0.19	-1.82
XBADJ	COGEN2	-3.78	-5.62	-10.85	-11.17	-11.16	-10.81

XBADJ	H701	-14.67	-14.70	-15.49	-20.32	-21.02	-27.68
XBADJ	H701	-27.66	-26.81	-25.14	-24.96	-10.03	-19.40
XBADJ	H701	-20.27	-20.52	-20.15	-19.17	-17.60	-15.50
XBADJ	H701	-1.74	1.35	2.18	2.93	3.60	4.16
XBADJ	H701	4.59	4.89	5.03	2.90	0.69	4.61
XBADJ	H701	5.50	6.21	6.74	7.06	7.17	7.06

XBADJ	FL	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FL	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FL	0.00	0.00	0.00	0.00	0.00	0.00

XBADJ	FL	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FL	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FL	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLQAVE	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	FLMIN	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	COGEN1	1.49	3.59	5.58	8.06	5.79	3.34
YBADJ	COGEN1	0.79	-1.79	-4.31	-6.70	-8.89	-0.12
YBADJ	COGEN1	-3.65	-7.06	6.70	5.83	3.29	0.65
YBADJ	COGEN1	-2.01	-4.61	-7.06	-8.06	-5.79	-3.34
YBADJ	COGEN1	-0.79	4.68	4.71	6.70	8.89	7.47
YBADJ	COGEN1	7.97	-8.39	-6.70	-4.81	-2.77	-0.22
YBADJ	COGEN2	6.28	5.24	4.03	2.70	1.29	-0.16
YBADJ	COGEN2	-1.61	-3.00	-4.31	-5.48	-6.49	-7.30
YBADJ	COGEN2	-7.89	-8.24	0.26	-3.52	-7.20	7.65
YBADJ	COGEN2	-6.28	-5.24	-4.03	-2.70	-1.29	0.16
YBADJ	COGEN2	1.61	3.00	4.31	5.48	6.49	7.30
YBADJ	COGEN2	7.89	8.24	2.16	1.40	0.60	-0.22
YBADJ	H701	6.03	5.36	3.88	7.65	5.13	6.47
YBADJ	H701	2.58	-1.38	-5.31	-9.07	-8.03	6.09
YBADJ	H701	6.19	3.53	0.76	-2.03	-4.76	-7.35
YBADJ	H701	-6.03	-5.36	-3.88	-2.29	-0.63	1.06
YBAD	H701	2.70	4.27	5.71	6.97	8.03	-

J 6.09

YBAD H701 -3.92 -1.62 0.73 3.05 5.28
J 7.35

YBAD FL 0.00 0.00 0.00 0.00 0.00 0.0
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YBAD FL 0.00 0.00 0.00 0.00 0.00 0.0
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YBAD FLQAVE 0.00 0.00 0.00 0.00 0.00 0.0
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YBAD FLQAVE 0.00 0.00 0.00 0.00 0.00 0.0
J 0
YBAD FLQAVE 0.00 0.00 0.00 0.00 0.00 0.0
J 0

```
  YBA     FLMI      0.00   0.0   0.0   0.0   0.00   0.00
  DJ      N         0.00   0     0     0     0.00   0.00
  YBA     FLMI      0.00   0.0   0.0   0.0   0.00   0.00
  DJ      N         0.00   0     0     0     0.00   0.00
  YBA     FLMI      0.00   0.0   0.0   0.0   0.00   0.00
  DJ      N         0.00   0     0     0     0.00   0.00
  YBA     FLMI                           0.0
  DJ      N                              0
  YBA     FLMI                           0.0
  DJ      N                              0
  YBA     FLMI                           0.0
  DJ      N                              0

  FL
  FLQAVE
  FLMIN

  SRCGROUP
  QMax
  SRCGROUP
  Qave
  SRCGROUP
  Qmin
  SRCGROUP
  ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
  INCLUDED 2018.rou
RE FINISHED
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****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
  SURFFILE AERMET.SFC
  PROFFILE AERMET.PFL
  SURFDATA 12345 2015
  UAIRDATA 12345678 2015
  PROFBASE 1090.0 METERS
  STARTEND 2018 1 1 1 2018 12 31 24
ME FINISHED
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** AERMOD Output Pathway
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**
**
OU STARTING
  RECTABLE ALLAVE 9TH
  RECTABLE 1 9TH
** Maximum Annual Average POST files for Each Met Year
  POSTFILE ANNUAL ALL PLOT 2018.AD\ANNUAL_G001.PLT 31
  POSTFILE ANNUAL QMax PLOT 2018.AD\ANNUAL_G002.PLT 32
```

```
POSTFILE ANNUAL Qave PLOT 2018.AD\ANNUAL_G003.PLT 33
POSTFILE ANNUAL Qmin PLOT 2018.AD\ANNUAL_G004.PLT 34
** Auto-Generated Plotfiles
PLOTFILE 1 ALL 9TH 2018.AD\01H9GALL.PLT 35
```

