



May 26, 2025

SENT VIA EMAIL ONLY

Office of the Regulator of Oil and Gas Operations (OROGO)

P.O.Box 1320
Yellowknife, NT
X1A 2L9

Attention: Pauline de Jong, Executive Director

**RE: Information Request No. 1:
Application for an Operations Authorization (OA-2025-001-CNRL)**

Dear Ms. de Jong,

Please see below and attached for additional information requested for your review of the above mentioned application.

1.1 Safety Plan

Please find attached a concordance table detailing the items requested in regards to the Safety Plan and Contingency Plan. An updated Safety Plan has also been attached.

1.2 Contingency Plan

Please find attached a concordance table detailing the items requested in regards to the Safety Plan and Contingency Plan. An updated Safety Plan has also been attached.

1.3 Environmental Protection Plan

- The Environmental Protection Plan has been updated with the requested information.
- Organizational chart is included in Section 2 – page 2 of the updated plan.
- Hazard Identification and mitigations are provided in Table 4.2 in Section 4.11 on page 9 of the updated plan
- Structures, equipment and facilities critical to protection of the environment are identified in Section 4.12 page 10 of the updated plan.

Canadian Natural Resources Limited

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1.4 Post Abandonment Site Closure and Reclamation

On May 15, 2025 Canadian Natural responded to OROGO's April 11 request, providing comment on the pilot approach to regulating legacy contamination. Since the 2014 Devolution Agreement, OROGO and the Mackenzie Valley Land and Water Board have maintained clear and effective regulatory jurisdiction for oil and gas operations in the NWT. OROGO's legislative authority has focused on exploration, drilling, and production under the Oil and Gas Operations Act (OGOA) and the MVLWB's mandate has been effective land use management including community engagement, environmental protection plans and reclamation outcomes through the Land Use Permit process. Canadian Natural supports OROGO and the MVLWB in these roles as it creates clear accountability and delivery of well-established responsibilities and avoids duplication.

The current Land Use Permits administered by the LWB include all key aspects of benefits plans, community engagement, environmental protection and outcomes for legacy oil and gas operations. Canadian Natural looks forward to working with the MVLWB to address any commitments to legacy contamination at the Liard P-66 site through the Land Use Permit process.

1.5 Engagement Plan

Updates on the status of the Engagement Plan

- On April 1st an engagement package was sent out to the identified parties in the engagement plan with a request to provide feedback by April 15th
- On April 8th Acho Dene Koe First Nation (ADKFN) requested a virtual meeting with Canadian Natural to review the scope of work and future operation intentions within their Traditional Territory.
- A virtual meeting was held on April 15th with the ADKFN. A follow up email from ADKFN was sent afterwards thanking us for the meeting and providing us with contact information for Boyd Clark whom oversees business development with ADK's Economic Development Arm to review opportunities for local services.
- On April 24th CNRL provided Boyd Clark with the Scope of Work for the pipeline abandonments as well as our proposed benefits plan.
- On May 13th Boyd responded with his approval of our plan.
- To date no further feedback or responses have been received from any other parties on the engagement plan.

1.6 Proof of Financial Responsibility

The worst case scenario that could occur from a spill or debris during the abandonment operation of the two pipelines, although very unlikely, would be a pipeline failure during pigging operations.

The pipelines have been previously pigged as part of discontinuation operations, therefore any fluids present would be a result of invasion of surface water from a failure point. As such the worst case scenario of a spill would be a fresh water release underground. This has a very low potential to cause some localized erosion and possible vegetation impact.

For these reasons, CNRL proposes that the required amount of Proof of Financial Responsibility should be no greater than \$100,000 for monitoring of an impacted area to confirm natural vegetation regrowth, with a slight possibility of additional soil management or replanting required.

This scenario was developed under consultation of internal pipeline professionals and environmental professionals.



1.7 Benefits Plan

On April 16th the Department of Industry, Tourism, and Investment requested that CNRL provide a letter of support from the ADKFN for our proposed plan.

On May 14th CNRL forwarded the ADKFN's approval of the proposed plan to the Department. The Department confirmed receipt of this approval and advised that they would review and send a recommendation to the Minister and would advise once a decision has been made on the plan.

Thank you,
Canadian Natural Resources Limited

Ryan Munro, P.Eng.
Manager, Pipeline Abandonments Planning



OROGO-NWT REGULATORY CONCORDANCE

REQUIREMENTS FOR NORTHWEST TERRITORIES
OPERATIONS AUTHORIZATION # OA-2025-001-CNRL

1.1 Safety Plan

Request: Please submit an updated Safety Plan that includes correct references to the regulatory authorities as well as all information identified in section 5 of the Safety Plan Guidelines and Interpretation Notes specific to the proposed operation.

Regulatory Requirement	Reference to Applicable Canadian Natural Section of Safety Plan for Compliance	Comment
<p>Section 11 of the Safety Plan (Appendix E of the application) identifies the National Energy Board as the regulatory authority for oil and gas activities in the Northwest Territories.</p> <p>The Safety Plan submitted on April 2, 2025, does not meet the requirements of Section 5 of the Safety Plan Guidelines and Interpretation Notes. Missing information includes, but is not limited to:</p> <ul style="list-style-type: none"> • Mitigation measures related to wildlife encounters such as predator defense; • Location and availability of a medic during operations; • Location of health care facilities; 	<ul style="list-style-type: none"> • Section 11 -Page 49 OROGO • 2.22 Firearms has been added to meet the requirement. 3.2 Safety Training for Workers in Field Positions • 5.2 Transportation of Injured Worker & Evacuation Plan – Page 36 and Appendix #2 Transportation of Injured Worker and Evacuation Plan document 	<ul style="list-style-type: none"> • Updated reference to OROGO responsibilities • 2.22 outlines firearm use for protection from predatory wildlife. 3.2 addition of Bear / Wildlife Awareness training • The Transportation of Injured Worker & Evacuation Plan is completed before work starts and provides details of: <ul style="list-style-type: none"> ▪ medic location(s) ▪ Location of medical care facilities ▪ Please see the partially completed document Appendix # 2



<ul style="list-style-type: none"> • Contact information for the individuals identified in the organizational structure; • List of structures facilities and equipment critical to safety; and • Project Site Safety Plan as referenced in the scope of this submission. 	<ul style="list-style-type: none"> • 13 Organizational Chart – Page 53 • 12 Project Specific Information – Page 51 	<ul style="list-style-type: none"> • Contact information has been updated to include key personnel. Field based contacts will be identified at the time of execution. • Added knockout tank and scrubber and Medical Transport Center (MTC) to Execution Plan and Schedule.
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OROGO-NWT REGULATORY CONCORDANCE

REQUIREMENTS FOR NORTHWEST TERRITORIES

OPERATIONS AUTHORIZATION # OA-2025-001-CNRL

1.2 Contingency Plan
 Request: Please submit an updated Contingency Plan that includes information identified in section 5 of the Contingency Plan Guidelines and Interpretation Notes specific to the proposed operation.

Regulatory Requirement	Reference to Applicable Canadian Natural Section of Safety Plan for Compliance	Comment
Description of the organizational structure for the proposed work or activity, contact information for personnel responsible for implementing the Contingency Plan and their roles in implementing the Contingency Plan; and Training and compliance monitoring related to emergency response.	<ul style="list-style-type: none"> • 13 Organizational Chart – Page 53 • 3.2 Training 	<ul style="list-style-type: none"> • Updated contact information and responsibilities of plan implementation • All Canadian Natural supervisors have Emergency Response training as part of their Training and Competency profiles. This includes Computer Based Annual Training, ICS-100 and ICS-200.

2025/2026

Canadian Natural Resources



NWT Abandonment / Reclamation Project Safety Plan



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PURPOSE

The purpose of this Project Site Safety Plan is to exhibit that Canadian Natural Resources understands the regulatory expectations and will conduct its operations with diligence to ensure that all reasonable steps are taken to maintain risk levels as low as reasonably practicable. As per Section 6(c) of the Oil and Gas Drilling and Production Regulations (OGDPR) which states that an application for an Operations Authorization must include a Safety Plan, the Project Site Safety Plan sets out the procedures, practices, resources, sequence of key safety-related activities and monitoring measures necessary to ensure the safety of the proposed work or activity.

It is expected that all project personnel will meet or exceed the requirements described in this plan. This is not an all-encompassing document; subcontractors are expected to comply with any additional regulatory requirements applicable to their work, and must adhere to their own company policies and procedures.

The intent of this Project Site Safety Plan is to be a living document that will grow with the project to address hazards and controls. Any questions regarding intent or interpretation of this document may be directed to the Canadian Natural Conventional / Thermal Health and Safety Manager for clarification. Requests for variances or suggested changes must be put in writing and sent to the Canadian Natural Conventional / Thermal Health and Safety Manager for review and approval.

SCOPE

This Safety plan is designed using the Canadian Natural Safety Management System (SMS) as the foundation for all work to be conducted by Canadian Natural employees, contractors and or service providers during the planned Abandonment and Reclamation project.

The Project Site Safety Plan addresses the items listed below.

- a) references to the safety management system that demonstrate how it will be applied to the proposed work or activity and how the duties set out in Regulations with regard to safety will be fulfilled;
- b) a summary of the how hazards will be identified and to evaluate safety risks related to the proposed work or activity;
- c) a description of the hazards that were identified and the results of the risk evaluation;
- d) a summary of the measures to avoid, prevent, reduce and manage safety risks;
- e) a list of all structures, facilities, equipment and systems critical to safety and a summary of the system in place for their inspection, testing and maintenance;
- f) a description of the organizational structure for the proposed work or activity and the command structure on the installation, which clearly explains
 - I. their relationship to each other, and
 - II. the contact information and position of the person accountable for the Project Site Safety Plan and of the person responsible for implementing it; and
- g) a description of the arrangements for monitoring compliance with the plan and for measuring performance in relation to its objectives



INTRODUCTION

Safety at Canadian Natural:

- Is a **Core Value**. Priorities change, Core Values do not
- We are committed to **Safety Excellence: “No Harm to People; No Safety Incidents”**
- Through **Continuous Improvement** we will do everything practical to protect the health, safety and welfare of all our employees, Service Providers, and the public
- We encourage a **Front Line Driven Safety Culture** in which safety is the responsibility of every worker and is highly valued by each and every employee

Safety shall be held at the same level as job productivity and business performance. To empower every worker with the knowledge and skills to prevent injuries, four “Pillars” must be in place for all work conducted at a Canadian Natural worksite:

1. **Orientation** – all workers on a Canadian Natural worksite must meet the safety orientation requirements: New workers must complete the Common Safety Orientation (CSO) administered by Energy Safety Canada; they must also complete the site-specific orientation. • More information is provided in Element 3 Employee Training
2. **Hazard Assessment** – all work conducted on a Canadian Natural worksite must be guided by a Hazard Assessment conducted before the work starts. Potential hazards must be identified, assessed and controlled. Workers and Service Providers should be part of conducting Hazard Assessments and must understand the Hazard Assessment and the Controls they are expected to use. Part of Safe Work Permits / Hazard Assessment is ensuring that Job Safety Analysis / Step-by-Step Procedures are in place for the work planned. • More information is provided in Element 15 Hazard Assessment / Task Analysis
3. **Service Provider Hazard Assessment** – although the Canadian Natural Hazard Assessment identifies hazards associated with the site, when Service Providers are hired to conduct work on behalf of Canadian Natural, they must conduct and document a Hazard Assessment for the specialized service they are providing. • More information is provided in Element 15 Hazard Assessment / Task Analysis
4. **Transportation of Injured Worker and Evacuation Plan** – although Canadian Natural expects that every precaution will be taken to ensure workers are not injured, every worksite must be prepared to evacuate a worker if required. • More information is provided in Element 5 Emergency Preparedness

This Safety Management System will be reviewed on an ongoing basis to ensure it is current with changing conditions of the company, worksites, and with any regulatory changes.



1 - LEADERSHIP COMMITMENT

1.1 – General

Canadian Natural maintains a Corporate Statement on Health, Safety and Welfare that clearly indicates management's commitment to Health, Safety and Welfare through reference to personal injury, occupational health, property damage, and regulatory compliance.

To help ensure that all workers are aware of Canadian Natural commitment to Health, Safety and Welfare this policy will be:

- Reviewed annually
- Signed by the President and Chief Operating Officers
- Included in manuals and appropriate booklets
- Used as part of employee or contractor orientation
- Displayed prominently in meeting rooms, area offices, or any place that workers may gather
- Displayed and referenced as part of any training
- Part of safety or operational meetings
- Displayed and referenced during meetings with contractors and service providers

1.2 - Program Coordinator

Canadian Natural employs Health and Safety Managers that report directly to Senior Management and direct teams whose primary responsibilities are coordinating the Health, Safety and Compliance of company employees and contract workers employed by Canadian Natural.

1.3 - Senior and Middle Management Participation

All levels of management are expected to show their support to Health, Safety and Welfare through their actions on a daily basis and at special events throughout the year:

- Senior management will support the Corporate Statement on Health and Safety by letters, memos, and personal visitations to employees at least once per year
- Senior management will participate in health and safety field tours or inspections at least once per year
- If a project will involve a workforce of 100 or more, appropriate management will participate in the project "kick-off" meetings for contractors
- All managers will attend safety meetings whenever possible to demonstrate support and commitment to issues relevant to workers
- Middle management, as part of their duties, will participate in health and safety inspections of facilities at least every three months
- Front line managers will conduct health and safety inspections in their respective BU / Group at least monthly using developed checklists appropriate to the work site. Any deficiencies identified must be marked for appropriate follow up action.



All levels of management are expected to participate in activities such as Safety Award functions, corporate safety meetings, contractor general and safety meetings.

1.4 - Refusal of Dangerous / Unsafe Work

Canadian Natural recognizes that from time to time circumstances may arise when a worker does not feel safe to conduct a task. The worker may not be adequately trained or experienced in the completion of the requested work or he / she may believe conditions exist that make it dangerous / unsafe to continue. Occupational Health and Safety regulation requires that workers refuse work that is dangerous / unsafe and Canadian Natural enforces the concept that this is an obligation not a choice or right.

Any worker on a Canadian Natural worksite is required to refuse work that is believed to be dangerous / unsafe and must immediately report the reason to the supervisor.

1.5 - Responsibilities

Responsibility and accountability for the health and safety of all workers lie with every manager, supervisor, employee, and contracted worker. Safety must be a united effort and a shared responsibility.

Senior management is responsible to:

- Be familiar with the Canadian Natural Safety Management System
- Provide safe work policies, standards and guidelines
- Provide direction and leadership for safety performance
- Establish responsibilities for all supervisors and workers
- Establish accountabilities at all levels
- Communicate safety programs or policies to workers directly and through supervisors
- Insist on safety performance throughout operations by ensuring contractors and employees are competent
- Provide adequate resources to maintain safe operations
- Ensure that the activities of employers, workers and other persons at the workplace relating to health and safety are coordinated
- Do everything that is reasonably practicable to establish and maintain a system or process that will ensure the health, safety and welfare of workers and compliance with regulations
- Maintain all workplaces in a manner that ensures the health, safety and welfare of persons at or near the workplace
- Provide contractors and employers information known that is necessary to identify and eliminate or control hazards
- Ensure the development of emergency response procedures
- Recognize employees and groups for safe work achievements

Supervisors are responsible to:



- Be familiar with the Canadian Natural Safety Management System
- Insist on performance and behavior that meet the standards of the company's health and safety management system
- Encourage employee involvement in health and safety by demonstrating management's commitment to health and safety
- Be knowledgeable of regulatory requirements and ensure all operations under their supervision comply
- Provide adequate supervision at every worksite
- Ensure workers know what is expected of them through orientation
- Ensure workers are qualified to perform their work
- Ensure workers know and are prepared to deal with potential hazards of their work and any specific hazards on the worksite
- Ensure workers are not subjected to or participate in harassment or violence
- Ensure training needs are identified and met
- Ensure safe work practices are used including the safe handling of hazardous substances
- Identify hazards through inspections, and remove them if possible
- Correct dangerous / unsafe conditions and behavior immediately
- Provide appropriate equipment required for each job
- Ensure incidents are reported, investigated and corrective actions are taken
- Ensure all devices and personal protective equipment is available, properly used, stored, maintained and replaced when necessary
- Ensure they are knowledgeable of the Emergency Response Plan and when to implement it
- Coordinate activities of contractors when there are two or more employers present at the worksite to ensure activities don't interfere or cause hazards for others
- Consult and cooperate with the Joint Work Site Health and Safety Committee or Health and Safety Representative

Workers are responsible to:

- Protect themselves and others at the worksite.
- Learn how to do their jobs properly - this includes:
 - Actively participate in training provided
 - Develop competence in safe operating practices and standard work procedures
 - Gain knowledge about standards and regulations that pertain to their workplace
- Become thoroughly familiar with the health and safety program
- Participate in health and safety program development and maintenance



- Comply with rules and regulations
- Follow company safety policies, procedures and requirements
- Refuse to perform work when dangerous / unsafe conditions exist or that they are not competent to perform
- Report potential hazards, incidents and injuries to supervisors as soon as practical
- Report contravention of the regulations of which the worker is aware to the supervisor
- Report the absence of or defect in any protective equipment
- Use required devices, personal protective and safety equipment
- Be clean shaven when required to use respiratory protection
- Check tools and equipment, including devices, personal protective and safety equipment for potential hazards before using them
- Know the location, type and operation of emergency equipment
- Know the location of SDS when working with hazardous products
- Know the roles and responsibilities as outlined in the Canadian Natural emergency response plan
- Refrain from causing or participating in harassment or violence
- Not engage in horseplay or similar conduct
- Be fit for work; not impaired by alcohol, drugs or other causes while on duty or designated on call
- Cooperate with the supervisor, Joint Work Site Health and Safety Committee or Health and Safety Representative

Contractors are responsible to:

- Cooperate with Canadian Natural and other contractors in providing a safe workplace
- Comply with regulatory and safety requirements
- Develop their own health and safety program and safe work procedures
- Report to the site supervisor or site entrance gate when arriving at a worksite
- Ensure their employees know and follow their safe work procedures
- Ensure work is conducted as outlined in the Canadian Natural Hazard Assessment
- Report all incidents or injuries to the Canadian Natural supervisor
- Assist Canadian Natural personnel in investigations
- Follow Canadian Natural procedures during an emergency
- Refuse dangerous / unsafe work



Visitors are responsible to:

- Report to the site supervisor or site entrance gate when arriving at a worksite
- Receive a site orientation involving worksite hazards
- Follow the instructions of the site supervisor or personal escort
- Wear personal protective equipment as required
- Never walk about a worksite unescorted

2 - Organizational Guidelines / Standards / Policies

2.1 - General Health and Safety Guidelines, Standards, Policies

Canadian Natural will maintain written Health and Safety Guidelines, Standards, and Policies that will be available and communicated to all employees. Every worker will be provided with ready access to these Guidelines, Standards, and Policies.

- At Safety Meetings / Toolbox Talks / Tailgate Meetings etc.
- Through Safety News
- Through Safety Bulletins
- At Orientation

Whenever possible, workers that will be affected will be included in the process of developing new Guidelines, Standards, and Policies or revising existing ones to update the information.

2.2- Specialized Work Guidelines, Standards, Policies

Where potential risk associated with certain tasks cannot be adequately addressed by general Guidelines, Standards, and Policies, Canadian Natural will ensure that specific procedures are in place or developed. Examples may include turn-around work, confined space entry, and site specific procedures.

2.3 Corrective Action and Disciplinary Process

Although potential hazards exist in all types of work, dangerous / unsafe conditions can be eliminated by following established rules and procedures. Canadian Natural will make every effort to ensure the health, safety and welfare of all workers; however workers are responsible to follow Canadian Natural guidelines and procedures.

The need for disciplinary measures is reserved for personnel who:

- Have little or no respect for the health, safety and welfare of themselves or others
- Ignore and defy health and safety rules or guidelines

Violations of rules and procedures by an employee will not be tolerated. Depending on the severity of the infraction, disciplinary action, up to and including termination may be taken as outlined in Human Resources (HR) policy guidelines. Actions taken may include:

- A verbal reprimand
- A written reprimand



- Counsel by manager or supervisor
- Suspension
- Termination of employment

The Canadian Natural discipline policy will take effect in the case of willful or repeated noncompliance to Guidelines, Standards, and Policies. When it has been determined that disciplinary action will be required, the following HR guideline will be used.

2.4 - Warning Signs / Identification / Flagging

Signs provide important communication and warning for any person who may access Canadian Natural worksites.

Signs that may be posted include:

- Facility entrance signs must have:
 - Canadian Natural logo
 - Facility name and surface location
 - Emergency contact phone number
 - Hazard symbol:
 - H₂S or Poisonous Gas for sour locations
 - Flammable gas for sweet locations
 - Site safety requirements
- First Aid Facilities location must be identified
- Emergency Eye Wash / Showers location must be identified
- Hearing Protection Required signs at worker entrance of high noise level locations
- Noise levels must be posted where required by Occupational Health and Safety regulation
- Danger High Voltage – Keep Out signs must be posted in areas or buildings with generators or high voltage electrical equipment
- Overhead power lines warning signs as required
- This machine may start automatically or by remote must be identified
- Confined Spaces must be identified where workers could enter
- Visitors Report to Office / Security as applicable
- Private property, no unauthorized personnel
- Personal Protective Equipment required as applicable
- Applicable hazard warnings and symbols
- Regularly used (more than once / month) truck loading / unloading facilities must be clearly identified and signs posted with the Canadian Natural truck loading / unloading procedure
- Other areas where grounding or bonding may be required must also be posted
- Pipeline crossings must have clear signs posted at road crossing and lease entrance
- Video surveillance as applicable
-

Flagging identifies to workers that there are potential hazards in the work area.

- **CAUTION** - identified by **YELLOW** flagging used for minor excavation, work on overhead scaffolding, or tripping hazards i.e. cords, hoses etc. Workers must proceed with caution and look for hazards.



- **DANGER** - identified by **RED** flagging used for cranes working overhead, process leaks; holes or trenches or potentially life threatening hazards. Workers must **STOP** - entry is strictly prohibited until you have authorization.

2.5 - Unauthorized Entry

Wherever practical, Canadian Natural will take steps to prevent unauthorized entry to our sites and facilities:

- To prevent damage to wellheads, equipment or buildings and theft
- To protect members of the public from inadvertent injury related to our processes, equipment or any associated potential risks

When unauthorized or unknown persons are identified, they should be asked to leave and the incident reported to supervisors. Workers may access a site on a regular basis through the working day, however when fences and gates are provided, they should be kept closed and locked when the facility will be left unattended for a period of time. Canadian Natural personnel must be aware and take appropriate precautions to avoid placing themselves at risk. For instance, in the event of an alarm, operators must not challenge intruders alone; call for back up from security or police.

2.6 – Theft

Theft must be reported using an Incident Report. Supervisors will report to authorities for investigation and follow up as required. Keys should be removed from mobile equipment and all valuable equipment should be stored out of sight and in a lockable and secure facility, if possible. Canadian Natural insurance does not cover personal items left in company vehicles and the company will not be responsible for these items.

2.7 - Workplace Hazardous Material Information System 2015 (WHMIS 2015)

WHMIS is the Canadian hazard communication standard. The key elements of the system are:

- Cautionary labeling of containers of WHMIS 2015 “hazardous products”
- Provision of Safety Data Sheets (SDSs)
- Worker education and training programs

WHMIS 2015 is implemented through coordinated federal, provincial and territorial legislation. Supplier labeling and SDS requirements are set out under the federal “Hazardous Products Act” and associated “Hazardous Products Regulations”. All of the provincial, territorial and federal agencies responsible for occupational safety and health have established WHMIS 2015 employer requirements within their respective jurisdictions.

Many of the products that Canadian Natural workers deal with regularly are hazardous products and fall under WHMIS 2015 legislation. Canadian Natural is committed to complying with all WHMIS 2015 legislation including consistent worker training, effective application of labels and markings, and availability of Safety Data Sheets.

Canadian Natural keeps SDSs current for all products produced at our facilities as well as all other hazardous products brought in for use. Each worker must have easy access to all applicable SDSs and know where to find the information required. When electronic systems are used, workers must be



properly trained in the use of the system. Canadian Natural relies on an online SDS Management System to ensure SDSs are available and current. SDSs for products no longer in use must be discarded.

When decanting products in to smaller containers for handling or use, workers will have access to workplace labels and must apply an appropriate label to every container used to transport or move any hazardous product. All containers, such as “Jerry Cans” must be appropriately labeled to ensure all workers are aware of the contents. A reoccurring problem with in our industry has been transferring small amounts of hazardous products, such as methanol, into bottles and when not completely used, left and mistaken for drinking water.

Canadian Natural will inspect WHMIS 2015 compliance in each BU / Group during inspections / audits and any deficiencies will be noted and corrected by the formal action plan.

Workers are expected to have current WHMIS 2015 training certification through the computer based training modules on the CNQ’U training portal

Canadian Natural facilities must utilize an effective system to identify hazardous products in piping and process systems, with arrows indicating the direction of the flow of the product.

Systems may:

- Use different colored piping etc. for various products
- Use labels attached to piping to identify what is in the pipe or vessel
- Use different colored labels to identify what is in the pipe or vessel

When color coded systems are used, either with painted pipes or various colored labels, a chart must be prominently displayed to identify the product that each color represents.

2.8 - Driving

At the time of hiring, or before employees are allowed to drive company vehicles, Canadian Natural reserves the right, as part of the employee certification process to:

- Ensure that the candidate holds a valid driver’s license
- Request a driver’s abstract from the candidate
- Request permission to review the candidate’s drivers abstract annually
- Review driver’s accumulated demerit points
- Conduct a fit for duty certification test

Management will consider each case and use its discretion to make a decision regarding a potential candidate’s eligibility for hire.

Driver Training

Workers whose duties include operating a motor vehicle will be trained as required by Orientation for the area they will be working in.

Workers in Conventional / Thermal Operations that are required to operate company vehicles will receive a Driver Attitude training course or equivalent within six months of employment.

When a driver has experienced a preventable vehicle incident, the applicable supervisor must refer to the Accountability Matrix to determine appropriate action. Additional Driver Education must be considered.



Loss of License

If an employee is required to drive a company vehicle as part of their job, and loses his license for any reason, he must immediately notify the supervisor of the loss of his driver's license and the reason.

Each case will be considered on its own merit by supervisors or management to determine if it is practical to modify duties for a short time or if the worker's employment will be continued.

Safe Driving Procedures

Canadian Natural expects vehicles to be driven in a safe manner in compliance with all applicable Highway and Traffic laws:

- Ensure every passenger is wearing a seat belt before proceeding
- Ensure vehicles are maintained in a safe condition, including tires, brakes and windshield
- Drivers are to walk around their vehicles prior to driving to check for obstacles, leaks, tire condition, or any defects
- Follow the Canadian Natural Policy to "Drive In, Drive Out"
- Drive defensively and courteously
- Slow down on unfamiliar roads or in poor weather conditions, drive to conditions.
- Never drive while under the influence of alcohol or drugs
- Don't drive tired – fatigue causes impairment
- Drive responsibly – control distractions like cellular phones, 2 way radios, radios or CD players, conversations, eating, drinking, etc.

Drive In, Drive Out Policy

Whenever possible, drivers must park their vehicles in a position that does not require backing up to park or to leave the parking spot. Drivers must leave their vehicle in a position with the front of the vehicle facing the direction they will take when they leave that parking spot.

In some situations, when drive in / drive out is not feasible; drivers must back their vehicle in to the parking spot so they can leave in a forward direction. Many vehicle incidents occur when drivers must back up when leaving a parking spot. When drivers are able to simply drive forward, potential hazards that may have changed while they were parked are in their line of sight and many incidents are avoided. Drivers, intending to back in to a parking spot, will check the intended parking spot before making the decision to park there.

Many of the incidents that have occurred involving Canadian Natural vehicles over the past years have happened because conditions changed after the driver parked the vehicle. Another vehicle pulled up beside or behind them and when the driver intended to leave the location he backed into another vehicle.

Another frequent cause of incidents that occur when backing up is a driver that parks his vehicle beside or too close to a post, building or other stationary object. Then, when leaving the location, they back up and while turning sharply to one side or the other striking the stationary object causing damage to their vehicle.



2.9 Contractor / Service Provider Management

Service Providers with an effective, recognizable health and safety program and a low injury rate will be given preference when awarding work. It will be the responsibility of the Canadian Natural representative hiring Service Providers or Service Providers to access Canadian Natural's Contractor Management System through Complyworks to ensure Service Providers are eligible for hire.

Service Providers are required to be familiar with and comply with all applicable regulation. Small Contractors who do not have their own health and safety program will follow the Canadian Natural health and safety program guidelines.

In some circumstances, as identified by business requirements or by Worksite Safety Observation, Canadian Natural personnel may conduct reviews or audits of Service Provider's Safety Programs to ensure compliance to Canadian Natural requirements and Occupational Health & Safety legislation.

Safety Orientation

Every person involved in work on a Canadian Natural worksite must receive appropriate orientation. Proof of Orientation does not expire.

Hazard Assessment

Canadian Natural will provide as much information as possible regarding all known or expected hazards at each job site. Service Providers must conduct an appropriate Hazard Assessment and provide written procedures for the service(s) they are providing.

Responsibilities

Service Providers are responsible to:

- Provide adequate on-site safety personnel and support for the number of workers on location.
- Ensure subcontractors and their employees are familiar with and follow applicable legislation for the work they are conducting.
- Ensure all workers are familiar and comply, as applicable, with Canadian Natural standards, practices, and expectations.
- Ensure all hazards are identified.
- Provide competent workers able to do the work. Service Providers are expected to perform the work they are hired for in a safe and competent manner. If the position requires certification, such as crane operators, a copy of the certification must be provided to the Site Supervisor and documented on the Canadian Natural Hazard Assessment.
- Include all health, safety and welfare provisions of the contract in any agreement with a subcontractor.
- Ensure that their workers have safe working conditions including reasonable hours of work. It is the Service Provider's responsibility to ensure workers have received adequate rest and are not impaired by fatigue or anything else. Workers must be fit for duty.
- Ensure their workers have received appropriate training.
- Ensure their workers have received appropriate job orientation.



- Ensure their workers have been provided with all required Personal Protective Equipment.
- Conduct regular and periodic inspections of the worksite to identify unsafe conditions or practices.
- Provide appropriate and safe equipment with appropriate safe guards that are required to do the job.
- Take all necessary precautions to protect all personnel including workers, visitors and the public from any injury or illness as a result of their work.
- Exercise the right to refuse dangerous / unsafe work by stopping all activities if it is considered dangerous / unsafe. The situation must be investigated and documented on a Canadian Natural Incident Report and resolved.
- The Canadian Natural Safety and Compliance Coordinator will conduct the investigation with the refusing worker of the dangerous / unsafe condition and a member of the Joint Work Site Health and Safety Committee or Health and Safety Representative.
- Report incidents using the Canadian Natural Incident Report form and conduct an appropriate investigation. Copies of the investigation report must be made available to Canadian Natural.
- Remove any worker or subcontractor who doesn't comply with health and safety requirements from the job site.

