



CLEANTECH CAREER AREA: NOVEL LAND & WELLSITE REMEDIATION

CLEANTECH AND TRANSITIONING CAREERS IN OIL & GAS

Career opportunities across Alberta's oil & gas innovation ecosystem

INTRODUCTION

To address climate change and improve environmental performance across a variety of industries requires innovation and new technologies to be developed quickly.

In this environment there is great opportunity for Alberta's workforce including experienced workers, students and new graduates, career counselors and human resource professionals, training and education institutes, innovators, entrepreneurs and employers and their hiring managers.

There is growing demand for all levels of skills and experience in innovation, technology and 'cleantech' development, as well as for the many supporting or related roles that will help apply these new solutions across many industries.

This document, and seven others in the *Cleantech and Transitioning Careers in Oil and Gas* series, is a guide to developing or adapting skills and experience for meaningful work and careers with direct impact on the environment and the economy, even as our province's resource industries transition to help meet climate challenges.

This series uses examples from Alberta's oil and gas industry. However, cleantech skills and roles are also in demand among agriculture, forestry, manufacturing, transportation and other sectors that are vital to the sustainability of our province.

NEW CAREER AREAS IN NOVEL LAND AND WELLSITE REMEDIATION

Wellsite remediation applies engineering, science and innovation to return the land disturbed by oil and gas production to its former state. It is fundamental to the oil and gas industry's circular economy and involves removing contaminants from the soil and water, equipment and materials that were used below the ground to produce oil and gas, and the facilities found at the surface.

Reclaiming a site to its previous state may require site contouring, revegetation or reforestation and/or the creation of micro-sites to support habitat development. Ensuring remediation and reclamation has been achieved takes ongoing monitoring and reporting.

Innovation is changing the oil and gas industry and creating new career opportunities for Albertans

The "novel" aspect of the wellsite remediation and reclamation processes involves using data capture, management and analytics, and integration of emerging technologies to enhance the environmental management of legacy assets. It also includes working with Indigenous communities and companies to incorporate Traditional Knowledge into the planning, remediation and reclamation processes. Examples include:

- Installing solar panels to provide landowners with access to affordable, renewable power for agricultural operations.
- Exploration and production of new energy sources such as geothermal and hydrogen, as well as rare minerals and gas including helium and lithium.
- Assessing sub-surface geology for carbon capture and storage potential.

Wellsite remediation offers opportunities to innovate, work across disciplines and regulators, and achieve market diversification while addressing an important environmental concern.

What is Novel Land and Wellsite Remediation in the Oil and Gas Industry?

Novel land and wellsite remediation practices leverage engineering, science and technology expertise to investigate the potential to transform a remediated or reclaimed wellsite into a new or improved production or operational process.

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CAREER PATHWAYS FOR NOVEL LAND AND WELLSITE REMEDIATION

Universal Attributes Required

Alongside technical skill requirements, workers in cleantech careers (in any industry) require important universal attributes. These are also known as soft skills, attitudes or behaviours.



WORKING IN NOVEL LAND AND WELLSITE REMEDIATION

Key phases involved in the timely, cost-effective and sustainable decommissioning, closure and repurposing of unused oil and gas assets include:

- **Project planning:** Conducting site assessments and collaborative ideation of solutions.
- **Subsurface decommissioning:** The permanent plugging of wellbores and isolating them from groundwater.
- **Surface decommissioning:** The removal of surface equipment and facilities.
- **Site remediation and reclamation:** The removal of contaminants and returning a site to its original state.
- **Reusing and repurposing:** An iterative assessment process throughout the project lifecycle to determine if existing surface and/or sub-surface infrastructure can be leveraged for economic diversification.



Want more details on activities within the Novel Land and Wellsite Remediation sector?

Find Novel Land and Wellsite Remediation Key Activities on the Clean Resource Innovation Network (CRIN) website:

WWW.CLEANRESOURCEINNOVATION.COM



KEY SKILLS AND OCCUPATIONS TABLES

The following table outlines the full lifecycle of novel land use and wellsite remediation and the skills, knowledge, and occupations required to address the environmental impact of oil and gas legacy assets.