APPENDIX C-11

```
  PLOTFILE 1 QMax 9TH 2018.AD\01H9G001.PLT 36
  PLOTFILE 1 Qave 9TH 2018.AD\01H9G002.PLT 37
  PLOTFILE 1 Qmin 9TH 2018.AD\01H9G003.PLT 38
  PLOTFILE ANNUAL ALL 2018.AD\AN00GALL.PLT 39
  PLOTFILE ANNUAL QMax 2018.AD\AN00G001.PLT 40
  PLOTFILE ANNUAL Qave 2018.AD\AN00G002.PLT 41
  PLOTFILE ANNUAL Qmin 2018.AD\AN00G003.PLT 42
  SUMMFILE 2018.sum
OU FINISHED
**
**************************************
** Project Parameters
**************************************
** PROJCTN  CoordinateSystemUTM
** DESCPTN  UTM: Universal Transverse Mercator
** DATUM    North American Datum 1983
** DTMRGN   CONUS
** UNITS    m
** ZONE     12
** ZONEINX  0
```

Appendix F – Mass Balance

HEAT & MATERIAL BALANCE

PFD Stream No.:		1	2	3	4	5	6	7	8	9	10	11	12	13
From:		Livestock Manure Input	Fresh Water	Liquid Digestate	Livestock Manure Blend Tanks	Outlet of Manure Slurry Heat Exchanger	Fresh Water	Liquid Digestate	Off-Farm Organic Food Resources Input	Off-Farm Organic Food Resources Blend Tanks	Outlet of Off-Farm Organic Food Resources Slurry Heat Exchanger	Manure & Off-Farm Organic Food Resources Blend Tanks	Pumphouse Heat Exchangers	Anaerobic Digesters
To:		Manure Blend Tanks	Manure Blend Tanks	Manure Blend Tanks	Inlet of Manure Slurry Heat Exchanger	Manure Blend Tanks	Off-Farm Organic Food Resources Blend Tanks	Off-Farm Organic Food Resources Blend Tanks	Off-Farm Organic Food Resources Blend Tanks	Inlet of Off-Farm Organic Food Resources Slurry Heat Exchanger	Off-Farm Organic Food Resources Blend Tanks	Pumphouse Heat Exchangers	Anaerobic Digesters	Biogas Conditioning/RNG Unit
Parameter	Units													
Stream Description		Livestock Manure	Fresh Slurry Water	Liquid Digestate	Livestock Manure Slurry	Heated Livestock Manure Slurry	Fresh Slurry Water	Liquid Digestate Recycle	Off-Farm Organic Food Resources Slurry	Off-Farm Organic Food Resources Slurry	Heated Off-Farm Organic Food Resources Slurry	Blended Feed Slurry	Heated Blended Feed Slurry	Biogas
Total Mass Flow														
Vapor Fraction		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Liquid Fraction		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000
Temperature	deg C	1.0	5.0	0.0	4.4	15.0	0.0	0.0	1.0	1.0	1.0	13.4	38.0	38.0
Pressure	kPag	ATM	345	0	345	300	0	0	ATM	345	300	345	340	3.5
Mass Flow	tonnes/day	219.2	904.1	0.0	1123.3	1123.3	0.0	0.0	164.4	164.4	164.4	1287.7	1287.7	59.7
Volumetric Flow	m3/day	259.6	913.2	0.0	1158.5	1159.4	0.0	0.0	177.6	177.6	177.7	1335.2	1344.0	58,219
Mass Density	kg/m3	844	990	0.0	970	969	0.0	0.0	925	925	925	964	958	1.170
Vapor Phase														
Phase Std Gas Volume Flow	Nm3/day	---	---	---	---	---	---	---	---	---	---	---	---	58,219.1
Phase Mass Density	kg/m3	---	---	---	---	---	---	---	---	---	---	---	---	1.17
Composition (dry basis)		---	---	---	---	---	---	---	---	---	---	---	---	---
Methane	% Vol	---	---	---	---	---	---	---	---	---	---	---	---	57.7