Designated Authority for Safety

Each Service Provider must designate, in writing, the person on each jobsite that has the responsibility and authority regarding the health, safety and welfare of that Service Provider's work activities on the site.

If the site supervisor leaves the site for any reason it is his responsibility to designate, in writing, an alternative person to have the ultimate authority for health, safety and welfare in his absence.

Safety Meetings

Service providers are expected to:

- Hold pre-job safety meetings with their workers to discuss health, safety and welfare issues pertinent to the job, such as site specific emergency plans and job specific hazards.
- Hold regular meetings to discuss general health, safety and welfare concerns, review incidents, and determine actions needed to improve job health, safety and welfare. Minutes of every meeting must be taken to document issues and concerns discussed as well as the attendance of each worker.
- Hold job specific tailgate meetings before beginning any potentially hazardous job to discuss hazards and the safe work procedures to be followed to control the hazards.

Alcohol and Drug Program

Service providers are encouraged to have a Alcohol and Drug program in place for their employees. If there is reasonable cause to suspect that a worker is unfit for duty, the worker will be removed from the Canadian Natural worksite. Canadian Natural may request that the worker's employer activate their Alcohol and Drug program.



Inspections

Service providers are expected to conduct regular and informal inspections of the worksite to ensure unsafe conditions or practices that may develop are dealt with and controlled.

Canadian Natural representatives will also conduct Worksite Safety Observations (WSO) to ensure that health, safety and welfare requirements are being followed. If unsafe conditions or equipment are identified, Canadian Natural may require the removal or repair of the faulty equipment or replacement at the Service Provider's expense.

2.10 - Harassment and Violence Free Workplace

Introduction

Canadian Natural is committed to a healthy, productive work environment, where the dignity and safety of each individual employee is respected and protected. Our Mission Statement provides strong support for this concept through its focus on 'people working together' and 'integrity'.

This policy is intended to prevent harassment and/or workplace violence against Canadian Natural employees and to deal effectively with any incident.

Policy

Harassment or violence in the workplace will not be tolerated. Verified incidents of harassment or violence in the workplace are subject to corrective action, including disciplinary actions up to and including termination of employment for cause.

Definition of Violence in the Workplace:

Any inappropriate physical contact or action, or threat of inappropriate physical contact or action that would result in pain and/or suffering to individuals.

This includes:

- Behavior that would be interpreted by a reasonable person as a substantial threat to harm another person(s) or to endanger the health, safety or wellbeing of other persons.
- Any abnormal behavior that causes emotional or physical distress to other persons.
- Any behavior that causes or is likely to cause physical or psychological injury or harm and includes domestic or sexual violence

Definition of Harassment:

Harassment is any form of conduct, comment, bullying or action that:

- Creates an intimidating, hostile, or offensive work environment
- Adversely affects an individual's employment relationship or work performance
- Denies an individual dignity and respect
- Causes or is likely to cause, physical or psychological injury or harm and includes domestic or sexual violence

Examples of behavior that is considered harassment are: insulting comments; slurs; insulting or demeaning posters; insulting or demeaning invitations; unwanted or offensive actions, teasing, jokes, cartoons, graffiti, innuendoes, drawings; unwanted touch; unwanted gifts; lack of respect for personal



space, etc. Harassment may have occurred if a behavior was known, or ought to have reasonably been known, will or would cause offence or humiliation to the worker, to be unwelcome or adversely affect an individual's health and safety.

The definition of harassment can be applied to the following categories:

- **Prohibited Grounds:** Harassment is prohibited on the grounds of Race, Color, Ethnic Origin, Sexual Orientation, Creed, Religion, Mental Disability, Physical Disability, Marital Status, Family Status, Pregnancy, Age, and Gender, Source of Income, Gender Identity or expression, as well as any other ground defined in the legislative jurisdictions where Canadian Natural operates.
- **Sexual Harassment:** Any conduct, comment, gesture, or contact of a sexual nature that is likely to cause offense or that may be reasonably perceived as placing a condition on employment or opportunity for career development.
- **Workplace Harassment:** Any unwelcome conduct or comment that an employee finds offensive, which interferes with work performance, affects employment relationships, or denies dignity and respect. This includes, but is not limited to, offensive language, unwanted taunting/teasing, and the display of written material that is offensive or derogatory.

Application:

This policy applies to all permanent and temporary employees of Canadian Natural Resources Limited, and all Service Providers who work with Canadian Natural employees and/or represent Canadian Natural in any way.

Any incidents of harassment or violence in the workplace that involved customers, vendors, or visitors to Canadian Natural will be managed by Canadian Natural's leadership through a process based on the procedure outlined below, but may require alternate steps and/or the cooperation of other business entities.

Victims of harassment, violence, or of the threat of violence may wish to report the incident to the police. Nothing in this policy prevents them from exercising that right.

Responsibilities:

All employees are responsible for:

- Refrain from causing or participating in harassment or violence
- Fostering a workplace where harassment or violence is not tolerated
- When encountering objectionable behavior, for advising that individual (where possible) that the behavior is unwelcome

Managers and Supervisors are responsible for:

- Ensure workers are not subjected to or participate in harassment or violence
- Taking seriously any allegation or report of harassment or violence
- Addressing any abnormal or threatening behavior or statements which indicate the possibility for violence
- Consulting with Human Resources in order to facilitate the resolution of any complaint

Human Resources is responsible for:

- Supporting a workplace free from harassment, discrimination violence, or threat of violence



- Taking seriously any allegation or report of harassment or violence
- Ensuring the investigation of any complaint of harassment or violence is conducted in an expedient, confidential, and fair manner

Vindictive or frivolous complaints are a serious offence. Employees who have been found to have made such a complaint will be subject to disciplinary action.

Confidentiality:

Complaints of harassment or violence will be treated with the strictest of confidence. They will be investigated and resolved with as few people involved as possible. The names of individuals involved and the circumstances will only be divulged if clearly necessary for the purpose of investigating the complaint or if required by Law.

Procedure:

If you are being harassed or have been subjected to violence or threat of violence:

1. If possible, tell the individual - either verbally or in writing - that the behavior is unwelcome and ask him/her to stop.
2. Keep a record of the incident(s) (dates, times, locations, what happened, witnesses, etc.).
3. If you are not comfortable that Steps #1 and #2 (will) resolve the issue, then file a complaint with any of:
 - Your immediate supervisor or Department Manager
 - Any member of the Canadian Natural Management Committee
 - Your Human Resources Advisor, or the Manager, Human Resources

Employees also have the right to contact the Alberta Human Rights Commission and, if appropriate, the police to file a charge of assault.

Once reported, the complaint will be kept strictly confidential. An investigation will be undertaken immediately and all necessary steps will be taken to resolve the problem as expeditiously as possible.

If the investigation reveals evidence to support the complaint, the harasser's behavior will be corrected appropriately, and the incident will be documented in the harasser's personnel file.

If the investigation fails to find supportive evidence, there will be NO documentation concerning the complaint placed on the alleged harasser's personnel file. However, no matter what outcome is reached, Human Resources will maintain a separate file that documents the investigation process. The resolution/decision of the issue will be shared with the victims of the harassment.

Regardless of the outcome, the employee lodging the complaint as well as others providing information will be protected from any form of retaliation by co-workers or superiors, including demotion, or denial of opportunities within Canadian Natural.

If you observe an incident of harassment, violence, or threat of violence:



1. If possible, tell the alleged harasser or source of violent behavior that the behavior is inappropriate and ask him/her to stop.
2. Keep a record of the incident(s) (dates, times, locations, what happened, etc.).
3. Refer the victim of the incident to this Policy and/or his/her immediate supervisor, a member of the Management Committee, or Human Resources.
4. Report the incident yourself to your Department Manager, a member of the Management Committee, or Human Resources.

Avoid Confrontation:

In the event that a confrontational situation or a perceived threat is recognized, either between Canadian Natural workers or between a Canadian Natural worker and a member of the public, every effort should be made to control the situation. If there appears to be a potential for escalation, personnel are expected to stop, back down, and ensure they protect themselves.

The situation must be reported and, if necessary, another way determined to handle it with the aid of a supervisor.

The following chart outlines some situations where workers at Canadian Natural could potentially encounter violence or harassment at the workplace. Controls and Actions to be taken in the event of violence or harassment are suggested.



SITUATION	HAZARD	CONTROLS AND ACTION
1. Dismissal of personnel	Potential conflict including violence resulting in injury Potential for property damage	Control the workplace environment. Terminations to be done in a room set up for easy exit and in presence of more than one individual. Terminations to be performed by trained personnel . Follow Human Resources termination of employment guidelines.
2. Acts of terror or violence from others.	Equipment changed or tampered with Break-ins / vandalism	Protect yourself. Security (system or method) Report any vandalism, threat or violence to supervisor
3. Land owner altercations / confrontations.	Violence or threat of violence occurs between land owner and employee	Do not allow to escalate, back away and Report all or any altercations, threats or harassment by landowners to immediate supervisor. Document time and situation.
4. Construction Project (Service Provider conflict with employee)	Unsuccessful Service Providers may confront employees at Construction sites with threats or actual violence to on site personnel	Do not allow to escalate, back away and Report any and all altercations or threats to immediate supervisor and document the time, place and situation.
5. Open houses / public consultations	General public may become agitated at public consultation meetings and threaten or actually physically or psychologically abuse an employee	Communicate set agenda prior to meeting Arrange for appropriate security beforehand Do not allow to escalate, do not argue Report any harassment, threats or violent behavior to supervisor
6. Road rage.	Employees may be subject to road rage from other drivers. Field personnel drive public roads	Slow, Stop, get out of the situation and Report aggressive driving behaviors of others to supervisor
7. Hunting confrontations	Operations personnel may be subject to harassment, violence or threats of violence when confronting hunters trespassing on company property	Be courteous when asking hunters to vacate company property and if they do not leave immediately, contact immediate supervisor or local authorities for assistance. Report any harassment, violence or threat of violence to supervisor. Document occurrence including description of personnel, license plate numbers or any other identifiable means



8. Employee altercations	Disagreements that turn into violence or threat of violence	Report to supervisor Document any situations that lead to harassment, violence or threat of violence
9. Acquisitions / take overs	Disgruntled employees may confront other employees Threats or violence may occur	Report to supervisor any actions that consist of harassment, violence or threat of violence Communication of changes as soon as possible to effected personnel
10. Horseplay / Practical jokes	Horseplay or practical jokes can get carried too far resulting in conflict including violence to personnel	Horseplay and practical jokes should be kept out of the work place Report situations to supervisor
11. Scouting locations (drilling)	Threats of personal injury may occur if confrontation occurs	Follow working Alone procedure Report any confrontations to supervisor
12. E-mail advances or abuse	Unwanted harassment or inappropriate emails may offend others	Report any inappropriate or unwanted email to supervisor

It is difficult to identify every possible problem or hazard, which could be encountered at Canadian Natural locations; however workers must recognize the need to always put their safety first when dealing with any situation. Should situations develop that require additional personnel and or equipment - notify your supervisor. Canadian Natural facilities are designed with personal safety in mind. The controls and safety equipment are in place to aid and protect personnel however it is the employee's responsibility to communicate any unwanted contact or action to the applicable personnel. Review established Human Resource procedures for workplace violence, know what to do.

2.11 - Working Alone

When workers are required to work alone or in isolation, an appropriate plan must be in place to protect workers and comply with applicable provincial regulation.

A plan must be implemented:

- Hazards must be assessed, documented and discussed with workers
- Hazards must be reduced or eliminated. Check-in intervals must be appropriate to potential hazards associated with the work. In most cases intervals should not exceed 2 hours.
- Effective communication (radio, telephone, scheduled check in points) must be provided for workers to summon assistance
- Check in times and locations must be documented
- An effective written plan must be in place and activated in the event of a missed check in



2.12 - Lifting and Carrying

Many back injuries occur while lifting and carrying. Whenever possible use mechanical assistance such as hoists, bars, jacks, rollers or hand trucks when moving heavy material. Never place yourself under a heavy object when it is being lifted. Be sure that footing is secure. Place feet firmly with one foot slightly ahead for stability and be very cautious of slippery surfaces.

Before attempting to lift an object, estimate the weight and get help, if needed. When lifting a load, start from a squatting position and, keeping the load as close to your body as possible, lift with your legs. If the load is heavier than anticipated, stop and get help. When two or more workers are lifting and carrying, ensure everyone understands signals or directions to work together to move the load. Work deliberately - when moving light objects, use the same, correct lifting procedures as you would for heavy weight. Never pick up or put down an object while in a twisted position. Do not twist your torso while lifting.

2.13 - Repetitive Strains

Repetitive Strain

Repetitive strain injuries can occur in many different areas of the body. Common examples include tennis elbow; runners knee problems and carpal tunnel syndrome.

Repetitive movements do not cause injuries. They are the result of the strain we subject our bodies to while we are in the act of performing repetitive movement. They can also be related to previous injuries, poor posture or other traumas.

Work at your own pace and take breaks. Whenever possible, organize tasks to include a variety of postures and movement. Maintain good posture and set up workstations, keyboards and chairs to fit you.

To help Preventing Injury:

- Maintain a straight wrist position (up, down and sideways). Your forearm should be parallel to the floor
- Never rest your wrists while typing (rest your wrists only when you are not typing).
- Use your whole arm (from the shoulder) to move your hands. Don't stretch for far away keys. (Escape, End, Insert and Delete)
- Keep your fingers curved. Don't hold your pinkie (or thumb) in the air. Relax your thumb. By relaxing your thumb you relax your whole hand
- Use strong fingers instead of stressing your pinkie. (Shift, Control, Alt, Tab and Enter)
- Use both hands for two key strokes. Don't stretch one hand to hit both
- Use a light touch. Pounding on the keyboard is like dancing on a concrete floor
- Work at a comfortable pace and take frequent breaks. If it hurts, stop
- Keep your fingernails short so you can use your fingertips instead of the flat of your finger



2.14 - Heat Stress

Workers at Canadian Natural may also be exposed to hot conditions when working inside process buildings or working outside in hot weather.

Three common disorders associated with heat are:

Heat cramps - painful cramps in the stomach, arms and legs can result if heavy sweating drains a person of salt. Cramps may occur suddenly while at work or after hours. Cramps are a warning that more serious heat disorders may occur if the stress continues. When heat cramps occur, move the victims to a cool area, loosen their clothing and have them drink cool water. If cramps continue, provide first aid and take victims to a doctor.

Heat exhaustion - occurs when the body's cooling system cannot keep up with the heat stress. Sweat contains a balance of important fluids and salts. If lost water and salt are not replaced, the body becomes dehydrated. Signs of heat exhaustion include: heavy sweating, cool, moist skin, body temperature greater than 38°C, weak pulse, normal or low blood pressure. Victims may be tired, weak, clumsy, upset or confused. They are usually very thirsty, panting and may have blurred vision. Victims should be moved to a cool area, given cool water to drink and have their clothing loosened. Since heat exhaustion can lead to heat stroke, provide first aid and send victims to a doctor.

Heat stroke - develops when all the water and salt available for sweating has been used up. The body's temperature rises to above 40°C, the skin becomes hot, dry and red. Victims may act strangely, be weak, confused, have a fast pulse rate, headache or be dizzy. In later stages, victims may faint or have convulsions. Heat stroke can kill. Anyone in this condition must be taken to a hospital immediately. During transport remove excess clothing from the victims, fan and spray their bodies with cool water, offer sips of cool water.

When hot work conditions are anticipated or encountered, a work plan must be developed applicable to the job effort and working environment. Natural ventilation and fans should be used whenever possible to provide cooler working areas where air conditioning is not practical. If possible, schedule work for cooler times of the day and allow workers to set their own work pace.

Workers must take frequent rest and drink breaks, frequently drinking small amounts of water or other cool (but not cold) fluids. One cup of fluid every 15 - 20 minutes should replace water lost in sweat. If workers drink only when they are thirsty, they may not get enough fluid.

Workers, supervisors, and first aid attendants must recognize heat stress disorders and how to treat them.

2.15 - Hot Work

Hot work is any activity which may cause an ignition source to be introduced into an area within 25 meters of a potential hydrocarbon source.

Examples of hot work include:

- Transporting infield condensate
- Welding
- Grinding



- Cutting with a torch
- Using electrical equipment that is not classified for use in a hazardous location

Whenever hot work is contemplated in an area with a potential hydro carbon source, appropriate documentation must be completed and followed to ensure controls are identified and implemented.

Controls may include isolation, depressurizing, and purging, along with appropriate gas detection and warnings to ensure an explosive atmosphere does not develop.

2.16 - Ground Disturbance

A ground disturbance is defined by the oil and gas industry as any work, operation or activity that results in a disturbance of the earth to a depth of 30cm or more, or in a reduction of the initial installation cover over a pipeline.

Anyone proposing to undertake a ground disturbance must make every effort to determine the existence of underground facilities in the vicinity. Canadian Natural defines the search area as an area extending 30m in all directions surrounding the work area. All underground facilities within the search area must be identified and marked prior to undertaking a ground disturbance.

Excavations and Trenches

No mechanical excavation may take place until:

- Canadian Natural Ground Disturbance documentation has been completed
- A 360° degree grid sweep has been done to identify all underground facilities within 30 meters of the proposed excavation
- All underground facilities have been exposed by hand or hydrovac

No worker may enter an excavation deeper than 1.5m (AB), 1.2 (BC/SK) unless it is adequately sloped or shored to prevent any possibility of cave in. Use a one to one ratio of slope, that is for every foot in depth, the side should be sloped back an equal amount, or use an engineered shoring system.

Safe access and egress must be provided when workers enter an excavation. A ladder may be used.

The spoil pile must be kept back at least a meter from the edge of the excavation.

All excavations must be clearly marked and barricaded.
See Canadian Natural Ground Disturbance Code of Practice.

2.17 - Fall Protection

Fall Protection is an integral part of Canadian Natural's commitment to a safe work environment. Falls from height can represent a high risk to workers if appropriate measures are not taken. Falls from the same elevation present a much lower risk but have a potential to occur more often.

All Canadian Natural field operators will receive formal fall protection training and all personnel required to use fall protection equipment must be trained in inspection and use of it by a competent person. As well, personnel expected to conduct a site rescue will be trained in the procedures and techniques to conduct such a rescue.



It must be recognized that falls and injuries can occur when working on the same elevation. Slips and trips account for approximately 60% of falls:

- Spills, smooth surfaces or other material that reduces traction
- Cords or hoses that could be tripped over
- Protruding objects, exposed corners
- Uneven surfaces
- Ruts
- Worker inattention

Although fall protection is required for any work above 3 meters, any work at an elevation above floor or grade level increases the hazard of a fall. Potential fall hazards include but are not limited to:

- Ladders – portable, temporary, or fixed
- Vessels
- Building roofs
- Rig Derricks
- Over water
- Over other obstacles where a fall could result in greater injury than a flat surface. E.g. – impalement
- Any work above 3 meters
- Working from a man basket

The goal of every worker at Canadian Natural should be to eliminate falls.

Fall Protection can be achieved through:

- Identification of hazards
- Elimination of hazards through engineering
- Administrative procedures to mitigate hazards through restraint systems
- Fall arrest

When equipment and facilities are designed and built, consideration should be given to worker access:

- The use of skid resistant materials and coatings should be used to reduce the risk of slips.
- Piping, cables etc. should be routed to avoid presenting a tripping hazard.
- Adequate lighting must be provided to ensure workers are aware of potential hazards.
- If work at height cannot be eliminated the following hierarchy should be used:
 1. Stairs and **platforms with guardrails** should be provided if possible.
 2. **Fall restraint** can be used to restrict worker movement to a safe area. An effective anchor capable of withstanding 3.5 kN (800#), appropriate length of lanyard, and a safety



belt or harness must be used to prevent workers from accessing any point they could fall from.

3. As a last resort, **fall arrest systems** will be used. This equipment is designed to protect workers after they have fallen. Full body harnesses, lanyards that restrict free fall to 1.2 meters (4') without a shock absorber and 1.9 meters (6') with a shock absorber, must be attached to an anchor capable of withstanding 22 kN (5000 #) (Alberta - 16 kN / 3500#).

Provincial OHS regulation requires that a written fall protection plan is in place prior to using a personal fall protection system for work with a potential fall hazard:

- AB / SK / MB - 3 meters (10') or more
- BC - 7.5 meters (25') or more

The plan must identify:

- Potential fall hazard
- The fall protection system to be used
- Instructions on how to assemble, use, and disassemble the system
- Instructions on how to rescue a worker who has fallen and can't initiate a self-rescue

Every task undertaken by a worker can have inherent risks associated with it. It is the worker's responsibility to assess their current task, the risk associated with it and what precautions must be taken to reduce or eliminate that risk while climbing and working at heights. When workers are unsure of the methods, equipment or procedures to reduce the risk, they are to seek direction from their supervisor.

Ladders

Although workers climbing or descending a ladder are not required to be in continuous fall protection, ladders may be equipped with a climbing device that workers can attach their harness to and remain in continuous fall protection as they climb, work from, and descend the ladder. An alternative is for workers to use two lanyards that can be moved up individually so protection remains constant.

- Workers on ladders must retain three points of contact at all times.
- Tools and equipment must not be carried in the workers hands.
- Portable ladders must be secured from movement and extend at least 1 meter (3') above the access point.
- All work from ladders must be short duration – 15 minutes or less and allow the worker to maintain a three point contact. A work positioning system can be used to allow the use of both hands.
- Workers must not reach - the worker's center of gravity must remain between the side rails at all times.
- No work from the top 2 rungs of step ladders.
- Canadian Natural does not permit walking on tank roofs unless;
 - A manufactured or engineered walkway extends across the tank roof, or
 - Engineering have confirmed the integrity of the tank roof.



Equipment Selection

All equipment selected for fall protection shall be:

- Canadian Standards Association (CSA) approved. Tags must remain legible
- Inspected prior to use by the worker using the equipment
- Inspected at least annually by a competent person as per manufacturers recommendations and legislated requirements

It is imperative that workers follow the manufacturer's guidelines in the inspection, use, care and maintenance of the specific equipment used

2.18 - Lock Out

Whenever work is done on any equipment at Canadian Natural, it must be rendered inoperative; all residual energy must be released, and effectively prevented from any inadvertent movement or release and locked out to prevent worker injury.

Canadian Natural has a general lock out procedure and there must be specific written lock out procedures available for workers when equipment must be locked out. The specific procedures must identify every potential energy source and the most effective way to isolate and lock each point.

Energy sources to consider are not limited to but include:

- Pneumatic
- Hydraulic
- Electrical
- Mechanical
- Gravity
- Chemicals
- Nuclear
- Any other form of energy
- Gas

Each worker that performs work on the equipment must ensure that each potential energy source is isolated and install his lock at each point.

After lock out is completed according to Canadian Natural Lock Out or Job Specific procedures, and all energy is bled off, it must be tested by attempting to start the equipment to ensure all appropriate switches, valves, etc. have been shut off.

Locks can only be removed by the worker that installed them. If the equipment is shut down through a shift change or similar circumstances, the worker leaving must remove his lock and his replacement must install his lock. If a worker inadvertently leaves his lock installed and the equipment needs to be restarted, the supervisor will make every effort to contact the worker and request that he return to the job site to remove his lock. If this is not possible, the supervisor will inspect the equipment and, when satisfied that everything is safe, remove the workers lock. Disciplinary action may be taken at the discretion of the supervisor.

Group Lock Out

When there are a large number of isolation points or a large number of workers working on equipment, such as turn arounds etc. it may be more practical to consider a group lock out procedure.



In a group lock out procedure:

A qualified, designated worker (two workers in BC) isolates and locks out each potential energy source using group locks. (AB – a second qualified worker must verify). The designated worker verifies effective isolation by testing start switches etc. as applicable.

All the keys to the isolation locks are then placed in a lock box designed for this purpose.

The qualified worker(s) that installed the isolation locks on each energy source then install their personal locks on the lock box.

The designated worker must complete, sign and post a check sheet indicating which equipment is isolated and locked out.

Additional workers that are required to work on the equipment can then simply install their locks on the lock box.

Multi Lock hasps will have to be used to accommodate every worker's locks.

Vehicles / Mobile Equipment

When maintenance work must be performed on any vehicles or mobile equipment, at a minimum, the operator must remove the key from the ignition and keep it on his person at all times while he is working on the machine. A tag must be used to inform any other workers that the machine or vehicle is not to be started or moved.

Depending on the work required, other options are available and should be considered, such as disconnecting the battery cables and applying a box and lock to prevent any way for it to be reconnected before the lock is removed.

Wheel chocks must be used to prevent movement when workers are working on the machine or vehicle.

Hydraulic cylinders, gravity, and air operated equipment must be correctly blocked or all energy must be at a zero state before workers attempt to enter to work on the equipment.

2.19 - Blinding / Blanking

The most effective way to isolate a vessel or any equipment from a piping system is to disconnect a flange as close as possible to the equipment to be isolated and install a blind that is certified and correctly rated for the application.

When this method is used, a blind list may be used to identify each flange blinded or blank used.

2.20 - Double Block & Bleed

To isolate piping, or a pipeline, a double block and bleed system may be used. Each potential source of energy must be isolated by 2 valves, secured in the closed position, with a bleed valve secured in the open position between them.



2.21 - Bypassing Safety Shutdowns

Much of the equipment operating on Canadian Natural worksites is protected by safety shutdown systems that are designed to detect abnormal conditions and initiate a shut down or pressure relief before dangerous conditions develop.

Examples of safety shutdown systems include:

- Control panels with fault detection.
- High / Low pressure switch (Presco Dyne) on pumping wellheads.
- Pilot button on catalytic heater control valve.
- Drilling / Service rig crown savers.

Safety shutdowns, devices and engineering controls are in place to protect:

1. People
2. Environment
3. Equipment

Whenever a safety shut down or alarm must be bypassed for maintenance or any reason, the BU / Group Supervisor must be notified and his approval given. The Canadian Natural Bypass Shutdown Check sheet must be completed and prominently posted to inform any workers that may be affected.

Safety Shutdowns are not to be bypassed for convenience or production.

2.22 - Firearms

Except for individuals in Law Enforcement (Peace Officers, RCMP, SRD etc.) that carry weapons in their normal line of duty, firearms are prohibited on any Canadian Natural work site unless specifically authorized by Canadian Natural.

Some Canadian Natural worksites are in remote areas, and many are in wildlife habitat so worker safety must be considered:

- Supervisors must consider times and areas where predatory wildlife presents a potential hazard
- When carrying a firearm is considered the only effective option, it is to be used as a last resort for protection only
- When using aircraft to access remote sites, alternative arrangements must be made to ensure worker safety

When workers are authorized by a Canadian Natural supervisor to carry a firearm:

- The Canadian Natural supervisor must develop a site specific guideline / procedure to clearly identify expectations and limits
- Firearm users must provide a firearm appropriate for protection from aggressive wildlife that could be encountered. Canadian Natural will not provide firearms.
- No restricted firearms will be allowed
- Firearm users must provide proof of training appropriate to the firearm. (Canadian Firearms Safety Course)



- Firearm users must hold a Possession Acquisition License (PAL) or Possession Only License (POL)
- Firearm users are responsible to ensure firearms are transported and secured safely at all times
- If workers are not comfortable with firearms, another worker may be assigned to conduct the work, or accompany other workers for their protection

3 - TRAINING AND COMPETENCY

3.1 - Roles and Responsibilities

Senior Management:

- Provides resources to implement safety training and competency activities.

Training and Competency Administrators/Coordinators:

- Act as the focal point for safety training and competency verification activities.
- Work together with BU/Group leadership and the Safety team to develop and maintain safety training matrices/guides.
- Work together with BU/Group leadership and the Safety team to select external safety training providers.
- Manage worker safety training and competency verification records and provide accurate reporting to BU/Group leadership when requested.

Supervisors:

- Ensure workers have completed their assigned safety training.
- Ensure worker competency verification activities are completed.
- Ensure workers are directly supervised until they are verified as competent.
- Work together with the Training and Competency Administrators/Coordinators to determine job-specific safety training requirements and evaluate external safety training providers.

Workers:

- A “Worker” is someone who performs work and/or supervises work on behalf of Canadian Natural.
 - Examples include: Canadian Natural employees, contract operators, contract tradesperson, consultants, students.
 - Contract operators and contract tradespersons have the same duties, responsibilities, expectations, liabilities, and training requirements as Canadian

Natural employees.

- Complete all assigned safety training.
- Participate in all competency development and verification activities.
- Review, understand and follow step-by-step procedures for the tasks they are assigned to perform. (Refer to SMS Element 15.)

3.2 - Safety Training for Workers in Field Positions

BU/Group leadership is responsible to determine safety training for their workers in field



positions, and ensure they meet the mandatory safety training and orientation requirements listed below.

Job-Specific Safety Training:

- BU/Group leadership is responsible to evaluate and determine job-specific safety training for their workers in field positions.
- The evaluation must consider:
 - Each worker's job duties (their own work and the work they may supervise);
 - The locations where work is conducted;
 - Technical knowledge and practical skills required to perform the tasks; and
 - Regulatory requirements and industry best practices.
- The job-specific training requirements are documented in the BU/Group training matrices/guides (Refer to Section 3.5).

Mandatory Safety Training/Courses for Workers in Field Positions:

- Common Safety Orientation (CSO) or equivalent
- CHAMP Basics
- WHMIS 2015
- Hazard identification, assessment and control (*course titles may vary by BU/Group*)
- H2S training (*course titles may vary by BU/Group*)
- Noise awareness (*course titles may vary by BU/Group*)
- Emergency response (*course titles may vary by BU/Group*)
- Bear / Wildlife Awareness

Orientation for New Workers in Field Positions:

- A "new worker" is someone who is:
 - New to Canadian Natural, the BU/Group, or the work location; or
 - Returning to a previous work location where hazards and/or site rules have changed during the worker's absence.
- The Supervisor must ensure new workers have completed the Common Safety Orientation (CSO) or equivalent and a site-specific orientation before starting work.
 - The "site-specific orientation" must include a review of work-related hazards, site rules, and emergency response procedures.

3.3 - Selection of Safety Training Providers

With input from BU/Group leadership and the Safety team, the Training and Competency Administrators/Coordinators are responsible to evaluate and select qualified safety training providers.