KEY SKILLS & KNOWLEDGE	PROJECT PLANNING <i>Site assessment and collaborative ideation of solutions</i>	SUBSURFACE DECOMMISSIONING <i>Permanent plugging of wellbores and completions</i>	SURFACE DECOMMISSIONING <i>Removal of surface equipment and facilities</i>	SITE REMEDIATION & RECLAMATION <i>Removal of contaminants and returning a site to its original state</i>
	<ul style="list-style-type: none"> Apply local knowledge of the field and community Pay attention to detail Identify non-routine situations Assess, prioritize and manage risk (technical, compliance, mineral expiries, environmental, and stakeholder) Leverage learnings to drive continuous technical and cost efficiencies Understand how to maximize return on funding and generate value for the corporation Identify technology requirements Data interpretation and analysis Budget preparation and control Valid driver's license with a clean abstract Plan, organize, schedule, and coordinate all assigned project activities including mobilization, demobilization, manpower requirements, and scheduling of equipment, materials, and facilities Stage 1 and 2 Preliminary Site Investigations training Spill response training. Groundwater monitoring training Surface water sampling training. Schedule B Site Reclamation Assessment training Proficiency with regulations and experience working with regulatory agencies. 	<ul style="list-style-type: none"> Problem-solving skills Manage regulatory compliance and actively work with regulators Ability to communicate and develop rapport with clients and stakeholders. Hazard identification and mitigation training Ability to complete job tasks in a safe and efficient manner Valid driver's license with a clean abstract Possess safety tickets including First Aid/CPR, Construction Safety Training (CSTS), Transportation of Dangerous Goods (TDG) and H2S Alive Ability to work independently while managing time and productivity Complete and maintain all required paperwork and documentation within set timelines: daily logs, dispatch and trip reports, and time sheets Perform pre and post trip inspections and ensure oilfield units are operating properly Data analytics and management Follow all local, provincial and federal compliance regulations and rules 	<ul style="list-style-type: none"> Problem-solving skills Manage regulatory compliance and actively work with regulators Ability to communicate and develop rapport with clients and stakeholders Hazard identification and mitigation training Ability to complete job tasks in a safe and efficient manner Knowledge of how to use a variety of power and hand tools Valid driver's license with a clean abstract Possess safety tickets including First Aid/CPR, Construction Safety Training (CSTS), Transportation of Dangerous Goods (TDG) and H2S Alive Ability to work independently while managing time and productivity Data analytics and management Follow all local, provincial and federal compliance regulations and rules 	<ul style="list-style-type: none"> Problem-solving skills Manage regulatory compliance and actively work with regulators Ability to communicate and develop rapport with clients and stakeholders Valid driver's license with a clean abstract Ability to complete job tasks in a safe and efficient manner Understand remediation techniques to address soil contamination Knowledge of land, plant and tree management Prepare regulatory reports and apply for reclamation certificate Data analytics and management Follow all local, provincial and federal compliance regulations and rules

REUSE AND REPURPOSE: *leveraging existing surface and/or sub-surface infrastructure for economic diversification.*

Specific skill and knowledge requirements will align with how the site will be reused or repurpose.



KEY OCCUPATIONS	<p>PROJECT PLANNING <i>Site assessment and collaborative ideation of solutions</i></p> <ul style="list-style-type: none"> • Project managers • Stakeholder engagement specialists • Site inspectors • Regulatory specialists • Environmental scientists/technologists: agrolologists, geologists, biologists, hydrologists • Procurement specialists 	<p>SUBSURFACE DECOMMISSIONING <i>Permanent plugging of wellbores and completions</i></p> <ul style="list-style-type: none"> • Wellsite supervisors • Regulatory specialists • Stakeholder engagement specialists • Environmental specialists • Truck drivers: water, picker/crane, waste fluids, vacuum, haul • Service rig crews • Oil and gas well services operators and labourers: coiled tubing, cementing, wireline • Health and safety specialists (medic) • Heavy equipment operators • Pipeline technicians 	<p>SURFACE DECOMMISSIONING <i>Removal of surface equipment and facilities</i></p> <ul style="list-style-type: none"> • Heavy equipment operators • Construction labourers • Truck drivers: haul, dump • Environmental compliance specialists • Health and safety specialists (medic) • Regulatory reporting specialists 	<p>SITE REMEDIATION & RECLAMATION <i>Removal of contaminants and returning a site to its original state</i></p> <ul style="list-style-type: none"> • Environmental, health and safety specialists • Environmental scientists/technologists: agrolologists, geologists, biologists, hydrologists • Soil specialists • Regulatory specialists/filers • Heavy equipment operators • Health and safety specialists (medic) • Environmental monitors
	<p>REUSE AND REPURPOSE: <i>leveraging existing surface and/or sub-surface infrastructure for economic diversification.</i></p> <ul style="list-style-type: none"> • Project managers • Regulatory specialists • Stakeholder and community engagement specialists • Reservoir engineers • Geologists • Geophysicists • Meteorologists • Water specialists • Civil engineers 			

The **Cleantech and Transitioning Careers in Oil and Gas Series** is the result of a 2021 project funded by the Province of Alberta working in partnership with the Government of Canada, and research conducted by consultants Cheryl Knight and Pat Hufnagel-Smith.

For more information please contact: info@cleanresourceinnovation.com and to view or download documents in the series, visit www.cleanresourceinnovation.com