Carbon Dioxide	% Vol	—	—	—	—	—	—	—	—	—	—	—	—	41.6
Nitrogen (N2)	% Vol	—	—	—	—	—	—	—	—	—	—	—	—	0.5
Oxygen	% Vol	—	—	—	—	—	—	—	—	—	—	—	—	0.2
Ammonia	ppm	---	---	---	---	---	---	---	---	---	---	---	---	75
H2S	ppm	---	---	---	---	---	---	---	---	---	---	---	---	200
Liquid Phase														
Mass Flow	tonnes/day	219.178	904.1	0.0	1123.3	1123.3	0.0	0.0	164.4	164.4	164.4	1287.7	1287.7	—
Volumetric Flow	m3/day	259.6	913.2	0.0	1158.5	1159.4	0.0	0.0	177.6	177.6	177.7	1344.0	1344.0	---
Mass Density	kg.m3	844.2	990.0	0.0	969.6	968.8	0.0	0.0	925.5	925.5	924.8	958.1	958.1	---
Percent Total Solids	% wt	41.0	0.0	0.0	8.0	8.0	0.0	0.0	22.9	22.9	22.9	9.9	9.9	---
Percent Volatile Solids of TS	% wt	87.4	0.0	0.0	87.4	87.4	0.0	0.0	92.8	92.8	92.8	89.0	89.0	---
Percent Total Nitrogen	% wt	1.6	---	0.00	---	---	---	0.00	0.57	---	---	0.345	0.345	---
Percent Ammonia Nitrogen of Total	% wt	---	---	0.00	---	---	---	0.00	---	---	---	0.00	0.00	---
Percent Organic Nitrogen of Total	% wt	---	---	0.00	---	---	---	0.00	---	---	---	100.00	100.00	---
Percent Phosphorous	% wt	0.39	---	0.00	---	---	---	0.00	0.07	---	---	0.075	0.075	---
Percent Potassium	% wt	0.76	---	0.00	---	---	---	0.00	0.28	---	---	0.165	0.165	---
Notes														Note 1/2

PFD Stream No.:		14	15	16	17	18
From:		Anaerobic Digesters	Digestate Separation	Digestate Separation	Digestate Separation	Digestate Separation
To:		Digestate Separation	Solid Digestate Storage	Liquid Digestate	Livestock Manure Blend Tanks	Digestate Pond
Parameter	Units					
Stream Description		Digestate	Digestate Solids	Liquid Digestate	Recycle Liquid Digestate	Liquid Digestate
Total Mass Flow						
Vapor Fraction		0.000	0.000	0.000	0.000	0.000
Liquid Fraction		1.000	1.000	1.000	1.000	1.000
Temperature	deg C	38.0	20.0	20.0	0.0	20.0
Pressure	kPag	25.00	ATM	345	0	345
Mass Flow	tonnes/day	1228.0	98.7	1129.3	0.0	1129.3
Volumetric Flow	m3/day	1237.9	111.1	1142.8	0.0	1138.4
Mass Density	kg/m3	992	888	988	0.0	992
Vapor Phase						
Phase Std Gas Volume Flow	Nm3/day	—	—	—	—	—
Phase Mass Density	kg/m3	---	---	---	---	---
Composition (dry basis)		---	---	---	---	---
Methane	% Vol	---	---	---	---	---
Carbon Dioxide	% Vol	---	---	---	---	---
Nitrogen (N2)	% Vol	---	---	---	---	---
Oxygen	% Vol	---	---	---	---	---
Ammonia	ppm	---	---	---	---	---
H2S	ppm	---	---	---	---	---
Liquid Phase						
Mass Flow	tonnes/day	1228.0	98.7	1129.3	0.0	1129.3
Volumetric Flow	m3/day	1237.9	111.1	1142.8	0.0	1138.4
Mass Density	kg.m3	992.0	888.0	988.2	0.0	992.0
Percent Total Solids	% wt	6.0	30.0	3.9	0.0	3.9
Percent Volatile Solids of TS	% wt	81.6	90.4	69.7	0.0	69.7
Percent Total Nitrogen	% wt	0.34	0.87	0.29	0.00	0.29
Percent Ammonia Nitrogen of Total	% wt	80.96	29.90	83.78	0.00	83.78
Percent Organic Nitrogen of Total	% wt	19.04	70.10	16.22	0.00	16.22
Percent Phosphorous	% wt	0.08	0.32	0.06	0.00	0.06
Percent Potassium	% wt	0.17	1.09	0.09	0.00	0.09
Notes						