- The evaluation must consider:
 - Regulatory requirements and industry best practices;
 - Course content and scope;
 - Qualification and experience of the instructor(s); and
 - Relevancy to the work at Canadian Natural.

3.4 - Documentation and Record Keeping

Safety Training Matrices/Guides:

- The Training and Competency Administrators/Coordinators are responsible to develop and maintain BU/Group safety training matrices/guides that indicate:
 - Training requirements for workers in frontline field positions; and
 - Renewal intervals for each safety training/course.



Safety Training Completion:

- Workers are responsible to complete all assigned safety training as required.
- Supervisors are responsible to monitor and ensure their workers have completed their assigned safety training.
- The Training and Competency Administrators/Coordinators are responsible to provide accurate data and reporting of training records.

Safety Training Renewals:

- Safety training/courses that are regulated (examples include: H2S Alive, First Aid, Transportation of Dangerous Goods) must be renewed according to their expiry dates.
- All other safety training/courses are considered competency-based and regular renewals are not mandatory, unless determined by BU/Group leadership.
- Workers are responsible to renew their safety training prior to expiry.

4 - HAZARD ASSESSMENTS / TASK ANALYSIS

4.1 - Management Directive

Canadian Natural, in a continued effort to provide an incident free work place, incorporates safety in to the planning and execution of every job. Every task should be well thought out in advance and broken down to basic steps. The task must be analyzed to determine what potential hazards may be involved and the appropriate precautions and practices to eliminate or mitigate the hazard.

Procedures must be developed, reviewed and followed in the performance of all tasks where there is a potential for personal injury or loss.

4.2 - Hazard Assessment / Permits

Work at Canadian Natural, as with most work and activities, presents potential hazards. With appropriate assessment and planning, all potential hazards can be eliminated or controlled so as not to present an undue risk to workers.

- Conventional / Thermal Operations use a Hazard Assessment See Appendix #1

Hazard Assessment is required for all work conducted by Service Providers.

The Hazard Assessment / Safe Work Permit is completed by a Canadian Natural representative, employee, or contract operator that is responsible to supervise the work.

If the Supervisor must leave the site, the Hazard Assessment / Safe Work Permit must be left at the worksite and the Onsite Designate will be responsible for safety at the site.

Workers conducting Hazard Assessments / Safe Work Permit will be appropriately trained including the Canadian Natural Site Supervisor Safety Training.

Hazard Assessments and Permits must be kept on file for a minimum of one year.

Hazard Assessments / Safe Work Permit:



- Identify the scope of the work to be completed
- Identify potential hazards of the work or task
- Ensure appropriate measures are taken to eliminate or control all identified hazards
- Are specific to the work to be done
- Identify the time period in which the work is to be completed
- Completed for each phase of an operation
- Are reviewed and / or redone if conditions of the work, or at the work site, change significantly
- Are reviewed with all workers who may be involved with the work to ensure they understand the hazards and the controls
- Are acknowledged by workers. (not used as a sign-in sheet)
- Identify what to do and where to go in an emergency
- Identify the On-Site Designate if Supervisor leaves

The Canadian Natural representative must include the workers involved to identify potential hazards before work commences. Each documented hazard must be considered and identified if applicable.

When a potential hazard is identified, appropriate control(s) must be documented and implemented. If additional potential hazards are identified, controls may be noted in the comments section, or on an additional page(s) which must be attached to the Hazard Assessment / Safe Work Permit.

Service Providers must also complete appropriate Hazard Assessment / Safe Work Permit and job specific procedures for specialized services being provided.

Additional Hazard Assessment / Safe Work Permit will be required for:

- Hot Work
- Confined Space Entry Hazard Assessment / Safe Work Permit
- Ground Disturbance / Backfill Report

Extended Hazard Assessments / Safe Work Permits may be issued to proven Service Providers who perform routine and repetitive work at similar work sites. If conditions at the worksite(s) change significantly or if the nature of the work performed changes, a new Hazard Assessment / Safe Work Permit must be conducted and issued. The Canadian Natural representative issuing the extended Hazard Assessment / Safe Work Permit must:

- Clearly identify all potential hazards and control measures to the Service Provider
- Clearly identify the need for the Hazard Assessment / Safe Work Permit to be in the possession of the Service Provider at the work site
- Verify that the Service Provider has their own Hazard Assessment / Safe Work Permit and job procedures at the worksite for the tasks to be done
- Ensure extended Hazard Assessments / Safe Work Permits are not used for any activity involving Hot Work, Confined Space Entry, Ground Disturbance, or pumping out any underground tanks at a battery or facility



When work procedures or peculiar circumstances require deviation from standards and guidelines outlined in this manual, appropriate written procedures must be developed in consultation with the BU / Group Safety and Compliance Coordinator, to ensure equivalent, or better, worker safety is provided.

Step-by-step written procedures are developed with consideration of the potential hazards that may be associated with the task. Controls of the hazards are identified and incorporated into all instructions, signs etc. at the worksite.

4.3 - High Risk Critical Procedure Inventory

Each BU / Group must maintain a list of tasks that have a high potential to cause personal injury or a significant loss if performed incorrectly.

A written Hazard Assessment / Procedure must be developed for each high risk / critical task on this list. Written procedures will be available for the workers conducting the tasks at their area of work. Workers that have received a high risk critical task procedure and demonstrated their understanding and competency to perform the task sign an acknowledgement with their Supervisor.

Written procedures should be reviewed as part of on the job training and at safety meetings etc. They should also be reviewed as part of any investigation that is required for high potential incidents to determine if they were used and followed and if they are adequate.

Supervisors in all areas are responsible to ensure workers under their direction review all applicable high risk critical procedures annually or, at minimum, prior to performing the task.

- In safety meetings
- During planned personal contacts
- When assigning tasks
- Employee orientation and training programs (Safety Orientation & Competency Training)
- Incident investigation
- Preparation for work observations (Worksite Safety Observation)
- Identification of health hazard
- Identification of needs for rules

4.4 - Task Analysis and Procedures for High Risk Critical Tasks

There are two basic steps to ensure a job is safe:

1. Hazard Assessments are to be conducted before tasks are performed to consider each aspect of the work with potential hazards and controls to eliminate or mitigate the hazard.
2. Job observations must be conducted by Supervisors to ensure procedures are followed. Supervisors must provide direction, take corrective action, and provide positive reinforcement as the situation warrants. Procedures can be developed or modified to improve work place practices.



When site specific procedures are developed, they must follow a hazard assessment format to identify hazards, risk ranking, and controls as well as step-by-step procedures.

4.5 - Procedures

Procedures are initially developed by workers in the field and are provided as reference for all workers to follow. When workers conduct a task procedure less frequently than once per month, they must review the procedure before conducting the work.

Canadian Natural does not conduct procedure review in a set frequency. Procedures are updated and / or enhanced if the following apply:

- New technology emerges
- Work procedures change
- Valid suggestions are received
- Regulations change
- Accepted Industry practice changes

5 - EMERGENCY PREPAREDNESS

5.1 - Emergency Response Plan

Canadian Natural maintains a Corporate Emergency Response Plan (ERP) and site-specific ERPs where applicable by regulatory requirements.

The Corporate ERP contains pertinent emergency response information such as forms, guidelines, procedures, roles and responsibilities and other general information. Site-specific ERPs contain site information (e.g. contact numbers, facility data, ERP map) for a specific facility.

ERPs may be available at applicable plant locations and BU / Group offices. An electronic version of the Corporate ERP is available on the company intranet (CiNQ).

An Emergency Response Guide, which is a condensed summary of the Corporate ERP, is provided to all field personnel for an easy and quick reference. This guide is printed in a smaller booklet format and consists of information such as field related guidelines and procedures, roles and responsibilities and the Media Statement. It may be used if the Corporate ERP manual is unavailable.

Emergency Response Sun Visor Kits are supplied to field personnel to help guide them in the initial stages of an emergency. The kits are to be kept in all vehicles and include:

- a copy of the Emergency Response Guide
- a Time / Action Log Post-It pad (yellow)
- a copy of the First Responders Guide (pamphlet)
- a copy of the Vehicle Incidents Reporting Procedure.

A corporate 24-Hour Emergency Phone List is updated and distributed regularly. These lists must be posted and kept current at locations as deemed necessary, such as at First Aid Stations, near phones and with designated personnel, such as first aid attendants.



Canadian Natural's 10 Steps for Emergency Response helps personnel manage an emergency situation from start to finish. It is a significant element of the company's Emergency Management system.

The 10 steps of an emergency:

1. Initial contact regarding problem
2. Assess situation
3. Classify emergency level
4. Activate emergency response plan
5. Define emergency planning zone
6. Decide on public protection method
7. Make external (government) notification
8. Activate personnel and equipment
9. Respond and control the emergency
10. Stand down

5.2 - Transportation of Injured Worker & Evacuation Plan

The Canadian Natural Transportation of Injured Worker & Evacuation Plan (TIWEP) must be completed and posted before work commences at any development operation such as Pipeline or Facility Construction, Drilling and Completions, Lease or Road construction, and Seismic. It must also be posted at Plants, Camps, Batteries, and Compressor Stations that have an office. Each worker at the site must be aware of the contents of the plan and what his role may be in the event of an emergency. Appendix #2 is an example document of the TIWEP.

The plan provides an effective emergency response and meets the intent of regulatory requirements by providing the following information:

- The equipment, supplies, facilities, first aid attendants and services available
- The location of, and how to call for, first aid
- Identify the First Aid Attendant
- How the first aid attendant is to respond to a call for first aid
- The authority of the first aid attendant over the treatment of injured workers
- Who is to call for transportation for the injured worker
- The method of transportation
- Co-ordinates (Longitude, and Latitude) of location
- Driving direction to location

The plan must be posted conspicuously in suitable locations throughout the workplace and the information communicated to workers.

The first aid attendant and all other persons authorized to call for transportation for injured workers must be trained in the procedures.



6 - Incident Reporting and Investigation

6.1 - Incident Reporting

All Injuries, Equipment Damage, Spills, and Near Misses must be reported as soon as possible after the incident is controlled and the site is secured.

*To report an incident involving Harassment and Violence in the workplace contact Human Resources. Ref: CNRL-OVR-POL-HR-000018.

Canadian Natural North American Operations follow the Canadian Association of Petroleum Producers "*Health & Safety Performance Metrics Reporting Guide*" to classify and report injury statistics. The incident reporting protocol provides accurate up-to-date incident information and identifies appropriate investigation.

Incident reports ensure:

- Incidents are reported in a timely manner
- Consistent information
- Accurate reporting
- All levels of management are aware of incidents and involved in prevention
- Consistent investigation
- Accurate statistics
- Costs are captured

Examples of incidents to be reported:

- Fatality
- Lost Time (LTI) – an injury that requires the worker to miss his next scheduled shift
- Medical Aid – medical physician visit with treatment, but worker returns to work on his next shift
- First Aid – minor injury, no medical aid required, visit medical physician but no treatment
- Restricted work
- Occupational illness
- Any refusal of dangerous / unsafe work
- Fire or Explosion
- Motor Vehicle Incidents (MVI) – must be reported to police as well as the Administrative Assistant for Commercial Operations
- Damage to equipment or property (includes unexpected failure but not normal wear and tear)
- Near misses – an occurrence which, under slightly different circumstances, may have caused harm to people, the environment, property, or the public
- Spills or emissions



- Pipeline Leaks – Mandatory Reporting to applicable Provincial Oil & Gas Regulatory Authority (AER, BCER, OROGO etc.)
- Theft
- Sabotage or vandalism – reported to police in jurisdiction, insurance carrier, and the Canadian Natural Coordinator for Legal Services
- Others – for example, Security violations, medical conditions, pipeline strikes.

Incidents may need to be reported to various regulatory bodies including, but not limited to:

- Alberta Boilers Safety Association or other provincial Safety Authorities
- Canadian Electrical Association
- Provincial Oil & Gas Regulators (AER, BCER, OROGO etc.)
- Provincial Occupational Health & Safety / Workers Compensation Boards
- Provincial Environment Regulators
- Canadian Nuclear Safety Commission
- Environment Canada
- Fisheries and Oceans Canada

The applicable Canadian Natural Supervisor, BU / Group Safety and Compliance Coordinator, and Safety Department Authority (i.e. Safety, Asset Integrity and Technical Safety) are responsible to ensure compliance with regulatory reporting requirements.

Incidents that must be reported to WSCC:

- “Accident causing serious bodily injury” means an accident at a work site that
 - (a) causes or could reasonably be expected to cause the death of an individual, or
 - (b) requires an individual to be admitted to a hospital as an in-patient for a period of 24 hours or more;
- “dangerous occurrence” means an occurrence that does not result in, but could have resulted in an accident causing serious bodily injury, such as
 - (a) structural failure or collapse of
 - (i) a structure, scaffold, temporary falsework or concrete formwork, or
 - (ii) a tunnel, caisson, coffer dam, trench, excavated shaft or excavation,
 - (b) failure of a crane or hoist or the overturning of a crane or powered mobile equipment,
 - (c) accidental contact with an energized conductor,
 - (d) bursting of a grinding wheel,
 - (e) uncontrolled spill or escape of a toxic, corrosive or explosive substance,
 - (f) premature or accidental detonation of explosives,



- (g) failure of an elevated or suspended platform, or
- (h) failure of an atmosphere-supplying respirator

When an incident occurs:

1. As soon as practical, notify your Supervisor.
2. Notify the BU / Group Safety and Compliance Coordinator (Environmental Coordinator if applicable) immediately after notifying your Supervisor.
3. As soon as possible (within 24 hours of incident) complete an Incident Report, attach Hazard Assessment / Field Level Hazard Assessment and send to Safety Admin. Include any applicable attachments (i.e. Spill drawings, contractor reports, photos etc.).

6.2 - Incidents to be investigated:

Canadian Natural is committed to conducting thorough and timely investigations. Incidents are not investigated to place blame or define responsibility but to learn what can be changed to prevent similar instances.

The severity, or potential severity, of the incident will determine the extent of the investigation process in the following sequence. Depending on the incident, legal client privilege may be required.

1. All incidents are reported using the Incident Report:
 - Supervisors and BU / Group Safety and Compliance Coordinators provide comments and recommendations for prevention.
 - Supervisors must assist with reported incidents to recommend and initiate appropriate corrective or preventative measures. Comments regarding the incident and corrective measures must be provided within 7 days and reports returned.
 - To be communicated with other workers at Safety Meetings for prevention
 - The Supervisor of the worksite and the BU / Group Safety and Compliance Coordinator are responsible to ensure that the Canadian Natural 4 Pillars of safety were in place when the incident occurred:
 - Orientation for all workers on site
 - Canadian Natural Hazard Assessment / Field Level Hazard Assessment
 - Service Provider Hazard Assessment / Step-by-Step Procedure / JSA
 - Canadian Natural Transportation of Injured Worker and Evacuation Plan
2. Incidents classified as severity 3 and above on the Corporate Risk Matrix are typically investigated by BU / Group Safety and Compliance Coordinators using the Canadian Natural Investigation Report Form.
3. When an incident classified as a severity 3 or above on the Corporate Risk matrix is reported, additional Safety Department Authority group engagement will be determined through discussion between the Safety Manager and the relevant Safety Department Authority BU / Group managers and / or management.



In cases when it is decided that other Safety Department Authority BU / Groups (e.g. Safety, Asset Integrity and Technical Safety) are better suited to conduct the investigation, they will lead and complete the investigation using the Canadian Natural Investigation Report Form. Ref: CNQ-OVR-FM-LM-000011.

6.3 - Reason for Investigation

Investigation determines:

1. Who was involved
2. What happened
3. When it happened
4. Why it happened
5. Where it happened
6. How it will be prevented in the future

Investigations are carried out:

- To prevent reoccurrences by determining and documenting the cause of the incidents or violations
- To develop helpful information to pass on to other areas of the company
- To comply with provincial regulatory requirements
- To help settle insurance claims as quickly as possible
- To determine actual costs
- To provide accurate, detailed information and determine company liability in case of possible future legal action
- To help assess the efficiency of company operations
- To increase the focus on safety for Supervisors and workers

6.4 - Who Investigates

The BU / Group Canadian Natural Safety and Compliance Coordinator will initiate and steward investigations unless the incident is deemed to be the responsibility of another Safety Department Authority:

- The Calgary Supervisor or the BU / Group Supervisor / Foreman responsible for the site or work will attend the worksite as soon as possible to work with the BU / Group Safety and Compliance Coordinator.
- In serious cases, or as required, the BU / Group Safety Lead will assist on site.
- Members of the Joint Work Site Health and Safety Committee or Health and Safety Representative as applicable will be involved.



- Senior Management will be notified and may be involved when an incident causes a disabling injury or death, or has significant potential.
- Other Canadian Natural Safety Department Authority BU / Groups will be notified as applicable, and may assist, including:
 - Asset Integrity
 - Environment
 - Land
 - Technical Safety Engineering
 - Instrumentation / Electrical
 - Legal / Financial
 - Supply Management
 - Process Safety
 - Fire Prevention
 - Other
- The BU / Group Safety and Compliance Coordinator will work with the appropriate Safety Department Authority BU / Group to determine and follow up when external resources are required for things like failure analysis, non-destructive testing etc.
- Some situations may require the assistance of external investigators to ensure impartiality and an objective approach. This will be determined by the Manager of Health and Safety in discussion with Senior Management.
- BU / Group Safety and Compliance Coordinators or Safety Department Authority will distribute final Investigation Reports to:
 - The appropriate Safety Department Authority Manager
 - BU / Group Supervisor / Foreman or Development Operations Superintendent
 - BU / Group Superintendent
 - Operations Manager or Development Operations Manager
 - Vice Presidents – Safety & Integrity, Production Operations, Drilling, Completions, etc. and Business Units as applicable.
 - Senior Vice President
 - BU / Group Safety Lead
 - Health and Safety Manager
 - Health and Safety Director
 - Joint Worksite Health and Safety Committee or Health and Safety Representative



6.5 - Responsibility for corrective action

Investigations will identify appropriate remedial actions and preventative measures. The supervisor most able to initiate and control recommendations will be assigned to ensure corrective measures are completed in an assigned time period.

BU / Group Safety and Compliance Coordinators and / or the Safety Department Authority representative who has completed the investigation are responsible to ensure corrective actions are completed in the time frame in the Investigation Report.

6.6 - Near Misses

A Near Miss is defined as an occurrence which, under slightly different circumstances, may have caused harm to people, the environment, property, or the public. Near misses will be given the same significance as an incident so that lessons can be learned and applied to prevent actual incidents or injuries.

Near Misses:

- Report using the Near Miss / Hazard Identification / Opportunity cards, or
- Report using the same Incident Reporting process as any other incident

Information regarding near misses must be distributed:

- As appropriate - through Newsletters, Safety Bulletins etc.
- To all BU / Groups that could have similar conditions
- Discussed at safety meetings / toolbox / tailgate meetings

6.7 - Securing the worksite

The worksite must be secured and undisturbed as much as possible in the event of an incident that may require reporting to any regulatory body:

- Stop work
- Secure the scene and leave it undisturbed except to ensure the safety of workers or others that could be affected
- Report the incident to Canadian Natural Supervisor and BU / Group Safety and Compliance Coordinator who will call regulators (WCB, OHS etc.) as required
- Take separate witness statements from workers that were involved or saw what happened
- Complete the Canadian Natural Incident Report
- Site will be released as determined by Canadian Natural BU / Group Safety and Compliance Coordinator in cooperation with regulators

6.8 - Contractors / Service Providers

Contractors and Service Providers working on Canadian Natural sites are required to follow the same reporting protocol:



1. Notify their Supervisor and the Canadian Natural Supervisor
2. Notify the BU / Group Safety & Compliance Coordinator
3. Consult with BU / Group Canadian Natural representative concerning any reporting requirements to appropriate regulatory bodies as applicable
4. Conduct their own investigation in co-operation with the Canadian Natural BU / Group Safety and Compliance Coordinator

Canadian Natural is responsible for:

- Obtaining a copy of their investigation report
- Releasing pictures or media statements
- Authorizing access to site
- Ensure external notifications are made properly

6.9 - Management Participation

In the event of an incident that requires a formal investigation as identified by the Corporate Risk Matrix of severity 3 and above. The Safety Vice President escalates the incident information to the appropriate level of Canadian Natural Senior Management who will be involved and assist in the investigation process. The applicable Vice President will review and approve the investigation report and prevention measures prior to final distribution.

Senior management demonstrates commitment to safety by contacting regulators, attending the incident scene, and getting involved to ensure appropriate preventative measures are put in place.

Investigation Reports will be discussed at Management Committee meetings. Concerns or questions will be forwarded to the applicable Health and Safety Manager for follow up.

7 – INSPECTIONS AND / OR AUDITS

7.1 - General Information

In the interest of maintaining the health, safety and welfare of workers in the workplace Canadian Natural has developed inspection programs to identify potential hazards and prevent incidents by verifying that hazard controls have been implemented and are working. There are many types of inspections, formal and informal, that can be used to meet this purpose. The key to successful inspections is a culture of continually looking for hazards.

Middle management, as part of their duties, will participate in safety inspections of various facilities at least every three months with the intention of identifying any safety concerns and demonstrating support of the health and safety program.

Formal Inspections are conducted by Supervisors, Operators, and Safety and Compliance Coordinators using applicable inspection forms to provide consistency and ensure items are not overlooked.



Informal Inspections are conducted by Supervisors, Operators, and Safety and Compliance Coordinators as part of their daily work routine. Checklists should be used as tools to remind the inspector of non-compliance or unsafe situations or conditions.

Workers have ongoing responsibilities to keep work areas safe that include:

- Watching for hazardous developing conditions in the work area
- Reporting real or potential hazards
- Continuous monitoring of equipment and parts
- Complete the appropriate forms
- Work Order Requests when maintenance or repair work is required

Planned safety inspections are to start before new jobs begin and continue throughout the job. Inspections must be documented and deficiencies noted for follow up. Safety meetings can be used to discuss inspection results.

Types of inspections include:

- Preventative maintenance
- Pre-start up
- Vehicle inspections
- Facility inspections
- Rig inspection
- Fire and safety inspections
- NORM testing

These inspections include compliance to Canadian Natural Safety Management System, Industry Standards, Federal and Provincial Regulatory Requirements.

Site Inspections should assess:

- Health and Safety hazards and potential impacts from materials handled or work carried out
- Physical layout and conditions of the site, including location, terrain, season and weather
- Condition of equipment and tools
- Work practices and behavior of people at the site (employees, contractors, service providers, and visitors)
- Level and quality of supervision given workers
- Compliance to Regulations and Legislation
- Compliance to Canadian Natural Standards, Policies and Procedures

Hazards include but are not limited to:

- Slipping and tripping hazards



- Faulty or missing emergency equipment
- Improper or missing signs
- Faulty machinery, cables, tie-downs etc.
- Equipment guarding
- Mobile equipment
- Hoisting devices
- Noise levels
- Poor housekeeping
- Atmospheric hazards present inside confined spaces
- Incorrect or missing Personal Protective Equipment
- Blocked exits
- Overhead hazards
- Electrical hazards
- Difficult terrain for vehicular or personal movement
- Improperly stored hazardous chemicals
- Lack of access to chemical safety information from SDSs
- Thermal Stress (heat stress or cold stress)
- Pathogens from animal droppings, handling sewage or untreated water etc.

Inspections of work practices and procedures should also be conducted by BU / Group supervisors to ensure workers:

- Know and follow standard work practices or procedures
- Use tools and equipment properly
- Use all devices, Personal Protective Equipment and other safety equipment properly
- Are adequately trained to perform their work properly
- Know emergency response procedures

7.2 - Reports

All inspection reports must be distributed to assigned personnel for review, and maintained on file in the BU / Group offices.

7.3 - Worksite Safety Observation (WSO)

The WSO is intended to provide positive reinforcement and identify opportunities for improvement of Health, Safety and Welfare through observation of people, equipment, processes and procedures while engaged in activities at Canadian Natural worksites.



Worksite Safety Observations are to be completed by Canadian Natural Representatives including:

- Canadian Natural (Employee, Contract Operator, or Consultant)

Worksite Safety Observations can be conducted on:

- Canadian Natural field operations
- Service Providers
- Consultants

Every Worksite Safety Observation, at a minimum, must identify that Canadian Natural's "Four Pillars" are in place for every worksite.

8 – PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Should engineering, administrative, and work practice controls fail, the last line of defense is Personal Protective Equipment.
- Ensure Personal Protective Equipment is adequately supplied, maintained, and properly used in all operations.
- Ensure Personal Protective Equipment requirements (standards) are in place and evaluated periodically.

To avoid or reduce personal injuries, Canadian Natural requires that all employees, contract workers and visitors use all devices and wear Personal Protective Equipment when required on a Canadian Natural work site.

Some potential hazards include:

- Fire
- Explosion
- Hazardous chemicals
- Toxic gas
- Falling or moving objects
- Loud noise
- Working at heights

Canadian Natural supplies all required Personal Protective Equipment for employees. Service Providers are to provide and maintain appropriate Personal Protective Equipment for their employees when working on a Canadian Natural work site.

Related Documents:

- Safety Footwear Policy

8.1 - Minimum Personal Protective Equipment

As a minimum, all workers on Canadian Natural field worksites are required to wear:

- Approved head protection.



- CSA approved footwear.
- Fire Resistant Clothing (FRC) (within 25 meters of a potential hydro carbon source).
- Safety Glasses with Side Shields.
- High Visibility outerwear when working around mobile equipment.
- Appropriate gloves for the task.
- Other Personal Protective Equipment for specific tasks and conditions as identified by Hazard Assessments.
- Outerwear must be appropriate for the work and should fit reasonably close to the body. All dangling objects must be removed.
- Field workers must ensure their legs are covered to the ankle and arms to the wrist.

9 – SAFETY MEETINGS

Safety meetings are an integral part of the Canadian Natural safety program.

Meetings may be used as education and communication opportunities of a general nature or of very specific issues as required. All workers on Canadian Natural sites are encouraged to remain alert and observe worksite conditions at all times. Unsafe conditions must be reported to their supervisor immediately and should be discussed at Safety Meetings.

All safety meetings should provide:

- A cooperative communication climate
- Appropriate information to workers
- An opportunity for everyone to contribute ideas or suggestions
- Continuing education and motivation

9.1- PRE-JOB MEETINGS

- Pre-job meetings are typically held for contract work or service providers before a crew of any size starts work. The Canadian Natural Hazard Assessment / Safe Work Permit should be discussed to ensure every worker understands the associated potential risks and the controls that have been put in place to eliminate or mitigate them. Every worker must understand the scope of the job, any other specific procedures (JSA's), the emergency response procedures, and his role for the duration of the work.
- Minutes are typically recorded by the service provider holding the meeting and must be kept on file.

9.2- TAILGATE SAFETY MEETINGS

- Tailgate meetings are held at least daily during an ongoing job to address issues workers are likely to encounter during their duties that day. The supervisor, considering the job site circumstances, may require additional meetings as required:
- If unexpected situations arise during the course of the regular work
- When conditions of the work or site change significantly
- When new tasks are started
- Prior to beginning high risk activities or specific work



- When other services come on site
- These are short meetings usually from five to fifteen minutes long.
- Minutes must be recorded and kept on file with the service provider for recall, if required.

10 – COMMUNICABLE DISEASE

Canadian Natural Resources Limited and all of its subsidiaries (collectively, or each individually, referred to as – the “Company”) place a priority on the safety and well-being of its Employees, Contractors and communities where we operate. Accordingly, during periods of elevated risk as identified by the Company, or where advised or recommended by an applicable public health authority, the Company reserves the right to implement Communicable Disease prevention measures, practices and policies on Company Property to ensure a safe, healthy and productive work environment. While specific measures will depend on the particular Communicable Disease, areas affected and mode of transmission, and any applicable orders, guidance, recommendations and notices issued by an applicable public health authority, the intent of the Communicable Disease policy is to:

- Outline the general standards and expectations that the Company will consider or implement to manage workplace risks arising from Communicable Disease in the workplace;
- Confirm the Company’s commitment to maintain a safe and healthy work place;
- Minimize risk associated with our operations; and
- Recognize the need to continuously evaluate and update the Company’s policies and practices to reflect changing risk levels and work practices.

11 – LEGISLATION AND INDUSTRY GUIDELINES & STANDARDS

The following legislative references were used in development of this Safety Plan. However, except where noted, this plan has adopted a “best practice” approach that will take the most restrictive reference in the development of specific requirements.

Field work associated with the project will take place primarily in the Northwest Territories but may also require travel through British Columbia, and/or Alberta. Canadian Natural and all contractors must comply with the applicable provincial and territorial legislation. The Occupational Health and Safety Regulation sets the minimum requirement for regulating the health and safety component of the Project. (NWT Government 2015). The Pipeline Abandonment and Reclamation program will comply with NWT Oil and Gas act regulations. Copies of the required legislation should be made readily available to all personnel at the work site.



Legislation	Remarks
Indian and Northern Affairs	<ul style="list-style-type: none"> • Works in partnership with Northern and Aboriginal governments and people to govern the allocation of Crown lands to the private sector for oil and gas exploration and develop the regulatory environment.
NWT Government	<ul style="list-style-type: none"> • The following legislation governs workplace health and safety in the Northwest Territories and Nunavut. <ul style="list-style-type: none"> ○ The Petroleum Resources Act ○ The Oil and Gas Operations Act ○ Safety Act and Regulations ○ Mine Health and Safety Act and Regulations ○ Explosive Use Acts and Regulations ○ Summary Convictions Procedures • The Petroleum Resources Act sets the rules around how a company can get permits to explore for and produce oil on N.W.T. lands. • The Oil and Gas Operations Act regulates what happens once a company starts exploring for or producing oil and gas
OROGO	<ul style="list-style-type: none"> • OROGO is an arm's length unit within the Department of Justice and is the regulatory authority for all oil and gas operations in the Northwest Territories, with the exception of federal lands, inter-provincial territorial pipelines and the Inuvialuit Settlement Region.

12- PROJECT SPECIFIC INFORMATION





The Pipeline Abandonment project consists of abandoning 2 pipelines for the following locations.

- 3" PW 16km line from P-66-60.40-123.30 to K-29-60.30-123.30
- 8" NG 16km line from P-66-60.40-123.30 to K-29-60.30-123.30

The scope of work is to abandon 2 previously deactivated pipelines in the Liard area from Canadian Natural (CNRL) P-66-60.40-123-30 to Paramount K-29-60.30-123-30. 1 pipeline is a 3" produced water line (PW) and the other is a 8" sour gas line (SG). These lines were acquired by CNRL from Ranger in 2001 and were discontinued (deactivated). The lines were reactivated in 2003 to test the water cut from a new drill at P-66 and then were discontinued again in 2004. CNRL will inspect the lines and re-pig to confirm that they are clean and safe for proper abandonment as per CSA, industry standards and local regulations. The risers will be plugged and removed at P-66. At K-29 the risers and pipelines will be removed from the lease to lease edge and plugged to allow Paramount to reclaim the lease. All fluids and materials collected during the abandonment of these pipelines and riser platform will be hauled to an approved disposal facility. CNRL proposes to conduct this work in June or July of 2025 based on approval of the plan from all involved parties.