NOTES:
(1) Biogas volumetric flow expressed as Nm3/day.
(2) Biogas composition reported on a dry basis.

TITLE	1	L	RMF	03-Jun-22	TE	JLM
REFERENCE DRAWINGS	NO	REVISION	BY	DATE	CKD	APP

PERMIT STAMP
PERMIT STAMP SHALL APPLY ONLY TO REVISION(S)

ENGINEER'S STAMP
PERMIT STAMP SHALL APPLY ONLY TO REVISION(S)

OBSIDIAN ENGINEERING

	DRAWN	CHECKED	APPROVED DESIGN ENG.
BY	RMF	TE	JM
DATE	03-Jun-22	03-Jun-22	2022-06-03
PROJECT NO.: 3007			DWG SIZE.: A3

RIMROCK BIOGAS PRODUCTION FACILITY
HEAT & MATERIAL BALANCE

SCALE	DRAWING NUMBER	REV:
NTS	Sheet 1/2	L

Appendix G- Secondary Containment Design

April 27th, 2022

Tidewater Renewables Ltd.
222 3 Ave SW #900, Calgary,
AB T2P 0B4, Canada

SECONDARY CONTAINMENT OF DIGESTER AND MANURE PROCESSING TANKS

INTRODUCTION

Stonecrest Engineering Inc. has prepared this report as part of the environmental approvals process for the proposed Rimrock Renewables Ltd. project in Foothills County Alberta. The purpose of this letter is to provide back ground on the secondary containment strategy pro posed for the project and should not be construed as detailed wall section design. Detailed wall designs will be submitted as part of the "ISSUED FOR CONSTRUCTION" set of drawings. A supporting document is submitted as an accompaniment to this letter dated 2022-04-18 and described as "SECONDARY CONTAINMENT DETAIL"

DISCUSSION

The material contained in all tanks is best described as organic waste. Organic waste takes many forms and in this particular case it has the closest resemblance to "manure", however there are no perfect references within Alberta regulation as to handle this waste product within this framework. Therefore we must rely on sound engineering design in the design of these tanks to protect the environment.

Starting with the requirements to safely store manure a protective layer or liner must be installed and shall be 1m above the water table. The protective layer for liquid manure is to provide the same protection as soil 10 m in depth with a hydraulic conductivity of not more than 1×10^{-6}. A liner shall provide the same protection as soil 1 m in depth with a hydraulic conductivity of not more than 1×10^{-7} centimetres per second for a liquid manure storage facility.

The tanks proposed as part of this project have primary containment of in the form of "liners" formed as concrete walls designed to the appropriate building codes and will be constructed of concrete of the correct strength and

chemical resistance for the purpose for which they are designed. They will have additives for sulfur resistance and waterstop placed at all cold joints. These result in tanks that are superior in their ability to contain the proposed materials to naturally occurring soils as described above.

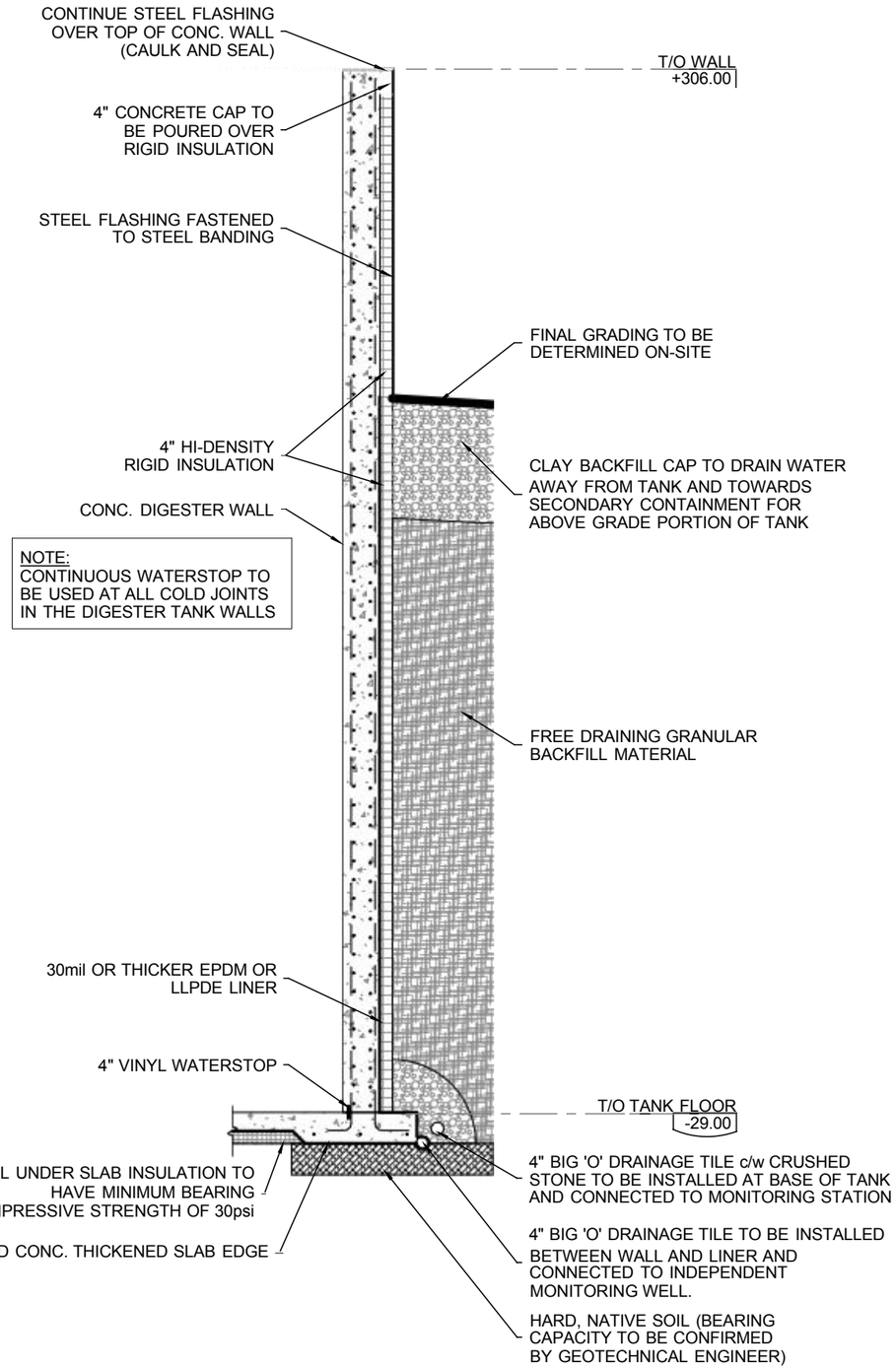
In this case the tanks are designed such that any in leakage from the concrete portion of the tank will be contained
by the secondary synthetic liner. Any leak will migrate to the bottom of the liner where it will enter in to the monitoring tile and will become visible within the connected monitoring well.

This is a very cautious approach as the soils as presented in the site pre construction geotechnical investigation show that the soils on site are suitable to provide containment of the material without fear of contaminating any groundwater.

Any leaks in the above ground portion of the tanks, secondary containment is to be managed through the use of a protective clay cap and site control measures described in the civil plan for the site.

If any questions arise as to the functionality of this strategy for groundwater protection please contact me at the number below.