Execution Plan and Schedule:

Planned start is June or July 2025 dependent on water levels in the Liard River and barge launch timing and availability. The expected duration of this project is approximately 7 days and will require 6 workers, a foreman and a CNRL Inspector. Equipment critical to safety operations are, knockout tank and scrubber unit and a medical transport center (MTC). A detailed equipment and crew list is provided at the end of this plan.

1. Mob crews and equipment from Liard to K-29
2. Set up crews and equipment at K-29
3. Fly air compressor and small tools to P-66 by helicopter; stage equipment on site
4. Excavate buried end of 3" PW line at K-29 to prepare for pigging
5. Prepare riser on 8" SG line at K-29 riser platform for pigging
6. Prepare 3" PW and 8" SG risers at P-66 for pigging
7. Pig 3" PW line with air compressor from P-66 to approved tank with scrubber at K-29
8. Pig 8" SG line with air compressor from P-66 to approved tank with scrubber at K-29
9. Drain any recovered fluids from the tank to a certified combo unit approved to transport said fluids
10. Excavate 3" and 8" pipelines at K-29 from end of pipeline to lease edge
11. Cut pipelines at lease edge and internally plug with mechanical plugs
12. Use tool to internally plug and cut risers at P-66; pull cut risers; back fill holes
13. Demobilize equipment from P-66 to K-29 or barge landing
14. Prepare riser platform at K-29 for decom and removal by dismantling or demolishing as necessary
15. Remove piles at K-29
16. Load scrap material and debris on to transport trucks
17. Demobilize all equipment, materials, scrap and debris, and crews to Liard.

*** All fluids and materials will be transported to approved salvage, recycling, or disposal facilities in Fort Liard or BC.



The Reclamation project consists of reclaiming the 3P-66 wellsite and access road leading south to Paramount K-29. The reclamation process is completed in 3 Phases:

1. Assessment

- Transport of equipment to the site;
- Test pitting the soil to delineate the hydrocarbon impacts at the site;
- Drilling and installation of monitoring wells to sample and test the groundwater at the site;
- Reporting results and completion of a remedial options assessment;
- Demobilization of equipment.

2. Remediation

- Transport of equipment to the site;
- Remediation of petroleum hydrocarbon impacted soil and groundwater;
- Confirmatory closure sampling to meet NWT remedial criteria;
- Demobilization of equipment.

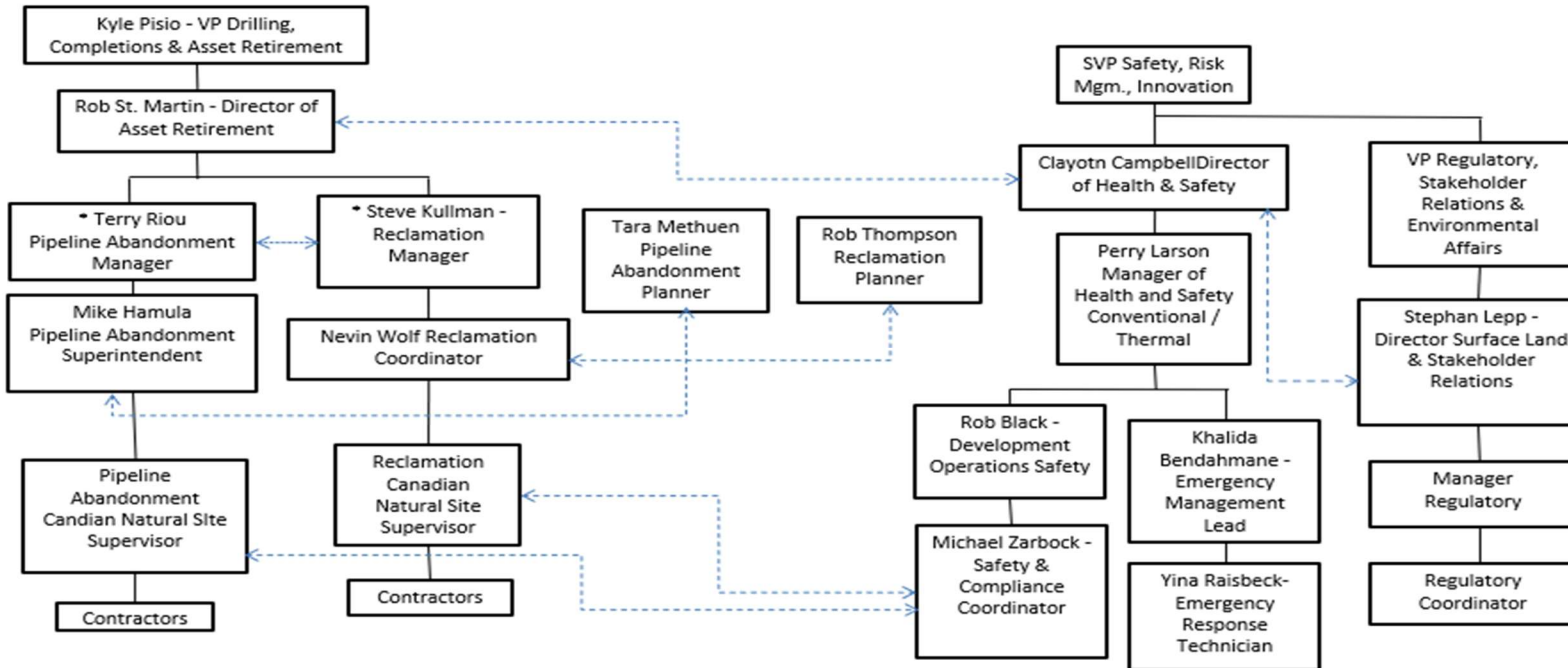
3. Reclamation

- Transport of equipment to the site;
- Removal of bridges, culverts, and approaches;
- Repair of any existing erosion;
- Slope stabilization;
- Creation of water diversion and erosion control features;
- Selective seeding of disturbed areas; and
- Re-contouring of the wellsite and seeding (if required and/or approved); and
- Demobilization of equipment



13 –ORGANIZATIONAL CHART

Organizational Roles for Project



* Responsible and Accountable for implementation of Safety Plan

Title	Name	Phone
Pipeline Abandonment Manager	Terry Riou	403-514-7489
Reclamation Manager	Steve Kullman	403-542-1071
Health and Safety Manager	Perry Larson	403-805-5697
Operations Superintendent	Collin Wright	250-263-6512
Director Surface Land	Stephan Lepp	403-816-4786
Director Asset Retirement	Rob St. Martin	403-826-5035
Director Health and Safety	Clayton Campbell	587-583-6143

Title	Name	Phone
Pipeline Abandonment Superintendent	Mike Hamula	403.386.6035
Reclamation Coordinator	Nevin Wolf	403.863.6925
Pipeline Abandonment Planner	Tara Methuen	587.998.9739
Reclamation Planner	Rob Thompson	403.716.6302
Safety Lead	Rob Black	403.877.6152
Safety Coordinator	Jarrett Charlton	780.713.6848
Emergency Management Lead	Khalida Bendhmane	587.575.0493
Emergency Management Technician	Yina Raisbeck	403.716.6324

The manager of the business conducting the work is responsible for the implementation of the plan. They will verify all workers are aware of the Safety and Contingency Plan and have the required training and competency in place before work starts.



14– Appendices (See Attached File)

- Appendix # 1 Hazard Assessment
- Appendix # 2 Transportation of Injured Worker and Evacuation Plan
- Appendix # 3: Corporate Risk Matrix
- Appendix # 4: Camp Inspections
- Appendix # 5: Worksite Safety Observations (WSO)
- Appendix # 6: Communicable Disease Policy



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OROGO Environmental Protection Plan for
CNRL et al North Liard 3P-66B
Remediation and Reclamation Program
Fort Liard, Dehcho Region, Northwest Territories

File 24NT0526 | MAY 2025



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Date <i>(Date revision made)</i>	Section Revised	Information Updated
May 23, 2025	2	Added Organizational Structure and contact phone numbers.
May 23, 2025	4.11	Included new sub-section listing Environmental Hazards and mitigations
May 23, 2025	4.12	Included new sub-section listing Environmental Protection systems.

Executive Summary

EnviroSearch Ltd. (EnviroSearch) was commissioned by Canadian Natural Resources Limited (Canadian Natural) to prepare and submit an Environmental Protection Plan as part of a Land Use Permit (LUP) Renewal Application. Canadian Natural proposes to complete remediation and reclamation activities on the 3P-66B well and associated infrastructure northeast of Fort Liard, in the Dehcho Region of the Northwest Territories (the Program).

Three drilling events took place on the 3P-66B wellsite. Ranger Oil Limited (Ranger) drilled the initial exploration well (P-66) at this location to evaluate the hydrocarbon potential from the Nahanni formation. The well was first slated to be drilled at surface location E-56, which is southwest of P-66. However, during wellsite construction, site instability at E-56 made it unsafe to support drilling rig, associated equipment, infrastructure and personnel. As a result, the location was moved to P-66 and the well was spudded on January 10, 1997, drilled to a depth of 3121m and evaluated.

Upon completion of the drilling and the poor production potential of the well, a new bottom-hole target was established. The P-66 well was plugged back to 1765m and a second leg (P-66A) was spudded on July 14, 1997 and drilled to a total depth of 3500m. Production casing was run into the P-66A well. In July 2000, Canadian Natural purchased Ranger's interest in Exploration Licence #363 (EL363) for P-66 and P-66A. From April 19 – May 13, 2003, Canadian Natural drilled a 3338m deviated re-entry well (3P-66B).

Canadian Natural determined that there are no longer any economic reserves of natural gas at this location. As a result, Canadian Natural abandoned the wellbore and pipelines in early 2006 and initiated the remediation and reclamation activities of the wellsite and areas requiring stabilization as part of Land Use Permit (LUP) MV2002A0089. Continued remediation and reclamation activities were applied for under LUPs MV2009X0007 and MV2017X0034 which have expired. Canadian Natural is now applying for a LUP Renewal to complete the remediation and reclamation activities on these sites and associated facilities.

Remediation and surface reclamation activities are contingent upon selection, approval and successful implementation of the remedial strategy for the petroleum hydrocarbon-impacted soil. Canadian Natural anticipates the following site remediation and reclamation activities may be required at the wellsites:

Pipeline Abandonment and Scrap Metal Removal

- Transport of equipment to the site;
- Improvements or clearing of both the access and wellsite as required;
- Repair of bridges as required;
- Completion of pipeline abandonment includes cutting, capping and burying ends below grade;
- Removal of scrap and debris; and
- Demobilization of equipment.



Remediation

- Transport of equipment to the site;
- Remediation of petroleum hydrocarbon-impacted soil stockpile;
- Additional delineation, excavation and remediation of petroleum hydrocarbon-impacted soil;
- Confirmatory closure sampling to meet NWT remedial criteria; and
- Demobilization of equipment.

Reclamation

- Transport of equipment to the site;
- Repair of any existing erosion;
- Slope stabilization;
- Creation of water diversion and erosion control features;
- Selective seeding of disturbed areas;
- Re-contouring of the wellsite and seeding (if required and/or approved);
- Removal of bridges, culverts, approaches and barge landings; and
- Demobilization of equipment.

EnviroSearch has examined the potential effects that this Program may have on the environment and is of the opinion that the Program will result in the restoration of the P-66 wellsite and associated facilities to more natural conditions. Net positive impact will be realized in the deficient areas resulting in stabilization and enhancement of the ecological conditions and functions of the sites. We recommend that the reclamation work be inspected the summer following completion and, if necessary, annually throughout the term of the permit, to ensure areas of concern have recovered.

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- Appendix 1-A Site Photographs
- Appendix 1-B Engagement Package

Abbreviations and Acronyms

AANDC..... Aboriginal Affairs and Northern Development Canada
 AB Alberta
 AER..... Alberta Energy Regulator
 Axiom Axiom Environmental Inc.
 CALM Circumpolar Active-Layer Monitoring
 Canadian Natural Canadian Natural Resources Limited
 CEA..... Cumulative Effects Assessment
 COSEWIC
 Committee on the Status of Endangered Wildlife in Canada
 DLUPC Dehcho Land Use Planning Committee
 DFO..... Department of Fisheries and Oceans Canada
 EBA EBA Engineering Consultants Ltd.
 EC Environment Canada
 EL..... Exploration Licence
 ECC..... Environment and Climate Change
 EPP Environmental Protection Plan
 ERP..... Emergency Response Plan
 GIS Geographic Information System
 GNWT Government of Northwest Territories
 IBA Important Bird Area
 IWA Important Wildlife Area
 LSA Local Study Area
 LUP Land Use Permit

MBCA Migratory Birds Convention Act
 MVEIRB..... Mackenzie Valley Environmental Impact Review Board
 MVLWB Mackenzie Valley Land and Water Board
 MVLUR Mackenzie Valley Land Use Regulations
 MVRMA Mackenzie Valley Resource Management Act
 MWH..... MWH Canada Inc.
 NT or NWT Northwest Territories
 NWT PAS Northwest Territories Protected Areas Strategy
 OROGO..... Office of the Regulator of Oil and Gas Operations
 Paramount..... Paramount Resources Ltd.
 PHC Petroleum Hydrocarbon
 PWNHC Prince of Wales Northern Heritage Centre
 Ranger Ranger Oil Limited
 RMO Resource Management Officer
 RSA Regional Study Area
 SARA Species at Risk Act
 SARC..... Species at Risk Committee
 SCP Spill Contingency Plan
 TEK..... Traditional Environmental Knowledge
 VC..... Valued Component
 WL Water Licence
 WMP Waste Management Plan

Units of Measurement

bbl barrel
 mbgl metres below ground level
 cm centimetre
 dBA decibel
 ha hectare
 hr hour
 kg kilogram
 km kilometre
 km/h kilometres per hour
 km/km² kilometres per square kilometre
 km² square kilometres
 L litre

lb pound
 Leq equivalent continuous noise level
 m metre
 m³ cubic metre
 m³/s..... cubic metres per second
 mASL..... metres above sea level
 mJ/m²/day..... milliJoules per square metre per day
 mm millimetre
 mm/yr..... millimetres per year
 °C..... degrees Celsius

1. INTRODUCTION

Canadian Natural Resources Limited (Canadian Natural) purchased Ranger Oil Limited's interests in Exploration Licence #362 and #363 (EL362 and EL363) in July 2000 along with all the associated obligations and commitments. The property associated with EL362 included the E-56 wellsite located at 60° 35' 24" North latitude, and 123° 41' 11" West longitude. The property associated with EL363 included the P-66 wellsite located at 60° 35' 56" North latitude, and 123° 41' 25" West longitude and associated supporting infrastructure.

Three drilling events took place on the 3P-66B wellsite. Ranger Oil Limited (Ranger) drilled the initial exploration well (P-66) at this location to evaluate the hydrocarbon potential from the Nahanni formation. The well was first slated to be drilled at surface location E-56, which is southwest of P-66. However, during wellsite construction, site instability at E-56 made it unsafe to support a drilling rig, associated equipment, infrastructure and personnel. As a result, the location was moved to P-66 and the well was spudded on January 10, 1997, drilled to a depth of 3121m and evaluated.

Upon completion of the drilling and the poor production potential of the well, a new bottom-hole target was established. The P-66 well was plugged back to 1765m and a second leg (P-66A) was spudded on July 14, 1997, and drilled to a total depth of 3500m. Production casing was run into the P-66A well.

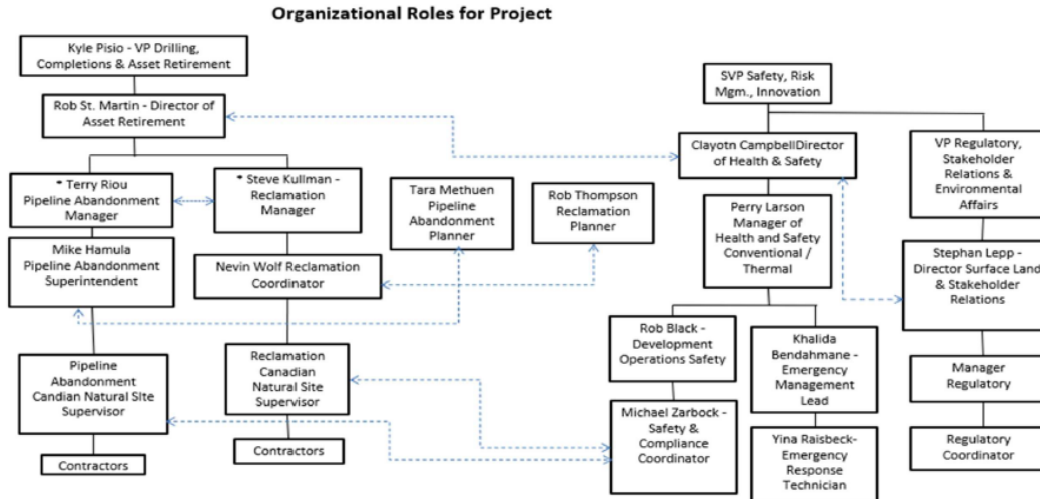
In July 2000, Canadian Natural purchased Ranger's interest in Exploration Licence #363 (EL363) for P-66 and P-66A. From April 19 – May 13, 2003, Canadian Natural drilled a 3338m deviated re-entry well (3P-66B). A list of components that are associated with the project is provided in Section 4 of this report.

Canadian Natural determined that there are no longer any economic reserves of natural gas at this location. As a result, Canadian Natural abandoned the wellbore and pipelines in early 2006 and initiated the remediation and reclamation activities at the wellsite and areas requiring stabilization as part of Land Use Permit (LUP) MV2002A0089. Continued remediation and reclamation activities were applied for under LUPs MV2009X0007 and MV2017X0034 which have expired. Canadian Natural is now applying for a LUP Renewal to complete the remediation and reclamation activities on these sites and associated facilities.

In accordance with requirements of the Mackenzie Valley Land and Water Board (MVLWB), EnviroSearch Ltd. (EnviroSearch) was retained by Canadian Natural to examine the effects that the remediation and reclamation Program may have on the environment and the social, economic and cultural well-being of the residents and community of Fort Liard, NT.

2. COMMUNICATION AND ORGANIZATIONAL STRUCTURE

13 –ORGANIZATIONAL CHART



* Responsible and Accountable for implementation of Safety Plan

Title	Name	Phone
Pipeline Abandonment Manager	Terry Riou	403-514-7489
Reclamation Manager	Steve Kullman	403-542-1071
Health and Safety Manager	Perry Larson	403-805-5697
Operations Superintendent	Collin Wright	250-263-6512
Director Surface Land	Stephan Lepp	403-816-4786
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Director Health and Safety	Clayton Campbell	587-583-6143

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Safety Coordinator	Jarrett Charlton	780.713.6848
Emergency Management Lead	Khalida Bendhmane	587.575.0493
Emergency Management Technician	Yina Raisbeck	403.716.6324

The manager of the business conducting the work is responsible for the implementation of the plan. They will verify all workers are aware of the Safety and Contingency Plan and have the required training and competency in place before work starts.

The following contact people are associated with this Environmental Protection Plan (EPP). Communications with respect to this EPP may be referred to:

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 President
EnviroSearch Ltd.
 1924 – 10 Avenue S.W.
 Calgary, AB T3C 0J8
 Phone: 403-543-5353
 Fax: 403-543-5353

3. METHODOLOGY

This assessment was initiated in November of 2024. Over the course of the previous LUPs there has been intermittent Stakeholder Engagement and site inspections by Canadian Natural over the past 16 years. Additional consultation regarding the proposed Project will be held in Fort Liard, NT closer to the planned work. The Stakeholder Engagement Plan is attached in **Appendix 1-B**.

4. PROJECT DESCRIPTION

The project area is bounded by the following coordinates:

SE Corner **N60° 10', W123° 30'**
NW Corner **N60° 40', W123° 45'**

It consists of:

- The 3P-66B wellsite located at N 60° 35' 56", W 123° 41' 25";
- The E-56 built but-not-drilled site located approximately 10km south of Mount Flett and 9 km west of the Liard River;
- The Mount Flett airstrip located at N 60° 39' 54", W 123° 35' 29";
- A construction campsite located 150 metres west of the Mount Flett airstrip;
- The Whisell barge landing and kilometres 98.5 and/or 99.7 quarry sites for barging/staging;
- Fuel storage sites located at the west end of the Mount Flett airstrip and at the nearby barge landing;
- Access road and water crossings includes a total of 43 culverts and 6 bridges;
- An all-season access road running north from Chevron's K-29 wellsite to P-66 and from P-66 to the barge landings near the Mount Flett airstrip;
- Two parallel 16.3km pipelines (one gas and one produced water) linking P-66 to Chevron's (now Paramount Resources Ltd.'s) K-29 well.

Much of the access road, airstrip and barge landing areas were initially constructed by Paramount Resources Ltd. (Paramount) for drilling their E-54 location. However, according to the applications and LUPs reviewed, assignment for the reclamation of these facilities was performed when Canadian Natural acquired Ranger's interests and drilled the 3P-66B leg of the well.

The P-66 well was abandoned under a previous LUP and the LUP Renewal is for the remediation and reclamation program that will consist of the following components:

Pipeline Abandonment and Scrap Metal Removal

- Transport of equipment to the site;
- Improvements or clearing of both the access and wellsite as required;
- Repair of bridges as required;
- Completion of pipeline abandonment includes cutting, capping and burying ends below grade;
- Removal of scrap and debris; and
- Demobilization of equipment.

Remediation

- Transport of equipment to the site;
- Remediation of petroleum hydrocarbon-impacted soil stockpile;
- Additional delineation, excavation and remediation of petroleum hydrocarbon-impacted soil;
- Confirmatory closure sampling to meet NT remedial criteria;
- Demobilization of equipment.

Reclamation

- Transport of equipment to the site;
- Repair of any existing erosion;
- Slope stabilization;
- Creation of water diversion and erosion control features;
- Re-contouring of the wellsite;
- Removal of bridges, culverts, approaches and barge landings;
- Selective seeding of disturbed areas; (if required and/or approved);
- Demobilization of equipment.

EnviroSearch (formerly Northern EnviroSearch Ltd.) conducted a third-party Phase II Environmental Site Assessment (ESA) of the 3P-66 wellsite and associated facilities in August 2006. The Phase II ESA confirmed the presence of elevated levels of petroleum hydrocarbons, total barium, electrical conductivity (EC), sodium adsorption ratio (SAR) and zinc on-site. Of these parameters, EC, SAR and zinc had only marginal exceedances of applicable remedial criteria and were localized to small areas on-site.

A human and ecological health risk assessment for barium was conducted by Axiom Environmental Inc. (Axiom) for the P-66 wellsite on behalf of Canadian Natural in May 2007. The scope of the risk assessment included barium since a total of 15,512 sacks of barite (barium sulphate) were used at the Site. The risk assessment was conducted for barium only because alternative remediation approaches are being considered for the other contaminants of concern (specifically petroleum hydrocarbons) present on-site. The assessment concluded that no remedial action is required at the Site to manage the barite-barium.

In 2007 approximately 28,000m³ of PHC-impacted soil/rock was excavated and stockpiled.

Canadian Natural, EnviroSearch (formerly MWH Canada, Inc.), and Aboriginal Affairs and Northern Development Canada (AANDC) Resource Management Officer (prior to devolution), inspected the P-66 lease in June 2010. At the time of the inspection there were no notable changes in the site conditions which required immediate attention. The stockpile of hydrocarbon-impacted soils was stable with no evidence of erosion. In September of 2011, MWH was commissioned to conduct inspections of the P-66 lease and access road. Soil samples were collected from the stockpile and used for a laboratory-based phytoremediation trial. Preliminary results have shown this to be a feasible remedial approach. Based on the results of the laboratory study, a small-scale field trial would aid in determining if the phytoremediation will work under the site conditions, prior to moving towards a full-scale remediation project. Should Canadian Natural determine that phytoremediation is a viable remedial option at the site, the findings of the pilot study will be compiled into a remediation strategy report, which will be issued to all stakeholders for review and feedback. If phytoremediation is not a viable remedial option, Canadian Natural will consider alternative remedial methods.

In 2010, EBA Engineering Consultants Ltd. (EBA) was retained by Canadian Natural to conduct a geotechnical inspection of the E-56 location to evaluate slope stability and, as necessary, generate a stabilisation and reclamation strategy for the site. The outcome of the study was that no stabilisation was required – the slope stability is typical of the region. A 2024 aerial photo of the site showing the condition has been included in **Appendix 1-A Site Photographs**.

In 2019 Canadian Natural decommissioned and reclaimed the associated infrastructure and access, including bridges, from the north (from the barge landing past Mount Flett airstrip) down to the P-66 lease. It is Canadian Natural’s understanding that this work has been completed to the satisfaction of Acho Dene Koe First Nation (ADKFN).

Remediation and surface reclamation activities are contingent upon selection, approval and successful implementation of the remedial strategy for the petroleum hydrocarbon-impacted soil.

4.1 Anticipated Program Schedule

The anticipated schedule for the Program components is detailed in **Table 4-1** below.

Table 4-1: Anticipated Program Schedule

Activity	Estimated Timeline
Land Use Permit Application	Winter 2025
Pipeline abandonment	2025
Assessment of impacts and review of remedial options	2026
Submission of Closure Plan	2027

The Program schedule will be contingent upon wellsite conditions, logistical constraints, receipt of the LUP, weather conditions, and equipment availability, selection, approval and successful implementation of the remedial technology.

4.2 Site Access/Transportation

The project area is located approximately 45km NNW of the community of Fort Liard, NT. The site will be accessed by a combination of winter-use and all-weather roads from Fort Liard. Equipment will cross the Liard River ice bridge (winter) or cross by barge (summer), follow the Chevron K-29 access, then turn off just before the K-29 plant and travel 17km to the P-66 lease.

Helicopters may be used for crew changes, movement of equipment, supply flights and for medivac, if required. Pickup trucks and all-terrain vehicles (ATVs) or snowmobiles will be used for ground transportation. Barges and jet boats will be used to cross the Liard River for work conducted in the summer months.

4.3 Crew Accommodation

The Project will be serviced by a 15-person temporary camp. The number of workers will fluctuate throughout all project phases. However, the maximum occupancy at any one time is anticipated to be 15 persons. An example of the camp survey and site layout has been included in **Appendix 8** of the Application.

4.4 Water Requirements

Water for domestic use will be obtained from the unnamed stream running west to east located approximately 50m north of the P-66 wellsite. The stream is a perennial headwater stream that is part of a larger catchment/drainage basin formed by the portion of the Franklin Mountain Range upon which the Site is situated. It is susceptible to high precipitation events which can significantly increase the volume and rate at which the stream flows. Due to the location being upstream from the Liard River, the numerous downstream Beaver dams and activity that exists at the base of

the mountains, as well as the difference in elevation from the site to the Liard River, the headwater stream is unlikely to be fish bearing or fish habitat. Water obtained from this stream will be treated prior to use.

Drinking water will be purchased and transported to the project area. The domestic water supply (camp wash water, showers, and toilets) will be treated prior to use. The water intake hose used on water pumps will be screened with 2.54mm mesh (as per Department of Fisheries and Oceans (DFO) requirements) to prevent entrainment of fish. Camp water use is estimated to be 1-2m³ per person per day (30m³/day at maximum capacity).

4.5 Waste Management

All food and waste will be stored in sealed containers to prevent the attraction of wildlife. Waste generated at the Program campsites will be sorted by waste type and disposed of as follows:

Temporary Camp

Combustible waste, which includes food waste, non-recyclables (plastics) and recyclables (cardboard, paper), will be incinerated. The incinerator will be dual-chambered and will meet the Canada-Wide Standards for Dioxins, Furans, and Mercury Emissions. To avoid attracting wildlife all domestic waste will be stored in airtight containers until they are incinerated. Camp staff will be trained in proper use of the incinerator to ensure that only proper/safe material is burned. Ash will be disposed of at an approved licenced landfill facility. Non-combustible wastes will be collected in secure metal containers and hauled by truck to an approved licenced disposal facility.

Given that specific waste handling procedures are directly dependent on the type of camp units that will be used on this Program, and that contracts have not been awarded at the time of submittal, Canadian Natural plans to use one of the three following options:

- a) Sewage solids and black water will be collected in the Pacto Toilet System and the waste generated will either be incinerated or will be stored in tanks and disposed of at an approved licenced facility. Grey water will be filtered and disposed to ground (only if bio-degradable detergents are used).
- b) Sewage solids will be handled with electric incinolets to reduce sewage volume. The material collected in the camps will be incinerated daily. Camp maintenance staff will be responsible for ensuring incinolets are functioning properly. Grey and black water collected from the kitchen facilities, showers and toilets will be handled with an evaporator to heat and evaporate most of the liquid. Any excess will be stored in tanks until it can be evaporated. The resulting residue will also be disposed of at an approved licenced facility.
- c) Should either system encounter mechanical problems, the contingency plan is to bag the solids and temporarily store in sealed containers until machinery is operational or the material will be transported out of the project area to an approved licenced disposal facility.

For additional information, refer to the Canadian Natural's Waste Management Plan in **Appendix 6**.

4.6 Fuel Storage and Handling

Fuel for Project activities will be transported and stored in fuel trucks or fuel sloops. Spill response equipment will be carried on fuel trucks. Fuel trucks will be parked a minimum of 100m from the

high watermark of watercourses and waterbodies. Additional fuel will be stored onsite in double walled envirotanks of 10,000L and 18,000L capacity. These volumes will be required onsite to maintain the project operations and associated facilities in the event of a road washout which could make the road unsafe for a fuel truck to pass.

4.7 Emergency Response & Safety

4.7.1 Emergency Response & Spill Contingency Planning

Spill response equipment/material will be available during the Program. Parked equipment will be inspected during a daily walk-around to identify and manage signs of spills or leaks. Drip trays will be used to capture minor spills and drips while refuelling equipment. Fuel will be stored at a minimum of 100m from the high-water mark of water bodies and watercourses. Similarly, refuelling operations will take place at least 100m from any water body. Personnel will be made aware of Canadian Natural's Emergency Response and Spill Contingency Plans (see **Appendix 5**). Should a reportable spill occur, the NT/NU 24-hour Spill Report Line will be contacted at (867) 920-8130; or alternatively the NT/NU Spill Report Form will be completed and emailed to spills@gov.nt.ca. All spills, regardless of volume, will be documented and reports submitted to the Government of the Northwest Territories (GNWT) Resource Management Officer upon request.