Nicholas Hendry, rmc, CD, MSc(Eng), (President)
P.Eng 2079 Line 34, Shakespeare, ON
N0B 2P0
Nick@stonecrestengineering.com
Cellular (519) 275-0878
Facsimile (519) 625-8966



NOTES:
PLEASE READ NOTE PAGE AT END OF DRAWING SET FOR ALL NOTES REGARDING THIS PROJECT

NO.	DATE:	DESCRIPTION:
1	2022/04/21	ISSUED FOR ENVIRON. APPROVAL

LEGEND:

- SPOT ELEVATION
- D1 — DOOR IDENTIFICATION TAG
- W1 — WALL IDENTIFICATION TAG
- F1 — FOOTING IDENTIFICATION TAG
- W1 — WINDOW IDENTIFICATION TAG
- C1 — COLUMN IDENTIFICATION TAG

PROJECT NORTH	TRUE NORTH

PROFESSIONAL ENGINEER'S SEAL

STONECREST ENGINEERING
SHAKESPEARE, ONTARIO, CANADA
PH: (519)-625-8025
FX: (519)-625-8966

CONTRACTOR TO CHECK ALL DIMENSIONS AND ELEVATIONS AND REPORT ANY DISREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK

DO NOT SCALE THE DRAWINGS

CLIENT: RIMROCK RNG Ltd.

LOCATION: FOOTHILLS, ALBERTA

PROJECT TYPE: SECONDARY CONTAINMENT DETAIL

PROJECT STATUS AND VERSION: DESIGN DRAWINGS

DRAWN BY:	PRINT DATE:
TRAVIS L.	2022-04-21

PAGE DESCRIPTION: PROJECT DETAILS

SCALE: AS NOTED

FILE: 7877-1

PAGE NUMBER: A

Clifton

05 May 2022

Attention:	Denny Boisvert, PEng	dboisvert@tidewatermidstream.com
Company:	Rimrock Renewables Ltd.	
Address:	3700, 400 3rd Avenue SW Calgary, Alberta, T2P 0B4,	

Surface Clay Liner **File CG3555.1**
Rimrock Biodigester
NE-06-019-29W4M & NW-05-019-29W4M, Foothills County, AB

As requested by Rimrock Renewables Ltd (Rimrock), Clifton Engineering Group Inc. (Clifton) was asked to provide additional commentary regarding the hydraulic conductivity of subsurface soils on the site of the proposed biodigester facility.

In 2021, Clifton completed geotechnical drilling on the site and provided the results in a draft report[1] that was reviewed in preparation of this letter. Nineteen boreholes were completed across the site. The subsurface conditions encountered on the site generally consisted of topsoil followed by clay underlain with bedrock. Laboratory testing on the clay included water content, Atterberg Limits, Standard Proctor, and hydraulic conductivity. In situ hydraulic conductivities were also measured in two monitoring wells using falling head and rising head tests.

The Atterberg Limits tests confirmed that the clay was low plastic. The results were generally consistent with an average Liquid Limit of 33 and an average Plastic Limit of 18. The Standard Proctor tests also indicated that the soil was consistent with an average Standard Proctor Maximum Dry Density (SPMDD) of 1834 kg/m^3 with an optimum moisture content (OMC) of 15.7%.

It is our understanding that the biodigester tanks will be constructed with a synthetic liner and the clay will not be used as secondary containment.

The clay soils exhibited a laboratory hydraulic conductivity of 8×10^{-10} m/s while the average in-situ hydraulic conductivities were 3×10^{-6} m/s. These results indicate that the remoulded native clay can be used to provide surficial barrier layers around the tanks and in ditches. Although the in-situ testing showed higher hydraulic conductivities than required for secondary

1 Clifton Engineering Group Inc. 2021. *Korova Feeders Rimrock Biodigester, Foothills County, Alberta.* Prepared for Korova Feeders Ltd., Project No. CG3555 dated December 2021.

containment, they still show hydraulic conductivities that will significantly retard migration of the biodigester fluids should a leak be detected in the synthetic liner secondary containment system.

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Clifton trusts this letter meets your present requirements. If you have any questions, please contact the undersigned at 403-263-2556.

Yours truly,
Clifton

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