4.7.2 Fire Safety

Canadian Natural will adhere to the Forest Fire Prevention Suppression Guidelines for Industrial Activities and the Forest Protection Act, where applicable. Care will be taken in ensuring that Program activities do not contribute to seasonal fires and fire load. The Program crew will be equipped with appropriate equipment capable of controlling and extinguishing a fire that might occur as a result of Program activities. Fire extinguishers will be available at each location during site maintenance activities and within refuelling vehicles.

Canadian Natural will liaise with the GNWT Environment and Natural Resources (ENR) to obtain current Fire Danger Ratings, expected weather, and to report observed wildfires. In the event of a forest fire, the GNWT Forest Fire Management Division hotline will be called at 1-877-698-3473.

4.7.3 Wildlife Safety

The potential for bear encounters in the area is higher during the summer. Canadian Natural will ensure that employees and contractors working on site will be made aware of the potential for bear and other wildlife encounters. Information from the GNWT-ENR manual, "*Safety in Grizzly and Black Bear Country*" (refer to **Appendix 7**) will be incorporated into orientations and reviewed with Program personnel (GNWT, 2018a). Workers may be supported by an armed wildlife monitor during summer activities. Hunting will not be permitted by Program personnel and harassment of wildlife will be prohibited.

4.8 Abandonment

Wellsite abandonment activities were initiated and completed in the winter of 2006. Downhole equipment (packers, tubing, bottom hole assembly, etc.) were removed and cement bridge plugs were placed to seal the wellbore. The remaining free space in the casing was displaced with inhibited water.

Pipeline abandonment activities were initiated in the winter of 2006 and involved isolation, pigging and purging of the line. Completion of pipeline abandonment will include cutting, capping and burying ends below grade. All viable equipment and structures have already been hauled off-site for re-use. Scrap and debris will be hauled off-site for disposal to an approved licenced facility.

4.9 Remediation

The remediation phase of the Project will include: possible rock segregation from hydrocarbon-impacted soil currently on-site, confirmatory sampling, further excavation and delineation, selection of an appropriate remedial technology, implementation of the selected technology and closure sampling. The following remediation options are currently being considered, and additional options may be evaluated as part of the remedial options assessment:

- **Landfilling:** Landfilling of material will occur at the Class 2 Northern Rockies Landfill near Fort Nelson, British Columbia.
- **Phytoremediation:** Phytoremediation is the use of a plant's natural ability to contain, degrade, or remove toxic chemicals and pollutants from soil or water. This method can be used to clean up a variety of contaminants (e.g. metals, pesticides, solvents, explosives, crude oil, salts etc.). Canadian Natural plans to explore phytoremediation by performing bench scale studies (lab and field) to assess and evaluate the applicability and effectiveness of this technique. A summary of the proposed phytoremediation system is as follows:
 - Physical soil treatment: Tilling the soil to allow exposure to air and sunlight to photooxidize the contaminants.
 - Application of plant growth promoting rhizobacteria (PGPR) to the seeds to prevent the synthesis of stress ethylene prior to sowing. The PGPR used are natural, and non-pathogenic strains (usually *Pseudomonads*); and,
 - Sowing of the seeds mainly rye grass, barley, fescue etc.

This method has been successfully tested at hydrocarbon-impacted sites yielding the following results:

- Fine grained soils with fraction F3 hydrocarbons from 2,000 to 10,000 mg/kg
 - Site can be phytoremediated in 2 to 4 years.
 - Tier I standards can be met using CCME methods.
- Fine grained soils with fraction F3 hydrocarbons above 10,000 mg/kg
 - Site can be phytoremediated in 3 to 6 years.
 - Tier II approach may be required to differentiate petrogenic hydrocarbons from phytogenic hydrocarbons.
- Coarse grained soils with fraction F3 hydrocarbons above 3,000 mg/kg
 - Phytoremediation will bring petroleum hydrocarbons down significantly.
 - However, a Tier II approach may be required because remediation targets are very low and phytogenic hydrocarbons could interfere with analyses.

Bioremediation: Bioremediation utilizes living organisms to clean up contaminated soil or water. The following are three main types of bioremediations that can be applied in-situ or ex-situ:

- Biostimulation -- Nutrients and oxygen (in a liquid or gas form) are added to contaminated water or soil to encourage the growth and activity of bacteria already existing in the soil or water. The reduction of contaminants is monitored to ensure that remediation occurs.
- Bioaugmentation -- Microorganisms that can clean up a particular contaminant are added to the contaminated soil or water.
- Intrinsic Bioremediation -- Also known as natural attenuation, this type of bioremediation occurs naturally in contaminated soil or water. This natural bioremediation is the work of microorganisms and has been applied in petroleum contamination sites, such as old gas stations with leaky underground storage tanks.

4.10 Reclamation

Reclamation activities will be initiated upon successful implementation of the selected remedial technology. To reclaim the site to the desired end land use, Canadian Natural will facilitate discussions between GNWT Lands and community representatives to ensure that both the community and regulatory reclamation requirements are achieved. Canadian Natural is aware of its land restoration requirements under section 26(1) (O) of the Mackenzie Valley Land Use Regulations. Canadian Natural will ensure these, and any specific reclamation requirements outlined in the Land Use Permit are met.

Additional revegetation efforts along the pipeline right-of-way (ROW) are not necessary since seeding after construction and natural encroachment have already provided suitable vegetation cover. Scrap and other debris will be removed to Fort Liard for storage or disposal.

Upon completion of the remediation and reclamation activities, associated equipment will be demobilized from the Program area. Final clean-up and reclamation activities will take place following removal of equipment.

4.11 Environmental Hazards

Canadian Natural has identified hazards associated with the program. Surface hazards assessed were: fuel, gray and wastewater, vehicle spills (hydrocarbons, oil, hydraulic fluid, antifreeze), petroleum-hydrocarbon impacted soil and used oil and lubricants. A summary of the identified hazards and mitigations is provided below.

Table 4-2: Environmental Hazards and their Mitigations.

Hazards	Description	Mitigations
Fuel	spill	Shut-off nozzles Spill kits on-site
Gray and wastewater	spill	Stored in tanks Trucked out for disposal.
Vehicle spills	spills	Spill kits on-site
Contaminated soil	Hydrocarbon and/or drilling impacted soil	Stored in drums and removal of contaminated soil by a registered hazardous waste carrier to an approved disposal facility offsite
Used oil, lubricants, hydraulic fluid, and absorbent pads	Petroleum or synthetic oil that has been used, and absorbent materials used for spill clean up	Used oil and lubricants will be disposed at an approved waste storage facility

4.12 Environmental Protection Systems

Canadian Natural Safety Management System requires all service provider companies and workers to participate in safety orientation and have all required safety training. Canadian Natural will conduct a pre-job kick-off meeting prior to work starting on the Ft. Laird project. This meeting will be attended by Canadian Natural Supervisors, service providers, and all workers assigned to the project. The agenda for the meeting will be a review of project specific documentation which includes the Safety and Environmental plans, project maps, safety policies, emergency planning, incident reporting, personal protective equipment, and hazard assessment.

Daily safety meetings will be held to discuss and review the daily operations plan, daily hazard assessment, and procedure review for all tasks. If the work scope, hazards, or conditions change, work will stop. Canadian Natural supervisors will be contacted, and the work scope will be reviewed, the plan or procedures changed, hazard assessment renewed / updated and acknowledged by all workers and visitors on site prior to proceeding.

Worksite safety observations will be completed on a regular basis. Critical equipment will be inspected prior to mobilization.

Equipment critical to the protection of the environment includes the knockout tank, vacuum truck and crew trucks containing safety kits and spill kits. Facilities critical to the protection of the environment include the municipal sewage treatment facility for sewage and non-hazardous waste disposal in Fort Liard, NT and the Secure Industrial Landfill for upstream oil and gas waste in Fort Nelson, BC.

5. SOCIO-CULTURAL ENVIRONMENT

5.1 Public Consultation

James Agate (Canadian Natural), Dwayne Werle (Canadian Natural), Tim Chidlaw (EnviroSearch), and Evelyne Nyairo (EnviroSearch) met with Chief Steven Kotchea, community members and representatives from local organizations in Fort Liard on November 21, 2008. The public consultation was conducted in conjunction with a proposed site maintenance Program for fourteen wellsites located northeast of Fort Liard, also owned by Canadian Natural. Consultation details and plans for the remediation and reclamation activities were presented and discussed. Prior to the meeting, the agenda for the proposed consultation meeting was forwarded to the Fort Liard Band Office and public notices were posted to inform the community of the meeting.

A PowerPoint presentation, including maps showing the Program area were presented to the meeting attendees. The following points raised by community members were discussed:

- Plan to renew the LUP to continue remediation and reclamation activities;
- Future plans for addressing the hydrocarbon-impacted soil on site;
- Confirmation if confirmatory sampling has been done on site and associated facilities and if further excavation will be conducted;
- Possibility of leaving the access in place for the use of the community;
- Training opportunities for members of the local community;
- Explanation of the remedial options that Canadian Natural is currently exploring;
- Plans for pipeline abandonment;

- Effects on animals,
- Noxious weed management (scentless chamomile); and
- Employment and business opportunities for the community.

Overall, the community was very receptive of Canadian Natural's plan to remediate and reclaim the Site. Canadian Natural will continue to work with the community of Fort Liard to address any issues that might arise.

Engagement was undertaken in April and May of 2014. Written notification and an engagement package was sent to potentially affected parties for review and comment. Follow-up phone calls were undertaken to ensure potentially affected parties received the notification documents and to discuss any potential concerns. As outlined in the Pre-Submission Engagement Summary, no concerns were raised by the potentially affected parties.

Engagement was undertaken in October of 2017 to support the MV2017X0034 LUP Renewal Application. Only the Acho Dene Koe First nation (ADKFN) provided a formal, written response requesting Canadian Natural to outline ways to prevent, reduce, and mitigate the effects of development on ADKFN land in the remediation and reclamation plan, to engage ADKFN in the proposed project and associated activities, and to involve ADKFN community members and businesses in project-specific work opportunities.

Renewed engagement is being undertaken in 2025 to support this LUP Renewal Application.

The 2025 Engagement Package is provided in **Appendix 1-B**.

5.2 Traditional Knowledge

Traditional Environmental Knowledge (TEK) information is collected to determine current and traditional uses and sensitivities in a selected area. During the community consultation, Canadian Natural solicited input from the Chief and community members present in the meeting to comment on areas around the Program area that are of cultural value. Given that the Project area is an existing site and that the proposed project activities intend to reclaim the area to its initial land capability, no concerns were raised. However, should historical or cultural artifacts be uncovered during the Program life cycle, the Prince of Wales Northern Heritage Centre and community will be notified.

5.3 Employment Opportunities

Canadian Natural recognizes the importance of providing employment and business opportunities to local businesses and individuals. The Program may create seasonal jobs, training opportunities, and revenue for local contractors. The exact number of opportunities that will be created has not been determined yet; however, it is the intent of Canadian Natural to use local contractors and/or contractors with local/Indigenous Joint Ventures/Partnerships as much as possible.

6. INTERACTING ENVIRONMENT

This section examines the interacting environment; a term used in this EPP to describe the environment, social, and cultural context of the Program, using reports and legislation prepared to protect values that society holds for within the Program area.

6.1 NT Established and Proposed Conservation Areas

The Northwest Territories Protected Areas Strategy (PAS) was an 8-step process that communities in the Northwest Territories can use to protect areas with natural and/or cultural significance. Following the devolution of many of the responsibilities for land and resource management from the federal to territorial government on April 1, 2014, the GNWT instated a pause on all PAS working groups and activities (Canadian Parks and Wilderness Society, 2017). The GNWT has since set out its vision for land use and management in the *Northern Lands Northern Leadership – The GNWT Land Use and Sustainability Framework (LUSF)* (GNWT, 2014) and the *Healthy Land, Healthy People: GNWT Priorities for Advancement of Conservation Network Planning 2023-2028* (GNWT, 2023).

The proposed Program is not located within an established or proposed conservation network in the NT (GNWT, 2015a). The overall intent of the Program is to remediate, reclaim and improve the overall condition of the P-66 wellsite and associated infrastructure, returning the disturbed areas to more natural conditions.

6.2 Canadian Important Bird Areas

A search of the Important Birds Areas (IBA) Canada interactive website (IBA Canada, 2025) indicated that the proposed Program area does not fall within a designated IBA.

6.3 Draft Interim Dehcho Land Use Plan

The Dehcho Land Use Planning Committee (DLUPC) was established to develop a land use plan as a management tool for determining the land use activities that should be permitted throughout the Dehcho Region. The intent of the plan will be to balance economic, social, environmental and cultural needs and interests. The land use plan will be guided by the principles of sustainable development and respect for the land as understood and explained by the Dehcho elders. Once approved, the plan will provide legally binding direction to regulatory agencies and decision-makers in their assessment of development projects, protected area proposals and other land uses. The planning area excludes municipal areas and Nahanni National Park Reserve. Crown consultations on the Draft Interim Dehcho Land Use Plan are expected to occur in 2025, after which, Dehcho First Nations, the GNWT and Canada can begin their plan approval process. Canadian Natural will work with regulatory agencies and the local communities in ensuring that the desired end land use for the P-66 well and associated infrastructure is consistent with the proposed Land Use Plan.

7. BIOPHYSICAL COMPONENTS

This section examines the ecological, atmospheric, terrestrial and aquatic environments, non-renewable resources, and the potential effects of the Program, and the mitigation measures that will be in place.

7.1 Ecoregions

7.1.1 *Boreal Cordillera Mid-Boreal Ecozone*

The project is situated within the Liard Range Ecoregion of the Boreal Cordillera Ecozone of Canada. This Ecoregion is characterised by Paleozoic and Mesozoic sandstones interbedded with shales and limestones forming the ridges and underlying the valleys; rock slumps are common where shales and sandstones are interbedded. Continental and Cordilleran glaciers left till deposits on the valley sides, glaciofluvial and lacustrine deposits on the valley floors, and a few rock glaciers. Modern-day alluvial deposits along the major rivers in gently sloping valley bottoms are usually sands and silts; coarse-textured braided alluvial deposits occur along tributaries in steeper terrain. Permafrost is discontinuous and is indicated by the occurrence of scattered peat plateaus and solifluction terrain. Brunisols are associated with subalpine conifer forests; Brunisols, Luvisols, and Gleyed Luvisol underlie boreal coniferous, deciduous and mixed-wood forests in valley bottoms. Boreal communities dominate the Ecoregions, and a complex of pure and mixed white spruce, aspen, paper birch, and lodgepole pine forests occupy the valleys and lower slopes across much of the Ecoregion (Ecosystem Classification Group, 2010).

7.2 Atmospheric Environment

7.2.1 *Climate*

The ecozone is marked by short, cool wet summers (June-August) and long, cold snowy winters. The climate averages for Fort Liard for the period 1991-2020 were used to estimate climate parameters for the project site. The mean annual temperature ranges from -4 to -5°C (Ecosystem Classification Group, 2010). The average annual daily temperature ranges from -20.8°C in January to 17.6°C in July. The extreme maximum has reached 35.2°C and extreme minimum has reached -45.0°C. The mean annual precipitation averages 449.2 millimetres (mm) per year, with the average rainfall at 296.4 mm and the average snowfall at 165.3 centimetres (cm). Extreme daily rainfall has been as high as 50 mm and extreme daily snowfall has been as high as 30 cm (Environment and Climate Change Canada, 2021).

The NT is experiencing faster changes in climate than most other regions in the world. The winters are warming and lightning strikes have increased in the tundra (GNWT, 2022). Additionally, an increase in ground disturbance and vegetation cover can also affect the active layer in the winter by not freezing completely thereby degrading the permafrost below. Thermokarst landscapes, peatland degradation, thaw lakes and landslides are increasing in number and extent in the NT (GNWT, 2022). In forested regions, the active layer is increasing in thickness and staying unfrozen long each year. Changes in active-layer depths in the North are being monitored by the Circumpolar Active-Layer Monitoring (CALM, 2012) Program. These changes are not happening at a constant rate and some years environmental changes can be fast and unpredictable.

7.2.1.1 Air Quality

Ambient air quality data is not available for the Fort Liard area. The Government of the Northwest Territories, Environment and Climate Change Department Air Quality Monitoring Network was examined. Baseline air quality surveys were not found for Fort Liard or within the vicinity of the Program area.

7.2.1.2 Mitigation Measures

As stated in **Table 7-1** below, the Program is not anticipated to have effects on air quality.

Table 7-1: Summary of Potential Air Quality Effects and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Emissions	<ul style="list-style-type: none"> Program activities are not anticipated to have deleterious effects on air, climate, or atmosphere. Gasoline or diesel equipment, which will emit greenhouse gases, are necessary to conduct the Program.

7.2.1.3 Residual Effects

Program-related residual effects on the atmospheric environment are expected to be negligible under normal operating conditions. The short duration, intermittent sources of emissions are temporary and are anticipated to rapidly disperse and will not exceed NT Air Quality Guidelines.

7.2.2 Noise

Baseline noise surveys are not known to have been conducted for Fort Liard or within the vicinity of the Program area. Noise guidelines commonly followed in the NT are outlined in the Alberta Energy Regulator (AER) document Directive 038: Noise Control (AER, 2024). For remote locations, where noise-sensitive receptors (such as occupied dwellings) are located more than 1.5 km from the proposed development, ambient noise levels are permitted to cause a five decibel (dBA) increase in equivalent continuous noise level (L_{eq}) above estimated background levels of 35 dBA. At a distance of 1.5 km, the noise level of a facility or development should not exceed 40 dBA L_{eq} (AER, 2024).

Table 7-2 identifies examples of noise sources and corresponding dBA levels.

Table 7-2: Noise Level Outputs

Sound Level	dBA	Example of Noise Source
Deafening	120	Gunshot at 1m Range: Threshold of Pain
	115	Hard-Rock Concert
	110	Accelerating Motorcycle at 1m Range
	105	Loud Car Horn at 3m Range
Very Loud	100	Dance Club
	95	Jackhammer at 15m Range
	90	Inside a Noisy Factory
	85	Large Truck Passing at 15m Range
Loud	80	Inside a Noisy Bar
	75	Near the Shoulder of a Major Highway
	70	Vacuum Cleaner at 15m Range
	65	Normal Human Voice at 1m Range
Moderate	60	Hair Dryer at 1m Range
	55	Running Tap Water
	50	Running Air Conditioner
	45	Inside a Typical Office
Faint	40	Inside a Typical Library: Guide 038 Guideline for L_{eq} at 1.5km

Sound Level	dBA	Example of Noise Source
	35	Typical Quiet Outdoors
	30	Inside a Quiet Bedroom at Night
	25	Inside a Quiet Broadcast Studio
Very Faint	20	Deep Woods on a Calm Day
	15	A Quiet Whisper
	10	Rustling Leaves at 15m Range
	5	At-Rest Human Breathing
	0	Quietest Sound That Can be Heard: Threshold of Human Hearing

Source: (Mackenzie Gas Project, 2004)

7.2.2.1 Mitigation Measures

Table 7-3 below provides a summary of the noise mitigation measures to be employed by Canadian Natural.

Table 7-3: Summary of Potential Noise Effects and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Increase noise levels	<ul style="list-style-type: none"> Program activities will be conducted during appropriate seasons to minimize activity during critical periods for wildlife (spring and fall). Equipment will be properly maintained to minimize noise. Noise will be limited to the worksites and helicopter flight path. Noise will be local and temporary.

7.2.2.2 Residual Effects

Program-related residual effects generated by increased noise are expected to be negligible under normal operating conditions. Adherence to the mitigation measures and protocols (**Table 7-3**) is expected to minimize the potential residual effects of the Program.

7.3 Terrestrial Resources

This section examines the terrestrial resources with respect to soil, vegetation, wildlife and birds as well as the potential effects of the Program, the mitigation measures that will be implemented, and the residual effects of the Program.

7.3.1 Soil

Soils of the Liard Range Ecoregion are characterised as Brunisols, Luvisols and Gleyed Luvisols that underlie boreal coniferous, deciduous and mixed-wood forests in valley bottom. Gleysols and Organic soils occur with wet shrublands, sedge fens and black spruce fens. Regosols are associated with tundra at higher elevations; there are a few barren bedrock and colluvial areas where soil development does not occur. Organic Crysols occur with peat plateaus scattered throughout the Ecoregion (Ecosystem Classification Group, 2010).

7.3.1.1 Mitigation Measures

Table 7-4 provides a summary of the identified potential effects of the Program on soil and the protection and mitigation measures to be employed by Canadian Natural.

Table 7-4: Summary of Potential Soil Effects and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Soil Contamination	<ul style="list-style-type: none"> • Fuel sleighs will be equipped with well maintained hoses, nozzles and pumps to prevent accidental spillage. • Parked equipment will be inspected during a daily walk-around to identify and manage signs of spills or leaks. • Care will be taken during refuelling. Drip tray and absorbent pans will be used to capture minor spills and drips while fuelling equipment. The drip trays will be monitored for fluid levels and replaced as necessary. • Fuel caches will be set-back a minimum of 100m from the high-water mark of any water body or watercourse. • Fuel storage containers greater than 4,000L will have secondary containment. • Canadian Natural has developed Emergency Response and Spill Contingency Plans (refer to Appendix 5) that will be adhered to throughout the course of the Program. • Spill kits will be kept on-site during operations. Spill response equipment includes waste bags, absorbent pads, and shovels. • In the event of a spill, Canadian Natural will implement spill reporting, clean-up and sampling as per regulations and requirements. • Should a spill occur, Canadian Natural will endeavour to clean-up the spill before infiltration occurs. • Spills, regardless of volume, will be documented and records kept by Canadian Natural. • Should a regulatory reportable spill occur, the NT/NU 24-hour Spill Report Line will be contacted at (867) 920-8130, or alternatively the NT/NU Spill Report Form will be completed and emailed to spills@gov.nt.ca.
Ground Disturbance	<ul style="list-style-type: none"> • Program activities are to take place on previously cleared locations, minimizing additional vegetation removal and related potential effects to terrain, soils and vegetation. The intent of the Program is to remediate and reclaim the P-66 wellsite and associated infrastructure. • Canadian Natural is proposing to conduct remediation activities during appropriate weather conditions (e.g. frozen ground and snow cover) to prevent risk of impacts to the ground or under summer conditions to allow better soil segregation, if required. • Reclamation activities will be conducted upon successful completion of remediation activities. • Canadian Natural is proposing to conduct summer reclamation activities using heli-portable equipment supplemented by pick-up trucks, ATVs, and other construction equipment.
Erosion	<ul style="list-style-type: none"> • Only existing crossings will be utilized. • If ground disturbance does occur, it will be re-contoured and reseeded with an approved mix and inspected within one full growing season. • Where the potential for erosion exists, erosion protection materials (such as coconut matting, silt fencing, and/or rip-rap) will be installed.

7.3.1.2 Residual Effects

Program related residual effects generated by disturbance to the site soils are considered low under normal operating conditions. Adherence to the mitigations and protocols (**Table 7-4**) is expected to minimize the potential residual effects of the Program.

7.3.2 Permafrost

Permafrost is defined by ground temperature, where rocks and soil remain below 0°C for at least two years (GNWT, 2008). The permafrost in the Program area is characterized as extensive and discontinuous with moderate to low ice content and is characterized by sparse ice wedges (GNWT, 2022).

The state of permafrost in the NWT is monitored using ground temperature sensors, measuring active layer thickness (the layer of ground above permafrost that thaws in the summer and refreezes in winter), and mapping the presence of thermokarst as an indicator of sensitive terrain (GNWT, 2022). Even for permafrost well below thawing temperatures, ecosystem disturbances (e.g., human activities, wildfires) and extreme summer temperature or precipitation events can affect its stability (GNWT, 2022).

7.3.2.1 Mitigation Measures

Table 7-5 provides a summary of the identified potential effects of the Program on permafrost and the protection and mitigation measures to be employed by Canadian Natural.

Table 7-5: Summary of Potential Permafrost Effects and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Permafrost Regime Alteration	<ul style="list-style-type: none"> The worksites will be monitored for melting permafrost from solar exposure and rutting. Repairs will be made as required to protect the permafrost. Program activities are to take place on previously cleared locations, minimizing additional vegetation removal and related potential effects to terrain, soils and vegetation. The intent of the Program is to remediate and reclaim the P-66 wellsite and associated infrastructure During the winter activities, frozen ground conditions will mitigate potential damage to surface soils and permafrost. Canadian Natural is proposing to conduct summer reclamation activities using heli-portable equipment supplemented by pick-up trucks, ATVs, and other construction equipment.

7.3.2.2 Residual Effects

Program related residual effects on permafrost are expected to be low under normal operating conditions. Adherence to the above-mentioned mitigations and protocols (**Table 7-5**) are expected to minimize the potential residual effects of the Program.

7.3.3 Vegetation

The following is a list of plant species that that have ranges that overlap with the Program area:

Black Spruce	<i>Picea mariana</i>	Cloudberry	<i>Rubus chamaemorus</i>
White Spruce	<i>Picea glauca</i>	One-Sided Wintergreen	<i>Pyrola secunda</i>
Tamarack	<i>Larix laricina</i>	Northern Bastard Toadflax	<i>Geocaulon lividum</i>
Aspen	<i>Populus tremuloides</i>	Bunchberry	<i>Cornus canadensis</i>
Willow Species	<i>Salix spp.</i>	Round-Leaved Sundew	<i>Drosera rotundifolia</i>
Red Osier Dogwood	<i>Cornus stolonifera</i>	Marsh Cinquefoil	<i>Potentilla palustris</i>
Dwarf Birch	<i>Betula pumila</i>	Common Horsetail	<i>Equisetum arvense</i>
Labrador Tea	<i>Ledum groenlandicum</i>	Marsh Reed Grass	<i>Calamagrostis canadensis</i>
Red Swamp Currant	<i>Ribes triste</i>	Water Sedge	<i>Carex aquatilis</i>
Alpine Bearberry	<i>Arctostaphylos rubra</i>	Sheathed Cotton-Grass	<i>Eriophorum vaginatum</i>
Bog Bilberry	<i>Vaccinium uliginosum</i>	Sphagnum Moss Species	<i>Sphagnum spp.</i>
Bog Cranberry	<i>Vaccinium vitis-idaea</i>	Stair-Step Moss	<i>Hylocomium splendens</i>
Crowberry	<i>Empetrum nigrum</i>	Red-Stemmed Feather Moss	<i>Pleurozium schreberi</i>
Sweet Gale	<i>Myrica gale</i>	Reindeer Lichen Species	<i>Cladina spp.</i>
Dwarf Bog Rosemary	<i>Andromeda polifolia</i>	Club Lichen Species	<i>Cladonia spp.</i>

7.3.3.1 Regulations Pertaining to Vegetation

Regulations found to be the most applicable to vegetation in the Northwest Territories are summarized below.

SARA is intended to protect species at risk in Canada (Species at Risk Act, 2002). Species afforded protection are listed in Schedule 1 of SARA. Section 32(1) of the federal *Species at Risk Act (SARA)* (2002) states that no person shall kill, harm, harass, capture, or take listed species.

Section 33 states that no person shall damage or destroy the residence of a listed species. Section 36(1) states that no person shall kill, harm, harass, capture, or take a species listed by a provincial or territorial minister, and that no person shall damage or destroy the residence of a species listed by a provincial or territorial minister. Section 79 of SARA (2002) states that adverse effects on the listed species must be identified and, regardless of significance, be mitigated and monitored. The treatment of other species determined to be at risk will be equivocal to that of SARA-listed species for the purposes of this EPP.

Canadian Natural will ensure that the above legislation is complied with, and that personnel respect and adhere to the mitigation measures in place to reduce effect to vegetation.

7.3.3.2 Vegetation at Risk

It should be noted that no plant, bryophyte, or lichen species at risk were found to potentially occur in the Program area indicating a low risk for associated effects. Vegetation species which are listed in the *NWT Species 2021-2025 – General Status Ranks of Wild Species in the Northwest Territories* (GNWT, 2021) as having a status of either “Sensitive” or “May Be at Risk”, could occur within the Program area. Neither category is currently protected at this time.

“Sensitive” species are not at high risk of extinction or extirpation but may require some protection to prevent them from being at risk. These species are ranked with a medium priority for a detailed assessment. Species listed as “May be at Risk” are species that may be at risk of extinction or extirpation and are therefore these species are ranked with the highest priority for a detailed risk assessment. Program activities are located on previously cleared locations, minimizing additional vegetation removal and related potential effects to terrain, soils and vegetation.

7.3.3.3 Mitigation Measures

Table 7-6 provides a summary of the identified potential effects of the Program on vegetation and the protection and mitigation measures to be employed by Canadian Natural.

Table 7-6: Summary of Potential Vegetation Effects and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Habitat Loss	<ul style="list-style-type: none"> Program activities are located on previously cleared locations, minimizing additional vegetation removal and related potential effects to terrain, soils and vegetation.
Ongoing compaction	<ul style="list-style-type: none"> Canadian Natural is proposing to conduct summer reclamation activities using heli-portable equipment supplemented by pick-up trucks, ATVs, and other construction equipment.
Changes in species composition	<ul style="list-style-type: none"> Any required seeding and/or follow-up inspections will be performed at the direction of INAC’s Land Use Inspector. Activity will be restricted to the defined Program area, which will limit the area being disturbed. Frozen ground conditions during the winter Program activities will mitigate potential damage to ground vegetation. Access ground surface will be monitored for erosion and rutting and damage.
Species Introduction / Decreased diversity	<ul style="list-style-type: none"> Care will be taken to clean equipment prior to mobilization into the Program area to limit the likelihood of the introduction of non-native species.
Potential Forest Fire Hazard	<ul style="list-style-type: none"> Firefighting equipment will be maintained at fuel storage locations. Fire prevention methods include designated smoking areas and fire bans as conditions warrant. As per section 10 and 19 (1) of the Forest Protection Act, Canadian Natural will adhere to Forest Fire Prevention and Suppression Guidelines for Industrial Activities. In the event of a forest fire, the GNWT Forest Fire Management Division hotline will be called at 1-877-698-3473.

7.3.3.4 Residual Effects

The significance of the contribution of the Program to the residual effects on vegetation is expected to be low. The intent of the Program is to remediate and reclaim the P-66 wellsite and associated infrastructure.

7.3.4 Wildlife & Birds

Program components that may affect wildlife and birds include:

- Increased potential for wildfires due to summer activities; and
- Increased equipment and helicopter activity during the summer/winter.

A summary of the influences these Program components may have on wildlife include:

- Sensory disturbance from equipment and helicopter activity;
- A relatively small risk to increased mortality; and
- Additional stress from increased disturbance.

Potential effects will be mitigated through implementation of the measures outlined in **Table 7-9** and through the eventual reclamation of the P-66 wellsite and associated infrastructure.

7.3.4.1 Regulations Pertaining to Wildlife and Birds

The *NWT Wildlife Act* (GNWT, 2018b) pertains to the harvesting and management of wildlife in the NT. Section 51(1) of the Act states that no person shall, without a licence or permit, destroy, disturb, or take an egg of a bird, the nest of a bird when the nest is occupied, or the nest of a prescribed (listed in the regulations) bird. Section 51(2) states that no person shall, without a licence or permit, break into, destroy, or damage a den, beaver dam or lodge, muskrat push-up or hibernaculum. Section 52 states that no person shall, without a licence or permit, engage in an activity that is likely to result in a significant disturbance or unnecessarily chase, fatigue, disturb, torment or otherwise harass game or other prescribed wildlife. Section 38 states that no person shall harvest game without a hunting licence or harvest prescribed wildlife without a permit.

SARA is intended to protect species at risk in Canada (Species at Risk Act, 2002). Species afforded protection are listed in Schedule 1 of SARA. Under SARA, it is forbidden to kill, injure, harass, destroy the residence or critical habitat of, capture or take an individual designated as *extirpated*, *endangered*, or *threatened* on federally-regulated lands. On territorial land, SARA-listed species are not protected unless the species is federally managed, such as under the *Migratory Birds Convention Act* (MBCA) (Migratory Birds Convention Act, 1994). The MBCA states that without authorization or a permit, the disturbance or destruction of a nest or eggs of a migratory bird is prohibited.

Canadian Natural will ensure that the above legislation is complied with, and that personnel respect and adhere to the mitigation measures in place to protect wildlife.

Other relevant documents pertaining to wildlife management include:

- Amended recovery strategy for the woodland caribou (*Rangifer tarandus caribou*), boreal population, in Canada (Environment and Climate Change Canada, 2020);
- Management Plan for the Northern Mountain Population of Woodland Caribou (*Rangifer tarandus caribou*) in Canada (Environment Canada, 2012);
- Mackenzie Valley Resource Management Act (MVRMA) (1998, amended 2024);

- Mackenzie Valley Land Use Regulations (1998, amended 2017); and
- Northern Land Use Guidelines – NWT Seismic Operations (GNWT, 2015b) (in regard to setback distances and timing restrictions).

7.3.4.2 Species at Risk

SARA came into full effect on December 12, 2002. Section 79 (2) of SARA states that, during an assessment of effects of a project, the adverse effects of the project on a listed wildlife species and its critical habitat must be identified, that measures are taken to avoid or lessen those effects, and that the effects need to be monitored (Species at Risk Act, 2002). This section applies to all species listed on Schedule 1 of SARA as “Special Concern”, “Threatened”, or “Endangered”. As a matter of best practice, Canadian Natural has considered species on other Schedules of SARA, as well as those under consideration for listing on SARA, including those designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for this EPP.

Many of the species native to the NT have been assessed in a document entitled *NWT Species 2021-2025 – General Status Ranks of Wild Species in the Northwest Territories* (GNWT, 2021). Those species ranked as “At Risk” are presented in **Table 7-7**.

The Species at Risk Committee (SARC) was established under the *Species at Risk (NWT) Act* and is composed of a group of experts that assesses the biological status of species that “May Be at Risk” of extinction in the NT, using both traditional knowledge and scientific information. The committee makes recommendations to the Conference of Management Authorities, who then list species under the Act. Species that are currently on the approved assessment schedule for 2025-2029 (SARC, 2025) are presented in **Table 7-7**, with the proposed year of assessment listed.

The species included in **Table 7-7** are considered to be Species at Risk in the Northwest Territories by one or more of the above-named organizations.

Table 7-7: Species at Risk in the NT

Species	Status in NT				Status in Canada	
	NT General Status Ranking	Habitat in the Program Area	SARC Assessment (Proposed Year Assessment)	NWT Legal List	COSEWIC Assessment	Federal Species at Risk Act Listing
Mammals						
Barren-ground Caribou (<i>Rangifer tarandus groenlandicus</i>)	At Risk	Yes	Threatened (March 2027)	Threatened	Threatened	Under Consideration
Bowhead Whale (<i>Balaena mysticetus</i>)	Secure	No	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Collared Pika (<i>Ochotona collaris</i>)	Sensitive	Yes	Not Assessed	No Status	Special Concern	Schedule 1 Special Concern
Dall’s Sheep (<i>Ovis dalli</i>)	Secure	Yes	Not Assessed (March 2029)	No Status	No Assessed	No Status
Dolphin and Union Barren-ground Caribou (<i>Rangifer tarandus groenlandicus x pearyi</i>)	At Risk	No	Special Concern	Special Concern	Endangered	Schedule 1 Special Concern

Species	Status in NT				Status in Canada	
	NT General Status Ranking	Habitat in the Program Area	SARC Assessment (Proposed Year Assessment)	NWT Legal List	COSEWIC Assessment	Federal Species at Risk Act Listing
Eastern Red Bat (<i>Lasirursus borealis</i>)	Presence Expected	No	Not Assessed	No Status	Endangered	Under Consideration
Grey Whale (<i>Eschrichtius robustus</i>)	Undetermined	No	Not Applicable	Not Applicable	Not at Risk	Schedule 1 Special Concern
Grizzly Bear (<i>Ursus arctos</i>)	Sensitive	Yes	Special Concern	No Status	Special Concern	Schedule 1 Special Concern
Little Brown Myotis (<i>Myotis lucifugus</i>)	At Risk	Yes	Special Concern (March 2027)	Special Concern	Endangered	Schedule 1 Endangered
Muskox (<i>Ovibos moschatus</i>)	Sensitive	No	Not Assessed (March 2028)	No Status	No Assessed	No Status
Muskrat (<i>Ondatra zibethicus</i>)	Secure	Yes	(March 2026)	No Status	No Assessed	No Status
Northern Myotis (<i>Myotis septentrionalis</i>)	At Risk	Yes	Special Concern (March 2027)	Special Concern	Endangered	Schedule 1 Endangered
Peary Caribou (<i>Rangifer tarandus pearyi</i>)	At Risk	No	Threatened	Threatened	Threatened	Schedule 1 Endangered
Polar Bear (<i>Ursus maritimus</i>)	Sensitive	No	Special Concern	Special Concern	Special Concern	Schedule 1 Special Concern
Ringed Seal (<i>Pusa hispida</i>)	Secure	No	Not Applicable	Not Applicable	Special Concern	Under Consideration
Silver-Haired Bat	Undertermined	No	Not Assessed	No Status	Endangered	Under Consideration
Wolverine (<i>Gulo gulo</i>)	Sensitive	Yes	Not at Risk	No Status	Special Concern	Schedule 1 Special Concern
Wood Bison (<i>Bison bison athabascaae</i>)	At Risk	Yes	Threatened (March 2026)	Threatened	Special Concern	Schedule 1 Threatened
Woodland Caribou Boreal Population (<i>Rangifer tarandus caribou</i>)	At Risk	Yes	Threatened	Threatened	Threatened	Schedule 1 Threatened
Woodland Caribou Northern Mountain Population (<i>Rangifer tarandus caribou</i>)	Sensitive	Yes	Special Concern	Special Concern	Special Concern	Schedule 1 Special Concern
Birds						
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	May be at Risk	No	Special Concern	Under Consideration	Not at Risk – 1987	No Status
Bank Swallow (<i>Riparia riparia</i>)	At Risk	Yes	Not Applicable	Not Applicable	Threatened	Schedule 1 Threatened
Barn Swallow (<i>Hirundo rustica</i>)	At Risk	Yes	Not Applicable	Not Applicable	Threatened	Schedule 1 Threatened
Buff-breasted Sandpiper (<i>Calidris subruficollis</i>)	Sensitive	No	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Canada Warbler (<i>Wilsonia canadensis</i>)	Sensitive	Yes	Not applicable	Not Applicable	Special Concern	Schedule 1 Threatened

Species	Status in NT			Status in Canada		
	NT General Status Ranking	Habitat in the Program Area	SARC Assessment (Proposed Year Assessment)	NWT Legal List	COSEWIC Assessment	Federal Species at Risk Act Listing
Common Nighthawk (<i>Chordeiles minor</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Eskimo Curlew (<i>Numenius borealis</i>)	At Risk	No	Not Applicable	Not Applicable	Endangered	Schedule 1 Endangered
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	Secure	No	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Harris's Sparrow (<i>Zonotrichia querula</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Special Concern	Under Consideration
Horned Grebe (<i>Podiceps auritis</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Hudsonian Godwit (<i>Limosa haemastica</i>)	At Risk	No	Not Applicable	Not applicable	Threatened	Under Consideration
Island Red Knot (<i>Calidris canutus islandica</i>)	At Risk	No	Not Applicable	Not Applicable	Not at Risk	Schedule 1 Special Concern
Ivory Gull (<i>Pagophila eburnean</i>)	At Risk	No	No Applicable	Not Applicable	Endangered	Schedule 1 Endangered
Lesser Yellowlegs (<i>Tringa flavipes</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Threatened	Under Consideration
Olive-Sided Flycatcher (<i>Contopus cooperi</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Peregrine Falcon (<i>Falco peregrinus anatum/tundrius</i>)	Sensitive	No	Not Assessed (March 2022)	No Status	Not at Risk	Removed from Schedule 1
Rufa Red Knot (<i>Calidris canutus rufa</i>)	At Risk	No	Not Applicable	Not Applicable	Endangered	Schedule 1 Endangered
Roselaari Red Knot (<i>Calidris canutus roselaarii</i>)	-	No	-	-	Non-active	Schedule 1 Threatened
Red-necked Phalarope (<i>Phalaropus lobates</i>)	Secure	Yes	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Rusty Blackbird (<i>Euphagus carolinus</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Short-Eared Owl (<i>Asio flammeus</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Threatened	Schedule 1 Special Concern
Whooping Crane (<i>Grus americana</i>)	At Risk	No	Not Applicable	Not Applicable	Endangered	Schedule 1 Endangered
Yellow Rail (<i>Coturnicops noveboracensis</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Amphibians						
Canadian Toad (<i>Anaxyrus hemiophrys</i>)	Sensitive	No	(March 2025)	No Status	Not At Risk	Not At Risk (2003)
Northern Leopard Frog (<i>Lithobates pipiens</i>)	At Risk	No	Threatened (March 2025)	Threatened	Special Concern	Schedule 1 Special Concern
Red-sided Garter Snake (<i>Thamnophis sirtalis</i>)	Sensitive	No	Special Concern	Under Consideration	Not Assessed	No Status

Species	Status in NT				Status in Canada	
	NT General Status Ranking	Habitat in the Program Area	SARC Assessment (Proposed Year Assessment)	NWT Legal List	COSEWIC Assessment	Federal Species at Risk Act Listing
Western Toad (<i>Anaxyrus boreas</i>)	At Risk	Yes	Threatened (March 2025)	Threatened	Special Concern	Schedule 1 Special Concern
Fish						
Bull Trout (<i>Salvelinus confluentus</i>)	Sensitive	Yes	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Dolly Varden (<i>Salvelinus malma</i>)	Sensitive	No	Not Applicable	Not Applicable	Special Concern	Schedule 1 Special Concern
Northern Wolfish (<i>Anarhichas denticulatus</i>)	At Risk	No	Not Applicable	Not Applicable	Threatened	Schedule 1 Threatened
Shortjaw Cisco (<i>Coregonus zenithicus</i>)	At Risk	No	Not Applicable	Not Applicable	Threatened	Schedule 1 Threatened
Insects						
Gypsy Cuckoo Bumble Bee (<i>Bombus bohemicus</i>)	At Risk	Yes	Data Deficient	No Status	Endangered	Schedule 1 Endangered
Mckay's Bumble Bee (formerly Western Bumble Bee) (<i>Bombus occidentalis</i>)	Sensitive	Yes	Data Deficient	No Status	Special Concern	Schedule 1 Special Concern
Suckley's Cuckoo Bumble Bee (<i>Bombus suckleyi</i>)	Undetermined	Yes	Not Assessed	No Status	Threatened	Under Consideration
Traverse Lady Beetle (<i>Coccinella transversalis</i>)	Secure	Yes	Not Assessed	No Status	Special Concern	Schedule 1 Special Concern
Yellow-banded Bumble Bee (<i>Bombus terricola</i>)	Undetermined	Yes	Not at Risk	No Status	Special Concern	Schedule 1 Special Concern
Plants						
Arctic Orangebush Lichen (<i>Seiophora aurantiaca</i>)	May Be at Risk	No	Not Assessed	No Status	Not Assessed	No Status
Bank's Island Alkali Grass (<i>Puccinellia banksiensis</i>)	May Be at Risk	No	Not Assessed	No Status	Not Assessed	No Status
Drummond Bluebell (<i>Mertensia drummondii</i>)	May Be at Risk	No	Not Assessed	No Status	Not Assessed	No Status
Hairy Braya (<i>Braya pilosa</i>)	At Risk	No	Threatened	Threatened	Endangered	Schedule 1 Endangered
Mackenzie Hairgrass (<i>Deschampsia mackenzieana</i>)	May Be at Risk	No	Not Assessed	No Status	Special Concern	Schedule 1 Special Concern
Nahanni Aster (<i>Symphotrichum nahanniense</i>)	Sensitive	No	Not Assessed	No Status	Special Concern	Schedule 1 Special Concern
Raup's Willow (<i>Salix raupii</i>)	May Be at Risk	Yes	Not Assessed	No Status	Not Assessed	No Status
Rock Cranberry (<i>Vaccinium vitis-idaea</i>)	Secure	Yes	(March 2028)	No Status	No Assessed	No Status

Note: Environment Canada has a national role to play in the conservation and recovery of Species at Risk in Canada, as well as responsibility for management of birds described in the Migratory Birds Convention Act (MBCA). Day-to-day management of terrestrial species not covered in the MBCA is the responsibility of the Territorial Government. Populations that exist in National Parks are managed under the authority of the Parks Canada Agency.

7.3.4.3 Valued Components (VCs)

Table 7-8 outlines a list of wildlife VCs considered by EnviroSearch for this EPP. Those species that are listed in **Table 7-7** and have ranges that overlap with the Program area were identified as VCs and are described in more detail below.

Table 7-8 Listed Wildlife Species within the Project Area

Species	SARA	COSEWIC	NWT Species at Risk
Mammals			
Collared Pika (<i>Ochotona collaris</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Dall's Sheep (<i>Ovis dalli</i>)	No Status	Not Assessed	No Status
Grizzly Bear (<i>Ursus arctos</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Little Brown Myotis (<i>Myotis lucifugus</i>)	Schedule 1 Endangered	Endangered	At Risk
Muskrat (<i>Ondatra zibethicus</i>)	No Status	Not Assessed	No Status
Northern Myotis (<i>Myotis septentrionalis</i>)	Schedule 1 Endangered	Endangered	At Risk
Wolverine (<i>Gulo gulo</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Wood Bison (<i>Bison bison athabasca</i>)	Schedule 1 Threatened	Special Concern	At Risk
Woodland Caribou Boreal Population (<i>Rangifer tarandus caribou</i>)	Schedule 1 Threatened	Threatened	At Risk
Woodland Caribou Northern Mountain Population (<i>Rangifer tarandus caribou</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Birds			
Barn Swallow (<i>Hirundo rustica</i>)	Schedule 1 Threatened	Threatened	At Risk
Bank Swallow (<i>Riparia riparia</i>)	Schedule 1 Threatened	Threatened	At Risk
Canada Warbler (<i>Wilsonia canadensis</i>)	Schedule 1 Threatened	Threatened	At Risk
Common Nighthawk (<i>Chordeiles minor</i>)	Schedule 1 Special Concern	Threatened	At Risk
Harris's Sparrow (<i>Zonotrichia querula</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Horned Grebe (<i>Podiceps auritis</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Lesser Yellowlegs (<i>Tringa flavipes</i>)	Under Consideration	Threatened	Sensitive
Olive-Sided Flycatcher (<i>Contopus cooperi</i>)	Schedule 1 Special Concern	Threatened	At Risk
Red-necked Phalarope (<i>Phalaropus lobates</i>)	Schedule 1 Special Concern	Special Concern	Secure
Rusty Blackbird (<i>Euphagus carolinus</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Short-Eared Owl (<i>Asio flammeus</i>)	Schedule 1 Special Concern	Threatened	Sensitive
Yellow Rail (<i>Coturnicops noveboracensis</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Amphibians			

Species	SARA	COSEWIC	NWT Species at Risk
Western Toad (<i>Anaxyrus boreas</i>)	Schedule 1 Special Concern	Special Concern	At Risk
Fish			
Bull Trout (<i>Salvelinus confluentus</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Insects			
Gypsy Cuckoo Bumble Bee (<i>Bombus bohemicus</i>)	Schedule 1 Endangered	Endangered	At Risk
Mckay's Bumble Bee (formerly Western Bumble Bee) (<i>Bombus occidentalis</i>)	Schedule 1 Special Concern	Special Concern	Sensitive
Suckley's Cuckoo Bumble Bee (<i>Bombus suckleyi</i>)	Under Consideration	Threatened	Undetermined
Traverse Lady Beetle (<i>Coccinella transversalis</i>)	Schedule 1 Special Concern	Special Concern	Secure
Yellow-banded Bumble Bee (<i>Bombus terricola</i>)	Schedule 1 Special Concern	Special Concern	Undetermined

7.3.4.4 Mammals

The following is a list of common mammal species that may be found within, or near, the Program area:

Arctic Ground Squirrel	<i>Spermophilus parryii</i>	Least Chipmunk	<i>Tamias minimus</i>
American Beaver	<i>Castor canadensis</i>	Red Fox	<i>Vulpes vulpes</i>
Black Bear	<i>Ursus americanus</i>	Masked Shrew	<i>Sorex cinereus</i>
Canada Lynx	<i>Lynx canadensis</i>	North American Porcupine	<i>Erethizon dorsatum</i>
Common Muskrat	<i>Ondatra zibethicus</i>	Northern River Otter	<i>Lontra canadensis</i>
Cougar	<i>Puma concolor</i>	Red Fox	<i>Vulpes vulpes</i>
Coyote	<i>Canis latrans</i>	Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Grey Wolf	<i>Canis lupus</i>		

Habitat data of some of these species was provided from a variety of sources including COSEWIC, NWT Species at Risk, and the GNWT-ECC (Wildlife Division).

Canadian Natural is providing further information on the species which have potential to be found in the Program area and are listed as species at risk in **Table 7-7** and therefore considered as VCs **Table 7-8**.

Collared Pika (*Ochotona collaris*)

The collared pika is a small lagomorph (the group that includes rabbits and hares) with small round ears, a white underbelly and a distinctive “collar” of light grey fur around its neck. Collared pikas live in boulder fields, or talus, interspersed with meadows of northern Canada. The boulders help shelter the pikas from weather and predators (GNWT, 2024). Collared pikas are solitary, and defend individual territories of about 15 to 25m radius. Pikas spend long hours harvesting grasses and other plant material during the spring and summer months for their winter stores. Before storing the material in their rocky dens, pikas will spread the vegetation across the flat surfaces of rocks to allow it to dry and cure in the sun. Pikas do not hibernate; they are active throughout the winter, feeding on their hay stores and on lichens. Pikas mate in early spring, bearing two to six young in early summer. If food is plentiful and if conditions permit, a second litter may be

produced in late summer (COSEWIC, 2011a). Their range in the NT extends into the Richardson Mountains west of Aklavik and throughout the Mackenzie Mountains in the Dehcho and Sahtu regions (GNWT, 2024).

Potential threats to collared pikas in the NT is the effect of climate change including changes in precipitation patterns in spring and increasing temperature in summer. The specifics of how climate change affects collared pika behaviour are not well studied; however, it is known that increases in precipitation and increases in summer temperatures have led to population declines in some areas (GNWT, 2024).

Portions of the Program to be carried out during the summer may coincide with collared pika brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the previously disturbed areas to avoid disturbing collared pika nest sites. No additional disturbance will occur since the remediation and reclamation Program will utilize existing access and the lease will be reclaimed.

Grizzly Bear (*Ursus arctos*)

Grizzly bears are omnivorous, exploiting a wide range of food sources. They are larger than black bears and are more heavily built. They can be recognized by their prominent shoulder hump, dish shaped face and long claws. Colour varies from light gold to almost black with pale bears being the most common on the barren-lands (GNWT, 2024). Grizzly bears occupy diverse habitats including open or semi-forested areas, most commonly in alpine and subalpine terrain, on the tundra and less commonly in the boreal forest. Grizzly bears hibernate in dens throughout the winter months, living off stored fat reserves. However, they can be roused relatively easily while dormant.

Grizzly bears do not reproduce until they are between six and eight years of age. They will mate in the summer, with one to two altricial cubs born in February. As a result of the mother's weakened condition and the dependent cubs, disturbance to a denning female with cubs greatly increases the chance of mortality (Linnel et al, 2000). Due to the relatively low densities across the landscape and low reproductive rates, the death of a reproductive-aged female could have population level effects.

Grizzly bears are also locally important species. SARA states that adverse effects on the listed species must be identified and, regardless of significance, be mitigated and monitored (s.79). The treatment of SARA species must be consistent with COSEWIC species.

Individual bears move great distances so they may be exposed to negative effects of human developments or activities, even when these activities occur at a considerable distance from the core range (GNWT, 2024). Population estimates in much of the range are highly uncertain; the Canadian population is estimated at 26,000, but the number of mature individuals is uncertain and could be close to 10,000 (COSEWIC, 2016a).

Portions of the Program to be carried out in the winter may coincide with grizzly bear denning activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity. The crew's activity will be restricted to the existing worksites which will limit the area being disturbed. Personnel will be notified of the potential of bear activity and will be instructed in bear

awareness. The GNWT-ENR manual, “*Safety in Grizzly and Black Bear Country*” (see **Appendix 7**) will be reviewed with Program personnel.

Bears may tolerate disturbance to some degree in the winter during denning, but they have been shown to select or abandon their dens in response to activity. Potential residual effects for grizzly bear are discussed in Section 8 of this EPP.

Little Brown Myotis (*Myotis lucifugus*)

The little brown myotis is a medium-sized bat that can be found across much of North America. Fur on its back ranges from yellowish-brown to dark brown-black and is often glossy. Fur on its underside is lighter and goes from light brown to tan. The tragus (fleshy projection which covers the entrance of the ear) is short and blunt (GNWT, 2024). A nocturnal insectivore, it uses echolocation to locate prey in the dark. Mating takes place in fall and may occur again in the winter or the spring. Migrations of up to several hundred kilometres may be taken in the fall to find appropriate hibernacula, typically in caves. The little brown myotis hibernates in large groups from fall to spring, waking periodically to eliminate wastes. In the spring, females form nursery colonies, often around open water, in man-made structures (like attics), tree cavities, under the bark of trees, rock crevices and caves (GNWT, 2024). A single pup is born in early summer and remains with the mother in the nursery for one to two months (National Audubon Society, 1996).

An emergency assessment was conducted by COSEWIC in February 2012 on three Canadian bat species, including the little brown myotis, in response to rapidly declining population sizes. White-nose syndrome, a disease affecting bats caused by an invasive white fungus, is at least partially responsible for the observed population declines. White-nose syndrome disrupts bat hibernation, causing the animals to wake in mid-winter when food and water is scarce, at which time the bats die of starvation or dehydration (COSEWIC, 2012a). White-nose syndrome has not yet been detected in the NWT but is spreading rapidly throughout Canada and the United States and could eventually spread north (GNWT, 2024).

Portions of the Program to be carried out in the winter may coincide with little brown myotis overwintering activities, and portions of the Program to be carried out during the summer may coincide with little brown myotis brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew’s activity will be restricted to the existing worksites to avoid disturbing little brown myotis hibernacula or nursery colonies.

Northern Myotis (*Myotis septentrionalis*)

The northern myotis is very similar in colour and size to the little brown myotis, but the ears are longer (extend beyond the nose when pressed forward) and the tragus (fleshy projection which covers the entrance of the ear) is long, slender and pointed (GNWT, 2024). The northern myotis is a nocturnal insectivore, using echolocation to locate prey in the dark. Mating takes place in fall, and may occur again in the winter or the spring. The northern myotis typically hibernates in caves or in mines, individually or in small groups. In the spring, females may form nursery colonies in man-made structures (like attics), tree cavities, under the bark of trees, rock crevices and caves. A single pup is born in early summer and remains with the mother in the nursery for one to two months (National Audubon Society, 1996). Winter hibernation sites are usually in caves or mines.

An emergency assessment was conducted by COSEWIC in February 2012 on three Canadian bat species, including the northern myotis, in response to rapidly declining population sizes. White nose syndrome, a disease affecting bats caused by an invasive white fungus, is at least partially responsible for the observed population declines. White nose syndrome disrupts bat hibernation, causing the animals to wake in mid-winter when food and water is scarce, at which time the bats die of starvation or dehydration (COSEWIC, 2012a). White-nose syndrome has not yet been detected in the NWT but is spreading rapidly throughout Canada and the United States and could eventually spread north (GNWT, 2024).

Portions of the Program to be carried out in the winter may coincide with northern long-eared myotis overwintering activities, and portions of the Program to be carried out during the summer may coincide with northern myotis brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing northern long-eared myotis hibernacula or nursery colonies.

Wolverine (*Gulo gulo*)

Wolverines resembles a small stocky bear. Colour varies from brown to black, often with a pale facial mask and yellowish or tan stripes running along its sides from the shoulders and crossing at the tail (GNWT, 2024) Wolverines exist at low population densities and are primarily nocturnal, though they may be active at any time. Wolverines are highly opportunistic feeders, capable of killing large prey, stealing and scavenging kills from other predators (COSEWIC, 2003). The coat of the wolverine contains oil that repels water, snow, and frost, therefore, wolverine pelts are highly sought after by humans for making winter clothing. Wolverines are typically solitary, coming together to mate in the summer. Wolverines occupy dens periodically during the winter months, though they do not hibernate. Litters of two to five young are born in early spring and remain with their mother for up to two years (COSEWIC, 2003). Declines in wolverine populations in Canada have largely occurred due to habitat loss and alteration, decreases in large prey animal population sizes, and increased anthropogenic pressures (COSEWIC, 2003).

Although recently classified as Not at Risk in the NT, development and other human activities can still disturb wolverines and fragment habitat, even if these activities are a considerable distance from their core range (GNWT, 2024). Potential threats to the wolverine in the NT include disturbance of maternal den sites. Wolverines appear to be very sensitive to disturbance at natal den sites and will move or abandon kits if disturbed (Jalkotzy, et al, 1997). The potential for this response would indicate residual effects from the Program could be present for this species. Potential residual effects for wolverine are discussed in Section 8 of this EPP.

Portions of the Program to be carried out in the winter/early spring and summer may coincide with wolverine denning and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing wolverine den sites.

Wood Bison (*Bison bison athabascaae*)

Wood bison are a distinct northern subspecies of the American Bison currently listed as "Special Concern". Wood bison can be differentiated from other subspecies by their heavier build, typically darker colour, woollier pelage, and thicker horns. Wood bison are mixed feeders, selecting a combination of both herbaceous and woody plants to consume. Wood bison typically feed on

grasses, sedges, and willows found in wet meadows and in riparian areas. Herds are composed of females, calves, and sub-adults for the majority of the year, sexually mature bulls are typically solitary, with the animals forming large mixed-sex herds during the mating season which can extend from June to September. Calves are born in April - May. Typical habitat of the Nahanni population includes meadows and oxbows with sedges and horsetails (GNWT, 2024).

Potential threats to the wood bison in the NT include introduced bovine brucellosis and tuberculosis, limited genetic diversity, naturally occurring outbreaks of anthrax, collisions with vehicles, spring floods and falling through thin ice, and bison/human conflicts (GNWT, 2024).

Planned Program activities may coincide with a posted wood bison sensitive period; designated March 1st – July 15th (GNWT, 2015b). Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing wood bison herds.

Woodland Caribou Boreal Population (*Rangifer terandus caribou*)

Woodland caribou boreal population (*Rangifer terandus caribou*) are members of the deer family and are a subspecies of caribou that were once common across much of Canada. Compared to the barren-ground caribou, boreal caribou are larger and darker, have thicker and broader antlers, longer legs and a longer face. Boreal caribou tend to remain in their forested habitat year-round as opposed to migrating across the tundra as do barren-ground caribou. Boreal caribou feed primarily on lichens in the winter and on graminoids in the summer. Nagy et al. (2005) found boreal caribou to typically occur in small groups ranging from around two individuals in the summer to just fewer than 12 during late winter. Typical habitat includes almost all forested areas east of the Mackenzie Mountains. Median home range size of these boreal groups was reported to be 2,080 km² (Nagy, et al., 2005). Mating takes place during the "rut" in the fall, and calves are born in late May to early June (GNWT, 2024).

Potential threats to woodland caribou boreal populations in the NT are human caused and natural habitat disturbance which leads to more predators, linear features (forestry, industrial and agricultural developments) that results in increased access by predators and hunters and climate change impacts on the forest landscape (GNWT, 2024). Increased human activity in the Program area may result in caribou avoiding disturbed areas, access roads and areas along helicopter flight paths due to increased sensory disturbance. In studies conducted in northern AB, woodland caribou avoided industrial developments by up to 1km, and avoidance distances appeared to be positively-correlated with human activity level (Dyer, O'Neill, Wasel, & Boutin, 2001).

Planned Program activities may occur during important woodland caribou calving or rut (May-15 – Oct 15) (GNWT, 2015b). Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing caribou herds.

Even with these mitigations, residual effects may result from increased sensory disturbance. Residual effects from increased helicopter and vehicle traffic, equipment use and associated site maintenance stimuli can contribute to natural limiting factors that affect year-to-year abundance of boreal caribou in the Regional Study Area (RSA). These residual effects are expected to be low as the Program is small in scale and short in duration. The RSA and potential residual effects for caribou are discussed further in Section 8 of this EPP.

Woodland Caribou Northern Mountain Population (*Rangifer terandus caribou*)

Woodland Caribou Northern Mountain Population (*Rangifer terandus caribou*) are a subspecies of caribou that account for approximately one quarter of the woodland caribou across Canada (Environment Canada, 2012b). The northern mountain population are very similar biologically to the boreal population, but they have different habitat preferences and behaviour. Compared to the barren-ground caribou, northern mountain caribou are larger and darker, have thicker and broader antlers, longer legs and a longer face. Woodland caribou northern mountain population can be found in groups of up to thousands from late summer to late spring, and have distinct migrations at varying elevations over the seasons (Antoniuk, et al., 2009). Portions of the trace occurrence range of the northern mountain population occur within the Project area.

Potential threats to woodland caribou northern mountain populations in the NT are human caused and natural habitat disturbance which leads to more predators, linear features (forestry, industrial and agricultural developments) that results in increased access by predators and hunters and climate change impacts on the forest landscape. Human activity in the NT has been of a limited nature historically; however northern industrial activity is expected to increase rapidly in the near future (GNWT, 2024). Increased human activity in the Program area may result in caribou avoiding disturbed areas, access roads and areas along helicopter flight paths due to increased sensory disturbance. In studies conducted in northern AB, woodland caribou avoided industrial developments by up to 1km, and avoidance distances appeared to be positively-correlated with human activity level (Dyer, O'Neill, Wasel, & Boutin, 2001).

Planned Program activities may occur during important woodland caribou calving or rut (May-15 – Oct 15) (GNWT, 2015b). Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing caribou herds.

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7.3.4.5 *Birds*

The following is a short list of bird species that may occur within or near the Program area:

Arctic Tern	<i>Sterna paradisaea</i>	Least Sandpiper	<i>Calidris minutilla</i>
American Bittern	<i>Botaurus lentiginosus</i>	Lesser Yellowlegs	<i>Tringa flavipes</i>
American Coot	<i>Fulica americana</i>	Mew Gull	<i>Larus canus</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Northern Goshawk	<i>Accipiter gentilis</i>
Barn Swallow	<i>Hirundo rustica</i>	Northern Pintail	<i>Anas acuta</i>
Belted Kingfisher	<i>Ceryle alcyon</i>	Northern Shrike	<i>Lanius excubitor</i>
Bohemian Waxwing	<i>Bombycilla garrulus</i>	Olive-Sided Flycatcher	<i>Contopus cooperi</i>
Boreal Owl	<i>Aegolius funereus</i>	Osprey	<i>Pandion haliaetus</i>
Canada Goose	<i>Branta canadensis</i>	Red-Breasted Merganser	<i>Mergus serrator</i>
Canada Warbler	<i>Wilsonia canadensis</i>	Red-Breasted Nuthatch	<i>Sitta canadensis</i>



Common Loon	<i>Gavia immer</i>	Red-Tailed Hawk	<i>Buteo jamaicensis</i>
Common Nighthawk	<i>Chordeiles minor</i>	Rusty Blackbird	<i>Euphagus carolinus</i>
Common Raven	<i>Corvus corax</i>	Sharp-Tailed Grouse	<i>Tympanuchus phasianellus</i>
Dark-eyed Junco	<i>Junco hyemalis</i>	Short-Eared Owl	<i>Asio flammeus</i>
Downy Woodpecker	<i>Picoides pubescens</i>	Snowy Owl	<i>Bubo scandiacus</i>
Harris's Sparrow	<i>Zonotrichia querula</i>	Trumpeter Swan	<i>Cygnus buccinator</i>
Horned Grebe	<i>Podiceps auritis</i>	Willow Ptarmigan	<i>Lagopus lagopus</i>
Killdeer	<i>Charadrius vociferus</i>	Yellow Rail	<i>Coturnicops noveboracensis</i>

Canadian Natural is providing further information on the species which have potential to be found in the Program area and are listed as species at risk in **Table 7-7** and therefore considered as VCs in **Table 7-8**.

Bank Swallow (*Riparia riparia*)

The bank swallow is a small, slender insectivorous songbird with pale brown upper-parts and rump, white under-parts and throat, and a well-defined dark band across its chest. Both males and females have similar plumage (GNWT, 2024). It is distinguishable in flight from other swallows by its quick erratic wing beats and its almost constant buzzy, chattering vocalizations. The species is highly social at all times of the year and is conspicuous at colonial breeding sites near open habitats along rivers, streams, lakes and gravel pits where they search for flying insects (COSEWIC, 2013). Bank swallows arrive in the NT in the spring and construct their nests on artificial and natural sites with vertical sand-silt banks such as riverbanks, lake and ocean bluffs, sand/gravel mounts, aggregate quarries and road cuts. A burrow is dug into the side of the sites, which leads to a nest chamber (GNWT, 2024).

This widespread species has shown a severe long-term decline amounting to a loss of 95% of its Canadian population since the 1970s (GNWT, 2024). The reason for these declines are not well understood, but are likely driven by cumulative effects of several threats. Potential threats to the bank swallow in the NT include large-scale decline or other changes in insect populations, direct and indirect mortality due to severe weather events on their breeding grounds, disturbance or destruction of nests located at sand/gravel mounds or aggregate quarries during nesting season, slumping of river banks where bank swallows nest and habitat loss and degradation from human activities (COSEWIC, 2013).

Portions of the Program to be carried out in the summer may coincide with barn swallow brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing barn swallow nest sites.

Barn Swallow (*Hirundo rustica*)

The barn swallow is a small bird easily recognized by its steely-blue upper-parts, cinnamon underparts, chestnut throat and forehead and deeply forked tail (GNWT, 2024). Both sexes have similar plumage, with males having longer outer tail streamers than females and tend to be darker chestnut on their under-parts. The barn swallow feeds on flying insects, capturing prey on the wing often very close to the ground or to the surface of ponds or lakes. Barn swallows arrive in the NT in the spring. Barn swallows prefer to construct their nests in human-made structures. Females lay four to six eggs in cup-shaped nests constructed from mud and vegetation. Barn

swallows leave the Northwest Territories in the fall for their wintering grounds in Central and South America (COSEWIC, 2021a).

Potential threats to the barn swallow in the NT include large-scale decline or other changes in insect populations, direct or indirect mortality due to severe weather events on their breeding grounds, and in southern ranges the loss of nesting and foraging habitat due to changes in farming practices (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with barn swallow brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing barn swallow nest sites.

Canada Warbler (*Wilsonia canadensis*)

The Canada warbler is grey on the dorsal surface, with a yellow under body with short black stripes on the throat and across the eye. Typical habitat includes moist deciduous and mixed deciduous-coniferous boreal forest with a well-developed shrub layer, often on steep slopes (GNWT, 2024). The Canada warbler feeds on insects by foraging in foliage or captures them on the wing. Canada warblers arrive in the Northwest Territories in the early summer. Canada warblers nest on the ground in forested areas near wetlands. Females lay four to five eggs. It is thought that the Canada warbler is monogamous. In its wintering range, the Canada warbler inhabits primarily cloud rainforests. These rainforests have been deforested, with up to 95% of the original forests removed (COSEWIC, 2020a).

Potential threats to the Canada Warbler in the NT include loss and degradation of habitat, increased human activity and declining food sources in the boreal forest, and human activities resulting in increased number of predators (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with Canada warbler mating and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing Canada warbler nest sites.

Common Nighthawk (*Chordeiles minor*)

The common nighthawk is a species of nightjar with a brown and tan mottled body, a white gular slash, and black wings with prominent white banding (GNWT, 2024). The common nighthawk is crepuscular (mainly active at dusk and dawn). Common nighthawks are insectivorous and can often be seen feeding on vast quantities of insects around artificial light sources (COSEWIC, 2018a). Common nighthawks arrive in the Northwest Territories to breed in early summer, nesting directly on the ground in a wide variety of habitat types, including forested areas, beaches, wetlands, and gravel pads. The female lays two eggs, which she incubates while the male provides her with food. The male continues to provide food to the female once the chicks hatch, at which time he also begins feeding the chicks. Common nighthawks leave the Northwest Territories in August to September for their wintering grounds in South America.

Potential threats to the common nighthawk include collisions with vehicles and aircraft, human activities resulting in increasing numbers of predators (cats, foxes, ravens, and gulls), large-scale decline or some other change in insect populations, habitat loss and degradation from human

activities, and direct and indirect mortality due to severe weather events on their breeding grounds (GNWT, 2024).

Portions of the Program to be carried out during the summer may coincide with common nighthawk mating and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing common nighthawk nest sites.

Harris's Sparrow (*Zonotrichia querula*)

The Harris's sparrow is North America's largest sparrow. It has a chunky body with a barrel-shaped chest that makes its head look a bit small. Males and females have a similar appearance with streaky brown and black plumage, grey or brown cheeks, a white belly, and a pink bill. Breeding adults have a distinctive black bib, face and crown (GNWT, 2024). Harris's sparrows consume fruits, seeds, and insects. Feeding on the ground, where they scratch and kick ground refuse (COSEWIC, 2017a). Harris's sparrows arrive on their breeding territories in the NT in late May to early June. They breed in semi-forested tundra (open tundra mixed with patches of trees and shrubs). Breeding territories typically include coniferous trees. It nests on the ground, hidden in dense shrubby vegetation dominated by dwarf birch, alder and willow. A female typically lays three to five eggs (GNWT, 2024). The species frequents a variety of habitats throughout the winter and migration periods, with riparian thickets, woodland edges, hedgerows, and willow thickets commonly used (COSEWIC, 2017a).

The Harris's sparrow has undergone a significant long-term population decline. Christmas Bird Counts on the wintering grounds have shown a decline of 59% between 1980 and 2014 (GNWT, 2024). Potential threats to the Harris's sparrow in the NT include breeding habitat degradation from climate change, habitat loss and degradation from resource exploration and development, and human activities resulting in declining food sources and increased numbers of predators (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with the Harris's sparrow mating and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing Harris's sparrow nest sites.

Horned Grebe (*Podiceps auritis*)

The horned grebe is a water bird with breeding plumage that is characterized by a black back and head, a white belly, with chestnut flanks and two beige feather tufts ("horns") crowning the head (GNWT, 2024). Horned grebes feed on a variety of aquatic prey items, including fish, amphibians, and aquatic insects. Typical habitat includes small ponds, marshes and wetlands, either natural or man-made. Horned grebes arrive in the Northwest Territories in May and build floating nests among emergent vegetation in wetland areas. Five to seven eggs are laid in early summer, hatching in mid-June or July. Adult grebes leave the Northwest Territories for their coastal wintering areas in late summer, with the last individuals leaving their northern ranges at the end of September or early October (COSEWIC, 2023a).

Potential threats to the horned grebe in the NT include human activities resulting in increasing numbers of nest and chick predators and climate change causing loss of wetlands and/or changes in water quality (GNWT, 2024).

Portions of the Program to be carried out in the summer may overlap horned grebe breeding and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing horned grebe nest sites. Fuel caches will be set-back a minimum of 100m from the high-water mark of water bodies or watercourses and operations will not be conducted within 30m of any waterbodies not being crossed.

Lesser Yellowlegs (*Tringa flavipes*)

The lesser yellowlegs is a medium-sized shorebird. Breeding birds have uniform gray to grayish brown upperparts with pale spotting. They have a dark bill, long slender neck, and distinctive bright, long yellow legs (GNWT, 2024). Lesser yellowlegs nests on dry ground near peatlands, marshes, ponds and other wetlands in the boreal forest and taiga. In winter and during migration, the species frequent coastal salt marshes, estuaries and pods, as well as lakes, other freshwater wetlands, and anthropogenic wetlands such as flooded rice fields and sewage lagoons (COSEWIC, 2020b). They can begin breeding at one year old and is estimated to have a generation length of four years. Females typically lay a single clutch of four eggs in mid-May and may lay a second clutch if the first is lost to predation (COSEWIC, 2020b).

Approximately 80% of the breeding population occurs in Canada. Estimates from breeding and migration surveys suggest that populations of lesser yellowlegs have declined by 70% since 19070 and that the rate of decline has been increasing in recent decades (GNWT, 2024). Potential threats to the lesser yellowlegs in the NT include breeding habitat degradation from threats like climate change and industrial development and direct disturbance at nest sites from human activities, such as resource exploration and development (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with lesser yellowlegs mating and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing lesser yellowlegs nest sites.

Olive-Sided Flycatcher (*Contopus cooperi*)

The olive-sided flycatcher is olive grey with a white belly and has a small crest and a bi-coloured beak. The olive-sided flycatcher is insectivorous, perching on branches and awaiting the passing of flying prey. Typical habitat includes young boreal forests, including those created by forest fires or clear cuts, and mature conifer stands near open areas containing tall trees or snags for perching (GNWT, 2024). Olive-sided flycatchers arrive in the Northwest Territories to breed in early summer. Females lay two to five eggs, in a nest constructed of twigs and rootlets. Olive-sided flycatchers leave the Northwest Territories in late summer for their wintering grounds in Central and South America (COSEWIC, 2018b).

Potential threats affecting olive-sided flycatchers are uncertain and may be more applicable to their southern breeding and wintering range. The availability of breeding habitat may be decreasing due to fire suppression as a forest management practice. Extreme weather on breeding grounds may be a potential threat due to decreases in the availability of food which could delay nesting or reduce nestling survival (GNWT, 2024). The Olive-sided flycatcher experienced a decline of about 70% since the 1970s. However, a 10% increase in population was recently estimated in Canada over a ten year period (2009-2019) (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with olive-sided flycatcher mating and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing olive-sided flycatcher nest sites.

Red-necked Phalarope (*Phalaropus lobatus*)

The red-necked phalarope is a small shorebird with a thin, needle-like bill. Both sexes have a dark head with a white spot above the eye, white throat and dark back with bold, buff coloured streaking (GNWT, 2024). The bright, chestnut-red stripe that extends down the side of the neck from behind the ear is distinctive. The female colours are generally brighter and bolder, and they are slightly larger than the males. Typical habitat includes low and sub-arctic tundra, or tundra-forest transition habitats. Nest-sites are typically located in grass-sedge vegetations near freshwater wetlands, lakes, ponds, rivers or streams (GNWT, 2024). Red-necked phalaropes can be found throughout much of the NT during the breeding season, arriving from late-May to early June. Females lay a clutch of four eggs which is then incubated by the male for a period of 19 to 21 days.

Potential threats affecting red-necked phalarope in the NT are loss and degradation of breeding habitat and direct disturbance at nest sites from human activities, such as resource exploration and development (GNWT, 2024). Phalaropes appear to have experienced significant declines at an important migratory staging area since the 1970's, but the overall population trend is unknown (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with red-necked phalarope mating and brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing red-necked phalarope nest sites. Fuel caches will be set-back a minimum of 100m from the high-water mark of water bodies or watercourses and operations will not be conducted within 30m of any waterbodies not being crossed.

Rusty Blackbird (*Euphagus carolinus*)

Rusty blackbirds are medium sized forest birds. During breeding season (May to July), males are uniformly black with a faint greenish gloss on the body. Females are slate grey without gloss. In fall and winter, males and females show rusty brown feathers on the head, back and chest (GNWT, 2024). The rusty blackbird feeds primarily on aquatic insects and larvae, particularly dragonfly nymphs. The rusty blackbird inhabits forested areas near wetlands and can often be seen foraging in wet vegetation in small flocks (COSEWIC, 2017b). Rusty blackbirds live in the boreal forest of the NT from early May to mid-October. They breed near open water in treed wetlands (bogs, fens and swamps), often forming loose colonies. Rusty blackbirds primarily nest in small spruce trees. Nests are primarily constructed from twigs, grass, and lichens in riparian trees and shrubs, with females laying three to six eggs. Rusty blackbirds spend the winter in the southeastern United States (GNWT, 2024).

Rusty blackbirds have seen a decline of 66-80% from 1970 to 2014. It appears the pattern of long-term decline may have moved toward a stable trend over the last decade. The population trend in the NT is uncertain but there are some indications of a possible decline based on Breeding Bird Surveys (GNWT, 2024). Potential threats to the rusty blackbird in the NT include activities that alter forest and wetland habitat including forest clearing, changes in surface water levels or

flow patterns, and wetlands drying as a result of climate change, mercury in wetlands, deposited from the atmosphere and melting permafrost, and human activities resulting in declining food sources and increased numbers of predators. (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with rusty blackbird brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing rusty blackbird nest sites. Fuel caches will be set-back a minimum of 100m from the high-water mark of water bodies or watercourses and operations will not be conducted within 30m of any waterbodies not being crossed.

Short-Eared Owl (*Asio flammeus*)

The short-eared owl is a small light tan owl with wide brown streaks on their upperparts and thinner well-defined vertical streaks on their breast and belly (GNWT, 2024). There are black spots on the undersides of their wings near the wrists. Females are slightly larger and darker than males with heavier streaking. Short-eared owls are similar in size to a crow with yellow eyes and two small black tufts forming the "ears" on the top of the head. Short-eared owls feed primarily on small mammals, hunting at dawn and dusk, and will move around as small mammal populations fluctuate. Typical habitats include grasslands, tundra, bogs, marshes and other open (non-forested) areas (GNWT, 2024). Short-eared owls typically arrive in the NT in April or May, laying an average of seven eggs by mid-June in nests built on the ground, with owlets hatching in early July. Short-eared owls probably leave the NT by late October.

Potential threats in the NT include habitat loss and degradation from human activities, mainly in their southern range and climate changes resulting in the alteration of their tundra habitat or prey populations (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with short-eared owl brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing short-eared owl nest sites.

Yellow Rail (*Coturnicops noveboracensis*)

The yellow rail is a small bird with a short tail, short bill and buff-coloured plumage. The wide dark stripes on its back are crossed by white bars. The white wing patch, which is visible in flight helps distinguish yellow rails from other similar marsh birds (GNWT, 2024). Typical habitat includes marshes dominated by sedges and grasses, wet meadows and shrubby wetlands. Yellow rails arrive in the Northwest Territories in the later part of May and build their nests on the ground near wetland areas. Nesting areas have little or no standing water (generally 0 to 12 cm). Females lay seven to ten eggs which are concealed with a canopy of dead vegetation. Males take no part in brood-raising activities. Yellow rails leave the Northwest Territories in September to October, migrating in flocks at night (COSEWIC, 2023b).

The primary threats facing yellow rails in the NT is habitat loss and degradation, and declining food sources resulting from human activities, increased number of predators and breeding habit degradation from climate change (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with yellow rail brood-rearing activities. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of

activity near the work area. The crew’s activity will be restricted to the existing worksites to avoid disturbing yellow rail nest sites. Fuel caches will be set-back a minimum of 100m from the high-water mark of water bodies or watercourses and operations will not be conducted within 30m of any waterbodies not being crossed.

7.3.4.6 Amphibians and Reptiles

The following is a list of amphibian and reptile species that may occur within or near the Program area:

Boreal Chorus Frog	<i>Pseudacris maculata</i>	Red-Sided Garter Snake	<i>Thamnophis sirtalis</i>
Canadian Toad	<i>Anaxyrus hemiophrys</i>	Terrestrial Garter Snake	<i>Thamnophis elegans</i>
Long-Toed Salamander	<i>Ambystoma macrodactylum</i>	Western Toad	<i>Anaxyrus boreas</i>
Northern Leopard Frog	<i>Lithobates pipiens</i>	Wood Frog	<i>Lithobates sylvatica</i>

Canadian Natural is providing further information on the species which have potential to be found in the Program area and are listed as “Species at Risk” in **Table 7-7** and therefore considered as VCs **Table 7-8**.

Northern Leopard Frog (*Lithobates pipiens*)

The Northern Leopard Frog is usually green, or sometimes brownish. It has dark spots surrounded by distinct, light borders and an unmarked, milky-white underside. Newly hatched tadpoles are slender and black (GNWT, 2024). They have two light-coloured dorsolateral ridges, one on each side, from behind the eyes to the lower back (COSEWIC, 2021b). The northern leopard frog overwinters in cold, well oxygenated water bodies that do not freeze solid; breeding and larval life occur in pools, ponds, marshes, lakes, and occasionally in slow moving streams and creeks; and, moist upland meadows and native prairie are used during the summer (COSEWIC, 2021b). The northern leopard frog habitat in the NT is limited to the southern NT where suitable overwintering sites exist (SARC, 2013).

Potential threats in the NT include emerging diseases (chytrid fungus and ranavirus), loss or modification of wetland habitats from human activities, accidental human-caused mortality, environmental contaminants, and increasing UV-B radiation (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with the active period of northern leopard frogs. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew’s activity will be restricted to the previously disturbed areas to avoid disturbing critical habitat. Fuel caches will be set-back a minimum of 100m from the high-water mark of water bodies or watercourses and operations will not be conducted within 30m of any waterbodies not being crossed.

Western Toad (*Anaxyrus boreas*)

Western toads are usually green or brown. They have a light stripe down the middle of the back and reddish-brown “warts” on the back, sides and upper limbs. Newly hatched tadpoles and toadlets are black (GNWT, 2024). Western toads are largely terrestrial, feeding on ground-dwelling invertebrates. Western toads will often walk as opposed to hopping, and are largely nocturnal. Western toads are active in the Northwest Territories from April until September, breeding in April to June and hibernating in underground hibernacula in the fall (COSEWIC, 2012b). Eggs are laid in long strings, which are attached to submerged vegetation in shallow

ponds. Up to 16,500 eggs may be laid in a single clutch (COSEWIC, 2012b). Tadpoles metamorphose approximately six to eight weeks after hatching (Russell and Bauer, 2000).

Potential threats in the NT include climate change resulting in increased UV-B radiation, habitat loss and alteration, diseases (ranarivirus and chytrid fungus), accidental mortality during mass movement events. Loss or modification of wetland habitats from human activities (GNWT, 2024).

Portions of the Program to be carried out in the summer may coincide with the active period of Western toads. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the existing worksites to avoid disturbing critical habitat. Fuel caches will be set-back a minimum of 100m from the high-water mark of water bodies or watercourses and operations will not be conducted within 30m of any waterbodies not being crossed.

7.3.4.7 Insects

The following is a list of "Species at Risk" insects that have ranges which overlap with the Program area:

Gypsy Cuckoo Bumble Bee	<i>Bombus bohemicus</i>
McKay's Bumble Bee	<i>Bombus mckayi</i>
Suckley's Cuckoo Bumble Bee	<i>Bombus suckleyi</i>
Yellow-banded Bumble Bee	<i>Bombus terricola</i>

Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*)

The gypsy cuckoo bumble bee is a medium-sized bumble bee. The upper segment of the hind leg has a convex, densely hairy outer surface and lacks a pollen basket (GNWT, 2024). Females usually have a white-tipped abdomen. Sides of the thorax are mostly black in both sexes. Gypsy cuckoo bumble bee can be distinguished from other cuckoo bumble bees found in the NT by black hairs on the top of the head; other similar species have pale coloured hairs. Gypsy cuckoo bumble bees are "social parasites" and require host bumble bee nests, which are typically underground in abandoned rodent burrows. Females likely overwinter in soil, mulch or rotting logs (GNWT, 2024).

Gypsy cuckoo bumble bees have been found in the NT at Reindeer Depot, Aklavik, Fort McPherson, Norman Wells, Fort Simpson, Hay River and Fort Smith, but these sightings were recorded prior to 1972. Potential threats in the NT include the introduction of exotic bumble bee species for pollination, pesticide and herbicide use, declines in the populations of host species, such as the western bumble bee and the yellow-banded bumble bee and at high densities, imported honey bees can outcompete native bumble bees for pollen (GNWT, 2024).

Portions of the Reclamation Program to be carried during the summer months may coincide with the active period of gypsy cuckoo bumble bees. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to existing the previously disturbed areas to avoid disturbing critical habitat.

McKay's Bumble Bee (*Bombus mckayi*)

McKay's Bumble Bee is a medium-sized bumble bee. It has a short head and a band of yellow hair across the thorax in front of the base of the wings (GNWT, 2024). Between the wings there is a black band or large black central spot. The tip of the abdomen is almost always white. This

northern species has longer hair overall and yellow hair behind the wings and on the third segment of the abdomen, which help to tell it apart from the Western Bumble Bee, of which it was formerly a subspecies (GNWT, 2024). McKay's Bumble Bee uses a wide range of habitats, as long as flowers and nest sites are available. Nests are usually underground in abandoned rodent burrows or within hollows in decaying wood. Queens typically overwinter in loose soil or rotting logs (GNWT, 2024).

McKay's Bumble Bee is found in the western mountains of the NT as well as northern British Columbia, Alaska and Yukon. Recent surveys suggest that the northern species is still common. However, the closely related southern species (*Bombus occidentalis*) is experiencing a severe population decline. Potential threats in the NT include the introduction of exotic bumble bee species for pollination, pesticide and herbicide use, high parasite loads compared to other bumble bee species and at high densities, imported honey bees can outcompete native bumble bees for pollen (GNWT, 2024).

Portions of the Reclamation Program to be carried during the summer months may coincide with the active period of western bumble bees. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the previously disturbed areas to avoid disturbing critical habitat.

Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)

Suckley's cuckoo bumble bee is a medium-sized bumble bee with a black head. The upper segment of the hind leg has a convex, densely hairy outer surface and lacks a pollen basket. Suckley's cuckoo bumble bee looks similar to the gypsy cuckoo bumble bee, but its thorax is mostly yellow on the sides. There are prominent triangular ridges on the underside on the last segment of the abdomen (GNWT, 2024). Suckley's cuckoo bumble bee is a social parasite of nest-building bumble bees but follows the same basic life cycle pattern of other bumble bee species and has a generation time of one year (COSEWIC, 2019). In the spring, female cuckoos invade the nests of the host nest-building species and displace the resident host queen, either by killing or subduing her (COSEWIC, 2019). They do not produce a eusocial colony with distinct castes (i.e. no workers) (COSEWIC, 2019). Suckley's cuckoo bumble bee does not collect pollen for its own nest provisions. They are generalist nectar foragers and visit flowers for nectar such as aster, thistle and goldenrod (GNWT, 2024).

Bumble bees have a type of sex determination that makes them very prone to extinction when population sizes are small (GNWT, 2024). Potential threats to Suckley's cuckoo bumble bee in the NT are decline in the populations of host species, such as McKay's bumble bee and yellow-banded bumble bee, introduction of exotic bumble bee species for pollinations, which can spread diseases to native bees, use of pesticides and herbicides, and at high densities, imported honey bees can outcompete native bumble bees for pollen (GNWT, 2024).

Portions of the Reclamation Program to be carried during the summer months may coincide with the active period of Suckley's cuckoo bumble bees. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew's activity will be restricted to the previously disturbed areas to avoid disturbing critical habitat.

Transverse Lady Beetle (*Coccinella transversoguttata*)

The transverse lady beetle is a small, round beetle that can be distinguished from other lady beetles by its colour pattern. Its wing covers are red to orange with black markings: a ‘transverse’ black band across the front and four elongated black spots toward the back. The head is black with two separate pale spots. The plate behind the head is also black with pale markings on either side (GNWT, 2024). Transverse lady beetles use a wide range of habitats and are found on a variety of plants. They move around to take advantage of available prey (aphids and other insects) (GNWT, 2024). Transverse lady beetles have four life stages: egg, larva, pupa, and adult, and can have two generations per year (COSEWIC, 2016b).

Since 1986 the transverse lady beetle has undergone population declines. In many areas where it was once common it is now absent, below detection limits, or at low numbers (GNWT, 2024). Reasons for the population declines are unclear but introduced non-native lady beetles are probably an important factor that has brought increased competition and predation, as well as new diseases and parasites and the use of pesticides (GNWT, 2024).

Portions of the Reclamation Program to be carried during the summer months may coincide with the active period of transverse lady beetle. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew’s activity will be restricted to the previously disturbed areas to avoid disturbing critical habitat.

Yellow-banded Bumble Bee (*Bombus terricola*)

The yellow-banded bumble bee is a medium-sized bumble bee with a short head. It has yellow hair on the second and third segments of the abdomen as well as a band of yellow hair across the thorax in front of the base of the wings (GNWT, 2024). The rest of the body is primarily black, except for a fringe of brownish-yellow hairs on the fifth segment of the abdomen. A wide range of habitats are used as long as flowers and nest sites are available. Nests are usually underground in abandoned rodent burrows or within hollows in decaying wood. Queens typically overwinter in loose soil or rotting logs (GNWT, 2024).

The yellow-banded bumble bee is found in the northern United States and throughout much of Canada. It was once one of the most common bumble species in Canada, however since the 1990s there have been significant population declines across southern and central Canada. Potential threats in the NT include the introduction of exotic bumble bee species for pollination, pesticide and herbicide use and at high densities, imported honey bees can outcompete native bumble bees for pollen (GNWT, 2024).

Portions of the Reclamation Program to be carried during the summer months may coincide with the active period of yellow-banded bumble bees. Personnel, specifically Wildlife Monitors, will be directed to look for evidence of activity near the work area. The crew’s activity will be restricted to the previously disturbed areas to avoid disturbing critical habitat.

7.3.4.8 Mitigation Measures

Canadian Natural is committed to limiting the effects of the Program on wildlife and wildlife habitat. **Table 7-9** provides a summary of the identified potential effects of the Program on wildlife and birds and the protection and mitigation measures to be employed by Canadian Natural.

Table 7-9: Summary of Potential Effects on Wildlife and Birds and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Habitat loss, sensory disturbance and mortality risk	<ul style="list-style-type: none"> • During the site orientation workers will receive awareness training which will include discussions on: not feeding the wildlife; not hunting; and not harassing wildlife. Work crews will be encouraged to support the work of the wildlife monitors. • Wildlife will not be approached or fed by Program personnel and Program personnel will not be permitted to hunt on the worksites. • Helicopter flights within the region will adhere to the minimum flight altitude and vertical distances as recommended in the publication <i>Flying Low? Think Again...</i> (GNWT, 2013), unless safety is a concern. • Den, dam, lodge, and nest sites will be actively avoided. • The wildlife monitor will observe and document wildlife and potential wildlife impacts to ensure that environmental protection measures are being implemented as appropriate. Species at risk mammal and amphibian observations will be reported to WILDLIFEOBS@gov.nt.ca. Species at risk bird observations will be reported to NWTchecklist@ec.gc.ca. Species at risk insect observations will be reported to NWTBugs@gov.nt.ca. • Waste will be managed in accordance with the Program Waste Management Plan (refer to Appendix 6). Food will be stored securely and garbage disposed of frequently. • Program activities are not anticipated to occur during the spring and fall migration. • Program operations will avoid damaging nests (active or inactive). Destruction, or disruption of eggs and/or nests, including inactive nests, is prohibited by the <i>Wildlife Act</i> (s. 51(1)). • The deposition of any substance into waters or areas frequented by migratory birds is prohibited under the <i>Migratory Birds Convention Act</i> (Section 5.1). • Substances harmful to migratory birds will not be placed in waters or areas frequented by migratory birds or in a place from which the substance may enter such waters or such an area. • Project activities will be conducted during appropriate seasons to minimize activity during critical periods for wildlife (spring and fall). • Operations will not be conducted within 30m of any waterbodies not being crossed. • Vehicles and other equipment will be limited to travelling 40km/h, will be required to communicate approach and hazards using radios, and will be instructed to slow down when passing wildlife or on-coming traffic.

7.3.4.9 Residual Effects

Residual effects of the Program on wildlife and birds are species-specific and will vary with the type, intensity, and duration of the disturbance. Residual effects are not expected to be present for the majority of species. However, grizzly bear, wolverine and caribou may experience residual effects from the Program. These species will be discussed further within Section 8 of this EPP.

The Program is not predicted to result in significant environmental effects since the disturbance from the Program will be short in duration. The predicted effects will be mitigated in the short term by implementing measures described in **Table 7-9**, adapting these mitigations as required, and in the medium to long term, through continued reclamation. The intent of the Program is to remediate, reclaim and improve the overall condition of the P-66 wellsite and associated infrastructure.

7.4 Aquatic Resources

This section examines the aquatic resources with respect to hydrology, surface water quality, groundwater quality and, fish and fish habitat, as well as the mitigation measures that will be implemented and residual effects of the Program.

7.4.1 Surface Water and Groundwater Quantity & Quality

The potential for effects on surface water and groundwater quantity and quality from the proposed Program are anticipated to be low. Potential effects of spills and leaks from equipment could lead to surface water effects. Mitigation measures are summarized in **Table 7-10** and are also found in the Emergency Response and Spill Contingency Plans (refer to **Appendix 5**).

7.4.1.1 Mitigation Measures

Table 7-10 provides a summary of the identified potential effects of the Program on surface water and groundwater and the protection and mitigation measures to be employed.

Table 7-10: Summary of Potential Surface Water and Groundwater Effects and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Water Quality Changes	<ul style="list-style-type: none"> Materials will not be stored on the surface ice of water bodies or within 100m of the normal high-water mark to minimize the potential for contamination of water resources. Parked equipment will be inspected during a daily walk-around to identify and manage signs of spills or leaks. Drip trays and absorbent pans will be used to capture minor spills and drips while fuelling equipment. The drip trays will be monitored for fluid levels and replaced as necessary. Care will be taken during refuelling. Fuel caches will be set-back a minimum of 100m from the high-water mark of any water body or watercourse. Fuel storage containers greater than 4,000L will have secondary containment. Canadian Natural has developed Emergency Response and Spill Contingency Plans (refer to Appendix 5) that will be adhered to throughout the course of the Program. Spill kits will be kept on-site during operations. Spill response equipment includes waste bags, absorbent pads, and shovels. If a spill occurs, Canadian Natural will implement spill reporting, clean-up and sampling as per regulations and requirements. Spills, regardless of volume, will be documented and records kept by Canadian Natural. Should a regulatory reportable spill occur, the NT/NU 24-hour Spill Report Line will be contacted at (867) 920-8130, or alternatively the NT/NU Spill Report Form will be completed and emailed to spills@gov.nt.ca. If a spill does occur, Canadian Natural will endeavour to clean-up the spill before infiltration occurs. Effort will be made to avoid wetlands/bogs during summer operations. Ice thickness will be tested prior to watercourse crossings during winter operations. Operations will not be conducted within 30m of any waterbodies not being crossed. Waste will be managed in accordance with the Program Waste Management Plan (refer to Appendix 6).
Water Flow or Level Changes	<ul style="list-style-type: none"> Canadian Natural does not require >100m³ of water per day to conduct the proposed wellsite maintenance Program. Domestic water will be drawn from an unnamed non-fish bearing stream adjacent to the site. Bottled drinking water will be purchased and transported to the Program site. The proposed Program is not anticipated to affect the flow or level of surface water or groundwater.

7.4.1.2 Residual Effects

Program related residual effects on surface water and groundwater quantity and quality are expected to be negligible under normal operating conditions. Adherence to the above-mentioned mitigations and protocols (**Table 7-10**) is expected to minimize the potential residual effects of the Program.

7.4.2 Fish and Fish Habitat

The following is a list of common species that have ranges which overlap with the Program area:

Arctic Grayling	<i>Thymallus arcticus</i>	Longnose Sucker	<i>Catostomus catostomus</i>
Arctic Lamprey	<i>Lampetra camtschatica</i>	Mountain Whitefish	<i>Prosopium williamsoni</i>
Broad Whitefish	<i>Coregonus nasus</i>	Ninespine Stickleback	<i>Pungitius pungitius</i>
Brook Stickleback	<i>Culaea inconstans</i>	Northern Pike	<i>Esox lucius</i>
Bull Trout	<i>Salvelinus confluentus</i>		
Burbot	<i>Lota lota</i>	Northern Redbelly Dace	<i>Phoxinus eos</i>
Chum Salmon	<i>Oncorhynchus keta</i>	Pearl Dace	<i>Margariscus margarita</i>
Cisco	<i>Coregonus artedii</i>	Rainbow smelt	<i>Osmerus mordax</i>
Emerald Shiner	<i>Notropis atherinoides</i>	Round Whitefish	<i>Prosopium cylindraceum</i>
Finescale Dace	<i>Phoxinus neogaeus</i>	Slimy Sculpin	<i>Cottus cognatus</i>

7.4.2.1 *Regulations Pertaining to Fish*

Substantial changes to the federal Fisheries Act (1985) were invoked through the passing of the *Jobs, Growth and Long-term Prosperity Act* referred to hereafter as Bill C-38 (2012) in June 2012.

Division Five, section 136 of Bill C-38 (an amendment to sections 20 to 22 of the Fisheries Act) states that the owner or person who has the charge, management, or control of an obstruction, or of any other thing that is harmful to fish shall, on the Minister's request, conduct studies, analyses, samplings, and evaluations. If the Minister considers that doing so is necessary to ensure the free passage of fish or to prevent harm to fish, the owner or person who has the charge, management, or control of an obstruction or any other thing that is harmful to fish shall, on the Minister's request, remove the obstruction or thing, or shall allow for the passage of fish by means deemed suitable by the Minister. Furthermore, no person shall obstruct more than two-thirds of the width of any river or stream or more than one-third of the width of the main channel at low tide of any tidal stream (Bill C-38: *Jobs, Growth and Long-term Prosperity Act*, 2012).

Section 139 of Bill C-38 (2012) (an amendment to section 32 of the Fisheries Act) states that no person shall kill fish by means other than fishing.

Section 142 of Bill C-38 (2012) (an amendment to section 35 of the Fisheries Act) states that no person shall carry on any work, undertaking, or activity that results in the harmful alteration or disruption, or the destruction of fish habitat, unless otherwise authorized by the Minister, and the work, undertaking, or activity is carried on in accordance with the conditions established by the Minister.

Section 36 of the Fisheries Act (1985) states that no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.

Section 144 of Bill C-38 (2012) (an amendment to section 37 of the Fisheries Act) states that if a person carries on, or proposes to carry on any work, undertaking, or activity that results or is likely to result in the alteration, disruption, or destruction of fish habitat, or in the deposit of a deleterious substance in water frequented by fish or in any place under any conditions where that deleterious substance, or any other deleterious substance that results from the deposit of that deleterious substance, may enter any such waters, the person shall, on the request of the Minister, or without request, provide the Minister with any plans, specifications, studies, procedures, schedules, analyses, samples, evaluations, and other information relating to the work, undertaking or activity, or to the water, place or fish habitat that is or is likely to be affected by the work, undertaking or activity.

Section 145 of Bill C-38 (2012) (an amendment to section 38 of the Fisheries Act) states that every person shall, without delay, notify an inspector, a fishery officer, or an authority prescribed by the regulations, of a harmful alteration or disruption, or a destruction of fish habitat that is not authorized under this Act, or of a serious and imminent danger of such an occurrence; any person shall, as soon as feasible, take all reasonable measures consistent with public safety and with the conservation and protection of fish and fish habitat to prevent the occurrence or to counteract, mitigate, or remedy any adverse effects that result from the occurrence or might reasonably be expected to result from it; and, as soon as feasible after the occurrence or after learning of the

danger of the occurrence, the person shall provide an inspector, fishery officer, or an authority prescribed by the regulations with a written report on the occurrence or danger of the occurrence

Section 7(1) of the *Northwest Territories Fisheries Regulations (2012)* states that no person shall catch, kill, molest, or injure fish, except under authority of a license.

Canadian Natural will ensure that the above legislation is complied with, and that personnel respect and adhere to the mitigation measures in place to protect aquatic wildlife.

7.4.2.2 *Species at Risk*

Canadian Natural is providing further information on the fish species in **Table 7-8** which have potential to be found in the Program area and are listed as “Species at Risk”.

Bull Trout (*Salvelinus confluentus*)

The Bull Trout is a cold-water species with a long slender body, large, broad head with prominent upper jaw and a slightly forked tail fin. Its back is olive-green to blue grey, and its sides are silvery with small pink, lilac, yellow-orange or red spots (GNWT, 2024). Its belly is pale coloured and may become yellow, orange or red in males during spawning. Pelvic and anal fins have white leading edges with no black line (GNWT, 2024). Bull trout require habitat that is cold, clean, connected, and complex. Structurally complex habitat provides breeding habitat and cover for rearing young, while connected habitat is required by this migratory species to complete its life cycle making it particularly sensitive to habitat changes (COSEWIC, 2012c). Habitat is widely distributed, but in low abundance, throughout much of southern (Dehcho) and central (Sahtu) NT in drainages west of the Mackenzie River.

Spawning occurs in the fall in water temperature below 10°C in clean flowing streams over cobble or loose gravel. These areas are typically associated with groundwater sources. Potential threats to the Bull Trout in the NT include industrial activities and infrastructure that can degrade or fragment bull trout habitat; for example by adding sediment or nutrients, blocking movement of fish, or changing water flow and other threats like disease, pathogens, introduced and invasive species, climate change and cumulative effects (GNWT, 2024).

Potential effects on Bull Trout from the Program are limited to the potential contamination of water due to unexpected spills or incidents. Potential effects of spills and leaks from equipment could lead to reduced fish habitat quality.

7.4.2.3 *Effect on Fish Habitat*

The potential for effects on fish and fish habitat from the proposed Program are anticipated to be low. Potential effects on fish are limited to the potential contamination of water due to unexpected spills or incidents. Potential effects of spills and leaks from equipment could lead to reduced fish habitat quality. Mitigation measures are summarized in **Table 7-11** and are also found in the Emergency Response and Spill Contingency Plans (refer to **Appendix 5**).

Water for domestic use will be obtained from the unnamed stream running west to east located approximately 50m north of the P-66 wellsite. With the numerous downstream Beaver dams and activity that exists at the base of the mountains, upstream from the Liard River, and the difference in elevation from the site to the Liard River, the headwater stream would not be fish bearing or a fish habitat.

7.4.2.4 Mitigation Measures

Table 7-11 provides a summary of the identified potential effects of the proposed Program on fish habitat and the protection and mitigation measures to be employed by Canadian Natural.

Table 7-11: Summary of Potential Effects on Fish Habitat and Proposed Mitigation Measures

Potential Effects	Proposed Environmental Protection and Mitigation Measures
Changes in Fish Habitat Quality	<ul style="list-style-type: none"> Effort will be made to avoid wetlands/bogs during summer operations. Materials will not be stored on the surface ice of water bodies or within 100m of the normal high-water mark to minimize the potential for contamination of water resources. Parked equipment will be inspected during a daily walk-around to identify and manage signs of spills or leaks. Drip trays and absorbent pans will be used to capture minor spills and drips while fuelling equipment. The drip trays will be monitored for fluid levels and replaced as necessary. Care will be taken during refuelling. Fuel caches will be set-back a minimum of 100m from the normal high-water mark of any water body or watercourse. Fuel storage containers greater than 4,000L will have secondary containment. Canadian Natural has developed Emergency Response and Spill Contingency Plans (refer to Appendix 5) that will be adhered to throughout the course of the Program. Spill kits will be kept on-site during operations. Spill response equipment includes waste bags, absorbent pads, and shovels. If a spill occurs, Canadian Natural will implement spill reporting, clean-up and sampling as per regulations and requirements. Spills, regardless of volume, will be documented and records kept by Canadian Natural. Should a regulatory reportable spill occur, the NT/NU 24-hour Spill Report Line will be contacted at (867) 920-8130, or alternatively the NT/NU Spill Report Form will be completed and emailed to spills@gov.nt.ca. If a spill does occur, Canadian Natural will endeavour to clean-up the spill before infiltration occurs. Effort will be made to avoid wetlands/bogs during summer operations. Ice thickness will be tested prior to watercourse crossings during winter operations. Domestic water will be drawn from an unnamed non-fish bearing stream adjacent to the site. Bottled drinking water will be purchased and transported to the Program site. Project activities will be conducted during appropriate seasons to minimize activity during critical periods for wildlife (fall spawning). Operations will not be conducted within 30m of any waterbodies not being crossed. Waste will be managed in accordance with the Program Waste Management Plan (refer to Appendix 6).

7.4.2.5 Residual Effects

Program related residual effects on fish and fish habitat are expected to be negligible under normal operating conditions. Adherence to the mitigations and protocols (as described in **Table 7-11**) is expected minimize the potential residual effects of the Program.

8. CUMULATIVE EFFECTS ASSESSMENT

Cumulative Effects are changes to the environment caused by an activity combined with past, present and reasonably foreseeable future activities. This Cumulative Effects Assessment (CEA) follows the protocol outlined by the *Mackenzie Valley Environmental Impact Review Board Environmental Impact Assessment Guidelines March 2004* (MVEIRB, 2004). As such, the assessment involves:

- Establishing spatial and temporal boundaries for the analysis;
- Identifying Valued Components (VCs);
- Determining other past, present or reasonably foreseeable future developments acting on these VCs;

- Identifying potential residual effects of Program activities in combination with these other developments;
- Recommending mitigation measures that may be required for the management of cumulative effects in relation to future developments.

Analysis of the cumulative effects associated with the addition of the Program to the existing development in the area was addressed using Geographic Information System (GIS) analysis and a quantitative assessment. This analysis involved defining the current levels of activity in the regional study area relative to the selected Valued Components (VCs) and assessing the significance of the Program to the contribution to these effects following the proposed mitigation.

8.1 Identifying Valued Components & Potential Residual Effects

Residual effects are those impacts arising from the implementation of the proposed Program that cannot be effectively avoided or mitigated. When summed, they may lead to cumulative effects when interacting with other activities on the landscape. The selection of VCs and a preliminary assessment of Program impacts were completed in Section 7 (**Table 7-8**) of this EPP. Of the VCs identified, those with residual effects that may act cumulatively with other developments will be discussed in the CEA.

The Program is not expected to result in residual effects for the following:

- Air Quality;
- Noise Levels;
- Soils;
- Permafrost;
- Vegetation;
- Surface Hydrology;
- Groundwater;
- Fish;
- Socio-economics;
- Traditional Land Use.

Residual effects may occur and cumulative effects will be further assessed for the following:

- Wildlife (Table 7-7)

8.1.1 Program Activities Considered in the Cumulative Effects Assessment

Currently proposed Program activities to be considered in the CEA include:

- Increased activity (truck, ATV, snowmobile, equipment, and human) during the winter operating season from December through March, or increased activity (boat, barge, helicopter, truck, ATV, equipment, and human) during the summer operating season from June through September, over a period of 2 years.

8.1.2 Spatial Boundaries of the Cumulative Effects Assessment

A Regional Study Area (RSA) was selected based on:

- An area where potential effects associated with the proposed development and other interacting developments could potentially be observed.

The RSA encompasses Canadian Natural's P-66 wellsite, access and associated infrastructure and includes an approximately 5km-wide buffer. The RSA totals approximately 1,840km² (**Appendix 2**). This represents the study area in which to assess the potential effects of the proposed Program and past, current and potential interacting development and activity.

8.1.3 Temporal Boundaries of the Cumulative Effects Assessment

The proposed Program components will take place during the summer and winter depending on the activity, between the years 2025-2027. The intent of the Program is to remediate and reclaim the P-66 wellsite and associated infrastructure. The CEA considered the current conditions and immediate effects of the proposed Program, and other past, present and future interacting activities to better depict negative outcomes. However, cumulative effects assessments do not necessarily consider positive effects of a proposed Program; the best possible outcome ranking is no interaction or that the effect is negligible. However, it is important to note that the longer term and positive indirect effects of the Program will include reducing the potential for erosion, re-vegetation and site stabilization.

8.2 Other Development and Activities in the RSA

Identification of other actions that may interact with the above proposed Program components involved the consideration of past, present and reasonably foreseeable future developments within the RSA.

8.2.1 Past Developments

Past actions within the RSA and surrounding landscape, which could potentially interact with the proposed Program include:

- Abandoned oil and gas development;
- Existing oil and gas development;
- Seismic exploration;
- Road construction;
- Community development;
- Linear corridor creation;
- Fire; and
- Wildlife harvesting (i.e. hunting, fishing, trapping).

8.2.2 Current & Foreseeable Future Developments

The proposed Program will conduct remediation and reclamation activities on existing footprints and facilities. Interactions with potential future projects that are yet to be proposed will also occur and are more difficult to assess; nonetheless, potential future developments are identified in the assessment below.

The following types of developments and activities that may occur within the RSA in the future include:

- Reclamation activities;
- Longer-term oil and gas development;
- Increased traffic (land, air and water);
- Community development;

- Fire; and,
- Wildlife harvesting.

The ultimate scale and collective effects of these potential future developments depends on many interacting factors beyond the scope of this project-based CEA.

8.3 Contribution of Program Activities to the Cumulative Effects on Identified VCs

Interaction matrices were used to depict the possible relationships between the various activities associated with the Program and the VCs within the RSA. These rankings were defined on a scale from 0 to 5, with 0 being no interaction and 5 the highest level of interaction, and were based on a combination of the magnitude, duration, and extent of each activity (**Table 8-1, Table 8-2, Table 8-3**).

Following mitigations, residual effects of Program activities are expected to interact with past, present and future developments to contribute to relatively low ongoing cumulative effects on vegetation, wildlife, soils, and noise (**Table 8-4**).

Table 8-1: Magnitude of Program Effects on VCs

Activity	VC									
	Vegetation	Wildlife	Fish	Groundwater	Hydrology	Soils	Noise	Air Quality	Traditional Land Use	Socio-economics
Remediation Activities	1	1	1	1	1	2	1	0	0	0
Reclamation Activities	1	1	1	1	1	2	1	0	0	0
Monitoring and Potential Future Actions	2	2	0	0	0	2	1	0	0	0

Table 8-2: Duration of Program Effects on VCs

Activity	VC									
	Vegetation	Wildlife	Fish	Groundwater	Hydrology	Soils	Noise	Air Quality	Traditional Land Use	Socio-economics
Remediation Activities	1	1	1	1	1	2	1	0	0	0
Reclamation Activities	1	1	1	1	1	2	1	0	0	0
Monitoring and Potential Future Actions	1	1	1	0	1	1	1	0	0	0

Table 8-3: Spatial Extent of Program Effects on VCs

Activity	VC									
	Vegetation	Wildlife	Fish	Groundwater	Hydrology	Soils	Noise	Air Quality	Traditional Land Use	Socio-economics
Remediation Activities	1	1	1	1	1	2	1	1	0	0
Reclamation Activities	1	1	1	1	1	2	1	1	0	0
Monitoring and Potential Future Actions	1	1	1	0	1	1	1	0	0	0

Table 8-4: Summary of the Residual Effects of Program Activities

Activity	VC									
	Vegetation	Wildlife	Fish	Groundwater	Hydrology	Soils	Noise	Air Quality	Traditional Land Use	Socio-economics
Remediation Activities	L	L	L	L	L	L	L	N	N	N
Reclamation Activities	N	L	N	N	N	L	L	N	N	N
Monitoring and Potential Future Actions	L	L	N	N	N	L	L	N	N	N

Residual effects were summarized as negligible, low, moderate or high based on the average of magnitude, duration and extent of values in (Table 8-4).

With the consideration of the magnitude, duration and spatial extent of each Program activity, the associated residual effects on the VCs can be summarized as ranging from negligible to low. The residual effects of Program activities on fish, groundwater, hydrology, air quality, traditional land use and socio-economics are anticipated to be negligible. The residual effects of Program activities on vegetation, wildlife, soils, and noise levels and are anticipated to be low. Of these, potential residual effects on VCs, Program activities may contribute to cumulative effects on wildlife due to sensory disturbance during potentially sensitive periods from increased helicopter, equipment and human activity. Thus, a more detailed assessment on affected wildlife VCs are discussed below.

8.3.1 Cumulative Effects on Wildlife VCs

Program actions contributing to cumulative effects on wildlife include:

- Increased helicopter, equipment and human activity at the worksites.

Specific wildlife VCs that may be affected by residual impacts associated with the Program include:

- Caribou;
- Grizzly bear; and
- Wolverine.

8.3.1.1 Increased Helicopter, Equipment and Human Activity

Increased helicopter, equipment and human activity across the Program area may result in disturbance to wildlife from increased visual and audio stimuli. Due to the temporary nature of the increase in traffic and relatively short duration the worksites, this is not expected to contribute significantly to the cumulative effects of the Program on local wildlife populations. However, Program activity during potentially sensitive periods may influence the use of adjacent habitat for some species.

8.3.1.2 Species Specific Cumulative Effects Assessment

8.3.1.2.1 Caribou

Residual effects from increased human activity and associated stimuli can contribute to natural limiting factors that affect year-to-year abundance of boreal caribou in the RSA. These natural limiting factors generally include predation, snow, weather, and insects (Antoniuk, et al., 2009). Stresses from the increase in helicopter and vehicle traffic, equipment use, and human activity

throughout the project will interact with residual impacts of other projects within the RSA and natural factors such as predation, snow accumulation, winter weather conditions, and spring insect stresses to influence fitness and survival of caribou.

Woodland caribou have a low reproductive rate, which makes them particularly sensitive to human activities. A small change in the rate of survival can cause population decline (Antoniuk, et al., 2009). Future developments in the RSA will also continue to add cumulatively to these Program-specific residual impacts.

The Program will not contribute to the long-term disruption of caribou. However, it is expected that because of the stimuli associated with this activity, caribou use may decrease for the duration of the project activities, which are short-term and localized.

Short-term human activity in the area might impact local caribou populations to a relatively small extent by temporarily altering the movements and use of the immediate area, but longer-term contributions to the cumulative effects on caribou are not expected.

8.3.1.2.2 Grizzly Bear

The greatest contribution of the Program to cumulative effects on grizzly bears will be from potential disturbance during denning. Bears may tolerate disturbance to some degree in the winter during denning, but they have been shown to select or abandon their dens in response to activity. Linnell, et al (2000) suggested bears denning in developed areas generally select dens one to two kilometres from human activity. Activity within one kilometre, and especially 200 metres, has been observed to cause variable responses from denning bears, and could lead to den abandonment and, consequently, potential increased cub mortality (Linnell, et al, 2000). Although unlikely, a disturbance to a sow and cubs during denning or the additive effects of increased activity in an area used for denning could have significant and cumulative effects on the local population due to the relatively low densities and reproductive rate of this species.

Mitigation to reduce these potential effects included conducting servicing outside of the fall denning period, and having a Wildlife Monitor present during the Program. Thus, due to mitigation, it is unlikely that the Program will contribute considerably to cumulative effects on grizzly bears.

8.3.1.2.3 Wolverine

Potential effects of the Program on wolverines can be greatest from disturbance during denning. Wolverines appear to be very sensitive to disturbance at natal den sites and will move or abandon kits if disturbed (Jalkotzy, et al, 1997). Jalkotzy, Ross and Nasserden (1997) discussed three instances when researchers disturbed wolverines at natal den sites, and the females and their kits abandoned the area. There is little data on wolverine populations in the area, but they occur in low relative densities across large territories. Consequently, disturbance to a natal den site can influence a local population.

Female wolverines tend to enter natal sites in late February. Thus, due to future winter activity, sensitivity of wolverines, and tendency of wolverines to avoid of human activity, the Program may contribute to the cumulative effects on wolverines due to potential disturbance to a den or influencing natal den site selection. Longer-term residual impacts leading to wolverine avoidance of the area surrounding the Program are unlikely to occur due to the activities being short in duration and localized.



8.3.1.3 *Mitigations to Reduce Impacts on Wildlife and Wildlife Species at Risk*

Primary mitigations for wildlife species at risk include avoiding site maintenance during sensitive timing periods. The Program is not expected to directly affect wetlands, water bodies, or watercourses and, therefore, is not expected to affect fish, waterfowl, or overwintering sites for amphibians.

Mitigation to reduce residual impacts also includes the employment of Wildlife Monitors, and avoidance measures as required.

8.3.1.4 *Summary of Cumulative Effects on Wildlife and Wildlife Species at Risk*

The contribution of the residual effects associated with the Program to the cumulative effects on wildlife species at risk in the RSA were determined to be low due to the temporary nature of the increase in traffic and relatively short duration at the worksites. Ultimately, as discussed, wildlife will be affected by activity during potentially sensitive periods which may influence the use of adjacent habitat for some species. These residual effects are minimal, but may continue to interact with future projects as development in the area continues.

Cumulative effects can be defined as impact on environmental and social systems which result from the incremental impacts of the actions when added to other past, present and reasonably foreseeable future actions. This Program is designed to remediate, reclaim and improve the overall condition of the P-66 wellsite and associated infrastructure and returning the disturbed areas to more natural conditions. Potentially, there will be increased noise and traffic levels. However, the impact will be temporary. Canadian Natural will endeavour to put measures in place that will minimize potential impacts. While some permanent changes have been made to the Program area, the proposed activities will enhance the natural recovery of the disturbances and will result in a net positive effect.

9. CONCLUSION

EnviroSearch has examined the effects that this Program may have on the environment and is of the opinion that the Program can take place without significant effects provided that mitigation measures discussed in this EPP are followed. The intent of the Program is to remediate, reclaim and improve the overall condition of the P-66 wellsite and associated infrastructure. Longer term indirect effects will include reducing the potential for erosion, re-vegetation and returning the disturbed areas to more natural conditions.

We recommend that the work be inspected the following summer and, if needed, annually throughout the term of the permit, to ensure that areas of concern have recovered.

Respectfully submitted,
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24 Hour Emergency Phone Numbers:

Conventional/Thermal: 1(888) 878-3700 - Albian Sands: 1(780) 713-3700 - Horizon: 1(780) 828-3000

Reference this form as a First Aid Plan in case of worker illness or injury.

It must be in place prior to workers arriving onsite, communicated to all workers and posted conspicuously throughout the workplace.

Location / LSD:		Plan Date:	
Muster Area / Emergency Assembly Area:			
Prime Contractor:	Canadian Natural		
Site/Direct Supervisor:		Phone #:	
Safety and Compliance Coordinator (SCC):	Michael Zarbock	Phone #:	250-224-4295
First Aid Attendant(s)/EM Service Provider:		Phone #:	
Oil Sands Emergency Services:		Phone #:	
First Aid Equipment / Supplies / Facilities: (and their location)			
Note: Unless care is refused - The First Aid Attendant/EM Service Provider or Oil Sands Emergency Services is responsible and has full authority for all first aid treatment of the injured worker until the responsibility for treatment is accepted by; a place of medical treatment OR an accepted ambulance service OR by a person with equal or higher first aid certification. If the First Aid Attendant/EM Service Provider leaves the site with the injured worker, all critical work shall cease until they return or a replacement arrives.			
EMERGENCY SERVICES TO BE USED AT WORK LOCATION:			
The First Aid Attendant/EM Service Provider or Oil Sands Emergency Services is responsible to determine the most appropriate method of transportation depending on severity of injury, etc. If a helicopter is the primary or only method of evacuation, prior arrangements must ensure an aircraft will be available during working-hours. In certain situations, STARS / alternate Helicopter Service will be dispatched by 911 personnel.			
<input type="checkbox"/> Local Ambulance <input checked="" type="checkbox"/> Helicopter <input checked="" type="checkbox"/> On-Site ETV <input type="checkbox"/> Other:			
Local Ambulance:	Fort Nelson	Response Time to Location:	210 Minutes
Phone / Channel #:	250-953-3298		
Nearest Helicopter:	Great Slave Helicopters -Fort. Liard	Response Time to Location:	15 Minutes
Phone #:	867-873-2081		
Alternate Helicopter:	Bailey Helicopters Ltd. Ft Nelson	Response Time to Location:	45 Minutes
Phone #:	250-785-2518		
Nearest Medical Center:	Fort Nelson	Response Time to Center:	Minutes
Phone #:	250 774-8100		
COMMUNICATION METHOD TO CONTACT EMERGENCY SERVICES:			
The Site Supervisor or Oil Sands Manager/Superintendent is responsible to request emergency services when required, however if they are not able to, any other person on site may do so.			
Cell Phone #:		Radio (Chan. / Freq.):	
Other:			
INFORMATION TO BE GIVEN TO EMERGENCY RESPONDING PERSONNEL:			
Incident Location/Meeting Point:			
Site #:		Total # Workers Affected:	
Site Contact Phone #:		Nature of Injury:	
Legal Land Description:		Hazards to Responders:	
Latitude:		Weather Conditions:	
Longitude:		Radio Channel:	
Other:		Oil Sands BU/Area:	
Other:		Closest Airstrip:	Fort Liard
DIRECTIONS TO LOCATION:			
Transport by Ground:			
<input checked="" type="checkbox"/> Conventional / Thermal Operations: Provide clear directions to site using specific road instructions, including highway, township or range road #s and landmarks. If possible, have someone meet the ambulance at a main road to guide to location. In BC, the route in/out of the workplace and to medical treatment is required.			
<input type="checkbox"/> Oil Sands Operations: Provide a safe Emergency Meeting Point (EMP), or clear landmark and directions to the incident. If possible, have someone meet Emergency Services to provide an escort to the exact location.			
From Fort Nelson, Travel on Hwy 97 west approximately 29km. Turn right on Hwy 77 and travel approximately 175 km.			
Transport by Air: Provide Coordinates (Latitude / Longitude) / Legal Land Description (LSD) or Registered Helicopter Landing Site (if applicable).			
<input checked="" type="checkbox"/> Conventional / Thermal Operations: Request a Stretcher Equipped helicopter. Ensure a landing site is cleared and identified.			
<input type="checkbox"/> Oil Sands Operations: Emergency Dispatch is responsible for contacting Medivac.			
WORKERS COVERED BY THIS PLAN: (List workers on the back of this page or select site head-count method below). Canadian Natural Supervisors are responsible to ensure an accurate head-count and all workers are aware of the plan.			
<input type="checkbox"/> Reference List <input type="checkbox"/> Other i.e. Card Reader / Site Roster		<input checked="" type="checkbox"/> Reference Canadian Natural Hazard Assessment / Acknowledgement <input type="checkbox"/> All Oil Sands Employees / Contractors / Visitors	

Note: All injuries must be reported per Canadian Natural's Incident Reporting requirements.

Employers must report injuries in accordance with the applicable Workers Compensation Act to the provincial Workers Compensation Board.